CITY OF MENLO PARK HOUSING ELEMENT UPDATE

Draft Subsequent Environmental Impact Report

Prepared for
City of Menlo Park

November 2022

ESA

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TABLE OF CONTENTS

Chapter 1, Introduction 1-1
1.1 Project Overview 1-1
1.2 Determination to Prepare an SEIR 1-2
1.3 This is a Program EIR 1-2
1.4 Role and Standards of Adequacy of the SEIR 1-3
1.5 Environmental Review Process 1-4
1.6 Organization of the Draft SEIR 1-5
1.7 References 1-6

Chapter 2, Executive Summary 2-1
2.1 Introduction 2-1
2.2 Regional Location and Project Area 2-2
2.3 Purpose of the Housing Element Update, Safety Element Update, and Environmental Justice Element Update 2-5
2.4 Project Components 2-9
2.5 Project Objectives 2-15
2.6 Identified Significant Impacts 2-16
2.7 Alternatives to the Proposed Project 2-17
2.8 Comments on Notice of Preparation 2-18
2.9 Areas of Controversy 2-18
2.10 Issues to be Resolved 2-18

Chapter 3, Project Description 3-1
3.1 Introduction 3-1
3.2 Project Location and Setting 3-2
3.3 Background 3-5
3.4 Project Components 3-9
3.5 Project Objectives 3-18
3.6 Intended Uses of this SEIR 3-19
3.7 References 3-21

Chapter 4, Environmental Setting, Impacts, and Mitigation Measures 4.0-1
4.0 Introduction to the Environmental Analysis 4.0-1
4.1 Aesthetics 4.1-1
4.2 Air Quality 4.2-1
4.3 Biological Resources 4.3-1
4.4 Cultural Resources 4.4-1
4.5 Energy 4.5-1
4.6 Geology and Paleontological Resources 4.6-1
4.7 GHG Emissions 4.7-1
4.8 Hazards and Hazardous Materials 4.8-1
4.9 Hydrology and Water Quality 4.9-1
4.10 Land Use and Planning 4.10-1
4.11 Noise and Vibration 4.11-1

Page

4.12 Population and Housing 4.12-1
4.13 Public Services and Recreation 4.13-1
4.14 Transportation 4.14-1
4.15 Tribal Cultural Resources 4.15-1
4.16 Utilities and Service Systems 4.16-1
4.17 Wildfire 4.17-1
4.18 Issues Not Subjected to Detailed Analysis 4.18-1

Chapter 5, Alternatives 5-1
5.1 CEQA Requirements 5-1
5.2 Factors in the Selection of Alternatives 5-4
5.3 Description of Alternatives Selected for Analysis 5-11
5.4 Comparative Analysis of the Alternatives 5-15
5.5 Environmentally Superior Alternative 5-26

Chapter 6, Other CEQA Considerations 6-1
6.1 Significant and Unavoidable Adverse Impacts 6-1
6.2 Significant Irreversible Impacts 6-2
6.3 Growth-Inducing Impacts 6-3
6.4 Cumulative Impacts 6-6
6.5 Analysis of the Safety Element and Environmental Justice Element 6-6

Chapter 7, Report Preparation 7-1
7.1 Lead Agency 7-1
7.2 Environmental Consultants 7-2
7.3 Housing Element Consultants 7-3

Appendix

Appendix A. NOP and Responses
Appendix B. Biological Resources
Appendix C. Noise
Appendix D. Utilities & Service Systems

List of Tables

Table 2-1 ConnectMenlo EIR Project Description: Summary of Development Potential 2-6
Table 2-2 Regional Housing Needs Allocation 2-7
Table 2-3 Major Pipeline Projects 2-10
Table 2-4 Potential Housing Opportunity Sites List 2-12
Table 2-5 Summary of Impacts And Mitigation Measures for the City of Menlo Park Housing Element Update 2-20
Table 3-1 ConnectMenlo EIR Project Description: Summary of Development Potential 3-6
Table 3-2 Regional Housing Needs Allocation 3-7
Table 3-3 Major Pipeline Projects 3-10
Table 3-4 Potential Housing Opportunity Sites List 3-12
Table 3-5 City of Menlo Park Growth Projections 2021-2040 3-16
Table 4.0-1 Residential “Pipeline” Projects in the City 4.0-6
Table 4.0-2 City of Menlo Park Growth Projections 2021-2040 ..... 4.0-7
Table 4.2-1 Air Quality Index Statistics for the San Francisco Bay Area Air Basin 4.2-4
Table 4.2-2 Summary of Air Quality Monitoring Data (2018-2020) 4.2-7

Page

Table 4.3-1 Special-Status Species Potential to Occur in the HEU Study Area 4.3-4
Table 4.3-2 Special-Status Species Included in the ConnectMenlo EIR Not Expected to Occur in the HEU Study Area 4.3-6
Table 4.4-1 Previously Identified Historic Resources 4.4-6
Table 4.4-2 Previously Recorded Archaeological Resources 4.4-9
Table 4.5-1 Existing Annual State and Regional Energy Use 4.5-2
Table 4.5-2 PCE & PG&E Power Content Labels 4.5-3
Table 4.7 1 California GHG Emissions Inventory 4.7-3
Table 4.7 2 City of Menlo Park Emissions by Sector 4.7-4
Table 4.7-3 Consistency with Applicable GHG Reduction Actions in 2017 Scoping Plan Update 4.7-27
Table 4.7-4 Consistency with Actions in the 2030 Climate Action Plan 4.7-30
Table 4.8-1 Active and Relevant Hazardous Materials Release Sites 4.8-5
Table 4.9-1 CWA 303(d) Listed Surface Waters 4.9-4
Table 4.11-1 Existing Monitored Noise Levels Along Streets in the Vicinity of Housing Element Update Opportunity Sites 4.11-6
Table 4.11-2 Sound Levels That Protect Public Health (dBA) 4.11-6
Table 4.11-3 Reference Construction Equipment Noise Levels (50 feet from source) 4.11-15
Table 4.11-4 Vibration Levels for Construction Equipment 4.11-19
Table 4.11-5 Baseline and Projected Peak Hour Traffic Noise Levels Along Streets Housing Element Update 4.11-20
Table 4.11-6 Baseline and Projected Peak Hour Traffic Noise Levels Along Streets Housing Element Update 4.11-25
Table 4.12-1 City of Menlo Park Population and Housing Units per the US Census ... 4.12-4
Table 4.12-2 San Mateo County Population and Housing Units per the US Census ... 4.12-4
Table 4.13-1 Menlo Park City School District – Capacity and Enrollment 4.13-6
Table 4.13-2 Ravenswood City School District – Capacity and Enrollment 4.13-7
Table 4.13-3 Las Lomitas Elementary School District – Capacity and Enrollment 4.13-8
Table 4.13-4 Redwood City School District – Capacity and Enrollment 4.13-9
Table 4.13-5 HEU Student Generation 4.13-19
Table 4.14-1 Existing Transit Service, As of May 2022 ..... 4.14-10
Table 4.14-2 VMT Evaluation 4.14-22
Table 4.14-3 Cumulative VMT Evaluation 4.14-26
Table 4.16-1 Water Demand - Housing Element Update and Additional 2040 Growth Projections 4.16-26
Table 4.16-2 HEU Residential Units, Distribution in Water Service Areas and Demand 4.16-26
Table 4.16-3 Bear Gulch District Normal Year Water Supply and Demand Projections (AFY) 4.16-27
Table 4.16-4 MPMW Normal Year Water Supply and Demand Projections (AFY) 4.16-27
Table 4.16-5 MPMW Single-Dry-Year Potable Water Supply and Demand Projections (AFY) with Bay-Delta Plan Amendment 4.16-28
Table 4.16-6 Bear Gulch District Single Dry Year Potable Water Supply and Demand Projections (AFY) with Bay-Delta Plan Amendment 4.16-29
Table 5-1 Regional Housing Needs Allocation 5-5
Table 5-2 Alternative Impact Summary and Comparison 5-25

Page

List of Figures

Figure 2-1 City Boundaries and Regional Location 2-3
Figure 2-2 Potential Housing Opportunity and Land Use Strategy Sites 2-4
Figure 3-1 City Boundaries and Regional Location 3-3
Figure 3-2 Existing General Plan Land Use Designations 3-4
Figure 3-3 Potential Housing Opportunity and Land Use Strategy Sites 3-15
Figure 4.2-1 Existing Sources of TAC Emissions 4.2-24
Figure 4.6-1 Landslide and Liquefaction Zones 4.6-5
Figure 4.8-1 Cleanup Sites 4.8-4
Figure 4.9-1 Flood Zones 4.9-8
Figure 4.9-2 Dam Failure Inundation Zones 4.9-9
Figure 4.14-1 Existing Bicycle Facilities 4.14-5
Figure 4.14-2 Existing Transit Services 4.14-9
Figure 4.14-3 TAZ Level Increase in Units (Baseline + HEU Scenario vs. Baseline Scenario) 4.14-23
Figure 4.14-4 TAZ Level Increase in Units (Cumulative + HEU Scenario vs. Cumulative Scenario) 4.14-27
Figure 4.16-1 Housing Sites and Water Service Areas 4.16-46
Figure 5-1 Alternative 2: Low VMT Area Alternative 5-14

CHAPTER 1
Introduction

This Subsequent Environmental Impact Report (SEIR) has been prepared pursuant to the California Environmental Quality Act (CEQA), California Public Resources Code Sections 21000, et seq., and the Guidelines for the California Environmental Quality Act (CEQA Guidelines), California Code of Regulations, Title 14, Sections 15000, et seq., to disclose the potential environmental consequences of implementing the proposed City of Menlo Park Housing Element Update (HEU), referred to hereafter as the "project." As required under CEQA, the SEIR evaluates and describes the potentially significant environmental effects ("impacts") of the project, identifies mitigation measures to avoid or reduce the significance of potential impacts, and evaluates the comparative effects of potentially feasible alternatives to the project.

1.1 Project Overview

The HEU project analyzed in the SEIR would include adoption of General Plan amendments that would add or modify goals, objectives, policies, and implementation programs related to housing that would apply citywide, and that would address the maintenance, preservation, improvement, and development of housing in the city.

In addition, the HEU would identify specific sites appropriate for the development of multifamily housing, and the City of Menlo Park (City) would rezone those sites if/as necessary to meet the requirements of State law. Both the existing and proposed sites that can accommodate development of multifamily housing are located in a subset of the city, mostly in areas within and around downtown.

Based on the Regional Housing Needs Allocation (RHNA) set by the Association of Bay Area Governments (ABAG), the HEU will need to plan for at least an additional 2,946 dwelling units plus a "buffer" which has been identified at 30 percent or about 900 units for planning purposes. This SEIR evaluates the potential for housing sites sufficient to accommodate 4,000 new units, as well as accounting for pipeline projects (i.e., approved or pending housing developments) and potential accessory dwelling units (ADUs) in order to consider a maximum build-out scenario for purposes of the CEQA evaluation.

In addition to the amendments that would take place within the General Plan's Housing Element, a number of other amendments to other elements of the General Plan would be required to fully conform those elements to the changes made in the Housing Element or comply with other changes in State law. Specifically, amendments to the City's Land Use Element may be needed to reflect changes to the Housing Element, and the City is proposing updates to the Safety Element

to address fire risk and climate adaptation and resiliency strategies. Finally, the City is proposing adoption of a new Environmental Justice Element in conformance with California Government Code Section 65302(h).

1.2 Determination to Prepare an SEIR

CEQA requires a public agency to prepare an EIR describing the environmental effects of a project before a public agency can approve a project that may have potentially significant, adverse physical effects on the environment. The EIR is a public information document that identifies and evaluates potential environmental impacts of a project, recommends mitigation measures to lessen or eliminate significant adverse impacts, and examines feasible alternatives to the project.

The City prepared and certified an EIR analyzing the update to its General Plan referred to as *ConnectMenlo* (State Clearinghouse No. 20150622054), a program environmental analysis certified in 2016. Pursuant to Section 15162 of the CEQA Guidelines, a SEIR is required if the City, as the CEQA Lead Agency, determines on the basis of substantial evidence in light of the whole record that there have been substantial changes to the project and/or the circumstances under which the project is undertaken, or substantial new information has arisen, and that one or more of the foregoing will result in new or substantially more severe impacts and that thus necessitate major revisions to the prior EIR and/or new mitigation measures or alternatives are now applicable.

The City has determined, pursuant to CEQA, that the proposed HEU project will require the preparation of a SEIR to substantially revise the *ConnectMenlo* Final EIR. A SEIR is warranted because the HEU involves an update to the adopted General Plan and there is reasonable potential that the update may result in new or substantially more severe significant environmental effects than those identified in the certified *ConnectMenlo* Final EIR.

The information contained in the SEIR must be reviewed and considered by the City of Menlo Park and by any responsible agencies (as defined in CEQA) prior to a decision to approve, disapprove, or modify the project.

1.3 This is a Program EIR

Like the *ConnectMenlo* Final EIR, this SEIR will be presented as a program EIR, as provided for in CEQA Guidelines Section 15168. Section 15168(a) of the CEQA Guidelines states that a program EIR is appropriate for projects which are "… a series of actions that can be characterized as one large project and are related either:

1. Geographically;
2. A logical part in the chain of contemplated actions;
3. In connection with issuance of rules, regulations, plans or other general criteria to govern the conduct of a continuing program; or

4. As individual activities carried out under the same authorizing statutory or regulating authority and having generally similar environmental effects which can be mitigated in similar ways."

Section 15168(b) of the CEQA Guidelines further states "Use of a Program EIR can provide the following advantages. The Program EIR can:

1. Provide an occasion for a more exhaustive consideration of effects and alternatives than would be practical in an EIR on an individual action;
2. Ensure consideration of cumulative impacts that might be slighted in a case-by-case analysis;
3. Avoid duplicate consideration of basic policy considerations;
4. Allow the Lead Agency to consider broad policy alternative and program-wide mitigation measures at an early time when the agency has greater flexibility to deal with basic problems or cumulative impacts; and
5. Allow reduction in paperwork."

Future discretionary actions that would be facilitated by the HEU's adoption, particularly those related to the development of housing, would require additional assessment to determine consistency with the analysis and mitigation provided in this program SEIR. The potential future actions would be subject to the mitigation measures and the performance criteria established in this SEIR, or as determined in the subsequent environmental document if it is found that future actions could result in environmental impacts not foreseen in this program SEIR.

It is important to note that while the law requires the HEU to include an inventory of housing sites and requires the City to zone those sites for multifamily housing, the City is not required to actually develop housing on these sites. Future development on the identified sites will be up to the property owners and will be largely dependent on market forces and (in the case of affordable housing) available subsidies.

As noted above, this SEIR constitutes a substantial revision of the *ConnectMenlo* Final EIR, a programmatic environmental analysis certified in 2016, and analyzes proposed amendments to the City's General Plan that would, if adopted, update the Housing Element and Safety Element, and add an Environmental Justice Element. This SEIR relies on and incorporates information contained in the *ConnectMenlo* Final EIR where that information remains relevant, and provides additional information and analysis where warranted. Impact evaluations are based on an updated (2021) baseline and identify where conclusions vary from the *ConnectMenlo* Final EIR. The *ConnectMenlo* Final EIR and associated documents may be found on the City's website.

1.4 Role and Standards of Adequacy of the SEIR

The CEQA Guidelines define the role and standards of adequacy of an EIR as follows:

- **Informational Document.** An EIR is an informational document which will inform public agency decision-makers and the public generally of the significant environmental effect(s) of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project. The public agency shall consider the information in the EIR along

with other information which may be presented to the agency (CEQA Guidelines Section 15121[a]).

- **Standards for Adequacy of an EIR.** An EIR should be prepared with a sufficient degree of analysis to provide decision-makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure (CEQA Guidelines Section 15151).

CEQA Guidelines Section 15382 defines a significant effect on the environment as "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project…" Therefore, in identifying the significant impacts of the project, this SEIR describes the potential for the project to result in substantial physical effects within the area affected by the project, and identifies mitigation measures that would avoid or reduce the magnitude of those effects.

1.5 Environmental Review Process

1.5.1 Notice of Preparation

Pursuant to the requirements of CEQA for the initiation of environmental review, on December 23, 2021, the City sent a Notice of Preparation (NOP) to the State Clearinghouse [SCH No. 20150622054], responsible and trustee government agencies, organizations, and individuals potentially interested in the project. As discussed in the NOP and pursuant to the provisions of CEQA, the City did not prepare a CEQA Initial Study prior to issuance of the NOP, because the City determined that it was clear at the time that an SEIR was required (CEQA Guidelines Section 15060[d]). The NOP requested that agencies with regulatory authority over any aspect of the project describe that authority and identify relevant environmental issues that should be addressed in the SEIR. Interested members of the public were also invited to comment. The comment period for the NOP was set for December 23, 2021 through January 31, 2022. A scoping meeting was scheduled before the City's Planning Commission on January 24, 2022. The scoping meeting was available for remote participation via the internet.

The NOP and the comments received on the NOP during the comment period are included in **Appendix A** of this SEIR. While all comments received during the NOP comment period are included in Appendix A, a number of the comments related to issues and concerns that were not related to the environmental impacts of the HEU. Those comments will be responded to in a staff report and considered by the Planning Commission and City Council as they deliberate adoption of the HEU.

1.5.2 Public Review

The Draft SEIR is available for public review and comment as set forth in the Notice of Availability and Notice of Completion circulated by the City on November 4, 2022. During the

review and comment period set for **Friday November 4, 2022 through Monday December 19, 2022**, written comments (including email) regarding the Draft SEIR may be submitted to the City at the address below.

Tom Smith, Acting Principal Planner
Community Development Department
City of Menlo Park
701 Laurel Street, Menlo Park, CA 94025
tasmith@menlopark.orgmailto:
(650) 330-6730

The Draft SEIR, Notice of Availability, and other supporting documents, such as technical reports prepared as part of the SEIR process, are available for public review at the Menlo Park Main Library at 800 Alma Street and at the Belle Haven Branch Library at 413 Ivy Drive; on the City's HEU project webpage at: https://menlopark.gov/housingelement; and on the State Clearinghouse website at: https://ceqanet.opr.ca.gov/Project/2015062054.

1.5.3 Final SEIR and SEIR Certification

Following the public review and comment period for the Draft SEIR, the City will prepare responses that address all substantive written and oral comments on the Draft SEIR's environmental analyses that are received within the specified review period. The responses to comments and any revisions to the Draft SEIR initiated by City staff will be prepared as a Final SEIR document. The Draft SEIR and its Appendices, together with the Final SEIR, will constitute the SEIR for the project.

1.5.4 Mitigation Monitoring and Reporting Plan

Throughout this SEIR, mitigation measures are identified, where applicable, and presented in language that will facilitate preparation of a Mitigation Monitoring and Reporting Plan (MMRP). As required under CEQA, a MMRP will be prepared and presented to the City Council for adoption at the time of certification of the Final SEIR for the project, and will identify the timing and roles and responsibilities for implementation of adopted mitigation measures.

1.6 Organization of the Draft SEIR

This *Introduction* (Chapter 1) presents an overview of the process by which this SEIR will be reviewed and used by the decision-makers in their consideration of the project.

The *Summary* (Chapter 2) includes a brief project description and a summary table that lists the environmental impacts, proposed mitigation measures, and the level of significance after mitigation. Detailed analysis of these impacts and mitigation measures is provided in Chapter 4, *Environmental Setting, Impacts, and Mitigation Measures*. The Summary also provides a summary of the alternatives to the project.

The *Project Description* (Chapter 3) describes the project location and boundaries; lists the project objectives; and provides a general description of the technical, economic, and

environmental characteristics of the project. This chapter also includes a list of required approvals for the project and other agencies that may be responsible for approving aspects of the project.

The *Environmental Setting, Impacts, and Mitigation Measures* (Chapter 4) contains a description of the environmental setting (existing physical environmental conditions), the regulatory framework, and the environmental impacts (including cumulative impacts) that could result from the project. It includes the thresholds of significance used to determine the significance of adverse environmental effects. This chapter also identifies the mitigation measures that would avoid or substantially lessen these significant adverse impacts. The impact discussions disclose the significance of each impact both with and without implementation of mitigation measures.

Alternatives (Chapter 5) evaluates a range of reasonable alternatives to the project and identifies an environmentally superior alternative, consistent with the requirements of CEQA. The alternatives analysis evaluates each alternative's ability to meet the project objectives and its ability to reduce environmental impacts.

Other CEQA Considerations (Chapter 6) addresses growth-inducing effects, significant irreversible environmental changes, and significant unavoidable environmental effects of the Project.

Report Preparers, and Persons and Organizations Consulted (Chapter 7) identifies the authors of the SEIR. Persons and documents consulted during preparation of the SEIR are listed at the end of each analysis section.

Appendices. The appendices include environmental scoping information and technical reports and data used in the preparation of the Draft SEIR. These documents are included on CD at the back of the Draft SEIR.

1.7 References

California Environmental Quality Act (CEQA) Statutes and Guidelines; Public Resources Code 21000-21177) and California Code of Federal Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387. 2020.

City of Menlo Park. 2016. *Draft EIR for ConnectMenlo: General Plan Land Use & Circulation Elements and M-2 Area Zoning Update*. Available online: https://beta.menlopark.org/Government/Departments/Community-Development/Planning-Division/Comprehensive-planning/ConnectMenlo. Accessed August 22, 2022.

CHAPTER 2
Executive Summary

2.1 Introduction

As provided by Section 15123 of the California Environmental Quality Act (CEQA) Guidelines (CEQA *Guidelines*), this chapter provides a brief summary of the proposed City of Menlo Park Housing Element Update (HEU) and its consequences. This chapter is intended to summarize in a stand-alone section the proposed project described in Chapter 3 (*Project Description*), the impacts and mitigation measures discussed in the various subsections of Chapter 4 (*Environmental Setting, Impacts, and Mitigation Measures*), and the alternatives analysis presented in Chapter 5 (*Alternatives*).

The City prepared and certified an EIR analyzing the update to its General Plan referred to as *ConnectMenlo* (State Clearinghouse No. 20150622054), a program environmental analysis certified in 2016. Pursuant to Section 15162 of the CEQA Guidelines, a Subsequent Environmental Impact Report (SEIR) is required if the City, as the CEQA Lead Agency, determines on the basis of substantial evidence in light of the whole record that there have been substantial changes to the project and/or the circumstances under which the project is undertaken, or substantial new information has arisen, and that one or more of the foregoing will result in new or substantially more severe impacts and that thus necessitate major revisions to the prior EIR and/or new mitigation measures or alternatives are now applicable.

The City has determined, pursuant to CEQA, that the proposed HEU project will require the preparation of a SEIR to substantially revise the *ConnectMenlo* Final EIR. A SEIR is warranted because the HEU involves an update to the adopted General Plan and there is reasonable potential that the update may result in new or substantially more severe significant environmental effects than those identified in the certified *ConnectMenlo* Final EIR.

This SEIR has been prepared to evaluate the anticipated environmental effects of the project in conformance with the provisions of CEQA and the CEQA *Guidelines*. The lead agency, the City of Menlo Park, is the public agency that has the principal responsibility for approving the HEU.

Like the *ConnectMenlo* Final EIR, this SEIR will be presented as a program EIR, as provided for in CEQA Guidelines Section 15168. Section 15168(a) of the CEQA Guidelines states that a program EIR is appropriate for projects which are "… a series of actions that can be characterized as one large project and are related either:

1. Geographically;
2. A logical part in the chain of contemplated actions;

3. In connection with issuance of rules, regulations, plans or other general criteria to govern the conduct of a continuing program; or
4. As individual activities carried out under the same authorizing statutory or regulating authority and having generally similar environmental effects which can be mitigated in similar ways."

Section 15168(b) of the CEQA Guidelines further states: "Use of a Program EIR can provide the following advantages. The Program EIR can:

1. Provide an occasion for a more exhaustive consideration of effects and alternatives than would be practical in an EIR on an individual action;
2. Ensure consideration of cumulative impacts that might be slighted in a case-by-case analysis;
3. Avoid duplicate consideration of basic policy considerations;
4. Allow the Lead Agency to consider broad policy alternative and program-wide mitigation measures at an early time when the agency has greater flexibility to deal with basic problems or cumulative impacts, and
5. Allow reduction in paperwork."

Future discretionary actions that would be facilitated by the HEU's adoption, particularly those related to the development of housing, would require additional assessment to determine consistency with the analysis provided in this Program SEIR. Potential future actions would also be subject to the mitigation measures established in this Program SEIR unless superseded by a subsequent environmental document that is required to analyze significant environmental impacts not foreseen in this Program SEIR.

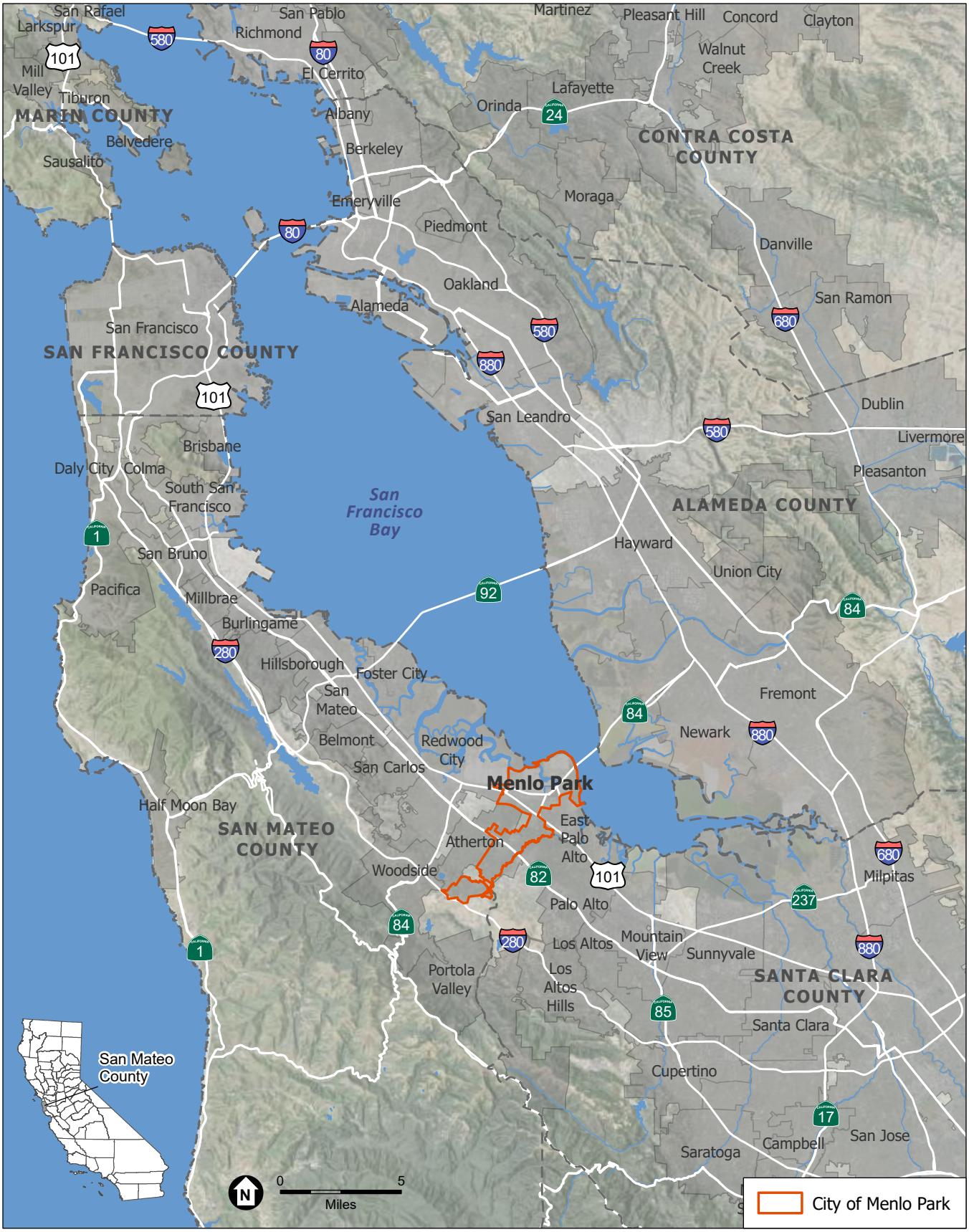
2.2 Regional Location and Project Area

2.2.1 Regional Setting

Menlo Park is located in the San Francisco Bay Area, approximately 30 miles south of downtown San Francisco and about 20 miles northwest of San Jose (latitude 37º27'10"N, longitude 122º11'00"W). The City is located at the southern edge of San Mateo County and was incorporated in 1927. The City encompasses approximately 17 square miles (approximately seven square miles of which is water) with a population of approximately 35,000 people. The City boundaries and its regional location are shown in **Figure 2-1**. The geographic extent of environmental analysis included in the SEIR for the proposed HEU will be the City limits.

2.2.2 Project Site

The HEU would identify specific sites appropriate for the development of additional multifamily housing, and the City would rezone those areas if/as necessary to meet the requirements of State law. The various housing opportunity sites and land use strategy sites that can accommodate development of multifamily housing are located in various locations in the City, but are primarily clustered in the downtown area. These areas appear in **Figure 2-2**, and comprise the housing opportunity and land use strategy sites for the HEU.

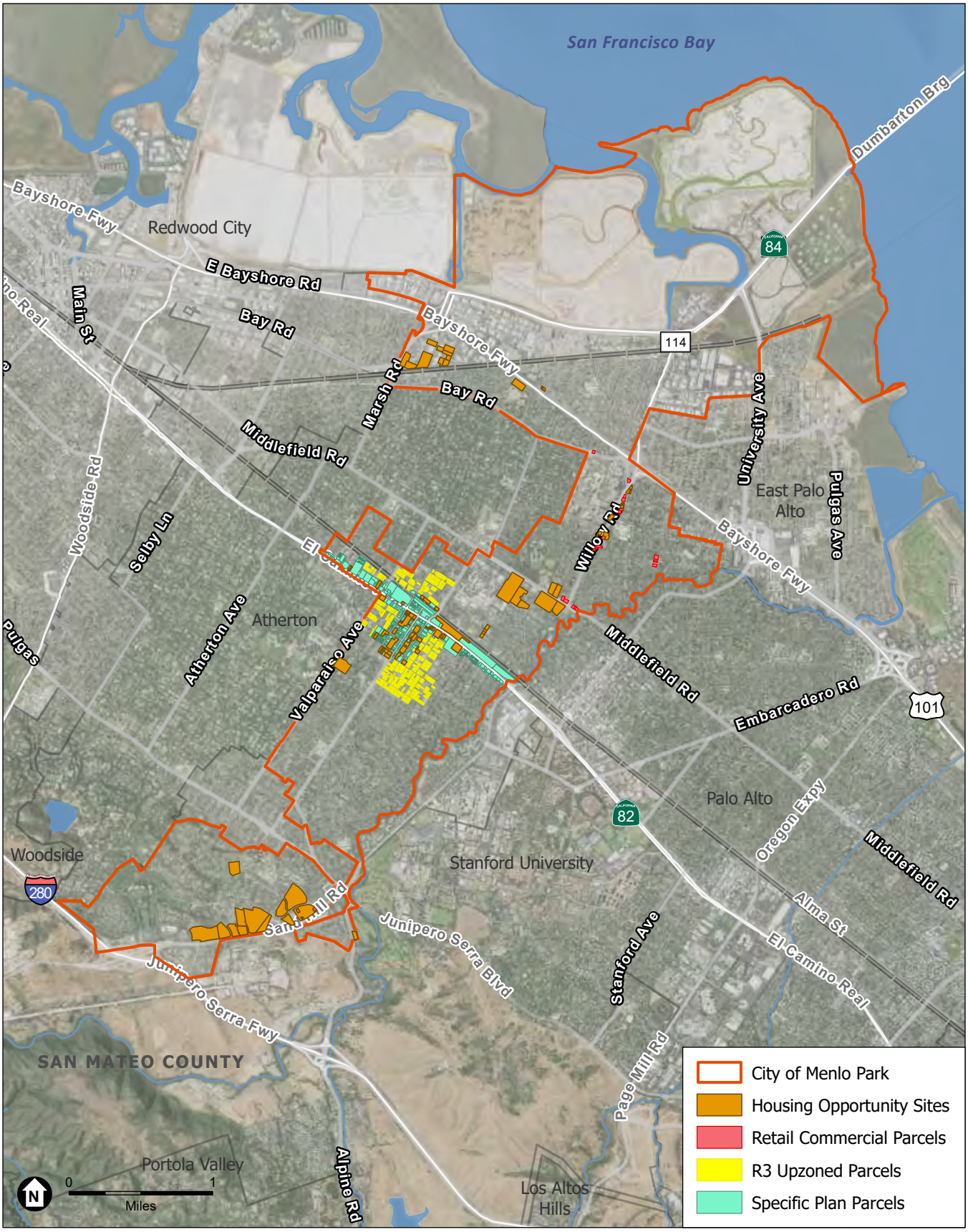


SOURCE: Esri, 2022; ESA, 2022

Menlo Park Housing Element Update EIR

Figure 2-1
City Boundaries and Regional Location

ESA



SOURCE: Esri, 2022; M-Group, 2022; ESA, 2022

Menlo Park Housing Element Update EIR

Figure 2-2
Potential Housing Opportunity and Land Use Strategy Sites

2.3 Purpose of the Housing Element Update, Safety Element Update, and Environmental Justice Element Update

2.3.1 Background

ConnectMenlo

The General Plan (Land Use and Circulation Elements) and M-2 Area Zoning Update public outreach and participation process known as *ConnectMenlo* began in August 2014 and concluded in November 2016 with adoption of updated Land Use and Circulation Elements following recommendations by a General Plan Advisory Committee, and consideration by the Planning Commission and the City Council at public meetings.

The updated Land Use Element included goals, policies, and programs to guide local decisions regarding land use, and framed the type and scope of potential development that may occur in the City. The Land Use Element encourages healthy and sustainable living, both economically and environmentally. The updated Circulation Element addresses transportation throughout the City and aims to improve mobility connections Citywide for all modes of travel. The General Plan amendments were accompanied by Zoning Ordinance amendments to foster a new live/work/play environment in the Bayfront Area. The City Council adopted three new zoning districts: Office (O), Life Sciences (LS), and Residential Mixed Use (R-MU) to set the framework for the creating the live/work/play concept.

A primary focus of *ConnectMenlo* was to balance the potential for development impacts with providing community amenities, especially for the Belle Haven neighborhood. Bayfront Area projects may propose development at the bonus level, which allows additional height, floor area ratio (FAR), and/or density above the base level of zoning regulations in exchange for community amenities. Highlighted community amenities included improved transportation alternatives, affordable housing to support both the adjacent neighborhood and the growing workforce, and expanded service and community-serving retail uses.

The new development potential created in the Bayfront Area was analyzed in the *ConnectMenlo* EIR, along with remaining development potential under the General Plan, and is summarized in **Table 2-1**.

This SEIR analyzes potential impacts of the HEU, and in doing so, describes ways in which the HEU would result in impacts that would be new or different from those identified in the 2016 *ConnectMenlo* EIR.

TABLE 2-1
CONNECTMENLO EIR PROJECT DESCRIPTION: SUMMARY OF DEVELOPMENT POTENTIAL[A]

Added Bayfront Area Development Potential	Existing General Plan Development Potential	Total Development Potential Analyzed in *ConnectMenlo* EIR
2.3 M sq. ft. non-residential	1.8 M sq. ft. non-residential	4.1 M sq. ft. non-residential
4,500 residential units	1,000 residential units	5,500 residential units
400 hotel rooms	0	400 hotel rooms

NOTES:

a City Council Resolution 6356, Adopted December 6, 2016, Table 1 Proposed Project Buildout Projections.

Purpose of General Plan Housing Element Update – Regional Housing Needs Allocation

The overall purpose of the update to the Housing Element is to address the housing needs of all types of households and income levels for current and future Menlo Park residents. State law requires that the City's Housing Element be updated by January 31, 2023 and that it contain specific contents, including an inventory or list of housing sites at sufficient densities to accommodate a specific number of units at various levels of affordability assigned to the City by the Association of Bay Area Governments (ABAG). ABAG assigns unit amounts to Bay Area jurisdictions based on a regional housing production target set by the California Department of Housing and Community Development (HCD). This assignment is referred to as the Regional Housing Needs Allocation (RHNA).

On December 16, 2021, ABAG adopted the *Final Regional Housing Needs Allocation (RHNA) Plan: San Francisco Bay Area, 2023-2031*, which distributed the regional housing need of 441,176 units across all local jurisdictions in the nine-county Bay Area. The 21 jurisdictions within San Mateo County received a total of 47,687 units, or about 10.8 percent of the regional allocation, and Menlo Park received an allocation of 2,946 units. This allocation is higher than the number addressed in the City's current Housing Element in part because the Bay Area region's overall allocation of 441,176 units from HCD is more than double the prior RHNA cycle allocation, which was approximately 189,000 units.

Within the update of the Housing Element, the City is required to plan for its allocation of housing units by income group. Income groups are defined based on area median household income, or AMI, updated annually by HCD. San Mateo County's 2021 Area Median Income (AMI) for a household of four persons is $149,600. Income categories include very low income (0-50 percent of AMI), low income (51-80 percent of AMI), moderate income (81-120 percent of AMI), and above moderate income (greater than 120 percent of AMI). Providing housing to meet the needs of all income levels is critical to the social and economic health of Menlo Park. The City must plan for its income-based housing allocation to address its share of the Bay Area region's housing needs.

Table 2-2 shows the RHNA distribution of required units in Menlo Park across the four income categories with and without additional units as a buffer (which HCD recommends equal 30 percent of the RHNA allocation).

TABLE 2-2
REGIONAL HOUSING NEEDS ALLOCATION

	Very Low Income Units[a] (0-50% AMI)	Low Income Units (51-80% AMI)	Moderate Income Units (81-120% AMI)	Above Moderate Income Units (>120% AMI)	Total New Units
6th Cycle RHNA without buffer	740	426	496	1,284	2,946
6th Cycle RHNA with 30% buffer[b]	962 (740+222)	554 (426+128)	645 (496+149)	1,669 (1,284+385)	3,830 (2,946+884)

NOTES:
a 47 percent of Very Low Income Units would be Extremely Low Income or less than 30% AMI]
b The California Department of Housing and Community Development (HCD) recommends a buffer of additional units above the RHNA. With a 30 percent buffer included (884 units), Menlo Park's RHNA is 3,830 total new units.

SOURCE: Association of Bay Area Governments (ABAG), *Final Regional Housing Needs Allocation (RHNA) Plan: San Francisco Bay Area, 2023-2031* adopted December 2021, and City of Menlo Park, December 2021.

A buffer is necessary to ensure that if one or more of the identified housing sites are developed at lower densities than projected, or with non-housing uses, there is remaining capacity elsewhere in the City to provide an ongoing supply of sites for housing during the eight-year planning period/cycle of the Housing Element. If there were no buffer and an identified housing site developed with a non-housing project or developed at a density less than that anticipated in the Housing Element, then the City could be obliged to identify new housing opportunity sites and amend the Housing Element prior to the end of the planning period/cycle.

The need for a substantial buffer is increasingly important because of new rules in the Housing Accountability Act's "no net loss" provisions. California State Senate Bill 166 (2017) adopted Government Code section 65589.5 which requires that the land inventory and site identification programs in the Housing Element always include sufficient sites to accommodate unmet RHNA. This means that if a housing site is identified in the Housing Element as having the potential for housing development that could accommodate lower-income units but is actually developed with units at a higher income level, or with fewer units than expected, or with non-residential uses, then the locality must either: 1) identify and rezone, if necessary, an adequate substitute site; or 2) demonstrate that the land inventory already contains an adequate substitute site. An adequate buffer will be critical to ensure that the City remains compliant with these provisions without having to identify and rezone sites prior to the end of the planning period on January 31, 2031.

While State law requires the Housing Element to include an inventory of housing sites and requires the City to appropriately zone sites to meet its RHNA, the law does not require the City to develop/construct housing on these sites. Future development on identified sites will be at the discretion of individual property owners and will be largely dependent on market forces, and in the case of affordable housing, available funding and/or other incentives. Nonetheless, this SEIR considers potential impacts of development that may result from adoption of the HEU, including

rezoning of potential housing sites to allow housing and/or mixed-use developments, and related actions to encourage housing production including, but not limited to, changes in allowable densities; changes in development standards; and adoption of incentives such as a density bonus for the creation of affordable housing.

Purpose of the General Plan Safety Element Update

The Safety Element is a State-mandated component of a General Plan and State law requires that it be updated as needed to address fire risk and climate adaptation and resiliency strategies (Government Code section 65302(g) and section 65302.15). The Safety Element focuses on protecting the community from risks associated with climate change, earthquakes, floods, fires, toxic waste, and other hazards, and is the means by which the City defines what measures will be undertaken to reduce the potential risk of personal injury, property damage, and economic and social dislocation resulting from natural and human-made hazards. The extent of a hazard depends on local conditions since most hazards are confined to a particular area or site. Also, long-term costs to the City, such as maintenance, liability exposure, and emergency services, are potentially greater where high hazards exist. Having an updated Safety Element in the General Plan will ensure that various health and safety hazards are considered in planning the location, design, intensity, density, and type of land uses in a given area.

Purpose of the New General Plan Environmental Justice Element

California Government Code section 65302(h) requires jurisdictions to adopt an Environmental Justice (EJ) Element if it contains a defined “Disadvantaged Community.” Adoption of an EJ Element can occur at any time, but is required when the jurisdiction is adopting or revising two or more General Plan elements concurrently. The City of Menlo Park is required to adopt an EJ Element because it is updating its required General Plan Housing Element and Safety Element.

According to State law, a "Disadvantaged Community" is an area identified by the California Environmental Protection Agency pursuant to Section 39711 of the Health and Safety Code as a low-income area that is disproportionately affected by environmental pollution and other hazards that can lead to negative health effects, exposure, or environmental degradation.[1] There are areas within Menlo Park that meet the State-defined criteria for “Disadvantaged Communities.” The purpose of the EJ Element is to address the unique or compounded health risks in “Disadvantaged Communities” within a jurisdiction. These measures could include, but are not limited to, improving air quality; and promoting public facilities, food access, safe and sanitary homes, and physical activity. In addition, the EJ Element serves to promote civic engagement in the public decision making process and prioritize improvements and programs that address the needs of these communities.

1 Gov. Code, § 65302, subd. (h)(4)(A))

2.4 Project Components

The Project analyzed in this SEIR would include adoption of General Plan amendments that would add or modify goals, objectives, policies, and implementation programs related to housing, safety, and environmental justice. General Plan amendments would also include conforming amendments to other elements of the General Plan, as needed, to ensure internal consistency. Amendments to the Housing Element would address among other things, the maintenance, preservation, improvement, and development of housing in the City. In addition, the Project would include a housing sites inventory with sufficient existing and new housing sites at appropriate densities to meet the City's RHNA requirement plus an ample buffer, and the City would modify provisions of its Zoning Ordinance, zoning map, and El Camino Real/Downtown Specific Plan as necessary to reflect the housing opportunity sites and land use strategies to meet the City's RHNA.

2.4.1 Housing Goals, Policies and Programs

The proposed Housing Element would include updated goals, policies, and programs to address the maintenance, preservation, improvement, and development of housing and to affirmatively further fair housing in the City. Proposed updates to the goals, policies, and programs in the current Housing Element were informed by a review of the implementation and effectiveness of that document, as well as updated information on demographic and economic trends, existing housing and market conditions, and special housing needs experienced by disabled persons, elderly households, large family households, single female-headed households, and homeless persons. The proposed goals, policies, and programs were also crafted to address an updated assessment of non-governmental and governmental constraints to the development, conservation, and rehabilitation of housing in the City, and to affirmatively further fair housing. For more information, including the definition of these terms, and the proposed updates to goals, policies, and programs, please see the Public Review Draft Housing Element, which can be found on the City's Housing Element Update webpage.[2]

2.4.2 Housing Sites Inventory

The proposed Housing Element identifies specific sites appropriate for development of housing (in particular affordable units), and the City would rezone those sites, as necessary, to meet the requirements of State law. The final housing opportunity sites inventory will be refined based on additional community input and analysis. This SEIR evaluates up to 4,000 new residential units within the eight-year planning period via a variety of strategies in addition to possible pipeline projects and accessory dwelling units, as described below.

Pipeline Projects

Pipeline projects are projects that have been recently approved, but not yet occupied or are pending (in review) that would provide housing. Adoption of the El Camino Real/Downtown Specific Plan in 2012; adoption of the current Housing element in 2014; and the *ConnectMenlo* General Plan Update in 2016 enabled opportunities for over 5,000 new housing units in the City.

[2] https://menlopark.gov/housingelement

At the time the Notice of Preparation (NOP) for this SEIR was published in December 2021, there were seven major residential projects in the "pipeline" as either approved or pending housing developments that would provide approximately 3,642 new units. Per HCD guidance, these units, as well as smaller projects in the City, could potentially count towards Menlo Park's RHNA requirement if the residential units are not completed and occupied prior to June 30, 2022. Major pipeline projects are listed in **Table 2-3** below, and are identified as either "approved" or "pending." For purposes of this SEIR, approved projects are considered part of the baseline, and pending projects are considered part of the Project being analyzed. (See the discussion of Growth Projections below.)

TABLE 2-3
MAJOR PIPELINE PROJECTS[1]

Project	Status	Net New Units
111 Independence Dr.	Approved	105
115 Independence Dr. (Menlo Portal)	Approved	335
141 Jefferson Dr. (Menlo Uptown)	Approved	483
Subtotal Approved Projects		*923*
123 Independence Dr.	Pending	432
165 Jefferson Dr. (Menlo Flats)	Pending	158
Willow Village	Pending	1,729
333 Ravenswood Ave. (Parkline)	Pending	400
Subtotal Pending Projects		*2,719*
Total		**3,642**

NOTES:

a This table shows major pipeline projects yielding greater than 10 units.

SOURCE: Table 3, Major Pipeline Projects, City Council Staff Report #21-210-CC, October 26, 2021

Accessory Dwelling Units

HCD allows the City to develop a projection of accessory dwelling units (ADUs) that will be built within the planning period based on average annual production between 2018 and 2020. Because Menlo Park permitted an average of 10.6 ADUs per year between 2018-2020, the City can anticipate development of 85 units during the 6th Cycle Housing Element planning period. These units could potentially count towards satisfying Menlo Park's RHNA requirement.

Housing Sites Inventory Strategies

While pipeline projects are generally located on the north side of US-101, with the proposed Housing Element, additional housing sites would be geographically dispersed throughout the City, primarily located in City Council Districts 2, 3, 4, and 5—generally, the areas south of US-101. Sites would be made available for multifamily housing through a combination of rezoning, increased densities, and/or updates to the Zoning Ordinance based on the following general strategies:

- **"Re-use" of sites from the City's current Housing Element.** The Housing Sites Inventory would reuse selected sites from the 5th Cycle Housing Element, which is ending this year, with densities to allow at least 30 dwelling units per acre (du/ac) and possibly more. Consistent with State law, sites that are "re-used" would either be up-zoned (increasing allowable residential density) or would have to be zoned to allow by-right (ministerial review) development for projects that include at least 20 percent affordable units (units affordable to low and very low-income households).
- **Increase the permitted densities within the El Camino Real/Downtown Specific Plan area and modify associated development standards.** The Housing Sites Inventory would include sites in the El Camino Real/Downtown Specific Plan area. The HEU would allow at least 30 dwelling units per acre (du/ac) as the base level density, and potentially increase the maximum bonus level density to 80 dwelling units per acre depending on the location within the Specific Plan area. Bonus level development requires a developer to provide a public benefit in exchange for higher density development potential. The intent of this strategy would be to remove the existing residential cap of 680 units permitted in the Specific Plan area and to modify development standards such as height and/or parking ratios to allow greater development potential on parcels. These actions would potentially require amendments to the Specific Plan, Land Use Element, and Zoning Ordinance.
- **Modify the Affordable Housing Overlay.** The Specific Plan area and sites in the Housing Sites Inventory would be rezoned to include the Affordable Housing Overlay (AHO) provided in Menlo Park Municipal Code Chapter 16.98. The HEU would call on the City to amend the Code to allow for densities up to 100 du/ac for 100 percent affordable housing developments (meaning 100 percent of units would be available to low and very low-income residents). This strategy could also include amendments to provide increased residential densities for mixed-income developments (market-rate units and affordable units combined) where the percentage of affordable housing exceeds the City's Below Market Rate requirement as provided in Menlo Park Municipal Code Chapter 16.96.
- **Modify Retail/Commercial Zoning Districts.** The Housing Sites Inventory would include some sites in the C-1, C-1-A, C-1-C, C-2, C-2-A, C-2-B, C-2-S, C-4, and P zoning districts and would require the City to modify Code provisions regarding retail/commercial zoning districts to allow for residential uses that would allow 30 du/ac and include other potential modifications to the development standards to encourage the production of mixed-use developments (residential and non-residential uses combined).
- **Remove the minimum lot size for R-3 zoned properties located around downtown.** The Housing Sites Inventory would include some R-3 zoned sites around downtown and would require the City to modify applicable Code provisions to remove the 10,000 square-foot minimum lot size, which would allow all sites in the R-3 area downtown a residential density of up to 30 du/ac.

Table 2-4 contains a preliminary list of sites that can accommodate development of multifamily housing as "potential housing opportunity sites" for the Housing Element's Housing Sites Inventory. This list does not include all sites affected by the land use strategies described above. Henceforth in this SEIR, the "Project" is defined as the proposed upzoning of the housing opportunity sites listed in the table below, combined with the zoning modifications described as part of the land use strategies described above. These principal components of the Project form the basis for the analysis in this SEIR. It is expected that some of the sites listed below could be removed as the HEU process moves forward, based on further refinements and community input,

but all of the opportunity sites have been included for analysis as part of this SEIR to ensure a sufficient evaluation of the HEU's potential impacts.

TABLE 2-4
POTENTIAL HOUSING OPPORTUNITY SITES LIST

Address/Location	Assessor's Parcel Number(s)	Zoning District
525 El Camino Real	071332130	SP-ECR-D: SW
1620 El Camino Real (R)	060344250; 060344240	SP-ECR-D: NE-L
2500 Sand Hill Road	074270240; 074270250	C-1-C
2400-2498 Sand Hill Road	074270280; 074270260; 074270170	C-1-C
1100 Alma Street (R)	061412440; 061412430	SP-ECR-D: SA E
900 Santa Cruz Avenue	071084220; 071084200; 071084090; 071084110; 071084100	SP-ECR-D: DA
728 Willow Avenue	062202050; 062202060; 062202210; 062202060	C-4
906 Willow Road	062211170; 062211180; 062211050	C-4; R-3
Between Chestnut and Curtis	071284100; 071284080	SP-ECR-D: D
Between Crane and Chestnut	071283140; 071283050	SP-ECR-D: D
325 Sharon Park Drive	074283100; 074283090; 074283040	C-2
345 Middlefield Road	062421070; 062390700	P-F
1105 Valparaiso Avenue (C)	071071070	R-E
Lot between El Camino Real and Chestnut on west side of Santa Cruz	071102400	SP-ECR-D: D
Lot between University and Crane on west side of Santa Cruz	071092290	SP-ECR-D: D
Lot between Evelyn and Crane	071281160	SP-ECR-D: D
Lot between Curtis and Doyle	071285160	SP-ECR-D: D
Lot behind Draeger's	071273160	SP-ECR-D: D
Lot off Oak Grove	071094180	SP-ECR-D: D
275 Middlefield Road	062422120	C-1
350 Sharon Park Drive	074281110; 074281120	R-3-A(X)
85 Willow Road	062422080	C-1
200 Middlefield Road	062271540	C-1
250 Middlefield Road	062271010	C-1
8 Homewood Place	062421010	C-1
401 Burgess Road	062390170	C-1-A
570 Willow Road	062370420	C-4
2200 Sand Hill Road	074283070	C-1(X)
445 Burgess Drive	062390200	C-1-A
720 Menlo Avenue	071284110	SP-ECR-D: D
800 Oak Grove Avenue	071091520	SP-ECR-D: DA
930 Santa Cruz Avenue	071084140	SP-ECR-D: DA
1008 University Drive	071274140	SP-ECR-D: DA
707 Menlo Road	071288610	SP-ECR-D: DA

TABLE 2-4 (CONT.)
POTENTIAL HOUSING OPPORTUNITY SITES LIST

Address/Location	Assessor's Parcel Number(s)	Zoning District
1300 University Drive	071091310	SP-ECR-D: DA
1377 El Camino Real	071103490	SP-ECR-D: ECR NW
801-877 El Camino Real	071331180	SP-ECR-D: ECR SW
320 Sheridan Drive	055303110	R-1-U
2250 Avy Avenue (C)	074351100	R-1-S
2650 Sand Hill Road (C)	074260740	R-1-S
431 Burgess Drive	062390190	C-1-A
425 Burgess Drive	062390180	C-1-A
1133-1159 El Camino Real	071102130	SP-ECR-D: SA W
1436 El Camino Real	061422350	SP-ECR-D: ECR NE
Rural Lane	074311600	R-1-S
796 Live Oak Avenue	071288560	R-3 near SP-ECR/D
555 Willow Road	062285300	R-3
700 El Camino Real	071333200	SP-ECR-D: ECR SE
2700-2770 Sand Hill Road	074260750	C-1-A
600 Sharon Park Drive	074282070; 074282090	R-3-A(X)
949 El Camino Real	071288570	SP-ECR-D
1246 El Camino Real	061430070	SP-ECR-D
1189 El Camino Real	071102350	SP-ECR-D
607 Menlo Avenue	071288190	SP-ECR-D
1161 El Camino Real	071102390	SP-ECR-D
1179 El Camino Real	071102370	SP-ECR-D
761 El Camino Real	071332080	SP-ECR-D
751 El Camino Real	071332090	SP-ECR-D
905 El Camino Real	071288580	SP-ECR-D
335 Pierce Road	062013170	R-3
610 Santa Cruz Avenue	071102140	SP-ECR-D
201 Ravenswood Avenue	062390050	R-1-S
550 Ravenswood Avenue	061412160	SP-ECR-D
3875 Bohannon Drive	055251120	O
795 Willow Road	062470060	P-F
1000 Marsh Road	055251340	O
3885 Bohannon Road	055251220	O
3905 Bohannon Drive	055253140	O
3925 Bohannon Drive	055253150	O
4005 Bohannon Drive	055253240	O
4025 Bohannon Drive	055253190	O
4060 Campbell Avenue	055253030	O
4060 Campbell Avenue	055253200	O
4065 Campbell Avenue	055251270	O

NOTES:

(R) denotes a reuse site from the current Housing Element; (C) denotes a religious facility that could potentially redevelop surface parking lot area for housing.

* This site was identified during ongoing discussions with the community during preparation of the Draft SEIR.

2.4.3 Other Elements of the General Plan

In addition to the amendments that would take place within the General Plan's Housing Element, a number of amendments to other elements of the General Plan would be required to fully conform those elements to changes made in the Housing Element or comply with other changes in State law.

The City is updating its Safety Element to bring it into compliance with recent changes in California General Plan law codified in Government Code section 65302(g) and section 65302.15. The updated Safety Element would incorporate information from the 2021 San Mateo County Multijurisdictional Local Hazard Mitigation Plan and the City's Climate Action Plan. The Safety Element would also be updated to:

- Provide information regarding fire hazards including wildfires, including goals, policies, objectives and implementation programs as needed.
- Identify residential developments in any hazard area identified in the Safety Element that do not have at least two emergency evacuation routes.
- Include updated scientific context about historic and future climate hazards (such as flooding and drought, extreme heat events, and wildfires).
- Include a vulnerability assessment that identifies risks from climate change and is linked to goals and policies.
- Incorporate results of an analysis of evacuation routes under a range of emergency scenarios unless this analysis can be referenced in a local hazard mitigation plan, emergency operations plan, or similar document.

The City is preparing its first Environmental Justice Element to address the issue of equity in accordance with changes in State law codified in Government Code section 65302(h). The Environmental Justice Element would identify objectives and policies to reduce the unique or compounded health risks in "disadvantaged communities" as defined by section 39711 of the California Health and Safety Code. Objectives and policies would seek to reduce pollution exposure, including improvement of air quality, and promotion of public facilities, food access, safe and sanitary homes, and physical activity. Other objectives and policies would promote civic engagement in the public decision making process and prioritize improvements and programs that address the needs of disadvantaged communities.

The City would amend its Land Use Element and General Plan Land Use Designations map as needed to reflect the Housing Sites Inventory and would make any corresponding changes to other elements of the General Plan needed to ensure internal consistency within the General Plan as a whole, including the updated Housing Element, Safety Element, and the new Environmental Justice Element.

2.4.4 Future Development Actions and this SEIR

Because the Housing Element establishes policies, goals and guidelines, and describes potential housing development that may or may not be built on any particular site, environmental review of

the HEU will necessarily be general. The CEQA Guidelines instruct that environmental review of a planning-level document need not contain the level of detail required for review of a specific construction project, for example. (CEQA Guidelines, Section 15146 ("[t]he degree of specificity required … will correspond to the degree of specificity involved in the underlying activity").

The Housing Element's inventory of sites is a State-mandated requirement to ensure that the City's RHNA can be accommodated. In other words, the housing inventory demonstrates that there is enough land zoned at appropriate densities to accommodate the RHNA allocation. However this inventory does not include all potential residential development sites within the City limits, and does not mean that sites in the inventory will be developed at the allowable densities. In addition, information about the design and placement of buildings on the sites will not be available unless/until a specific development is proposed.

It is important to note that while the law requires the HEU to include an inventory of housing sites and requires the City to zone those sites for multifamily housing, the City is not required to develop housing on these sites. Future development on the identified sites will be up to the property owners and will be largely dependent on market forces and (in the case of affordable housing) available subsidies.

Future development proposals will be reviewed to determine whether their impacts fall within the scope of the analysis in this SEIR or if additional site-specific environmental review will be required if new significant impacts would result. As provided for in CEQA Guidelines Sections 15152 and 15385, any subsequent environmental document that might be required could "tier" from this SEIR and focus its analysis on the new significant impacts.

2.5 Project Objectives

CEQA Guidelines Section 15124(b) requires the description of a project in an EIR to state the objectives sought by the project.

> "A clearly written statement of objectives will help the lead agency develop a reasonable range of alternatives to evaluate in the EIR and will aid the decision makers in preparing findings or a statement of overriding considerations, if necessary. The statement of objectives should include the underlying purpose of the project."

The primary purpose of the HEU is to comply with the requirements of State law by: 1) analyzing existing and projected housing needs, and updating goals, policies, objectives, and implementation programs for the preservation, improvement, and development of housing; 2) updating goals, policies and programs regarding safety; and 3) addressing the issue of environmental justice in the City's General Plan. The City has articulated three overarching and interrelated goals:

- **Create a balanced community**
  - Plan for the whole community in a sustainable, healthy and balanced way.

- **Focus on affordability**
  - Focus on affordable housing given the difficulty of developing it compared to market-rate housing, and the demand for affordable housing options.
- **Forward social justice**
  - Work with the community to help ensure participation and access to the public decision making process, and take intentional steps that improve equity for historically marginalized people and areas.

The City's objectives help achieve these overarching goals. Those objectives include the following:

- Update the General Plan's Housing Element to comply with State-mandated housing requirements and to address the maintenance, preservation, improvement, and development of housing in the City between 2023 and 2031;
- Include an adequate inventory of housing sites and rezone the sites as necessary to meet the required Regional Housing Needs Allocation and to provide an appropriate buffer;
- To affirmatively further fair housing (AFFH). In particular, integrate AFFH into the process of site selection, outreach and policy/program development;
- Incentivize the development of housing, particularly affordable housing, suited to special needs and all income levels;
- Amend land use designations in the Land Use Element of the City's General Plan as needed to maintain internal consistency between the elements, and update the Safety Element to enhance community safety and improve consistency with the County's Multijurisdictional Local Hazard Mitigation Plan and comply with recent changes in State law;
- Address climate adaptation and resiliency; and
- Address environmental justice and community health issues and promote civic engagement and investment in disadvantaged communities.

2.6 Identified Significant Impacts

As provided by the CEQA *Guidelines* Section 15123(b)(1), an EIR must provide a summary of the impacts, mitigation measures and significant impacts after mitigation for a proposed project. This information is presented in the various subsections within Chapter 4, *Environmental Setting, Impacts, and Mitigation Measures*, of this SEIR, and summarized in **Table 2-5** at the end of this chapter. The proposed project would result in the following significant and unavoidable impacts:

> **Air Quality Impact AQ-2:** Implementation of the HEU would result in a cumulatively considerable net increase of criteria air pollutants for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (*Significant and Unavoidable Impact, with Mitigation*).

Cultural Resources Impact CR-1: Implementation of the HEU could cause a substantial adverse change in the significance of an architectural historic resource pursuant to CEQA Guidelines Section 15064.5. (*Significant and Unavoidable Impact, with Mitigation*)

Cultural Resources Impact CR-4: Implementation of the proposed project, in combination with past, present and reasonably foreseeable projects, could result in a significant cumulative impact with respect to historic architectural resources (*Significant and Unavoidable Impact, with Mitigation*)

Transportation Impact TRANS-1: Implementation of the HEU would conflict with an applicable program, plan, ordinance, or policy establishing measures of effectiveness for the performance of addressing the circulation system, including transit, bicycle, and pedestrian facilities. (*Significant and Unavoidable Impact*)

Transportation Impact TRANS-2: Implementation of the HEU would exceed an applicable VMT threshold of significance (*Significant and Unavoidable Impact, with Mitigation*)

Transportation Impact TRANS-5: Implementation of the HEU, in combination with cumulative development, would conflict with an applicable program, plan, ordinance, or policy establishing measures of effectiveness for the performance of addressing the circulation system, including transit, bicycle, and pedestrian facilities. (*Significant and Unavoidable Impact*)

Transportation Impact TRANS-6: Implementation of the HEU, in combination with cumulative development, would exceed an applicable VMT threshold of significance (*Significant and Unavoidable Impact, with Mitigation*)

2.7 Alternatives to the Proposed Project

Chapter 5, Alternatives, analyzes a range of reasonable alternatives to the proposed project, including the No Project Alternative (Alternative 1), and the Low VMT Area Alternative (Alternative 2).

The analysis of the alternatives is summarized and compared in **Chapter 5**, which provides a summary of impact levels within all environmental topic areas. Overall, the analysis shows that the Low VMT Area Alternative would reduce some of the project's significant impacts.

Based on the evaluation described in Chapter 5, the No Project Alternative and the Low VMT Area Alternative would both be environmentally superior to the proposed project, though the No Project Alternative could result in the need to develop housing further from the City, and could thus contribute to greater impacts related to air quality, GHG emissions, and VMT. Regardless, the No Project Alternative would not meet any of the basic objectives of the project, nor is it legally feasible to adopt and implement.

CEQA requires that a second alternative be identified when the "No Project" alternative is the environmentally superior alternative (CEQA *Guidelines*, Section 15126.6(e)). Therefore, the Low

VMT Area Alternative would be the Environmentally Superior Alternative for the purpose of this analysis.

2.8 Comments on Notice of Preparation

In compliance with the requirements of CEQA for the initiation of environmental review, on August 2, 2021, the City sent a Notice of Preparation (NOP) to the State Clearinghouse [SCH Number 2015062054], responsible and trustee government agencies, organizations, and individuals potentially interested in the project. The NOP requested that agencies with regulatory authority over any aspect of the project describe that authority and identify relevant environmental issues that should be addressed in the SEIR. Interested members of the public were also invited to comment. The comment period for the NOP was set for August 2, 2021 through September 2, 2021. A scoping meeting was scheduled before the City's Planning Commission for August 16, 2021. The scoping meeting was available for remote participation via Zoom, and was also viewable on YouTube.

The NOP and the comments received on the NOP during the comment period are included in **Appendix A** of this SEIR. As discussed in the NOP and pursuant to the provisions of CEQA, the City did not prepare a CEQA Initial Study prior to preparation of the SEIR, because the City determined that it was clear at the time of the issuance of the NOP that an SEIR was required (CEQA Guidelines Section 15060[d]).

While all comments received during the NOP comment period are included in Appendix A, a number of the comments related to issues and concerns that were not related to the environmental impacts of the HEU. Those comments will be responded to in a staff report and considered by the Planning Commission and City Council as they deliberate adoption of the HEU.

2.9 Areas of Controversy

Section 15123(b)(2) of the CEQA *Guidelines* requires that an EIR summary identify areas of controversy known to the lead agency, including those issues raised by other agencies and the public. Issues known to have been raised by the public include concerns regarding air quality and greenhouse gas emissions, geology and soils, land use and density, population and housing, public services, and transportation. As a result, these issues are potential areas of controversy.

2.10 Issues to be Resolved

Section 15123(b)(3) of the CEQA *Guidelines* requires that an EIR present the issues to be resolved, including the choice among alternatives and whether or how to mitigate the significant effects. The major issues to be resolved for the proposed project include decisions by the City of Menlo Park, as the Lead Agency, as to whether:

- This SEIR adequately describes the environmental impacts of the proposed project;
- Recommended mitigation measures should be adopted or modified;

- Additional mitigation measures need to be applied to the proposed project;
- Feasible alternatives exist that would achieve the objectives of the project and reduce significant environmental impacts;
- Selection of different housing opportunity sites and land use strategy sites would meet the City's RHNA requirements;
- Significant and unavoidable impacts would occur if the HEU is adopted and implemented; and
- The HEU should or should not be approved.

TABLE 2-5
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF MENLO PARK HOUSING ELEMENT UPDATE

Impacts	Mitigation Measures	Significance after Mitigation
4.1. Aesthetics		
Impact AES-1: Implementation of the HEU would not have a substantial adverse effect on a scenic vista.	None required	Less than Significant Impact
Impact AES-2: Implementation of the HEU would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.	None required	Less than Significant Impact
Impact AES-3: Implementation of the HEU would not substantially degrade the existing visual character or quality of public views of the site and its surroundings or conflict with applicable zoning and other regulations governing scenic quality.	None available	Less than Significant Impact
Impact AES-4: Implementation of the HEU would not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.	None required	Less than Significant Impact
Impact AES-5: Implementation of the HEU would not combine with other past, present, and reasonably foreseeable projects to result in significant cumulative impacts with respect to aesthetics.	None required	Less than Significant Impact
4.2 Air Quality		
Impact AQ-1: Implementation of the HEU would not conflict with or obstruct implementation of the applicable air quality plan.	None required	Less than Significant Impact
Impact AQ-2: Implementation of the HEU would result in a cumulatively considerable net increase of criteria air pollutants for which the project region is in non-attainment under an applicable federal or state ambient air quality standard.	**Mitigation Measure AQ-2: Emission Reduction Measures.** The following mitigation measures are recommended to reduce criteria air pollutant emissions from multifamily housing developments under the HEU. a) [AQ-2b1 from *ConnectMenlo* with clarifying amendments]: As part of the City's development approval process, the City shall require applicants for future development projects to comply with the current Bay Area Air Quality Management District's basic control measures for reducing construction emissions of PM_{10} (Table 8-1<u>8-2</u>, Basic Construction Mitigation Measures Recommended for All Proposed Projects, of the BAAQMD CEQA Guidelines). b) [AQ-2b2 from *ConnectMenlo* EIR with clarifying amendments]: Prior to issuance of building permits, development project applicants that are subject to CEQA and exceed the screening sizes in the BAAQMD's CEQA Guidelines shall prepare and submit to the City of Menlo Park a technical assessment evaluating potential project construction-related air quality impacts. The evaluation shall be prepared in conformance with the BAAQMD methodology in assessing air quality impacts. If construction-related criteria	Significant and Unavoidable Impact, with Mitigation

TABLE 2-5 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF MENLO PARK HOUSING ELEMENT UPDATE

Impacts	Mitigation Measures	Significance after Mitigation
	air pollutants are determined to have the potential to exceed the BAAQMD thresholds of significance, as identified in the BAAQMD CEQA Guidelines, the City of Menlo Park shall require that applicants for new development projects incorporate emission reduction mitigation measures to reduce air pollutant emissions during construction activities to below these thresholds of significance (see for example e.g., Table 8-28-3, Additional Construction Mitigation Measures Recommended for Projects with Construction Emissions Above the Threshold of the BAAQMD CEQA Guidelines, or applicable construction mitigation measures subsequently approved by BAAQMD).3 These identified measures shall be incorporated into all appropriate construction documents (e.g., construction management plans) submitted to the City and shall be verified by the City's Building Division and/or Planning Division c) In the event that a project-specific analysis finds that the project could result in significant construction criteria air pollutant emissions that exceed significance thresholds, the project sponsor shall implement the following emission reduction measures to the degree necessary to reduce the impact to less than significance thresholds, and shall implement other feasible measures as needed to reduce the impact to less than the significance thresholds. 1. Diesel off-road equipment shall have engines that meet the Tier 4 Final off-road emission standards, as certified by CARB, as required to reduce the emissions to less than the thresholds of significance shown in Table 2-1 of the BAAQMD CEQA Guidelines (BAAQMD, 2017b). This requirement shall be verified through submittal of an equipment inventory that includes the following information: (1) Type of Equipment, (2) Engine Year and Age, (3) Number of Years Since Rebuild of Engine (if applicable), (4) Type of Fuel Used, (5) Engine HP, (6) Verified Diesel Emission Control Strategy (VDECS) information if applicable and other related equipment data. A Certification Statement is also required to be made by the Contractor for documentation of compliance and for future review by the BAAQMD as necessary. The Certification Statement must state that the Contractor agrees to compliance and acknowledges that a violation of this requirement shall constitute a material breach of contract. The City may waive the equipment requirement above only under the following unusual circumstances: if a particular piece of off-road equipment with Tier 4 Final standards is technically not feasible or not commercially available; the equipment would not produce desired emissions reduction due to expected operating modes; installation of the equipment would create a safety hazard or impaired visibility for the operator; or there is a compelling emergency need to use other alternate off-road equipment. If the City grants the waiver, the contractor shall use the next cleanest piece of off-road equipment available. 2. The project sponsor shall require the idling time for off-road and on-road equipment be limited to no more than 2 minutes, except as provided in exceptions to the applicable state regulations regarding idling for off-road and on-road equipment. Legible and visible signs shall be posted in multiple languages (English, Spanish,	

3 Table 8-3 was previously numbered at Table 8-2 in BAAQMD's 2011 guidance document, as recorded in the *ConnectMenlo* EIR.

TABLE 2-5 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF MENLO PARK HOUSING ELEMENT UPDATE

Impacts	Mitigation Measures	Significance after Mitigation
	Chinese) in designated queuing areas and at the construction site to remind operators of the 2-minute idling limit. d) [AQ-2a from *ConnectMenlo* EIR with clarifying amendments]: Prior to issuance of building permits, development project applicants that are subject to CEQA and exceed the screening sizes in the Bay Area Air Quality Management District's (BAAQMD) CEQA Guidelines shall prepare and submit to the City of Menlo Park a technical assessment evaluating potential project operation-phase-related air quality impacts. The evaluation shall be prepared in conformance with the BAAQMD methodology in assessing air quality impacts. If operational-related criteria air pollutants are determined to have the potential to exceed the BAAQMD thresholds of significance, as identified in BAAQMD's CEQA Guidelines, the City of Menlo Park Community Development Department shall require that applicants for new development projects incorporate emission reduction mitigation measures to reduce air pollutant emissions during operational activities to below the thresholds of significance.	
Impact AQ-3: Implementation of the HEU would not expose sensitive receptors to substantial pollutant concentrations.	**Mitigation Measure AQ-3: Health Risk Reduction Measures.** a) [AQ-3b from *ConnectMenlo* with amendments]: Applicants for residential and other sensitive land use projects (e.g., hospitals, nursing homes, day care centers) in Menlo Park within 1,000 feet of a major sources of toxic air contaminants (TACs) (e.g., warehouses, industrial areas, freeways, and roadways with traffic volumes over 10,000 vehicle per day), as measured from the property line of the project to the property line of the source/edge of the nearest travel lane, shall submit a health risk assessment (HRA) to the City of Menlo Park prior to future discretionary Project approval. The HRA shall be prepared in accordance with policies and procedures of the State Office of Environmental Health Hazard Assessment (OEHHA) and the Bay Area Air Quality Management District. The latest OEHHA guidelines shall be used for the analysis, including age sensitivity factors, breathing rates, and body weights appropriate for children ages 0 to 16 years. If the HRA shows that the incremental cancer risk exceeds ten in one million ($10E^{-06}$), $PM_{2.5}$ concentrations exceed 0.3 $\mu g/m^3$, or the appropriate noncancer hazard index exceeds 1.0, the applicant will be required to identify and demonstrate that mitigation measures are capable of reducing potential cancer and non-cancer risks to an acceptable level (i.e., below ten in one million or a hazard index of 1.0), including appropriate enforcement mechanisms. Measures to reduce risk may include but are not limited to: • Air intakes located away from high volume roadways and/or truck loading zones. • Heating, ventilation, and air conditioning systems of the buildings provided with appropriately sized maximum efficiency rating value (MERV) filters. Measures identified in the HRA shall be included in the environmental document and/or incorporated into the site development plan as a component of the proposed project. The air intake design and MERV filter requirements shall be noted and/or reflected on all building plans submitted to the City and shall be verified by the City's Building Division and/or Planning Division.	Less than Significant Impact, with Mitigation

TABLE 2-5 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF MENLO PARK HOUSING ELEMENT UPDATE

Impacts	Mitigation Measures	Significance after Mitigation
	Project sponsors proposing multifamily development projects within 1,000 feet of sensitive receptors, including residences, schools, day care centers, and hospitals, shall prepare a project-level health risk assessment at the time the project is proposed. In lieu of a project-level health risk assessment, a comparison of the project with other similar-sized projects located a similar distance from receptors where a quantitative analysis has been conducted and were found to not exceed the BAAQMD health risk thresholds can be used to demonstrate less than significant health risk impacts. In the event that a project-level health risk assessment finds that the project could result in health risks that exceed significance thresholds, the project sponsor shall implement the clean construction equipment requirement of Mitigation Measure AQ-2(c) to the degree necessary to reduce the impact to less than significance thresholds, and shall implement other feasible measures as needed to reduce the impact to less than the significant thresholds.	
Impact AQ-4: Implementation of the HEU would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.	None required.	Less than Significant Impact
Impact AQ-5: Implementation of the HEU, in conjunction with cumulative sources, would not result in exposure of sensitive receptors to a cumulatively considerable increase in levels of fine particulate matter ($PM_{2.5}$) and TACs under cumulative conditions.	None required.	Less than Significant Impact
Impact AQ-6: Implementation of the HEU, when combined with other past, present, or reasonably foreseeable projects, would not combine with other sources of odors that would adversely affect a substantial number of people.	None required.	Less than Significant Impact
4.3 Biological Resources		
Impact BIO-1: Implementation of the HEU would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service.	**Mitigation Measure BIO-1: Project-Specific Baseline Biological Resources Assessments.** Prior to individual project approval, the City shall require project applicants to prepare and submit project-specific baseline biological resources assessments on sites containing natural habitat with features such as mature and native trees or unused structures that could support special-status species and other sensitive biological resources, and common birds protected under Migratory Bird Treaty Act (MBTA) and California Fish and Game Code (CFGC). The baseline biological resources assessment shall be prepared by a qualified biologist. The biological resource assessment shall provide a determination on whether any sensitive biological resources are present on the property, including jurisdictional wetlands and waters, essential habitat for special-status species, and sensitive natural communities. If sensitive biological resources are determined to be present, appropriate measures, such as preconstruction surveys, establishing no-disturbance zones during construction, and applying bird-safe building design practices and materials, shall be developed by the qualified biologist to provide adequate avoidance	Less than Significant Impact, with Mitigation

TABLE 2-5 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF MENLO PARK HOUSING ELEMENT UPDATE

Impacts	Mitigation Measures	Significance after Mitigation
	or compensatory mitigation if avoidance is infeasible. Where jurisdictional waters or federally and/or State-listed special-status species would be affected, appropriate authorizations shall be obtained by the project applicant, and evidence of such authorization provided to the City prior to issuance of grading or other construction permits. An independent peer review of the adequacy of the biological resource assessment may be required by the City, if necessary, to confirm its adequacy.	
Impact BIO-2: Implementation of the HEU would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service.	**Implement Mitigation Measure BIO-1.**	Less than Significant Impact, with Mitigation
Impact BIO-3: Implementation of the HEU would not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.	**Implement Mitigation Measure BIO-1.**	Less than Significant Impact, with Mitigation
Impact BIO-4: Implementation of the HEU would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory corridors, or impede the use of native wildlife nursery sites.	**Implement Mitigation Measure BIO-1.**	Less than Significant Impact, with Mitigation
Impact BIO-5: Implementation of the HEU would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	None required.	Less than Significant Impact
Impact BIO-6: Implementation of the HEU in combination with past, present, and reasonably foreseeable projects, would not result in significant cumulative impacts with respect to biological resources.	**Implement Mitigation Measure BIO-1.**	Less than Significant Impact, with Mitigation
4.4 Cultural Resources		
Impact CR-1: Implementation of the HEU could cause a substantial adverse change in the significance of an architectural historic resource pursuant to CEQA Guidelines Section 15064.5.	**Mitigation Measure CR-1a: Identify Architectural Historic Resources.** Prior to any demolition work or significant alterations to any building or structure that is 45 years old or older, the City shall ensure that a qualified architectural historian who meets the Secretary of the Interior's Professional Qualification Standards evaluate the building or structure for eligibility for listing in the National Register, California Register, and for local eligibility. **Mitigation Measure CR-1b: Identify Character-Defining Features.** Prior to any demolition work or significant alterations initiated at a known historical resource or a resource identified via implementation of Mitigation Measure CR-1a, the City shall ensure that a qualified architectural historian who meets the Secretary of the Interior's Professional Qualification Standards identifies character-defining features of each historical resource. Despite being presumed or having been previously determined eligible	Significant and Unavoidable Impact, with Mitigation

TABLE 2-5 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF MENLO PARK HOUSING ELEMENT UPDATE

Impacts	Mitigation Measures	Significance after Mitigation
	for listing in the National Register and/or California Register, character-defining features of the historical resources that would be demolished or may be significantly altered may not have been explicitly or adequately identified. According to guidance from the National Park Service, a historical resource "must retain… the essential physical features [i.e., character-defining features] that enable it to convey its historic identity. The essential physical features are those features that define both *why* a property is significant…and *when* it was significant" (National Park Service, 1997). The identification of character-defining features is necessary for complete documentation of each historical resource as well as appropriate public interpretation and salvage plans. **Mitigation Measure CR-1c: Document Architectural Historic Resources Prior to Demolition or Alteration.** Prior to any demolition work or significant alterations initiated of a known historical resource or a resource identified via implementation of Mitigation Measures CR-1a, the City shall ensure that a qualified architectural historian who meets the Secretary of the Interior's Professional Qualification Standards thoroughly documents each building and associated landscaping and setting. Documentation shall include still photography and a written documentary record of the building to the National Park Service's standards of the Historic American Buildings Survey (HABS) or the Historic American Engineering Record (HAER), including accurate scaled mapping and architectural descriptions. If available, scaled architectural plans will also be included. Photos include large-format (4"x5") black-and-white negatives and 8"x10" enlargements. Digital photography may be substituted for large-format negative photography if archived locally. The record shall be accompanied by a report containing site-specific history and appropriate contextual information. This information shall be gathered through site-specific and comparative archival research and oral history collection as appropriate. Copies of the records shall be submitted to the Northwest Information Center at Sonoma State University.	
Impact CR-2: Implementation of the HEU would not cause a substantial adverse change in the significance of an archaeological historical resource or a unique archaeological resource pursuant to CEQA Guidelines Section 15064.5.	**Mitigation Measure CR-2a. Cultural Resources Study Requirements.** The City shall ensure that a cultural resources records search is performed at the Northwest Information Center (NWIC) of the California Historical Resources Information System for the project area for multi-family development projects arising from the HEU that require ground disturbance (i.e., excavation, trenching, grading, etc.). To receive project approval, an archaeologist meeting the U.S. Secretary of the Interior's Standards (SOIS) for Archeology must review the results and identify if the project would potentially impact cultural resources. If the archaeologist determines that known cultural resources or potential archaeologically sensitive areas may be impacted by the project, a pedestrian survey must be conducted under the supervision of a SOIS-qualified archaeologist of all accessible portions of the project area, if one has not been completed within the previous five years. Additional research, including subsurface testing, monitoring during construction, and/or a cultural resources awareness training may be required to identify, evaluate, and mitigate impacts to cultural resources, as recommended by the SOIS-qualified archaeologist. If avoidance is not feasible, the City shall consult with California Native American tribes identified by the Native American Heritage Commission (NAHC) to be affiliated with Menlo Park for the purposes of tribal consultation under Chapter 905, California Statutes of 2004 (if the resource is pre-contact or indigenous) to determine treatment measures to avoid, minimize, or mitigate any potential impacts to the resource pursuant to PRC Section 21083.2 and CEQA Guidelines Section 15126.4. This shall	Less than Significant Impact, with Mitigation

TABLE 2-5 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF MENLO PARK HOUSING ELEMENT UPDATE

Impacts	Mitigation Measures	Significance after Mitigation
	include documentation of the resource and may include data recovery (according to PRC Section 21083.2), if deemed appropriate, or other actions such as treating the resource with culturally appropriate dignity and protecting the cultural character and integrity of the resource (according to PRC Section 21084.3). A cultural report detailing the results of the research shall be prepared and submitted for review by the City and a final draft shall be submitted to the NWIC. Once the report has been approved by the City, the City may issue appropriate permits. **Mitigation Measure CR-2b. Inadvertent Discovery of Cultural Resources.** If pre-contact or historic-era archaeological resources are encountered during project construction and implementation, the project applicant shall halt all construction activities within 100 feet and notify the City. Pre-contact archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-era materials might include stone, concrete, or adobe footings and walls; filled wells or privies; and deposits of metal, glass, and/or ceramic refuse. An archaeologist meeting the U.S. Secretary of the Interior's Standards (SOIS) for Archeology shall inspect the findings and work shall be stopped within 100 feet of the potential archaeological resource until the material is either determined by the archaeologist to not be an archaeological resource or appropriate treatment has been enacted, with appropriate consultation, as needed. If the City determines that the resource qualifies as a historical resource or a unique archaeological resource (as defined pursuant to the CEQA Guidelines) and that the project has potential to damage or destroy the resource, mitigation shall be implemented in accordance with PRC Section 21083.2 and CEQA Guidelines Section 15126.4, with a preference for preservation in place. If preservation in place is feasible, this may be accomplished through one of the following means: (1) siting improvements to completely avoid the archaeological resource; (2) incorporating the resource into a park or dedicated open space, by deeding the resource into a permanent conservation easement; (3) capping and covering the resource before building the project on the resource site after the resource has been thoroughly studied by a SOIS qualified archaeologist and a report written on the findings. If preservation in place is not feasible, the City shall consult with California Native American tribes identified by the Native American Heritage Commissions (NAHC) to be affiliated with Menlo Park for the purposes of tribal consultation under Chapter 905, California Statutes of 2004 (if the resource is pre-contact or indigenous) to determine treatment measures to avoid, minimize, or mitigate any potential impacts to the resource pursuant to PRC Section 21083.2, and CEQA Guidelines Section 15126.4. This shall include documentation of the resource and may include data recovery (according to PRC Section 21083.2), if deemed appropriate by the archaeologist, in consultation with the City, or other actions such as treating the resource with culturally appropriate dignity and protecting the cultural character and integrity of the resource (according to PRC Section 21084.3).	

TABLE 2-5 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF MENLO PARK HOUSING ELEMENT UPDATE

Impacts	Mitigation Measures	Significance after Mitigation
Impact CR-3: Implementation of the HEU could disturb human remains, including those interred outside of formal cemeteries.	**Mitigation Measure CR-3. Inadvertent Discovery of Human Remains.** Procedures of conduct following the discovery of human remains have been mandated by Health and Safety Code Section 7050.5, Public Resources Code Section 5097.98 and the California Code of Regulations Section 15064.5 (CEQA). According to the provisions in CEQA, if human remains are encountered, the project applicant shall ensure that all work in the immediate vicinity of the discovery shall cease and necessary steps are taken to ensure the integrity of the immediate area. The San Mateo County Coroner shall be notified immediately. The Coroner shall then determine whether the remains are Native American. If the Coroner determines the remains are Native American, the Coroner shall notify the NAHC within 24 hours, who will, in turn, notify the person the NAHC identifies as the Most Likely Descendant (MLD) of any human remains. Further actions shall be determined, in part, by the desires of the MLD. The MLD has 48 hours to make recommendations regarding the disposition of the remains following notification from the NAHC of the discovery. If the MLD does not make recommendations within 48 hours, the landowner shall, with appropriate dignity, reinter the remains in an area of the property secure from further disturbance.	Less than Significant Impact, with Mitigation
Impact CR-4: Implementation of the HEU, in combination with past, present and reasonably foreseeable projects, would result in a significant cumulative impact with respect to historic architectural resources (*Significant and Unavoidable Impact, with Mitigation*), and less than significant cumulative impacts for archaeological resources and human remains.	**Mitigation Measures:** Implement **Mitigation Measures CR-1a, CR-1b, CR-1c**. **Mitigation Measure:** Implement **Mitigation Measures CR-1a, CR-1b, CR-1c, CR-2a, CR-2b, CR-3.**	Significant and Unavoidable Cumulative Impact, with Mitigation (historic architectural resources); and Less than Significant Cumulative Impacts (archaeological resources and human remains)
4.5 Energy		
Impact EN-1: Implementation of the HEU would not result in wasteful, inefficient, or unnecessary consumption of energy resources during project construction and operation.	None required.	Less than Significant Impact
Impact EN-2: Implementation of the HEU would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency.	None required.	Less than Significant Impact
Impact EN-3: Implementation of the HEU, in conjunction with cumulative development in the City, would not result in energy use that would be considered wasteful and unnecessary, or conflict with or obstruct a state or local plan for renewable energy or energy efficiency under cumulative conditions.	None required.	Less than Significant Impact
4.6 Geology, Soils, and Paleontological Resources		
Impact GEO-1: The project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong ground shaking or seismically induced ground failure, including landslides, liquefaction, and lateral spreading.	None required.	Less than Significant Impact

TABLE 2-5 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF MENLO PARK HOUSING ELEMENT UPDATE

Impacts	Mitigation Measures	Significance after Mitigation
Impact GEO-2: The project would not result in substantial soil erosion or the loss of topsoil.	None required.	Less than Significant Impact
Impact GEO-3: The project would not be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in onsite or offsite landslide, lateral spreading, subsidence (i.e., settlement), liquefaction, or collapse.	None required.	Less than Significant Impact
Impact GEO-4: The project would not be located on expansive soil creating direct or indirect substantial risks to life or property.	None required.	Less than Significant Impact
Impact GEO-5: The project would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	**Mitigation Measure GEO-5, Discovery of Paleontological Resources** In the event that fossils or fossil bearing deposits are discovered during ground disturbing activities, excavations within a 50-foot radius of the find shall be temporarily halted or diverted. Ground disturbance work shall cease until a City-approved qualified paleontologist determines whether the resource requires further study. The paleontologist shall document the discovery as needed in accordance with Society of Vertebrate Paleontology standards (Society of Vertebrate Paleontology 2010), evaluate the potential resource, and assess the significance of the find under the criteria set forth in CEQA Guidelines Section 15064.5. The paleontologist shall notify the appropriate agencies to determine procedures that would be followed before construction activities are allowed to resume at the location of the find. If avoidance is not feasible, the paleontologist shall prepare an excavation plan for mitigating the effect of construction activities on the discovery. The excavation plan shall be submitted to the City of Menlo Park for review and approval prior to implementation, and all construction activity shall adhere to the recommendations in the excavation plan.	Less than Significant Impact, with Mitigation
Impact GEO-6: Implementation of the HEU, when combined with other past, present, or reasonably foreseeable projects, would not contribute considerably to cumulative impacts relative to geology and paleontological resources.	**Mitigation Measure:** Implement **Mitigation Measure GEO-5.**	Less than Significant Impact, with Mitigation
4.7 Greenhouse Gas Emissions		
Impact GHG-1: Implementation of the HEU would not generate greenhouse gas emissions, either directly or indirectly, that would have a significant impact on the environment.	**Mitigation Measure GHG-1a: Enforce No Natural Gas Requirement.** Subsequent housing development projects proposed under the HEU shall not be eligible for exceptions from the "all electric" requirement in the City's Reach Codes. **Mitigation Measure GHG-1b: Enforce EV Charging Requirements in CALGreen Tier 2.** Subsequent housing development projects proposed under the HEU shall comply with EV charging requirements in the most recently adopted version of CALGreen Tier 2 at the time that a building permit application is filed.	Less than Significant Impact, with Mitigation
Impact GHG-2: Implementation of the HEU would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	**Mitigation:** Implement **Mitigation Measures GHG-1a and GHG-1b.**	Less than Significant Impact, with Mitigation

TABLE 2-5 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF MENLO PARK HOUSING ELEMENT UPDATE

Impacts	Mitigation Measures	Significance after Mitigation
4.8 Hazards and Hazardous Materials		
Impact HAZ-1: Implementation of the HEU would not create a significant hazard to the public or the environment through the routine transport, use, disposal, or accidental release of hazardous materials.	None required.	Less than Significant Impact
Impact HAZ-2: Implementation of the HEU would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	None required.	Less than Significant Impact
Impact HAZ-3: Implementation of the HEU could result in development projects being located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 and, as a result, would it create a significant hazard to the public or the environment.	**Mitigation Measure HAZ-3a: Environmental Site Management Plan** Project applicants shall ensure that construction at the sites with known contamination are conducted under a project-specific Environmental Site Management Plan (ESMP) that is prepared by qualified personnel in consultation with the RWQCB or the DTSC, as appropriate. The purpose of the ESMP is to protect construction workers, the general public, the environment, and future site occupants from subsurface hazardous materials previously identified at the site and to address the possibility of encountering unknown contamination or hazards in the subsurface. The ESMP shall summarize soil and groundwater analytical data collected on the project site during past investigations; identify management options for excavated soil and groundwater, if contaminated media are encountered during deep excavations; and identify monitoring, irrigation, or other wells requiring proper abandonment in compliance with local, State, and federal laws, policies, and regulations. The ESMP shall include measures for identifying, testing, and managing soil and groundwater suspected of or known to contain hazardous materials. The ESMP shall: 1) Provide procedures for evaluating, handling, storing, testing, and disposing of soil and groundwater during project excavation and dewatering activities, respectively; 2) Describe required worker health and safety provisions for all workers potentially exposed to hazardous materials in accordance with State and federal worker safety regulations; and; 3) Designate personnel responsible for implementation of the ESMP. **Mitigation Measure HAZ-3b: Vapor Intrusion Assessment** Project applicants shall ensure that a vapor intrusion assessment is performed by a licensed environmental professional for sites with potential residual contamination in soil, soil gas, or groundwater that are planned for redevelopment with an overlying occupied building. If the results of the vapor intrusion assessment indicate the potential for significant vapor intrusion into an occupied building, project design shall include vapor controls or source removal, as appropriate, in accordance with regulatory agency requirements. Soil vapor controls could include vapor barriers, passive venting, and/or active venting. The vapor intrusion assessment and associated vapor controls or source removal can be incorporated into the ESMP (Mitigation Measure HAZ-3a).	Less than Significant Impact, with Mitigation

TABLE 2-5 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF MENLO PARK HOUSING ELEMENT UPDATE

Impacts	Mitigation Measures	Significance after Mitigation
Impact HAZ-4: Implementation of the HEU would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	None required.	Less than Significant Impact
Impact 4.8-4: Implementation of the HEU would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	None required.	Less than Significant Impact
Impact HAZ-5: Implementation of the HEU, when combined with other past, present, or reasonably foreseeable projects, would not contribute considerably to cumulative impacts relative to hazards and hazardous materials.	**Implement Mitigation Measures HAZ-3a and HAZ-3b.**	Less than Significant Impact
4.9 Hydrology and Water Quality		
Impact HYDRO-1: Implementation of the HEU would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality.	None required.	Less than Significant Impact
Impact HYDRO-2: Implementation of the HEU would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable management of the groundwater basin.	None required.	Less than Significant Impact
Impact HYDRO-3: Implementation of the HEU would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: i) result in substantial erosion or siltation on- or offsite; ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite; iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or iv) impede or redirect flood flows.	None required.	Less than Significant Impact
Impact HYDRO-4: Implementation of the HEU in a flood zone, tsunami hazard area, or dam inundation zone would not risk release of pollutants due to project inundation.	None required.	Less than Significant Impact
Impact HYDRO-5: Implementation of the HEU would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.	None required.	Less than Significant Impact
Impact HYDRO-6: Implementation of the HEU, in combination with past, present, and reasonably foreseeable future development, would result in a less than significant cumulative impact with respect to hydrology and water quality.	None required.	Less than Significant Impact

TABLE 2-5 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF MENLO PARK HOUSING ELEMENT UPDATE

Impacts	Mitigation Measures	Significance after Mitigation
4.10 Land Use and Planning		
Impact LU-1: Implementation of the HEU would not physically divide an established community.	None required.	Less than Significant Impact
Impact LU-2: Implementation of the HEU would not cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.	**Mitigation Measure LU-2: Demonstrate consistency with the applicable goals, policies, and programs in the General Plan and the supporting Zoning standards.** Prior to individual project approval, as part of the project application process, future development in Menlo Park shall be required to demonstrate consistency with the applicable goals, policies, and programs in the General Plan and the supporting Zoning standards to the satisfaction of the City of Menlo Park's Community Development Department. A future project is consistent with the General Plan and Zoning standards if, considering all its aspects, it will further the goals, policies, and programs of the General Plan and supporting Zoning standards and not obstruct their attainment.	Less than Significant Impact, with Mitigation
Impact LU-3: Implementation of the HEU would not combine with other past, present, and reasonably foreseeable projects to result in significant cumulative impacts with respect to land use and planning.	None required.	Less than Significant Impact
4.11 Noise and Vibration		
Impact NOI-1: Construction activities associated with implementation of the HEU would not result in generation of a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	**Mitigation Measure NOI-1: Construction Noise Control.** Project applicants shall minimize the exposure of nearby properties to excessive noise levels from construction-related activity through CEQA review, conditions of approval, and/or enforcement of the City's Noise Ordinance. Prior to issuance of demolition, grading, and/or building permits for development projects, a note shall be provided on development plans indicating that during on-going grading, demolition, and construction, the property owner/developer shall be responsible for requiring contractors to implement the following measures to limit construction- related noise: • Demonstrate that any construction activities taking place outside daytime construction hours of 8:00 a.m. to 6:00 p.m. Monday through Friday shall comply with the 60 dBA Leq limit during the hours of 7:00 a.m. to 8:00 a.m. and the 50 dBA Leq limit during the hours of 6:00 a.m. to 7:00 a.m. In addition, the property owner/developer shall demonstrate that individual pieces of equipment proposed for use will not exceed the limit (85 dBA Leq at 50 feet) for powered equipment noise and that combined construction noise will not result in a 10 dBA increase over the ambient noise level at nearby sensitive receptors. Activities that would produce noise above applicable daytime or nighttime limits shall be scheduled only during normal construction hours. If it is concluded that a particular piece of equipment will not meet the requirements of this mitigation measure, that equipment shall not be used outside the daytime construction hours. • Verify construction activities are conducted at adequate distances or otherwise shielded with sound barriers, as determined through analysis, from noise-sensitive receptors when working outside the daytime construction hours of 8:00 a.m. to 6:00 p.m. Monday through Friday, and verify compliance with the Menlo Park Municipal Code though measurement.	Less than Significant Impact

TABLE 2-5 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF MENLO PARK HOUSING ELEMENT UPDATE

Impacts	Mitigation Measures	Significance after Mitigation
	• All internal combustion engines on construction equipment and trucks are fitted with properly maintained mufflers, air intake silencers, and/or engine shrouds that are no less effective than as originally equipped by the manufacturer. • Stationary equipment such as generators and air compressors shall be located as far as feasible from nearby noise-sensitive uses. • Stockpiling is located as far as feasible from nearby noise-sensitive receptors. • Limit unnecessary engine idling to the extent feasible. • Limit the use of public address systems. • Construction traffic shall be limited to the haul routes established by the City of Menlo Park. • Additional controls, as warranted, may include but are not limited to: – Upgraded construction equipment mufflers (e.g., improved mufflers, intake silencers, ducts, engine enclosures, acoustically attenuating shields, shrouds) on equipment and trucks used for project construction. – Equipment staging plans (e.g., locating stationary equipment at adequate distances). – Limitations on equipment and truck idling. – Shielding sensitive receptors with sound barriers to comply with the Menlo Park Municipal Code.	
Impact NOI-2: Stationary noise sources from development within the HEU area would not result in a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	None required.	Less than Significant Impact
Impact NOI-3: Implementation of the HEU would not result in generation of excessive groundborne vibration or groundborne noise levels.	None required.	Less than Significant Impact
Impact NOI-4: Transportation increases along roadways under the HEU would not result in a substantial permanent increase in ambient noise levels in the project vicinity above baseline levels without the project.	None required.	Less than Significant Impact
Impact NOI-5: Implementation of the HEU would not expose people residing or working in the project area to excessive noise levels due to being located within the vicinity of a private airstrip or an airport land use plan or within two miles of a public airport or public use airport.	None required.	Less than Significant Impact

TABLE 2-5 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF MENLO PARK HOUSING ELEMENT UPDATE

Impacts	Mitigation Measures	Significance after Mitigation
Impact NOI-6: Construction activities associated with implementation of the HEU, when combined with other past, present, or reasonably foreseeable projects, would not result in generation of a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	**Implement Mitigation Measure NOI-1.**	Less than Significant Impact, with Mitigation
Impact NOI-7: Stationary noise sources from development within the HEU area, when combined with other past, present, or reasonably foreseeable projects, would not result in a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	None required.	Less than Significant Impact
Impact NOI-8: Construction activities associated with implementation of the HEU, when combined with other past, present, or reasonably foreseeable projects, would not result in exposure of persons to or generation of excessive ground borne vibration levels.	None required.	Less than Significant Impact
Impact NOI-9: Transportation activities under the HEU, when combined with other past, present, or reasonably foreseeable projects, would not result in a substantial permanent increase in ambient noise levels in the project vicinity above baseline levels without the project and cumulative development.	None required.	Less than Significant Impact
4.12 Population and Housing		
Impact PH-1: Implementation of the HEU would not induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure).	None required.	Less than Significant Impact
Impact PH-2: Implementation of the HEU would not displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.	None required.	Less than Significant Impact
Impact PH-3: Implementation of the HEU would not combine with other past, present, and reasonably foreseeable projects to create a significant impact to population and housing.	None required.	Less than Significant Impact

TABLE 2-5 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF MENLO PARK HOUSING ELEMENT UPDATE

Impacts	Mitigation Measures	Significance after Mitigation
4.13 Public Services and Recreation		
Impact PS-1: Implementation of the HEU would not result in an increase in demand for fire protection and emergency medical response services that would require new or physically altered fire protection facilities in order to maintain acceptable service ratios, response times, or other performance objectives, construction of which could have significant physical environmental impacts.	None required.	Less than Significant Impact
Impact PS-2: Implementation of the HEU would not result in an increase in demand for police protection services that would require new or physically altered police facilities in order to maintain acceptable service ratios, response times, or other performance objectives, construction of which could have significant physical environmental impacts.	None required.	Less than Significant Impact
Impact PS-3: Implementation of the HEU would not result in an increase in new students for public schools at a level that would require new or physically altered school facilities in order to maintain acceptable service ratios or other performance objectives, construction of which would have significant physical environmental impacts.	None required.	Less than Significant Impact
Impact PS-4: Implementation of the HEU would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.	None required.	Less than Significant Impact
Impact PS-5: Implementation of the HEU would not result in substantial adverse impacts associated with the provision of or the need for new or physically altered library facilities.	None required.	Less than Significant Impact
Impact PS-6: The HEU, combined with cumulative development in the vicinity and Citywide, would not result in an adverse cumulative increase in demand for public services that would require new or physically altered governmental or park facilities, construction of which could have significant physical environmental impacts.	None required.	Less than Significant Impact
4.14 Transportation		
Impact TRANS-1: Implementation of The HEU would conflict with an applicable program, plan, ordinance, or policy establishing measures of effectiveness for the performance of addressing the circulation system, including transit, bicycle, and pedestrian facilities.	None feasible (bicycle and pedestrian facilities). None required (transit facilities).	Significant and Unavoidable Impact (bicycle and pedestrian facilities) Less than Significant Impact (transit facilities)

TABLE 2-5 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF MENLO PARK HOUSING ELEMENT UPDATE

Impacts	Mitigation Measures	Significance after Mitigation
Impact TRANS-2: Implementation of the HEU would exceed an applicable VMT threshold of significance.	**Mitigation Measure TRANS-2: Implement VMT Reduction Measures.** Individual multifamily housing development proposals that do not screen out from VMT impact analysis shall provide a quantitative VMT analysis using the methods outlined by the City's most recent VMT guidelines. Projects that result in a significant impact shall include travel demand management measures and/or physical measures (i.e. improving multimodal transportation network, improving street connectivity) to reduce VMT, including but not limited to the measures below, which have been identified as potentially VMT reducing in the California Air Pollution Control Officers Association (CAPCOA) Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity (December 2021). Potential VMT reduction estimates are included below, but detailed requirements, calculation steps, and limitations are described in the CAPCOA Handbook. Additional measures may be proposed by individual projects and/or required by City staff to achieve the necessary VMT reductions or to meet applicable TDM reduction requirements. • Unbundle parking costs (i.e. sell or lease parking separately from the housing unit). Effectiveness: up to 15.7 percent reduction in GHG from VMT per the CAPCOA Handbook. • Provide car-sharing, bike sharing, or scooter sharing programs. Effectiveness: 0.15 – 0.18 percent reduction in GHG from VMT for car share, 0.02 – 0.06 percent for bike share, and 0.07 percent for scooter share, per the CAPCOA Handbook. The higher car share and bike share values are for electric car and bike share programs. • Subsidize transit passes for residents of affordable housing. Effectiveness: up to 5.5 percent reduction in GHG from VMT per the CAPCOA Handbook.	Significant and Unavoidable Impact, with Mitigation
Impact TRANS-3: Implementation of the HEU would not result in designs for on-site circulation, access, and parking areas that fail to meet City or industry standard design guidelines.	None required.	Less than Significant Impact
Impact TRANS-4: Implementation of the HEU would not result in inadequate emergency access to development sites.	None required.	Less than Significant Impact
Impact TRANS-5: Implementation of the HEU, in combination with cumulative development, would conflict with an applicable program, plan, ordinance, or policy establishing measures of effectiveness for the performance of addressing the circulation system, including transit, bicycle, and pedestrian facilities.	None feasible (bicycle and pedestrian facilities). None required (transit facilities).	Significant and Unavoidable Impact (bicycle and pedestrian facilities) Less than Significant Impact (transit facilities)
Impact TRANS-6: Implementation of the HEU, in combination with cumulative development, would exceed an applicable VMT threshold of significance.	**Implement Mitigation Measure TRANS-2.**	Significant and Unavoidable Impact, with Mitigation
Impact TRANS-7: Implementation of the HEU, in combination with cumulative development, would not result in designs for on-site circulation, access, and parking areas that fail to meet City or industry standard design guidelines.	None required.	Less than Significant Impact

TABLE 2-5 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF MENLO PARK HOUSING ELEMENT UPDATE

Impacts	Mitigation Measures	Significance after Mitigation
Impact TRANS-8: Implementation of the HEU, in combination with cumulative development, would not result in inadequate emergency access to development sites.	None required.	Less than Significant Impact
4.15 Tribal Cultural Resources		
Impact TCR-1: Implementation of the HEU would not cause a substantial adverse change to previously unknown archaeological resources that are also tribal cultural resources, as defined in Public Resources Code Section 21074(a).	**Implement Mitigation Measures CR-2a, CR-2b, and CR-3.**	Less than Significant Impact, with Mitigation
Impact TCR-2: Implementation of the HEU, in combination with other cumulative projects, would not cause a substantial adverse change to previously unknown archaeological resources that are also tribal cultural resources, as defined in Public Resources Code Section 21074(a).	**Implement Mitigation Measures CR-2a, CR-2b, and CR-3.**	Less than Significant Impact, with Mitigation
4.16 Utilities and Service Systems		
Impact UT-1: Implementation of the HEU would not require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which would cause significant environmental effects.	None required.	Less than Significant Impact
Impact UT-2: Implementation of the HEU would have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years.	None required.	Less than Significant Impact
Impact UT-3: Implementation of the HEU would not result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.	None required.	Less than Significant Impact
Impact UT-4: Implementation of the HEU would not generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals.	None required.	Less than Significant Impact
Impact UT-5: Implementation of the HEU would comply with federal, state, and local management and reduction statutes and regulations related to solid waste.	None required.	Less than Significant Impact

TABLE 2-5 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES FOR THE CITY OF MENLO PARK HOUSING ELEMENT UPDATE

Impacts	Mitigation Measures	Significance after Mitigation
Impact UT-6: Implementation of the HEU, in combination with past, present, existing, approved, pending, and reasonably foreseeable future projects in the vicinity, would not contribute considerably to cumulative impacts on utilities and service systems.	None required.	Less than Significant Impact
4.17 Wildfire		
Impact WILD-1: Implementation of the HEU would not substantially impair an adopted emergency response plan or emergency evacuation plan.	None required.	Less than Significant Impact
Impact WILD-2: Implementation of the HEU would not exacerbate wildfire risks due to slope, prevailing winds, and other factors, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire.	None required.	Less than Significant Impact
Impact WILD-3: Implementation of the HEU would not require the installation or maintenance of infrastructure such as roads, fuel breaks, emergency water sources, power lines or other utilities that could exacerbate fire risk or that could result in temporary or ongoing impacts to the environment.	None required.	Less than Significant Impact
Impact WILD-4: Implementation of the HEU would not expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.	None required.	Less than Significant Impact
Impact WILD-5: Implementation of the HEU, when combined with other past, present, or reasonably foreseeable projects, would/would not result in a cumulative impact related to wildfire.	None required.	Less than Significant Impact

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CHAPTER 3
Project Description

3.1 Introduction

State law requires every city and county in California to have an adopted comprehensive long-range general plan with specific contents in order to provide a vision for the jurisdiction's future. The general plan is the overarching policy document that informs local decisions about land use and development. The City of Menlo Park's General Plan is comprised of four sections that cover seven "elements," which are mandated under State law, to the extent the provisions are locally relevant. The elements of the City's current General Plan are noted in the box below.

Current Contents of the Menlo Park General Plan

- Land Use Element, adopted November 2016
- Circulation Element, adopted November 2016
- Housing Element 2015-2023, adopted April 2014
- Open Space/Conservation, Noise and Safety Elements, adopted May 2013

The City of Menlo Park's current General Plan was last updated in 2016, when *ConnectMenlo*, an update of the Land Use and Circulation Elements, was adopted. The City's Housing Element was last adopted on April 1, 2014, and in accordance with State law, addresses the planning period from January 31, 2015 through January 31, 2023. As the end of this period is near, State law [Government Code Section 65588] requires the City to update its Housing Element to implement the most recent Regional Housing Needs Allocation (RHNA) and provides a due date of January 31, 2023. In accordance with State law, the planning period for the updated Housing Element (referred to as the RHNA "6th Cycle") will extend from January 31, 2023 through January 31, 2031.

Concurrent with updating the Housing Element, the City proposes to update the General Plan's Safety Element; prepare and adopt a new Environmental Justice Element; and make conforming amendments to other elements of the General Plan, as needed, to maintain internal consistency. The City also proposes to undertake changes to the City's Zoning Ordinance (Menlo Park Municipal Code Title 16) and the El Camino Real/Downtown Specific Plan (adopted June 12, 2012) that are needed to reflect the updated Housing Element and to maintain consistency with the General Plan, and proposes to rezone housing opportunity sites and the zoning districts identified in the Housing Element for those sites.

These proposed actions are the subject of this Subsequent Environmental Impact Report (SEIR), and are collectively referred to as the Housing Element Update (HEU). These combined components comprise the "Project" for purposes of CEQA. Each component of the HEU is described in this chapter, which also provides background information, lists Project objectives, and describes intended uses of the SEIR, including approval actions required.

3.2 Project Location and Setting

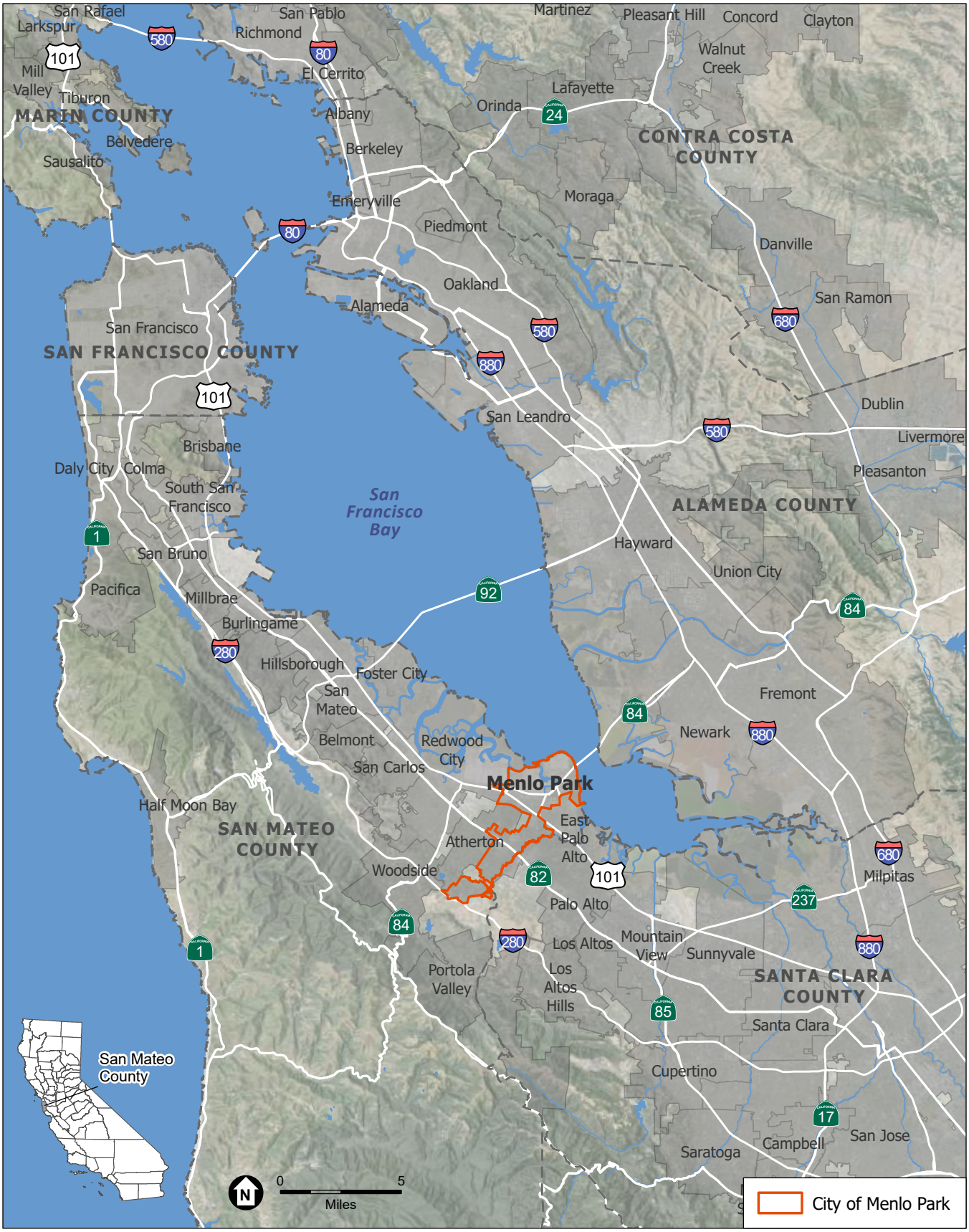
Menlo Park is located in the San Francisco Bay Area, approximately 30 miles south of downtown San Francisco and about 20 miles northwest of San Jose (latitude 37º27'10"N, longitude 122º11'00"W). The City is located at the southern edge of San Mateo County and was incorporated in 1927. The City encompasses approximately 17 square miles (approximately seven square miles of which is water) with a population of approximately 35,000 people. The City boundaries and its regional location are shown in **Figure 3-1**. The geographic extent of environmental analysis included in the SEIR for the proposed HEU will be the City limits.

The City of Menlo Park currently includes approximately 14,000 residential dwelling units[1] and an extensive employment base. The City is generally bounded by San Francisco Bay to the north and east; the Cities of East Palo Alto and Palo Alto and Stanford University to the southeast; and Atherton, unincorporated North Fair Oaks, and Redwood City to the northwest. The City is accessed by Interstate 280 (I-280), U.S. Highway 101 (US-101), Caltrain, State Route 84 (SR-84, or Bayfront Expressway) via the Dumbarton Bridge, and a variety of arterial roadways, as well as regional and local pedestrian and bicycles routes. Menlo Park has a Caltrain station located near the downtown area and is less than one hour from downtown San Francisco via train. Menlo Park has a range of urban and suburban land uses, including residential neighborhoods of varied densities, its downtown, parks, established business centers, and an emerging center for innovation and technology. **Figure 3-2** shows the existing General Plan's generalized land uses in Menlo Park, which are categorized as follows:

- Residential
- Commercial
- Bayfront
- Specific Plan Area
- Parks and Recreation
- Public/Quasi Public
- Baylands

The City's Bayfront Area is the northernmost part of Menlo Park and was the focus of the *ConnectMenlo* project, which resulted in rezoning the general industrial area (the former M-2 Area) in 2016 as further described in the sections below, providing for additional non-residential and residential development opportunities.

[1] The State Department of Finance, Table 2: E-5 City/County Population and Housing Estimates, from January 1, 2021 estimates 14,124 units. The City's transportation model estimates 13,992 existing units with 1,448 additional units that have been approved, some of which are under construction.

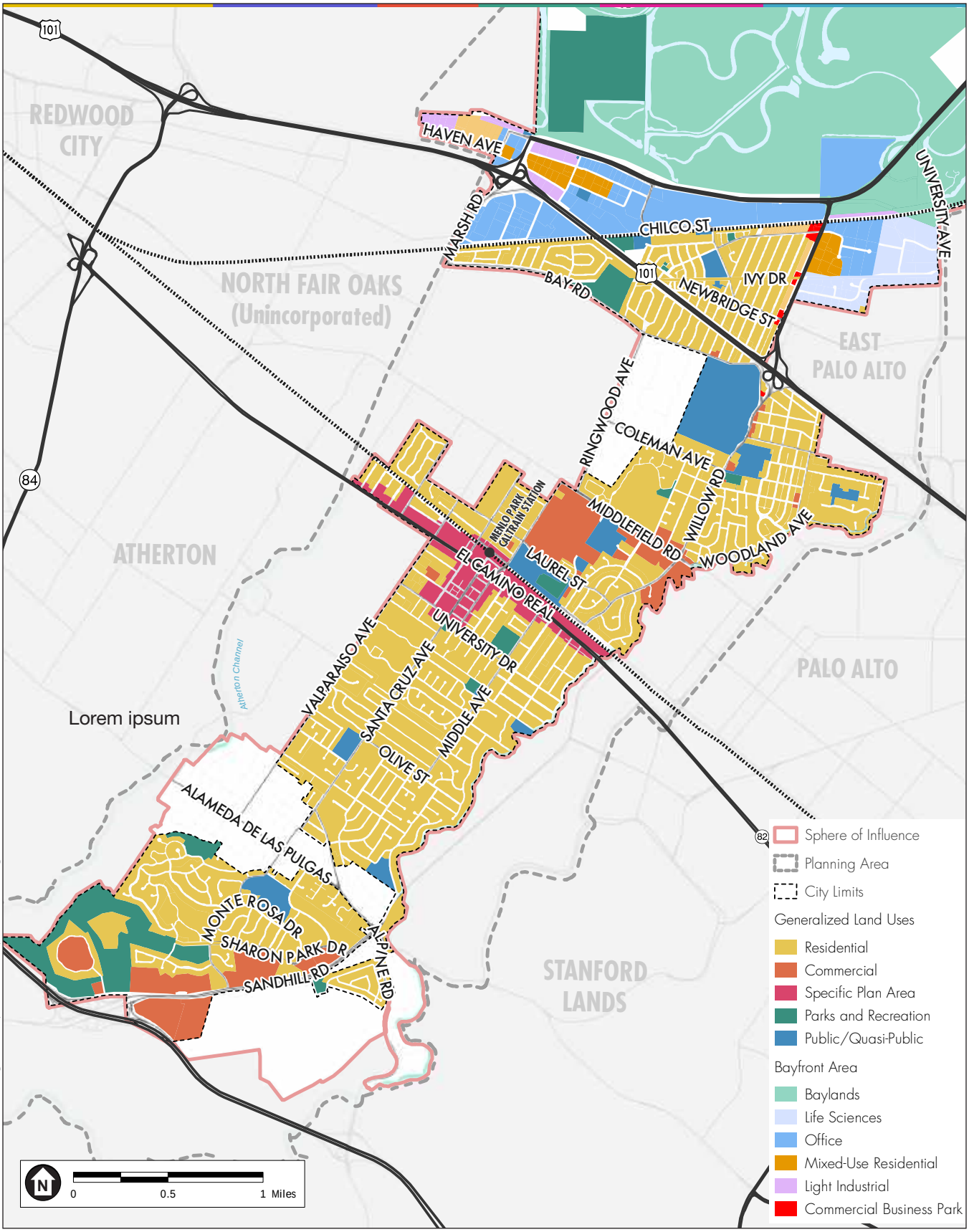


SOURCE: Esri, 2022; ESA, 2022

Menlo Park Housing Element Update EIR

Figure 3-1
City Boundaries and Regional Location

ESA



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SOURCE: M-Group, 2022

Note: Note: Specific land use designations are shown in the Bayfront Area and generalized land uses are shown elsewhere.

Menlo Park Housing Element Update EIR

Figure 3-2
Existing General Plan Land Use Designations

ESA

3.3 Background

The City is proposing to update the General Plan's Housing Element; update the Safety Element, and add a new Environmental Justice Element. These actions would build upon changes to the City's General Plan Update adopted in 2016, and would ensure the City's compliance with State law. The 2016 *ConnectMenlo* General Plan Update is briefly described below, along with relevant requirements of State law.

3.3.1 ConnectMenlo

The General Plan (Land Use and Circulation Elements) and M-2 Area Zoning Update public outreach and participation process known as *ConnectMenlo* began in August 2014 and included over 60 organized events, including workshops and open houses, mobile tours, informational symposia, stakeholder interviews, and focus groups, concluding in November 2016 with adoption of updated Land Use and Circulation Elements following recommendations by a General Plan Advisory Committee, and consideration by the Planning Commission and the City Council at public meetings.

The updated Land Use Element included goals, policies, and programs to guide local decisions regarding land use, and framed the type and scope of potential development that may occur in the City. The Land Use Element encourages healthy and sustainable living, both economically and environmentally. The updated Circulation Element addresses transportation throughout the City and aims to improve mobility connections Citywide for all modes of travel. The General Plan amendments were accompanied by Zoning Ordinance amendments to foster a new live/work/play environment in the Bayfront Area. The City Council adopted three new zoning districts: Office (O), Life Sciences (LS), and Residential Mixed Use (R-MU) to set the framework for the creating the live/work/play concept.

A primary focus of *ConnectMenlo* was to balance the potential for development impacts with providing community amenities, especially for the Belle Haven neighborhood. Bayfront Area projects may propose development at the bonus level, which allows additional height, floor area ratio (FAR), and/or density above the base level of zoning regulations in exchange for community amenities. Highlighted community amenities included improved transportation alternatives, affordable housing to support both the adjacent neighborhood and the growing workforce, and expanded service and community-serving retail uses.

The new development potential created in the Bayfront Area was analyzed in the *ConnectMenlo* EIR, along with remaining development potential under the General Plan, and is summarized in **Table 3-1**.

As discussed in Chapter 1 of this SEIR, *Introduction*, this SEIR analyzes potential impacts of the HEU, and in doing so, describes ways in which the HEU would result in impacts that would be new or different from those identified in the 2016 *ConnectMenlo* EIR.

TABLE 3-1
CONNECTMENLO EIR PROJECT DESCRIPTION: SUMMARY OF DEVELOPMENT POTENTIAL[a]

Added Bayfront Area Development Potential	Existing General Plan Development Potential	Total Development Potential Analyzed in *ConnectMenlo* EIR
2.3 M sq. ft. non-residential	1.8 M sq. ft. non-residential	4.1 M sq. ft. non-residential
4,500 residential units	1,000 residential units	5,500 residential units
400 hotel rooms	0	400 hotel rooms

NOTES:

a City Council Resolution 6356, Adopted December 6, 2016, Table 1 Proposed Project Buildout Projections.

3.3.2 Purpose of General Plan Housing Element Update – Regional Housing Needs Allocation

The overall purpose of the update to the Housing Element is to address the housing needs of all types of households and income levels for current and future Menlo Park residents. State law requires that the City's Housing Element be updated by January 31, 2023 and that it contain specific contents, including an inventory or list of housing sites at sufficient densities to accommodate a specific number of units at various levels of affordability assigned to the City by the Association of Bay Area Governments (ABAG). ABAG assigns unit amounts to Bay Area jurisdictions based on a regional housing production target set by the California Department of Housing and Community Development (HCD). This assignment is referred to as the Regional Housing Needs Allocation (RHNA).

On December 16, 2021, ABAG adopted the *Final Regional Housing Needs Allocation (RHNA) Plan: San Francisco Bay Area, 2023-2031*, which distributed the regional housing need of 441,176 units across all local jurisdictions in the nine-county Bay Area. The 21 jurisdictions within San Mateo County received a total of 47,687 units, or about 10.8 percent of the regional allocation, and Menlo Park received an allocation of 2,946 units. This allocation is higher than the number addressed in the City's current Housing Element in part because the Bay Area region's overall allocation of 441,176 units from HCD is more than double the prior RHNA cycle allocation, which was approximately 189,000 units.

Within the update of the Housing Element, the City is required to plan for its allocation of housing units by income group. Income groups are defined based on area median household income, or AMI, updated annually by HCD. San Mateo County's 2021 Area Median Income (AMI) for a household of four persons is $149,600. Income categories include very low income (0-50 percent of AMI), low income (51-80 percent of AMI), moderate income (81-120 percent of AMI), and above moderate income (greater than 120 percent of AMI). Providing housing to meet the needs of all income levels is critical to the social and economic health of Menlo Park. The City must plan for its income-based housing allocation to address its share of the Bay Area region's housing needs.

Table 3-2 shows the RHNA distribution of required units in Menlo Park across the four income categories with and without additional units as a buffer (which HCD recommends equal 30 percent of the RHNA allocation).

TABLE 3-2
REGIONAL HOUSING NEEDS ALLOCATION

	Very Low Income Units[a] (0-50% AMI)	Low Income Units (51-80% AMI)	Moderate Income Units (81-120% AMI)	Above Moderate Income Units (>120% AMI)	Total New Units
6th Cycle RHNA without buffer	740	426	496	1,284	2,946
6th Cycle RHNA with 30% buffer[b]	962 (740+222)	554 (426+128)	645 (496+149)	1,669 (1,284+385)	3,830 (2,946+884)

NOTES:

a 47 percent of Very Low Income Units would be Extremely Low Income or less than 30% AMI]

b The California Department of Housing and Community Development (HCD) recommends a buffer of additional units above the RHNA. With a 30 percent buffer included (884 units), Menlo Park's RHNA is 3,830 total new units.

SOURCE: Association of Bay Area Governments (ABAG), *Final Regional Housing Needs Allocation (RHNA) Plan: San Francisco Bay Area, 2023-2031* adopted December 2021, and City of Menlo Park, December 2021.

A buffer is necessary to ensure that if one or more of the identified housing sites are developed at lower densities than projected, or with non-housing uses, there is remaining capacity elsewhere in the City to provide an ongoing supply of sites for housing during the eight-year planning period/cycle of the Housing Element. If there were no buffer and an identified housing site developed with a non-housing project or developed at a density less than that anticipated in the Housing Element, then the City could be obliged to identify new housing opportunity sites and amend the Housing Element prior to the end of the planning period/cycle.

The need for a substantial buffer is increasingly important because of new rules in the Housing Accountability Act's "no net loss" provisions. California State Senate Bill 166 (2017) adopted Government Code section 65589.5 which requires that the land inventory and site identification programs in the Housing Element always include sufficient sites to accommodate unmet RHNA. This means that if a housing site is identified in the Housing Element as having the potential for housing development that could accommodate lower-income units but is actually developed with units at a higher income level, or with fewer units than expected, or with non-residential uses, then the locality must either: 1) identify and rezone, if necessary, an adequate substitute site; or 2) demonstrate that the land inventory already contains an adequate substitute site. An adequate buffer will be critical to ensure that the City remains compliant with these provisions without having to identify and rezone sites prior to the end of the planning period on January 31, 2031.

While State law requires the Housing Element to include an inventory of housing sites and requires the City to appropriately zone sites to meet its RHNA, the law does not require the City to develop/construct housing on these sites. Future development on identified sites will be at the discretion of individual property owners and will be largely dependent on market forces, and in the case of affordable housing, available funding and/or other incentives. Nonetheless, this SEIR considers potential impacts of development that may result from adoption of the HEU, including

rezoning of potential housing sites to allow housing and/or mixed-use developments, and related actions to encourage housing production including, but not limited to, changes in allowable densities; changes in development standards; and adoption of incentives such as a density bonus for the creation of affordable housing.

3.3.3 Purpose of the General Plan Safety Element Update

The Safety Element is a State-mandated component of a General Plan and State law requires that it be updated as needed to address fire risk and climate adaptation and resiliency strategies (Government Code section 65302(g) and section 65302.15). The Safety Element focuses on protecting the community from risks associated with climate change, earthquakes, floods, fires, toxic waste, and other hazards, and is the means by which the City defines what measures will be undertaken to reduce the potential risk of personal injury, property damage, and economic and social dislocation resulting from natural and human-made hazards. The extent of a hazard depends on local conditions since most hazards are confined to a particular area or site. Also, long-term costs to the City, such as maintenance, liability exposure, and emergency services, are potentially greater where high hazards exist. Having an updated Safety Element in the General Plan will ensure that various health and safety hazards are considered in planning the location, design, intensity, density, and type of land uses in a given area.

3.3.4 Purpose of the New General Plan Environmental Justice Element

California Government Code section 65302(h) requires jurisdictions to adopt an Environmental Justice (EJ) Element if it contains a defined “Disadvantaged Community.” Adoption of an EJ Element can occur at any time, but is required when the jurisdiction is adopting or revising two or more General Plan elements concurrently. The City of Menlo Park is required to adopt an EJ Element because it is updating its required General Plan Housing Element and Safety Element.

According to State law, a "Disadvantaged Community" is an area identified by the California Environmental Protection Agency pursuant to Section 39711 of the Health and Safety Code as a low-income area that is disproportionately affected by environmental pollution and other hazards that can lead to negative health effects, exposure, or environmental degradation.[2] There are areas within Menlo Park that meet the State-defined criteria for “Disadvantaged Communities.” The purpose of the EJ Element is to address the unique or compounded health risks in “Disadvantaged Communities” within a jurisdiction. These measures could include, but are not limited to, improving air quality; and promoting public facilities, food access, safe and sanitary homes, and physical activity. In addition, the EJ Element serves to promote civic engagement in the public decision making process and prioritize improvements and programs that address the needs of these communities.

[2] Gov. Code, § 65302, subd. (h)(4)(A))

3.4 Project Components

The Project analyzed in this SEIR would include adoption of General Plan amendments that would add or modify goals, objectives, policies, and implementation programs related to housing, safety, and environmental justice. General Plan amendments would also include conforming amendments to other elements of the General Plan, as needed, to ensure internal consistency. Amendments to the Housing Element would address among other things, the maintenance, preservation, improvement, and development of housing in the City. In addition, the Project would include a housing sites inventory with sufficient existing and new housing sites at appropriate densities to meet the City's RHNA requirement plus an ample buffer, and the City would modify provisions of its Zoning Ordinance, zoning map, and El Camino Real/Downtown Specific Plan as necessary to reflect the housing opportunity sites and land use strategies to meet the City's RHNA.

3.4.1 Housing Goals, Policies and Programs

The proposed Housing Element would include updated goals, policies, and programs to address the maintenance, preservation, improvement, and development of housing and to affirmatively further fair housing in the City. Proposed updates to the goals, policies, and programs in the current Housing Element were informed by a review of the implementation and effectiveness of that document, as well as updated information on demographic and economic trends, existing housing and market conditions, and special housing needs experienced by disabled persons, elderly households, large family households, single female-headed households, and homeless persons. The proposed goals, policies, and programs were also crafted to address an updated assessment of non-governmental and governmental constraints to the development, conservation, and rehabilitation of housing in the City, and to affirmatively further fair housing. For more information, including the definition of these terms, and the proposed updates to goals, policies, and programs, please see the Public Review Draft Housing Element, which can be found on the City's Housing Element Update webpage.[3]

3.4.2 Housing Sites Inventory

The proposed Housing Element identifies specific sites appropriate for development of housing (in particular affordable units), and the City would rezone those sites, as necessary, to meet the requirements of State law. The final housing opportunity sites inventory will be refined based on additional community input and analysis. This SEIR evaluates up to 4,000 new residential units within the eight-year planning period via a variety of strategies in addition to possible pipeline projects and accessory dwelling units, as described below. The analysis also generally considers, at a plan level, the effects of infrastructure improvements that could be required to support the development of additional housing in the City. Since specific development proposals have yet to be advanced, that analysis is necessarily general in nature, and assumes that any future infrastructure improvements that might be needed would be required to undergo project-specific analysis if and when such improvements are proposed.

[3] menlopark.org/housingelement

Pipeline Projects

Pipeline projects are projects that have been recently approved, but not yet occupied or are pending (in review) that would provide housing. Adoption of the El Camino Real/Downtown Specific Plan in 2012; adoption of the current Housing element in 2014; and the *ConnectMenlo* General Plan Update in 2016 enabled opportunities for over 5,000 new housing units in the City. At the time the Notice of Preparation (NOP) for this SEIR was published in December 2021, there were seven major residential projects in the "pipeline" as either approved or pending housing developments that would provide approximately 3,642 new units. Per HCD guidance, these units, as well as smaller projects in the City, could potentially count towards Menlo Park's RHNA requirement if the residential units are not completed and occupied prior to June 30, 2022. Major pipeline projects are listed in **Table 3-3** below, and are identified as either "approved" or "pending." For purposes of this SEIR, approved projects are considered part of the baseline, and pending projects are considered part of the Project being analyzed. (See the discussion of Growth Projections below.)

TABLE 3-3
MAJOR PIPELINE PROJECTS[1]

Project	Status	Net New Units
111 Independence Dr.	Approved	105
115 Independence Dr. (Menlo Portal)	Approved	335
141 Jefferson Dr. (Menlo Uptown)	Approved	483
Subtotal Approved Projects		*923*
123 Independence Dr.	Pending	432
165 Jefferson Dr. (Menlo Flats)	Pending	158
Willow Village	Pending	1,729
333 Ravenswood Ave. (Parkline)	Pending	400
Subtotal Pending Projects		*2,719*
Total		**3,642**

NOTES:

a This table shows major pipeline projects yielding greater than 10 units.

SOURCE: Table 3, Major Pipeline Projects, City Council Staff Report #21-210-CC, October 26, 202

Accessory Dwelling Units

HCD allows the City to develop a projection of accessory dwelling units (ADUs) that will be built within the planning period based on average annual production between 2018 and 2020. Because Menlo Park permitted an average of 10.6 ADUs per year between 2018-2020, the City can anticipate development of 85 units during the 6th Cycle Housing Element planning period. These units could potentially count towards satisfying Menlo Park's RHNA requirement.

Housing Sites Inventory Strategies

While pipeline projects are generally located on the north side of US-101, with the proposed Housing Element, additional housing sites would be geographically dispersed throughout the City, primarily located in City Council Districts 2, 3, 4, and 5—generally, the areas south of US-

101. Sites would be made available for multifamily housing through a combination of rezoning, increased densities, and/or updates to the Zoning Ordinance based on the following general strategies:

- **"Re-use" of sites from the City's current Housing Element.** The Housing Sites Inventory would reuse selected sites from the 5th Cycle Housing Element, which is ending this year, with densities to allow at least 30 dwelling units per acre (du/ac) and possibly more. Consistent with State law, sites that are "re-used" would either be up-zoned (increasing allowable residential density) or would have to be zoned to allow by-right (ministerial review) development for projects that include at least 20 percent affordable units (units affordable to low and very low-income households).
- **Increase the permitted densities within the El Camino Real/Downtown Specific Plan area and modify associated development standards.** The Housing Sites Inventory would include sites in the El Camino Real/Downtown Specific Plan area. The HEU would allow at least 30 dwelling units per acre (du/ac) as the base level density, and potentially increase the maximum bonus level density to 80 dwelling units per acre depending on the location within the Specific Plan area. Bonus level development requires a developer to provide a public benefit in exchange for higher density development potential. The intent of this strategy would be to remove the existing residential cap of 680 units permitted in the Specific Plan area and to modify development standards such as height and/or parking ratios to allow greater development potential on parcels. These actions would potentially require amendments to the Specific Plan, Land Use Element, and Zoning Ordinance.
- **Modify the Affordable Housing Overlay.** The Specific Plan area and sites in the Housing Sites Inventory would be rezoned to include the Affordable Housing Overlay (AHO) provided in Menlo Park Municipal Code Chapter 16.98. The HEU would call on the City to amend the Code to allow for densities up to 100 du/ac for 100 percent affordable housing developments (meaning 100 percent of units would be available to low and very low-income residents). This strategy could also include amendments to provide increased residential densities for mixed-income developments (market-rate units and affordable units combined) where the percentage of affordable housing exceeds the City's Below Market Rate requirement as provided in Menlo Park Municipal Code Chapter 16.96.
- **Modify Retail/Commercial Zoning Districts.** The Housing Sites Inventory would include some sites in the C-1, C-1-A, C-1-C, C-2, C-2-A, C-2-B, C-2-S, C-4, and P zoning districts and would require the City to modify Code provisions regarding retail/commercial zoning districts to allow for residential uses that would allow 30 du/ac and include other potential modifications to the development standards to encourage the production of mixed-use developments (residential and non-residential uses combined).
- **Remove the minimum lot size for R-3 zoned properties located around downtown.** The Housing Sites Inventory would include some R-3 zoned sites around downtown and would require the City to modify applicable Code provisions to remove the 10,000 square-foot minimum lot size, which would allow all sites in the R-3 area downtown a residential density of up to 30 du/ac.

Table 3-4 contains a preliminary list of sites that can accommodate development of multifamily housing as "potential housing opportunity sites" for the Housing Element's Housing Sites Inventory. This list does not include all sites affected by the land use strategies described above. Henceforth in this SEIR, the "Project" is defined as the proposed upzoning of the housing

opportunity sites listed in the table below, combined with the zoning modifications described as part of the land use strategies described above. These principal components of the Project form the basis for the analysis in this SEIR. It is expected that some of the sites listed below could be removed as the HEU process moves forward, based on further refinements and community input, but all of the opportunity sites have been included for analysis as part of this SEIR to ensure a sufficient evaluation of the HEU's potential impacts.

TABLE 3-4
POTENTIAL HOUSING OPPORTUNITY SITES LIST

Address/Location	Assessor's Parcel Number(s)	Zoning District
525 El Camino Real	071332130	SP-ECR-D: SW
1620 El Camino Real (R)	060344250; 060344240	SP-ECR-D: NE-L
2500 Sand Hill Road	074270240; 074270250	C-1-C
2400-2498 Sand Hill Road	074270280; 074270260; 074270170	C-1-C
1100 Alma Street (R)	061412440; 061412430	SP-ECR-D: SA E
900 Santa Cruz Avenue	071084220; 071084200; 071084090; 071084110; 071084100	SP-ECR-D: DA
728 Willow Avenue	062202050; 062202060; 062202210; 062202060	C-4
906 Willow Road	062211170; 062211180; 062211050	C-4; R-3
Between Chestnut and Curtis	071284100; 071284080	SP-ECR-D: D
Between Crane and Chestnut	071283140; 071283050	SP-ECR-D: D
325 Sharon Park Drive	074283100; 074283090; 074283040	C-2
345 Middlefield Road	062421070; 062390700	P-F
1105 Valparaiso Avenue (C)	071071070	R-E
Lot between El Camino Real and Chestnut on west side of Santa Cruz	071102400	SP-ECR-D: D
Lot between University and Crane on west side of Santa Cruz	071092290	SP-ECR-D: D
Lot between Evelyn and Crane	071281160	SP-ECR-D: D
Lot between Curtis and Doyle	071285160	SP-ECR-D: D
Lot behind Draeger's	071273160	SP-ECR-D: D
Lot off Oak Grove	071094180	SP-ECR-D: D
275 Middlefield Road	062422120	C-1
350 Sharon Park Drive	074281110; 074281120	R-3-A(X)
85 Willow Road	062422080	C-1
200 Middlefield Road	062271540	C-1
250 Middlefield Road	062271010	C-1
8 Homewood Place	062421010	C-1
401 Burgess Road	062390170	C-1-A
570 Willow Road	062370420	C-4
2200 Sand Hill Road	074283070	C-1(X)
445 Burgess Drive	062390200	C-1-A
720 Menlo Avenue	071284110	SP-ECR-D: D
800 Oak Grove Avenue	071091520	SP-ECR-D: DA
930 Santa Cruz Avenue	071084140	SP-ECR-D: DA
1008 University Drive	071274140	SP-ECR-D: DA
707 Menlo Road	071288610	SP-ECR-D: DA

TABLE 3-4 (CONT.)
POTENTIAL HOUSING OPPORTUNITY SITES LIST

Address/Location	Assessor's Parcel Number(s)	Zoning District
1300 University Drive	071091310	SP-ECR-D: DA
1377 El Camino Real	071103490	SP-ECR-D: ECR NW
801-877 El Camino Real	071331180	SP-ECR-D: ECR SW
320 Sheridan Drive	055303110	R-1-U
2250 Avy Avenue (C)	074351100	R-1-S
2650 Sand Hill Road (C)	074260740	R-1-S
431 Burgess Drive	062390190	C-1-A
425 Burgess Drive	062390180	C-1-A
1133-1159 El Camino Real	071102130	SP-ECR-D: SA W
1436 El Camino Real	061422350	SP-ECR-D: ECR NE
Rural Lane	074311600	R-1-S
796 Live Oak Avenue	071288560	R-3 near SP-ECR/D
555 Willow Road	062285300	R-3
700 El Camino Real	071333200	SP-ECR-D: ECR SE
2700-2770 Sand Hill Road	074260750	C-1-A
600 Sharon Park Drive	074282070; 074282090	R-3-A(X)
949 El Camino Real	071288570	SP-ECR-D
1246 El Camino Real	061430070	SP-ECR-D
1189 El Camino Real	071102350	SP-ECR-D
607 Menlo Avenue	071288190	SP-ECR-D
1161 El Camino Real	071102390	SP-ECR-D
1179 El Camino Real	071102370	SP-ECR-D
761 El Camino Real	071332080	SP-ECR-D
751 El Camino Real	071332090	SP-ECR-D
905 El Camino Real	071288580	SP-ECR-D
335 Pierce Road	062013170	R-3
610 Santa Cruz Avenue	071102140	SP-ECR-D
201 Ravenswood Avenue	062390050	R-1-S
550 Ravenswood Avenue	061412160	SP-ECR-D
3875 Bohannon Drive	055251120	O
795 Willow Road	062470060	P-F
1000 Marsh Road	055251340	O
3885 Bohannon Road	055251220	O
3905 Bohannon Drive	055253140	O
3925 Bohannon Drive	055253150	O
4005 Bohannon Drive	055253240	O
4025 Bohannon Drive	055253190	O
4060 Campbell Avenue	055253030	O
4060 Campbell Avenue	055253200	O
4065 Campbell Avenue	055251270	O

NOTES:

(R) denotes a reuse site from the current Housing Element; (C) denotes a religious facility that could potentially redevelop surface parking lot area for housing.

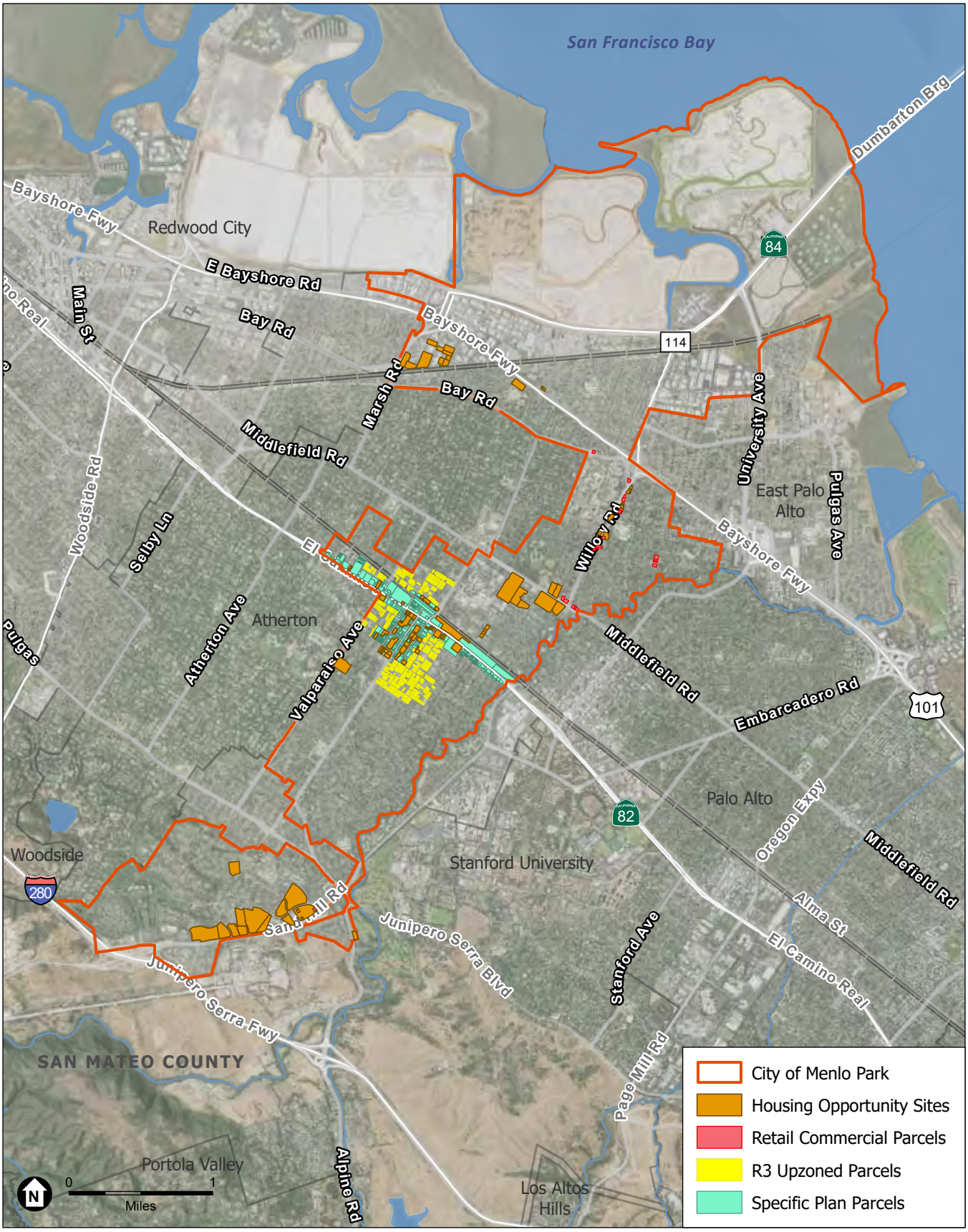
* This site was identified during ongoing discussions with the community during preparation of the Draft EIR.

Figure 3-3 shows the locations of the potential housing opportunity sites in Table 3-4, which are dispersed across the City, and it also shows the land use strategy areas, which are primarily clustered in the Downtown area. While these sites and their allowable residential densities may be refined by the City Council based on additional public input and analysis, for purposes of the environmental analysis in this SEIR, the final Housing Sites Inventory is assumed to result in production of approximately 4,000 housing units over the eight-year planning period from January 31, 2023 to January 31, 2031 in addition to 85 ADUs and pending pipeline projects.

3.4.3 Growth Projections

Changes to the City's General Plan proposed as part of the Project would build on the changes adopted in November 2016, when the Land Use and Circulation Elements were comprehensively updated as part of the *ConnectMenlo* General Plan Update. The *ConnectMenlo EIR* assessed impacts via the use of growth projections for the year 2040. To assess the increase in residential development planned with the HEU, this SEIR will use an updated baseline and updated projections for 2040. The updated baseline and projections are shown in **Table 3-5**, below, and are explained briefly here.

- **2015 Existing Conditions from the *ConnectMenlo* EIR** column is included for informational purposes. Comparison with the 2021 Baseline Conditions allows readers to understand changes since the *ConnectMenlo EIR* was prepared.
- **2021 Baseline Conditions** column reflects conditions on the ground in Menlo Park when the Notice of Preparation (NOP) for this SEIR was published in December 2021 and also includes development projects that have been approved and are either under construction or expected to commence construction shortly. As described in Section 4.0, this data is used as the baseline for the EIR's analysis of Project impacts.
- **The Housing Element Update** columns reflect pending (proposed but not yet approved) projects and ADUs that would count towards the City's RHNA along with the 4,000 additional units anticipated as a result of proposed land use strategies and rezoning. Taken together, these represent the Project being analyzed in this SEIR.
- **The 2040 Cumulative (Maximum Buildout) Projections from the *ConnectMenlo* EIR** is included for informational purposes and allows readers to understand the maximum buildout of the General Plan that was anticipated in the *ConnectMenlo EIR*.
- **The Updated 2040 Cumulative (Maximum Buildout) Projections with the Housing Element** column provides a summary of the maximum buildout of the General Plan as a result of the HEU plus other past, present, and reasonably foreseeable development projects that were not reflected in the *ConnectMenlo* 2040 projections. The data reflects the *ConnectMenlo* 2040 projections plus the 85 ADUs and the 4,000 additional units anticipated as a result of the HEU between 2023 and 2031, plus the 123 Independence Drive pipeline project, as well as an increment of additional growth that may occur between 2031 and 2040, in part due to the zoning and specific plan changes that would accompany the HEU. The additional increment of 299 units over nine years is relatively modest because the housing opportunity sites included in the HEU represent those parcels most likely to develop by 2031, leaving smaller sites that are less likely to develop in later years.



SOURCE: Esri, 2022; M-Group, 2022; ESA, 2022

Menlo Park Housing Element Update EIR

Figure 3-3
Potential Housing Opportunity and Land Use Strategy Sites

TABLE 3-5
CITY OF MENLO PARK GROWTH PROJECTIONS 2021-2040

	2015 Baseline (Existing) Conditions from *ConnectMenlo* EIR	2021 Baseline Conditions[a]		Housing Element Update			2040 Cumulative (Maximum Buildout) Projections from *ConnectMenlo* EIR	Updated 2040 Cumulative (Maximum Buildout) Projections with Housing Element Update[d]
		Existing	Approved Projects[a]	Pending Projects[b]	ADUs[c]	Additional Units		
Bayfront Area[e]								
Residential Units	0	735	923	2,319		0	5,430	5,581
Population[f]	0	1,874	2,373	5,960		0	13,960	14,343
Non-Residential SF	8.7 million	9.74 million				0	13.4 million	13.4 million
Hotel Rooms	0	250				0	850	850
Jobs	19,800	32,275[g]	(213)			0	39,950	39,950
Remainder of City								
Residential Units	13,100	13,281	525	414	85	4,000	14,450	19,248
Population[f]	32,900	34,841	1,350	1,064	218	10,280	36,390	49,467
Non-Residential SF	5.9 million	5.93 million				0	6.8 million	6.8 million
Hotel Rooms	570	631				0	640	640
Jobs	11,100	11,416[g]	1,470			0	13,300	13,300
Citywide Totals								
Residential Units	13,100	14,016	1,448	2,733	85	4,000	19,880	24,829
Population[f]	32,900	36,715	3,723	7,024	218	10,280	50,350	63,810
Non-Residential SF	14.6 million	15.7 million				0	20.6 million	20.6 million
Hotel Rooms	570	881				0	1,490	1,490
Jobs	30,900	43,691	1,257			0	53,250	53,250

NOTES:

a 2021 Baseline conditions reflect existing conditions plus approved projects that are in construction or likely to commence construction in the near term. The approved projects include 111 Independence Drive; Menlo Uptown (141 Jefferson Drive, 180-186 Constitution Drive); and Menlo Portal (104-110 Constitution Drive, 115 Independence Drive) in the Bayfront Area. In the remainder of the City, approved projects include 1275 El Camino Real, 500 El Camino Real, Springline (1300 El Camino Real), 1021 Evelyn Street, 1540 El Camino Real, 115 El Camino Real, 409 Glenwood Avenue, 706-716 Santa Cruz Avenue, 1300 Block of Willow Road, 201 El Camino Real, 1162 El Camino Real, 975 Florence Lane, and 661-687 Partridge Avenue.

b Pending projects reflect residential development applications that are currently on file for residential development in the City. These projects include Willow Village, Menlo Flats (165 Jefferson Drive), and 123 Independence Drive in the Bayfront Area. In the remainder of the City, pending projects include 1550 El Camino Real, Parkline (333 Ravenswood Avenue), and 1220 Hoover Street. Projects yielding greater than 10 units are listed in Table 3-3.

c Although the actual distribution of ADUs between the Bayfront and the Remainder of the City is unknown, the ADUs are shown in the Remainder of City totals here to represent their inclusion in the total number of residential units analyzed as part of the HEU in this SEIR.

d The Updated 2040 Cumulative represents the *ConnectMenlo* 2040 Cumulative plus approved and pipeline projects that were not anticipated in the *ConnectMenlo* EIR, plus the 85 ADUs and 4,000 units being zoned for in the Housing Element Update, plus an estimated 299 units that may result from development on small sites affected by zoning and Specific Plan changes as part of the HEU after the end of the planning period in 2031. The estimate of 299 units is based on the assumption that the best sites are those included in the Housing Sites Inventory that are assumed to be built-out by 2031, and the smaller sites remaining may see modest development in later years. Projects that were not anticipated in *ConnectMenlo* include 123 Independence Drive in the Bayfront Area. The 2040 "No Project" condition would include the housing unit and population values in this column, less the 4,000 units from the HEU (10,280 persons), and the 299 additional units noted above (768 persons). Thus the Citywide unit count for the "No Project" condition would be 20,530 units, with a resultant Citywide population of 52,762 persons.

e The Bayfront Area as defined in the *ConnectMenlo* EIR refers to areas on the Bay side of US-101 with the exception of the Belle Haven neighborhood.

f Population estimates presented for the *ConnectMenlo* existing baseline and 2040 Cumulative are based on the assumption of 2.57 persons per household used in the *ConnectMenlo* EIR which aligns with the City's transportation model.

g This number represents the 19,800 jobs from *ConnectMenlo* EIR Table 3-2 plus 5,412 from the occupied portion of Facebook Campus Expansion Project and 7,063 from space occupied from 2015 through 2021.[8] This number represents the 11,100 jobs from *ConnectMenlo* EIR Table 3-2 plus 316 jobs in space occupied from 2015 through 2021.

SOURCE: City of Menlo Park, March 2022.

The use of projections as a basis for analysis is appropriate when the project being analyzed is a proposed plan, as demonstrated by the *ConnectMenlo EIR* (Section 3.7.3, Buildout Projections). In this case, the amount of development anticipated to meet the City's RHNA allocation is used to analyze HEU impacts. This includes the amount of development attributable to pending "pipeline" projects, which may proceed with or without the Housing Element Update, as well as projected development of ADUs, and the 4,000 units anticipated as a result of strategies outlined in Section 3.4.2 Housing Sites Inventory, recognizing that the precise location of housing opportunity sites and densities may evolve based on public outreach and the results of the sites analysis that will be conducted in parallel to preparation of this SEIR.

In addition, this SEIR considers cumulative growth to the year 2040, which was the horizon year used in the *ConnectMenlo EIR*, providing an update to that analysis necessitated by the Housing Sites Inventory and pipeline projects that were not anticipated in that EIR. Section 15064(d) of the CEQA Guidelines state that "In evaluating the significance of the environmental effect of a project, the lead agency shall consider direct physical changes in the environment which may be caused by the project and reasonably foreseeable indirect physical changes in the environment which may be caused by the project." The 2040 buildout projections represent the City's projection of "reasonably foreseeable" development that could occur over the next 19 years under the General Plan and are used as the basis for the SEIR's cumulative analysis. See Section 4.0 for a description of environmental analysis scenarios used in this SEIR.

The year 2040 has been selected as the cumulative (maximum buildout) analysis year because it was used for analysis in the *ConnectMenlo EIR*. The 2040 horizon year is also consistent with *Plan Bay Area 2040*, which was the source of information used in the *ConnectMenlo EIR* and was the Bay Area's Regional Transportation Plan (RTP)/Sustainable Communities Strategy (SCS) until *Plan Bay Area 2050* was adopted in October, 2021. Because it will take up to three years for the growth forecast in *Plan Bay Area 2050* to be integrated into MTC's transportation model, after which updates to each county's transportation model will be required, *Plan Bay Area 2040* represents the best available source of information to form the foundation for long range population, housing and employment projections in this SEIR.

3.4.4 Other Elements of the General Plan

In addition to the amendments that would take place within the General Plan's Housing Element, a number of amendments to other elements of the General Plan would be required to fully conform those elements to changes made in the Housing Element or comply with other changes in State law.

The City of Menlo Park is updating its Safety Element to bring it into compliance with recent changes in California General Plan law codified in Government Code section 65302(g) and section 65302.15. The updated Safety Element would incorporate information from the 2021 San Mateo County Multijurisdictional Local Hazard Mitigation Plan and the City's Climate Action Plan. The Safety Element would also be updated to:

- Provide information regarding fire hazards including wildfires, including goals, policies, objectives and implementation programs as needed.

- Identify residential developments in any hazard area identified in the Safety Element that do not have at least two emergency evacuation routes.
- Include updated scientific context about historic and future climate hazards (such as flooding and drought, extreme heat events, and wildfires).
- Include a vulnerability assessment that identifies risks from climate change and is linked to goals and policies.
- Incorporate results of an analysis of evacuation routes under a range of emergency scenarios unless this analysis can be referenced in a local hazard mitigation plan, emergency operations plan, or similar document.

The City of Menlo Park is preparing its first Environmental Justice Element to address the issue of equity in accordance with changes in State law codified in Government Code section 65302(h). The Environmental Justice Element would identify objectives and policies to reduce the unique or compounded health risks in "disadvantaged communities" as defined by section 39711 of the California Health and Safety Code. Objectives and policies would seek to reduce pollution exposure, including improvement of air quality, and promotion of public facilities, food access, safe and sanitary homes, and physical activity. Other objectives and policies would promote civic engagement in the public decision making process and prioritize improvements and programs that address the needs of disadvantaged communities.

The City of Menlo Park would amend its Land Use Element and General Plan Land Use Designations map as needed to reflect the Housing Sites Inventory and would make any corresponding changes to other elements of the General Plan needed to ensure internal consistency within the General Plan as a whole, including the updated Housing Element, Safety Element, and the new Environmental Justice Element.

3.5 Project Objectives

CEQA *Guidelines* Section 15124(b) requires the description of a project in an EIR to state the objectives sought by the project.

> "A clearly written statement of objectives will help the lead agency develop a reasonable range of alternatives to evaluate in the EIR and will aid the decision makers in preparing findings or a statement of overriding considerations, if necessary. The statement of objectives should include the underlying purpose of the project."

The primary purpose of the HEU is to comply with the requirements of State law by: 1) analyzing existing and projected housing needs, and updating goals, policies, objectives, and implementation programs for the preservation, improvement, and development of housing; 2) updating goals, policies and programs regarding safety; and 3) addressing the issue of environmental justice in the City's General Plan. The City has articulated three overarching and interrelated goals:

- **Create a balanced community**
  - Plan for the whole community in a sustainable, healthy and balanced way.

- **Focus on affordability**
  - Focus on affordable housing given the difficulty of developing it compared to market-rate housing, and the demand for affordable housing options.
- **Forward social justice**
  - Work with the community to help ensure participation and access to the public decision making process, and take intentional steps that improve equity for historically marginalized people and areas.

The City's objectives help achieve these overarching goals. Those objectives include the following**:**

- Update the General Plan's Housing Element to comply with State-mandated housing requirements and to address the maintenance, preservation, improvement, and development of housing in the City between 2023 and 2031;
- Include an adequate inventory of housing sites and rezone the sites as necessary to meet the required Regional Housing Needs Allocation and to provide an appropriate buffer;
- To affirmatively further fair housing (AFFH). In particular, integrate AFFH into the process of site selection, outreach and policy/program development;
- Incentivize the development of housing, particularly affordable housing, suited to special needs and all income levels;
- Amend land use designations in the Land Use Element of the City's General Plan as needed to maintain internal consistency between the elements, and update the Safety Element to enhance community safety and improve consistency with the County's Multijurisdictional Local Hazard Mitigation Plan and comply with recent changes in State law;
- Address climate adaptation and resiliency; and
- Address environmental justice and community health issues and promote civic engagement and investment in disadvantaged communities.

3.6 Intended Uses of this SEIR

This SEIR is a program-level EIR and does not evaluate individual projects that may be allowed under the proposed General Plan and Zoning Ordinance at a site-specific level. Because the Housing Element establishes goals, policies, and programs, and describes potential housing development that may or may not be built on any particular site, environmental review will necessarily be general. The CEQA *Guidelines* instruct that environmental review of a planning-level document need not contain the level of detail required for review of a specific construction project. (CEQA Guidelines, Section 15146 ("[t]he degree of specificity required … will correspond to the degree of specificity involved in the underlying activity.")

The Housing Element's inventory of housing opportunity sites is a State-mandated requirement to ensure that the City's RHNA can be accommodated. In other words, the Housing Sites Inventory demonstrates that there is enough land zoned at appropriate densities to accommodate the RHNA allocation. However this inventory does not include all potential development sites within the City limits, and does not guarantee that sites in the inventory will be developed at the allowable

densities. In addition, information about the design and placement of buildings on the sites will not be available unless/until a specific development is proposed.

Future development proposals will be reviewed to determine whether their impacts fall within the scope of analysis in this SEIR or if additional site-specific environmental review is required because new potentially significant impacts would result. As provided for in CEQA *Guidelines* Sections 15152 and 15385, any subsequent environmental document that might be required for a development project could "tier" from this SEIR and focus its analysis on any new or more severe significant impacts. A future project could be ministerial, requiring no discretionary action, or, may require review and approval by the Community Development Director, Planning Commission, and/or City Council, and other bodies/agencies as needed.

3.6.1 Required Approvals

The proposed Housing Element Update is subject to review and certification by HCD, and the proposed Safety Element is subject to review by the California Geological Survey and the Department of Conservation. Following these reviews, adoption and implementation of the HEU would require a series of interrelated planning and regulatory approvals by the City of Menlo Park, as Lead Agency. Specifically, the City would take the following approval actions, relying on this SEIR after it has been certified:

- Certification of the SEIR pursuant to CEQA;
- Adoption of a resolution amending the General Plan to update the Housing Element, update the Safety Element, update the Land Use Element and General Plan Land Use Designations map, adopt the Environmental Justice Element, and make any corresponding changes to other elements of the General Plan needed to maintain internal consistency;
- Adoption of a resolution amending the El Camino Real/Downtown Specific Plan to reflect the modifications in densities and associated development standards; and
- Adoption of an ordinance amending the City's Zoning Ordinance (Menlo Park Municipal Code Title 16) and the City's zoning map.

The proposed actions would require review and recommendation by the Planning Commission, followed by consideration and action by the City Council.

3.6.2 Other Governmental Agency Approvals

As the Lead Agency and as appropriate under CEQA, the City also intends the SEIR to serve as the CEQA-required environmental documentation for consideration of the HEU by other Responsible Agencies and Trustee Agencies which may have discretionary approval authority over the HEU or related actions. Under the CEQA *Guidelines*, the term "Responsible Agency" includes all public agencies, other than the Lead Agency, which have discretionary approval power over aspects of a project for which the Lead Agency has prepared an EIR (CEQA *Guidelines* Section 15381); and the term "Trustee Agency" means a state agency having jurisdiction by law over natural resources affected by a project which are held in trust by the people of California (Section 15386).

While no actions would be required by Responsible Agencies and Trustee Agencies to adopt changes to the City's General Plan or zoning, future approval actions associated with implementing projects may require approvals from various agencies, which include, but are not limited to, the following:

- California Department of Transportation (Caltrans)
- San Mateo County

3.7 References

Association of Bay Area Governments (ABAG). 2021. Final Regional Housing Needs Allocation (RHNA) Plan: San Francisco Bay Area, 2023-2031. Adopted December 16, 2021. Available at: https://abag.ca.gov/sites/default/files/documents/2021-12/proposed%20Final_RHNA_Allocation_Report_2023-2031.pdf. Accessed December 22, 2021.

City of Menlo Park, *ConnectMenlo Final Environmental Impact Report* (State Clearinghouse Number 2015062054), certified December 6, 2016. Available at: https://www.menlopark.org/DocumentCenter/View/12063/ConnectMenloFEIR_101016?bidId=. Accessed January 13, 2022.

City of Menlo Park, *City Council Resolution 6356 Adopting CEQA Findings, A Statement of Overriding Considerations, and a Mitigation Monitoring and Reporting Program, and Certifying the Final EIR for the General Plan (Land Use & Circulation Elements) and M-2 Area Zoning Update,* Adopted December 6, 2016. Available at: https://www.menlopark.org/DocumentCenter/View/12598/Resolution?bidId=. Accessed January 13, 2022.

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CHAPTER 4
Environmental Setting, Impacts, and Mitigation Measures

4.0 Introduction to the Environmental Analysis

This Draft Subsequent Environmental Impact Report (SEIR) evaluates and documents the physical environmental effects that would potentially occur with the implementation of the proposed Housing Element Update (Project) in accordance with the California Environmental Quality Act (CEQA), Public Resources Code (PRC) Sections 21000, et seq., and the Guidelines for the California Environmental Quality Act (CEQA Guidelines), California Code of Regulations, Title 14, Chapter 3, Section 15000, et seq. Sections 4.1 through 4.18 consider the regulatory background, existing conditions, and environmental impacts associated with implementation of the Housing Element Update (HEU), as well as mitigation measures to reduce the impact of project-specific and cumulative environmental impacts, and the level of significance of impacts following mitigation.

This EIR is a Subsequent EIR (SEIR), in that it builds upon the City's current General Plan's EIR, which was last updated in 2016, when *ConnectMenlo*, an update of the Land Use and Circulation Elements, was adopted. Since the EIR prepared for *ConnectMenlo* is relatively current and much of the analysis is still applicable, the City has opted to build upon that effort by preparing a SEIR for the HEU. CEQA Guidelines Section 15162 provides for preparation of an SEIR when substantial changes are proposed or when new information is available that could influence the findings of the original EIR. Accordingly, this SEIR will enhance and update the analysis prepared for the *ConnectMenlo* effort.

This SEIR is also a program EIR, as provided for in CEQA Guidelines Section 15168. Section 15168(a) of the CEQA Guidelines states that a program EIR is appropriate for projects which are "… a series of actions that can be characterized as one large project and are related either:

1. Geographically;
2. A logical part in the chain of contemplated actions;
3. In connection with issuance of rules, regulations, plans or other general criteria to govern the conduct of a continuing program; or
4. As individual activities carried out under the same authorizing statutory or regulating authority and having generally similar environmental effects which can be mitigated in similar ways."

Future discretionary actions that would be facilitated by the HEU's adoption, particularly those related to the development of housing, would require additional assessment to determine consistency with the analysis provided in this SEIR. The potential future actions would also be subject to the mitigation measures established in this SEIR, unless superseded by a subsequent environmental document prepared to analyze environmental impacts not foreseen in this SEIR.

4.0.1 Definitions of Terms Used in this SEIR

This SEIR uses a number of terms that have specific meaning under CEQA. Among the most important of the terms used in the SEIR are those that refer to the significance of environmental impacts. The following terms are used to describe environmental effects of the project:

- **Significance Thresholds:** A set of standards used by the lead agency to determine whether an impact would be considered significant. (See CEQA Guidelines Section 15064.7.) Standards of significance used in this SEIR were derived from Appendix G of the CEQA Guidelines unless otherwise noted. In determining the level of significance, the analysis assumes that the project would comply with relevant federal, State, and local regulations and ordinances.

- **Significant Impact:** A project impact is considered significant if the project would result in a substantial adverse change in the physical conditions of the environment. Significant impacts are identified by the evaluation of project-related physical change compared to specified significance criteria. A significant impact is defined as "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance."[1]

- **Less-than-Significant Impact:** A project impact is considered less than significant when the physical change caused by the project would not exceed the applicable significance criterion.

- **Significant and Unavoidable Impact:** A project impact is considered significant and unavoidable if it would result in a substantial adverse physical change in the environment that cannot be feasibly avoided or mitigated to a less-than-significant level.

- **Cumulative Impact:** Under CEQA, a cumulative impact refers to "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts."[2] A significant cumulative impact is one in which the cumulative adverse physical change would exceed the applicable significance criterion and the project's contribution is "cumulatively considerable."[3]

- **Mitigation Measure:** A mitigation measure is an action that could be taken that would avoid or reduce the magnitude of a significant impact. Section 15370 of the CEQA Guidelines defines mitigation as:

    a. Avoiding the impact altogether by not taking a certain action or parts of an action;

1 CEQA Guidelines, Section 15382.
2 CEQA Guidelines, Section 15355.
3 CEQA Guidelines, Section 15130(a).

b. Minimizing impacts by limiting the degree of magnitude of the action and its implementation;

c. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;

d. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and

e. Compensating for the impact by replacing or providing substitute resources or environments, including through permanent protection of such resources in the form of conservation easements.

4.0.2 Section Format

Chapter 4 is divided into technical subsections (e.g., Section 4.1, *Aesthetics*) that present the physical environmental setting, regulatory setting, significance criteria, methodology and assumptions, and impacts on the environment for each environmental resource issue area. Where required, potentially feasible mitigation measures are identified to lessen or avoid potentially significant impacts. Each section includes an analysis of project-specific and cumulative impacts for each issue area.

The technical environmental subsections each begin with an introduction that summarizes the purpose of the section. Since this is an SEIR that builds upon the 2016 *ConnectMenlo* EIR, an overview of the *ConnectMenlo* EIR's findings is presented. A summary of any Notice of Preparation (NOP) comments that were received that are relevant to the topic under consideration is then presented, along with a list of principal information sources. Next, the project's **environmental setting** and the **regulatory setting** are presented as they pertain to the particular topic. The environmental setting provides a point of reference for assessing the environmental impacts of the HEU and its alternatives. The environmental setting discussion provides an overview of the setting as presented in the *ConnectMenlo* EIR, and then details the conditions that existed at the time of issuance of the SEIR's NOP and prior to implementation of the HEU. This setting establishes the baseline by which the HEU and its alternatives are measured for environmental impacts. The regulatory setting presents relevant information about federal, state, regional, and/or local laws, regulations, plans or policies that pertain to the environmental resources addressed in each section.

Next, each section presents **significance criteria**, which identify the standards used by the City of Menlo Park to determine the significance of the environmental effects of the project. Standards of significance used in this SEIR were derived from Appendix G of the CEQA Guidelines unless otherwise noted.

A **methods and assumptions** description in each section presents the analytical methods and key assumptions used in the evaluation of effects of the HEU, and is followed by an **impacts** and **mitigation** discussion. The impact and mitigation portion of each section includes impact statements, prefaced by a number in bold-faced type. A brief discussion of the findings of the *ConnectMenlo* EIR for that impact is then provided, followed by an analysis of the HEU's effects. An explanation of each impact is followed by an analysis of its significance. The section concludes with a statement that the impact, following implementation of any prescribed

mitigation measure(s) and/or the continuation of existing policies and regulations, would be reduced to a less-than-significant level or would remain significant and unavoidable.

The analysis of environmental impacts considers both the potential for construction-related and operational impacts associated with development allowed by the HEU. As required by Section 15126.2(a) of the CEQA Guidelines, direct, indirect, short-term, long-term, onsite, and/or off-site impacts are addressed, as appropriate, for the environmental issue area being analyzed. Under CEQA, economic or social changes by themselves are not considered to be significant impacts, but may be considered in linking the implementation of a project to a physical environmental change, or in determining whether the physical change is significant.[4]

Where enforcement exists and compliance can be reasonably anticipated, this SEIR assumes that implementation of the HEU would be undertaken in compliance with the requirements of applicable laws and other regulations.

Mitigation measures pertinent to each individual impact, if available, appear after the impact discussion section. The magnitude of reduction of an impact and the potential effect of that reduction in magnitude on the significance of the impact is also disclosed. An example of the format is shown below.

Impacts and Mitigation Measures

Impact 4.X-1: Impact statement.

A brief discussion of the findings of the *ConnectMenlo* EIR for that impact is then provided, followed by an analysis of the HEU's effects.

A discussion of the potential impact of the Project on the resource is introduced in paragraph form. To identify impacts that may be site- or project element-specific, where appropriate, the discussion differentiates between construction effects and operational effects. A statement of the level of significance before application of any mitigation measures is provided in bold.

Mitigation Measure

If the impact is determined to be less than significant, the text will say, "None required." If the impact is determined to be significant or potentially significant, mitigation with be included in the following format:

Mitigation Measure 4.X-1:

Recommended mitigation measure, numbered in consecutive order.

Where appropriate, one or more potentially feasible mitigation measures are described. If necessary, a statement of the degree to which the available mitigation measure(s) would reduce the significance of the impact is included in **bold**.

[4] A "significant effect on the environment" is defined in CEQA Guidelines Section 15382.

Cumulative Impacts

An analysis of cumulative impacts follows the Project-specific impacts and mitigation measures evaluation in each section. A cumulative impact consists of an impact that is created as a result of the combination of the Project evaluated in the SEIR together with other past, present and reasonably foreseeable projects causing related impacts.[5]

In this case, the HEU itself is a plan-level document which provides for increased residential development within the City across a relatively broad geography, including potential housing development that exceeds the regional forecast included for the City in regional plans (Plan Bay Area 2040)[6] and the City's transportation model. Indeed, the identification of housing sites as part of the HEU is intended to plan for and encourage housing which would be developed as part of numerous separate projects in various areas of the City.

The nature of the Project does not alter the need to analyze cumulative impacts, and consistent with State CEQA Guidelines Section 15130(b)(1), regional growth projections prepared for Plan Bay Area 2040 and contained in the City's transportation model are used for the analysis.

The regional projections for 2040, when adjusted to include the HEU and related rezonings, are sufficient to accommodate the past, present, and probable future "pipeline" projects as discussed in Chapter 3 of this SEIR, *Project Description*, and shown here in **Table 4.0-1**. Importantly, this list identifies already approved residential projects which are included in the environmental baseline used in this SEIR and pending projects that are included as development assumptions for the HEU itself because the City may count these developments towards its RHNA if they are permitted after June of 2022.

The beginning of the cumulative impact analysis in each technical section includes a description of the cumulative analysis methodology and the geographic or temporal context in which the cumulative impact is analyzed.

As noted above, where a cumulative impact is significant when compared to existing or baseline conditions, the analysis must address whether the Project's contribution to the significant cumulative impact is "considerable." If the contribution of the Project is considerable, then the EIR must identify potentially feasible measures that could avoid or reduce the magnitude of the Project's contribution to a less-than-considerable level. If the Project's contribution is not considerable, it is considered less than significant and no mitigation of the Project contribution is required.[7] The cumulative impacts analysis is formatted in the same manner as the Project-specific impacts, as shown above.

5 CEQA Guidelines Section 15355.

6 The Metropolitan Transportation Commission (MTC) and ABAG recently adopted an updated plan, Plan Bay Area 2050. However, it will take up to three years for the plan's growth forecast to be integrated into MTC's transportation model, after which updates to each county's transportation model will take place. For these reasons, and for purposes of this EIR, Plan Bay Area 2040 is the regional plan which will form the basis for long range population, housing and employment projections in this EIR.

7 CEQA Guidelines Section 15130(a)(2).

TABLE 4.0-1
RESIDENTIAL "PIPELINE" PROJECTS IN THE CITY

Project	Status	Net New Units
111 Independence Dr.	Approved	105
115 Independence Dr. (Menlo Portal)	Approved	335
141 Jefferson Dr. (Menlo Uptown)	Approved	483
Subtotal Approved Projects		*923*
123 Independence Dr.	Pending	432
165 Jefferson Dr. (Menlo Flats)	Pending	158
Willow Village	Pending	1,729
333 Ravenswood Ave. (Parkline)	Pending	400
Subtotal Pending Projects		*2,719*
Total		**3,642**

NOTES:

a This table shows major pipeline projects yielding greater than 10 units.

SOURCE: Table 3, Major Pipeline Projects, City Council Staff Report #21-210-CC, October 26, 2021

Further refinement of the SEIR's cumulative scenario for the City is shown below in **Table 4.0-2**. This table, which can also be found in Chapter 3 of this SEIR, *Project Description*, shows the baseline (2015) conditions from the *ConnectMenlo* EIR, the baseline conditions for this SEIR, and adds in new residential units from pipeline projects and the HEU. The table then shows the cumulative (2040) buildout projected for the *ConnectMenlo* EIR, and then presents an updated 2040 cumulative buildout projection with the HEU included. This last category will form the basis for the City's updated cumulative analysis presented in this SEIR.

Use of projections as a basis for analysis is appropriate when the project being analyzed is a proposed plan, as demonstrated by the *ConnectMenlo EIR* (see Section 3.7.3, *Buildout Projections*, from the *ConnectMenlo* EIR). In the case of the HEU, the amount of development anticipated to meet the City's RHNA allocation is used to analyze HEU's impacts. This includes the amount of development attributable to pending "pipeline" projects, which may proceed with or without the HEU, as well as projected development of ADUs, and the 4,000 units anticipated as a result of strategies outlined in Section 3.4.2 *Housing Sites Inventory*, in Chapter 3 of this SEIR, *Project Description*. This analysis recognizes that the precise location of housing inventory sites and densities may evolve based on public outreach and the results of the sites analysis that will be conducted in parallel to preparation of this SEIR.

TABLE 4.0-2
CITY OF MENLO PARK GROWTH PROJECTIONS 2021-2040

	2015 Baseline (Existing) Conditions from *ConnectMenlo* EIR	2021 Baseline Conditions[a]		Housing Element Update			2040 Cumulative (Maximum Buildout) Projections from *ConnectMenlo* EIR	Updated 2040 Cumulative (Maximum Buildout) Projections with Housing Element Update[d]
		Existing	Approved Projects[a]	Pending Projects[b]	ADUs[c]	Additional Units		
Bayfront Area[e]								
Residential Units	0	735	923	2,319		0	5,430	5,581
Population[f]	0	1,874	2,373	5,960		0	13,960	14,343
Non-Residential SF	8.7 million	9.74 million				0	13.4 million	13.4 million
Hotel Rooms	0	250				0	850	850
Jobs	19,800	32,275[g]	(213)			0	39,950	39,950
Remainder of City								
Residential Units	13,100	13,281	525	414	85	4,000	14,450	19,248
Population[f]	32,900	34,841	1,350	1,064	218	10,280	36,390	49,467
Non-Residential SF	5.9 million	5.93 million				0	6.8 million	6.8 million
Hotel Rooms	570	631				0	640	640
Jobs	11,100	11,416[g]	1,470			0	13,300	13,300
Citywide Totals								
Residential Units	13,100	14,016	1,448	2,733	85	4,000	19,880	24,829
Population[f]	32,900	36,715	3,723	7,024	218	10,280	50,350	63,810
Non-Residential SF	14.6 million	15.7 million				0	20.6 million	20.6 million
Hotel Rooms	570	881				0	1,490	1,490
Jobs	30,900	43,691	1,257			0	53,250	53,250

NOTES:

a 2021 Baseline conditions reflect existing conditions plus approved projects that are in construction or likely to commence construction in the near term. The approved projects include 111 Independence Drive; Menlo Uptown (141 Jefferson Drive, 180-186 Constitution Drive); and Menlo Portal (104-110 Constitution Drive, 115 Independence Drive) in the Bayfront Area. In the remainder of the City, approved projects include 1275 El Camino Real, 500 El Camino Real, Springline (1300 El Camino Real), 1021 Evelyn Street, 1540 El Camino Real, 115 El Camino Real, 409 Glenwood Avenue, 706-716 Santa Cruz Avenue, 1300 Block of Willow Road, 201 El Camino Real, 1162 El Camino Real, 975 Florence Lane, and 661-687 Partridge Avenue.

b Pending projects reflect residential development applications that are currently on file for residential development in the City. These projects include Willow Village, Menlo Flats (165 Jefferson Drive), and 123 Independence Drive in the Bayfront Area. In the remainder of the City, pending projects include 1550 El Camino Real, Parkline (333 Ravenswood Avenue), and 1220 Hoover Street. Projects yielding greater than 10 units are listed in Table 3-3.

c Although the actual distribution of ADUs between the Bayfront and the Remainder of the City is unknown, the ADUs are shown in the Remainder of City totals here to represent their inclusion in the total number of residential units analyzed as part of the HEU in this SEIR.

d The Updated 2040 Cumulative represents the *ConnectMenlo* 2040 Cumulative plus approved and pipeline projects that were not anticipated in the *ConnectMenlo* EIR, plus the 85 ADUs and 4,000 units being zoned for in the Housing Element Update, plus an estimated 299 units that may result from development on small sites affected by zoning and Specific Plan changes as part of the HEU after the end of the planning period in 2031. The estimate of 299 units is based on the assumption that the best sites are those included in the Housing Sites Inventory that are assumed to be built-out by 2031, and the smaller sites remaining may see modest development in later years. Projects that were not anticipated in *ConnectMenlo* include 123 Independence Drive in the Bayfront Area. The 2040 "No Project" condition would include the housing unit and population values in this column, less the 4,000 units from the HEU (10,280 persons), and the 299 additional units noted above (768 persons). Thus the Citywide unit count for the "No Project" condition would be 20,530 units, with a resultant Citywide population of 52,762 persons.

e The Bayfront Area as defined in the *ConnectMenlo* EIR refers to areas on the Bay side of US-101 with the exception of the Belle Haven neighborhood.

f Population estimates presented for the *ConnectMenlo* existing baseline and 2040 Cumulative are based on the assumption of 2.57 persons per household used in the *ConnectMenlo* EIR which aligns with the City's transportation model.

g This number represents the 19,800 jobs from *ConnectMenlo* EIR Table 3-2 plus 5,412 from the occupied portion of Facebook Campus Expansion Project and 7,063 from space occupied from 2015 through 2021.[8] This number represents the 11,100 jobs from *ConnectMenlo* EIR Table 3-2 plus 316 jobs in space occupied from 2015 through 2021.

SOURCE: City of Menlo Park, March 2022.

In addition, this SEIR considers cumulative growth to the year 2040, which was the horizon year used in the *ConnectMenlo EIR*, providing an update to that analysis necessitated by the Housing Sites Inventory and pipeline projects that were not anticipated in that EIR. Section 15064(d) of the CEQA Guidelines state that "In evaluating the significance of the environmental effect of a project, the lead agency shall consider direct physical changes in the environment which may be caused by the project and reasonably foreseeable indirect physical changes in the environment which may be caused by the project." The 2040 buildout projections represent the City's projection of "reasonably foreseeable" development that could occur over the next 19 years under the General Plan and are used as the basis for the SEIR's cumulative analysis.

The year 2040 has been selected as the cumulative (maximum buildout) analysis year because it was used for analysis in the *ConnectMenlo* EIR. The 2040 horizon year is also consistent with *Plan Bay Area 2040*, which was the source of information used in the *ConnectMenlo* EIR and was the Bay Area's Regional Transportation Plan (RTP)/Sustainable Communities Strategy (SCS) until *Plan Bay Area 2050* was adopted in October 2021. Because it will take up to three years for the growth forecast in *Plan Bay Area 2050* to be integrated into MTC's transportation model, after which updates to each county's transportation model will be required, *Plan Bay Area 2040* represents the best available source of information to form the foundation for long range population, housing and employment projections in this SEIR.

Cumulative Impacts and Regional Planning

Menlo Park is not the only Bay Area jurisdiction that has received a Regional Housing Needs Allocation (RHNA) from the nine-county Association of Bay Area Governments (ABAG). In all, 109 county and municipal jurisdictions in the Bay Area have received allocations from ABAG for the 6th Cycle, for a total housing regional allocation of 441,176 units. However, based on past experience, it is highly unlikely that all of those units will be constructed during the 2023-2031 6th Cycle planning period, and therefore using that total RHNA number for the region as the basis for the cumulative effects analysis would substantially overstate the level of impact. For this reason, and to more realistically assess the level of impact that could be reasonably foreseen during the HEUs planning period, for all jurisdictions other than Menlo Park, this SEIR will consider the regional household and population projections presented in Plan Bay Area 2040, which, among other things, provides estimates of likely new housing construction and population and employment growth through 2040.

4.1 Aesthetics

4.1.1 Introduction

This section evaluates the effects of the Housing Element Update (HEU) on aesthetics, focusing on changes to the *ConnectMenlo* EIR (certified in 2016) that may result in new or more severe impacts, and describes any mitigation measures needed to address any such impacts.

Findings of the *ConnectMenlo* Final EIR

Impacts of the *ConnectMenlo* project related to aesthetics were analyzed in Section 4.1 of the *ConnectMenlo* Draft EIR. The *ConnectMenlo* Final EIR determined that the project would have the following impacts with respect to aesthetics:

- AES-1: Implementation of the proposed project would not have a substantial adverse effect on a scenic vista. (*Less than Significant Impact*)
- AES-2: Implementation of the proposed project would not substantially degrade the view from a scenic highway, including, but not limited to, trees, rock outcroppings, and historic buildings. (*Less than Significant Impact*)
- AES-3: Implementation of the proposed project would not degrade the existing visual character or quality of the site and its surroundings. (*Less than Significant Impact*)
- AES-4: Implementation of the proposed project would not expose people on- or off-site to substantial light or glare which would adversely affect day or nighttime views in the area. (*Less than Significant Impact*)
- AES-5: Implementation of the proposed project, in combination with past, present, and reasonably foreseeable projects, would result in less than significant cumulative impacts with respect to aesthetics. (*Less than Significant Impact*)

Notice of Preparation Comments

The Notice of Preparation (NOP) for the SEIR was circulated on December 23, 2021 and a scoping meeting was held on January 24, 2022. The NOP and the comments received during the public comment period can be found in **Appendix A** of this SEIR. No comments relating to aesthetics were received during the NOP comment period.

Information Sources

The primary sources of information referenced in this section included those listed below. Please note that a full list of references for this topic can be found at the end of this section.

- City of Menlo Park General Plan (2016a).
- *ConnectMenlo* Draft EIR (2016b).

4.1.2 Environmental Setting

The *ConnectMenlo* EIR described conditions related to aesthetics as they existed at the time of the EIR's preparation. The description was limited to the Bayfront Area, which comprises the northernmost portion of Menlo Park and was the focus of the *ConnectMenlo* project. The discussion below describes existing conditions related to aesthetics for the HEU, which includes the entire City.

Existing Conditions

City of Menlo Park

The City of Menlo Park is primarily built out and nestled between the built environments of Atherton and Redwood City, East Palo Alto, and Palo Alto, and the San Francisco Bay (Bay). Menlo Park can generally be described as a modern suburb that encompasses a variety of natural landscapes. The southwestern-most portion of the City consists of residential hillside development. The central and southern portions of the City include a mix of housing types, business parks, shopping centers, and public uses ranging from low- to mid-rise development. Northeastern Menlo Park abuts the Bay and contains wetlands and vegetated open space, including marshes, flatlands, and shoreline of the Bay. To the south and west of the Bay, the City contains a mixture of light industry warehouses, business parks, and single-family and multi-family residential uses.

Single-family neighborhoods comprise more than two-thirds of residential land in Menlo Park. The residential areas of the City are divided into several principal neighborhoods, including downtown, Allied Arts/Stanford Park, Bayfront, Belle Haven, Flood Triangle, Central Menlo, Felton Gables, Linfield Oaks, Sharon Heights, Suburban Park, Lorelei Manor, and the Willows. Residential uses include single-family detached and attached homes, duplexes, secondary dwelling units, multi-family apartments, and condominiums.

Downtown Menlo Park is located southwest of El Camino Real and is centered on Santa Cruz Avenue. The boundaries are Valparaiso Avenue on the northwest, El Camino Real on the northeast, Fremont Street and Arbor Road to the southwest, and Middle Avenue to the southeast. Largely built out by at least 1948, the area was dominated by single-family homes with commercial buildings along El Camino Real. Downtown is comprised primarily of low-rise commercial buildings on Santa Cruz Avenue and El Camino Real that are surrounded by single and multi-family residential buildings. The area includes a variety of architectural styles with construction dates potentially spanning every decade of the 20th century as well as the early 21st century. The El Camino Real/Downtown Specific Plan area encompasses El Camino Real, the Caltrain rail station area, and downtown. The historic Victorian train station building and its newer clock tower are distinctive built features and a focal point within the Specific Plan area.

The area known as Central Menlo is southwest of Downtown Menlo Park and Allied Arts. It is bounded by Valparaiso Avenue to the northwest; Johnson Street, Fremont Street, and Arbor Road to the northeast; San Francisquito Creek to the southeast; and Vine Street, Cloud Avenue, and North Lemon Avenue to the southwest. By 1948 most of the roads were in place and a small percentage of the homes had been built. By 1956 the neighborhood was almost completely built

out. This residential neighborhood is dominated by one- and two-story, Ranch style, single-family homes.

The Bayfront Area comprises the northern most portion of Menlo Park and is generally bounded by San Francisco Bay to the north; Redwood City to the west; East Palo Alto to the southeast; and the Menlo Park neighborhoods of Belle Haven, Flood Triangle, Suburban Park, and Lorelei Manor to the south. The Bayfront Area has been historically defined by light industrial/office uses. The Bayfront Area is different from other Menlo Park residential and commercial districts in street patterns, building placement and lot coverage, building types, and landscaping. Building placement and landscaping vary, but buildings are usually surrounded by parking or other pavement on all sides, and siting and landscaping do not fit a consistent pattern. The Bayfront Area was the focus of the *ConnectMenlo* project, which resulted in rezoning the general industrial area (the former M-2 Area) in 2016, providing for additional non-residential and residential development.

The area known as Belle Haven is northeast of US-101 and centered around the Belle Haven Elementary School on Ivy Drive. The neighborhood is triangular with the railroad right-of-way on the north (just north of Terminal and Hamilton Avenues), US-101 on the southwest, and Willow Road on the southeast. It is primarily a residential neighborhood established in the 1940s and 1950s. By 1948 the streets had been laid out and a few dozen homes had been built. The neighborhood was nearly completely built out by 1956 including the elementary school. The single-family homes are mostly single-story, wood-frame, Minimal Traditional or Ranch style buildings. Willow Road is a commercial and multi-family home corridor. Ivy Drive is a boulevard with lanes of traffic divided by a landscaped median; few homes front Ivy Drive with the majority fronting the streets that branch off of Ivy Drive.

The area known as Sharon Heights is a residential neighborhood at the southwestern end of Menlo Park. The neighborhood is bounded by Sand Hill Road on the south; Santa Cruz Avenue and Altschul Avenue on the northeast; and Trinity Drive and the Sharon Heights Golf and Country Club on the northwest. This residential neighborhood includes the Sharon Heights Golf and Country Club as well as commercial and office uses along Sand Hill Road. The neighborhood includes both single- and multi-family homes that appear to date primarily to the 1960s.

Scenic Corridors and Vistas

Scenic corridors are considered an enclosed area of landscape, viewed as a single entity that includes the total field of vision visible from a specific point, or series of points along a linear transportation route. Public view corridors are areas in which short-range, medium-range, and long-range views are available from publicly accessible viewpoints, such as from City streets. However, scenic vistas are generally interpreted as long-range views of a specific scenic feature (e.g., open space lands, mountain ridges, bay, or ocean views).

The majority of the City, particularly from the north and east of US-101 in the Bayfront Area, is afforded views of the Santa Cruz Mountain Range, which runs the length of the San Francisco Peninsula and forms a barrier between the Pacific Ocean and the Bay. Scenic resources also include the Bay itself and its natural features, including the Salt Ponds and Bedwell Bayfront Park

as viewed from the eastern and northern portions of the City, and the densely vegetated riparian area lining the open water of San Francisquito Creek seen from views along the City's southeast border.

Menlo Park's main thoroughfares include El Camino Real, which is developed with traditional strip center developments and bisects the downtown area, which consists of pedestrian-scale, one- to three-story buildings. The Middlefield Road and Sand Hill Road thoroughfares include landscaped office parks with mid-rise buildings interspersed with landscaped parking areas, as does the US-101 corridor.

California's Scenic Highway Program was created by the Legislature in 1963 to preserve and protect scenic highway corridors from change that would diminish the aesthetic value of lands adjacent to highways. The State Scenic Highway Program includes a list of highways that either are eligible for designation as scenic highways or have been so designated. Caltrans has designated the segment of Interstate 280 (I-280) that runs from the Santa Clara County line to the San Bruno city limit as a scenic highway (Caltrans, 2022). This highway skirts the southernmost portion of the City in the vicinity of the Sand Hill Road interchange.

Light and Glare

Nighttime lighting is necessary to provide and maintain safe, secure, and attractive environments; however, these lights have the potential to produce spillover light and glare, and if designed incorrectly, could be considered unattractive. Although nighttime light is a common feature of urban areas, spillover light can adversely affect light-sensitive uses, such as residential units at nighttime.

Glare results when a light source directly in the field of vision is brighter than the eye can comfortably accept. Squinting or turning away from a light source is an indication of glare. The presence of a bright light in an otherwise dark setting may be distracting or annoying (*discomfort glare*) or may diminish the ability to see other objects in the darkened environment (*disability glare*). Reflective glare, such as the reflected view of the sun from a window or mirrored surface, can be distracting during the day.

Although there is considerable development in Menlo Park, commercial development is concentrated in the downtown area and intersections along major arterials, and industrial uses are concentrated in the Bayfront Area. Light pollution in most of the City is minimal, and is restricted primarily to street lighting along major arterial streets and US-101, and to nighttime illumination of commercial buildings, shopping centers, and industrial buildings. Light spillage from residential areas, particularly older neighborhoods, is mostly well screened by trees.

4.1.3 Regulatory Setting

The following section focuses on any changes to the regulatory setting that have occurred since certification of the *ConnectMenlo* EIR. Draft EIR Section 4.1, *Aesthetics*, evaluated effects to aesthetics and visual resources. There, Section 4.1.1.1, *Regulatory Framework*, described regulations applicable to this topic, and that description is still current for this SEIR, with the additions noted below.

State

California Scenic Highway Program

The California Scenic Highway Program, maintained by the California Department of Transportation (Caltrans), protects State scenic highway corridors from changes which would diminish the aesthetic value of lands adjacent to the highways. Caltrans has designated the segment of Interstate 280 (I-280) that runs from the Santa Clara County line to the San Bruno city limit as a scenic highway.

Local

Menlo Park General Plan

The Menlo Park General Plan is a comprehensive long-range general plan for the physical development of the City of Menlo Park (City of Menlo Park, 2016a). The General Plan contains the current City of Menlo Park Housing Element, which was adopted in 2014 (City of Menlo Park, 2014). The various elements within the General Plan include goals and policies for the physical development of the City. Goals and policies related to aesthetics and visual resources are listed below.

Goal LU-1: Promote the orderly development of Menlo Park and its surrounding area.

Policy LU-1.1: Land Use Patterns. Cooperate with the appropriate agencies to help assure a coordinated land use pattern in Menlo Park and the surrounding area.

Goal LU-2: Maintain and enhance the character, variety and stability of Menlo Park's residential neighborhoods.

Policy LU-2.1: Neighborhood Compatibility. Require new residential development to possess high-quality design that is compatible with the scale, look, and feel of the surrounding neighborhood and that respects the City's residential character.

Policy LU-2.2: Open Space. Require accessible, attractive open space that is well maintained and uses sustainable practices and materials in all new multiple dwelling and mixed-use development.

Policy LU-2.3: Mixed Use Design. Allow mixed-use projects with residential units if project design addresses potential compatibility issues such as traffic, parking, light spillover, dust, odors, and transport and use of potentially hazardous materials.

Policy LU-2.6: Underground Utilities. Require all electric and communications lines serving new development to be placed underground.

Policy LU-2.8: Property Maintenance. Require property owners to maintain buildings, yards, and parking lots in a clean and attractive condition.

Goal LU-3: Retain and enhance existing and encourage new neighborhood-serving commercial uses, particularly retail services, to create vibrant commercial corridors.

Policy LU-3.1: Underutilized Properties. Encourage underutilized properties in and near existing shopping districts to redevelop with attractively designed commercial,

residential, or mixed-use development that complements existing uses and supports pedestrian and bicycle access.

Policy LU-3.2: Neighborhood Shopping Impacts. Limit the impacts from neighborhood shopping areas, including traffic, parking, noise, light spillover, and odors, on adjacent uses.

Policy LU-3.3: Neighborhood Retail. Preserve existing neighborhood-serving retail, especially small businesses, and encourage the formation of new neighborhood retail clusters in appropriate areas while enhancing and preserving the character of the neighborhood.

Goal LU-4: Promote the development and retention of business uses that provide goods or services needed by the community that generate benefits to the City, and avoid or minimize potential environmental and traffic impacts.

Policy LU-4.3: Mixed Use and Nonresidential Development. Limit parking, traffic, and other impacts of mixed-use and nonresidential development on adjacent uses, and promote high-quality architectural design and effective transportation options.

Goal LU-6: Preserve open-space lands for recreation; protect natural resources and air and water quality; and protect and enhance scenic qualities.

Policy LU-6.1: Parks and Recreation System. Develop and maintain a parks and recreation system that provides areas, play fields, and facilities conveniently located and properly designed to serve the recreation needs of all Menlo Park residents.

Policy LU-6.2: Open Space in New Development. Require new nonresidential, mixed use, and multiple dwelling development of a certain minimum scale to provide ample open space in the form of plazas, greens, community gardens, and parks whose frequent use is encouraged through thoughtful placement and design.

Policy LU-6.6: Public Bay Access. Protect and support public access to the Bay for the scenic enjoyment of open water, sloughs, and marshes, including restoration efforts, and completion of the Bay Trail.

Policy LU-6.8: Landscaping in Development. Encourage extensive and appropriate landscaping in public and private development to maintain the City's tree canopy and to promote sustainability and healthy living, particularly through increased trees and water-efficient landscaping in large parking areas and in the public right-of-way.

Policy LU-6.9: Pedestrian and Bicycle Facilities. Provide well designed pedestrian and bicycle facilities for safe and convenient multi-modal activity through the use of access easements along linear parks or paseos.

Policy LU-6.11: Baylands Preservation. Allow development near the Bay only in already-developed areas.

Goal OSC-1: Maintain, protect and enhance open space and natural resources.

Policy OSC-1.1: Natural Resources Integration with Other Uses. Protect Menlo Park's natural environment and integrate creeks, utility corridors, and other significant natural and scenic features into development plans.

Policy OSC-1.6: South Bay Salt Pond Restoration Project and Flood Management Project. Continue to support and participate in Federal and State efforts related to the South Bay Salt Pond Restoration Project and flood management project. Provide public access to the Bay for the scenic enjoyment and recreation opportunities as well as conservation education opportunities related to the open Bay, the sloughs, and the marshes.

Policy OSC-1.11: Sustainable Landscape Practices. Encourage the enhancement of boulevards, plazas and other urban open spaces in high-density and mixed-use residential developments, commercial and industrial areas with landscaping practices that minimize water usage.

Policy OSC1.12: Landscaping and Plazas. Include landscaping and plazas on public and private lands and well-designed bicycle and pedestrian facilities in areas of intensive non-vehicular activity. Require landscaping for shade and surface runoff or to obscure parked cars in extensive parking areas.

Policy OSC1.13: Yard and Open Space Requirements in New Development. Ensure that required yard and open spaces are provided for as part of new multi-family residential, mixed-use, commercial, and industrial development.

Policy OSC1.14: Protection of Conservation and Scenic Areas. Protect conservation and scenic areas from deterioration or destruction by vandalism, private actions or public actions.

Policy OSC1.15: Heritage Trees. Protect Heritage Trees, including during construction activities through enforcement of the Heritage Tree Ordinance (Chapter 13.24 of the Municipal Code).

Policy OSC-1.16: Visual Amenities in Public Improvements. Require that all public improvements to facilities, such as streets, civic structures and major municipal projects, recognize the need for visual amenities such as landscaping, public plazas, public art, and pedestrian and bicycle access.

Menlo Park Municipal Code

The City of Menlo Park Municipal Code, organized by title, chapter, and section, contains all ordinances for Menlo Park. Title 13, Streets, Sidewalks and Utilities, Title 15, Subdivisions, and Title 16, Zoning, include regulations relevant to aesthetics and visual resources in Menlo Park.

Title 12 Adoption of Codes

Under Section 12.04.100A(E)(C)(1), lighting in multiple family dwellings is recommended for aisles, passageways, and recesses related to and within the building complex. The lighting level should be illuminated with an intensity of at least one foot-candle at the ground level during the hours of darkness. Lighting devices shall be protected by weather and vandalism resistance covers.

Title 13 Street, Sidewalk, and Utilities Regulations

Street, sidewalk, and utilities regulations are included in Title 13 of the Municipal Code. The ordinance provides development standards related to aesthetics such as landscaping, lighting, street trees, heritage trees and screening and undergrounding utilities.

Chapter 13.24, Heritage Trees

Chapter 13.24 of the Menlo Park Municipal Code regulates the removal and replacement of heritage trees, promotes additional heritage tree planting, and supports public education about the planting, maintenance, and preservation of healthy heritage trees. Pursuant to Section 13.24.050, a permit issued by the public works director is required to remove and conduct major pruning of a heritage tree. Heritage trees include:

1. All trees other than oaks that have a trunk with a circumference of 47.1 inches (diameter of 15 inches) or more, measured 54 inches above natural grade.
2. An oak tree (Quercus) that is native to California and has a trunk with a circumference of 31.4 inches (diameter of 10 inches) or more, measured 54 inches above natural grade.
3. A tree or group of trees of historical significance, special character, or community benefit—specifically, designated by resolution of the City Council.

Title 15 Subdivisions

Title 15 includes subdivision regulations that are established to ensure the orderly development of subdivisions and condominiums. Chapter 15.16 provides standards for surveying, design and construction, and installation of relevant infrastructure. Section 15.16.220 may allow for the standards to be varied when, amongst other conditions, a project sets out permanent scenic easements. Chapter 15.34 includes regulations for the development of condominiums.

Title 16 Zoning

The Zoning Ordinance, which, amongst other purposes, is intended to preserve and extend the charm and beauty inherent to the character of the City and encourage building construction of pleasing design. The Zoning Ordinance sets forth the standards requiring use permit and/or architectural control review and stipulating aesthetic criteria for development, such as ensuring that a development's proposed design and size is appropriate for the location and is compatible with adjacent uses and resources. Specifically, the Zoning Ordinance references the El Camino Real/Downtown Specific Plan for design standards in the Specific Plan Area, provides standards for architectural design for R-4-S, High Density Residential District, Special (Chapter 16.23) and also sets forth development standards related to aesthetics, including preservation of historic buildings (Chapter 16.54), fencing (Chapter 16.64), and daylight planes for residential development (Chapter 16.67). Additionally, under Section 16.68.020, Architectural Control, the planning commission, architectural committee, or community development director will review architectural drawings, including plans for buildings consisting of elevations of the proposed building or structure, proposed landscaping or other treatment of the grounds around such building or structure, and proposed design of, and access to required parking facilities for all building permit applications, with the exception of single-family dwellings, duplexes, and accessory buildings.

With recent changes in State law, including the Housing Accountability Act codified in Government Code Section 65589.5, the City's design review of proposed housing development projects (and mixed-use projects where at least two thirds of the square footage is designated for residential use) is limited to the application of "objective, quantifiable, written development standards, conditions, and policies appropriate to, and consistent with" meeting the City's RHNA

requirement. Objective standards and conditions and policies must be applied "to facilitate and accommodate development at the density permitted on the site and proposed by the development" (CGC 65589.5(f)). If proposed housing development projects comply with all objective general plan, zoning, and subdivision standards, the City can only deny the project or reduce its density if it finds that there would be a "specific adverse impact" upon public health or safety that can't be mitigated in any other way. The finding of a specific adverse impact must also be based on "objective, identified written public health or safety standards, policies, or conditions as they existed on the date the application was deemed complete" (CGC 65589.5(j)). These provisions suggest that design review provisions in City code will only apply to proposed housing developments to the extent they are objective and quantifiable.

Sections 16.43.140(6) and Section 16.45.130(6), Bird-Friendly Design

All new construction, regardless of size, is required to comply with the City of Menlo Park bird-safe design requirements provided in Menlo Park Municipal Code Sections 16.43.140(6) (with respect to the O District), 16.44.130(6) (with respect to the LS District), and 16.45.130(6) (with respect to the R-MU District). These design requirements include appropriate measures to reduce bird collisions, as follows:

A. No more than 10 percent of the façade surface area shall have non-bird-friendly glazing.

B. Bird-friendly glazing includes, but is not limited to, opaque glass; clear glass with patterns covering the outside surface; paned glass with fenestration, frit, or etching patterns; and nonreflective glass with external screens. Highly reflective glass is not permitted.

C. Occupancy sensors or other switch control devices shall be installed on non-emergency lights and programmed to shut off during non-work hours and between 10:00 p.m. and sunrise.

D. The placement of buildings shall avoid the potential funneling of flight paths toward a building façade.

E. Glass skyways or walkways, free-standing (see-through) glass walls and handrails, and transparent building corners shall not be allowed.

F. Transparent glass shall not be allowed at the rooflines of buildings, including in conjunction with roof decks, patios, and green roofs.

G. Rodenticides shall not be allowed.

H. A project may receive a waiver from one or more of the items listed in subsections (6)(A) to (F) of this section, subject to submittal of a site-specific evaluation from a qualified biologist and review and approval by the Planning Commission.

Chapter 16.64, Fences, Walls, Trees, and Hedges

Chapter 16.64 of the Menlo Park Municipal Code establishes standards for fences, walls, trees, and hedges in non-residential and residential areas. In non-residential areas, fences, walls, hedges, and similar structures between the building and front lot line are required to obtain written approval from the community development director. The following features must be considered when obtaining approval: structural stability; aesthetics; the general health, safety, and welfare of the community; clear lines of sight for vehicular and pedestrian traffic; and other safety factors.

Chapter 16.82, Permits

Sections 16.82.050 through 16.82.100 of the Menlo Park Municipal Code establish criteria for the issuance of conditional development permits (CDPs). A CDP may be issued to allow adjustments to zoning district requirements to secure special benefits through comprehensive planning of large developments. A CDP would be required for projects that seek to permit a master-planned project with bonus-level development, define any adjustments to City Zoning Ordinance development standards, identify project conditions and requirements, and create mechanisms for the City to use to process any revisions to projects that might arise over the HEU buildout period. Section 16.82.060 requires that each CDP application be accompanied by architectural drawings and plot plans that clearly identify elevations, locations of proposed buildings, landscaping, parking, and other physical features. Section 16.68.020 of the Menlo Park Municipal Code establishes requirements for architectural control approval. Each application for a building permit for construction or alteration of a building must be accompanied by architectural drawings showing elevations, landscaping or other ground treatments, and the design of parking facilities, including access points.

The City Council is the final decision-making body for a CDP; however, subsequent architectural control permits would be reviewed and acted upon, perhaps concurrently, by the Planning Commission. The Planning Commission would consider the following when conducting architectural control review of the proposed project:

1. The general appearance of the structures is in keeping with the character of the neighborhood.
2. The development will not be detrimental to the harmonious and orderly growth of the City.
3. The development will not affect the desirability of investment or occupation in the neighborhood.
4. The development provides adequate parking, as required in all applicable City ordinances, and has made adequate provisions for access to such parking.
5. That the development is consistent with any applicable specific plan.

El Camino Real/Downtown Specific Plan

The El Camino Real/Downtown Specific Plan (ECR/D Specific Plan) establishes a framework for private and public improvements on El Camino Real, in the Caltrain station area and in downtown Menlo Park for the next several decades. The plan's focus is on the character and extent of enhanced public spaces, the character and intensity of private infill development and circulation and connectivity improvements. It includes a strategy for implementation of public space improvements, such as wider sidewalks and plazas, and other infrastructure improvements. The ECR/D Specific Plan contains design standards and guidelines to ensure that the community character and aesthetics of the area are realized in the Specific Plan Area.

4.1.4 Environmental Impacts and Mitigation Measures

Scope of Analysis

The analysis in this SEIR describes impacts identified in the 2016 *ConnectMenlo* EIR, and describes how the impacts of the HEU would differ, as applicable.

Significance Thresholds

The thresholds used to determine the significance of impacts related to aesthetics are based on Appendix G of the *CEQA Guidelines*. Implementation of the HEU would have a significant impact on the environment if it would:

- Have a substantial adverse effect on a scenic vista.
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.
- In nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings (public views are those that are experienced from publicly accessible vantage point); or if the project is in an urbanized area, conflict with applicable zoning and other regulations governing scenic quality.
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

Methodology and Assumptions

The analysis of potential impacts related to aesthetics in this SEIR relies on qualitatively comparing the existing built and natural environment to the future built and natural environment that would result from implementation of the HEU. Whether an adverse environmental effect on aesthetics occurs is based on whether development that would occur with implementation of the HEU would result in the substantial interference or obstruction of a scenic view from a public vantage point or have a substantial demonstrable negative aesthetic effect. The obstruction of an individual landowner's view from private property is not considered a significant environmental impact under CEQA. As a result, the analysis generally does not consider or evaluate the HEU's impact on views from private residences or other private vantage points. A significance determination for impacts related to scenic vistas (e.g., broad expansive views of natural features and landscapes) and scenic resources (e.g., scenic corridors) is based on whether the development that would occur with implementation of the HEU would prominently obstruct or block the majority of the expanse of scenic vista or scenic resource as seen by most viewers from public locations while taking into account the view as a whole as well as the City's land use policies. The analysis considers the sensitivity of the affected resource based on the prominence of its visibility and/or the viewpoint location, as well as the characteristics of the view. View characteristics include whether it is widely unobstructed, fleeting, intermittent, or transitory as viewed from roadways. Moreover, the significance is measured in light of the context in which the effect occurs. For example, an activity which may be significant in a rural area may not be significant in an urban area. With respect to visual character, for a project to have significant visual impacts, a project

must either block views of an aesthetic resource, be located in an area that is itself considered to be an aesthetic resource, or have a substantial demonstrable negative aesthetic effect. The analysis also addresses whether the HEU would conflict with applicable zoning and/or other regulations governing scenic quality or create a new source of substantial light or glare.

Impacts and Mitigation Measures

Impacts

Impact AES-1: Implementation of the HEU would not have a substantial adverse effect on a scenic vista. ***(Less than Significant Impact)***

The *ConnectMenlo* EIR found that the project would not have a substantial adverse effect on a scenic vista. The EIR identified that future development potential in the Bayfront Area where new potential development is expected to occur would be concentrated on sites either already developed and/or underutilized, and/or in close proximity to existing development, where future development would have a lesser impact on scenic vistas. The EIR identified that proposed changes in the Bayfront Area consisted of increased development intensities and increases in height. However, the EIR identified that the development standards for the development potential for the remainder of the City would not change under the project; therefore, no intensification of density or increases in height would occur on these sites as a result of the project.

The EIR stated that the more intense development and increases in proposed building heights of potential new development under the project in the Bayfront Area could block views of the Bay and its scenic resources from various vantage points. However, due to the natural topography and location of the Bayfront Area on the City's northern border, the analysis determined that the far-field views of the Santa Cruz Mountain Range, foothills, and San Francisquito Creek would not be impacted by new development potential in the Bayfront Area. The analysis further noted that maximum heights permitted in the Zoning Ordinance limit the opportunity for views of scenic vistas from street-level public viewing. Therefore, the analysis found that the height increases permitted under the project, which are limited to certain parcels in the Bayfront Area, would not cause any further substantial obstruction from the street level view to any scenic resource.

In addition, the EIR found that potential future development Citywide, if needed, would be subject to the City's existing architectural control process, in accordance with Section 16.68.020 of the Zoning Ordinance and would be required to comply with existing design standards outlined in the Zoning Ordinance and identified in the El Camino Real/Downtown Specific Plan, In addition, the identified General Plan goals and policies (see Section 4.1.3 of this SEIR, above) require local planning and development decisions to consider impacts to aesthetic resources, including scenic vistas.

In addition, with respect to the new development potential in the Bayfront Area where more intense development and increased height was being considered, the EIR identified that the project includes zoning regulations that include design standards intended to reduce potential aesthetic-related impacts of future development under the project. The design standards control the appearance of development, including aspects such as connectivity via new street and paseo requirements, lot size, building mass and scale, the building's relationship to the street, ground-

floor exterior, public and private open space, sidewalks and paseos, building projections and facades, roof planes, and upper-story stepbacks. In addition, the design standards include requirements for trash and storage and associated screening, and requirements for durable and high-quality building materials. These design standards specifically apply to all new construction, regardless of size, and building additions and/or alterations affecting 10,000 or more square feet of gross floor area. In summary, the EIR determined that impacts to scenic vistas would be less than significant, and no mitigation would be required.

As detailed in Chapter 3 of this SEIR, *Project Description*, the project analyzed in this SEIR would include adoption of General Plan amendments that would add or modify goals, objectives, policies, and implementation programs related to housing, safety, and environmental justice. General Plan amendments would also include conforming amendments to other elements of the General Plan, as needed, to ensure internal consistency. Amendments to the Housing Element would address among other things, the maintenance, preservation, improvement, and development of housing in the City. In addition, the HEU would include a housing sites inventory with sufficient existing and new housing sites at appropriate densities to meet the City's RHNA requirement plus an ample buffer, and the City would modify provisions of its Zoning Ordinance, zoning map, and El Camino Real/Downtown Specific Plan as necessary to reflect the housing sites inventory and strategies to meet the City's RHNA.

The final housing sites inventory will be refined based on additional community input and analysis. This SEIR evaluates up to 4,000 new residential units within the eight-year planning period via the housing inventory sites in addition to possible pipeline projects and accessory dwelling units (ADUs). Pipeline projects are projects that have been recently approved, but not yet occupied or are pending (in review) that would provide housing. Pipeline projects are generally located on the north side of US-101 in the Bayfront Area. Figure 3-3 in Chapter 3 of this SEIR, *Project Description*, shows the locations of the potential housing inventory sites which are dispersed across the City.

It is important to note that the identification of housing sites in the City's Housing Element does not mean someone necessarily will develop housing on those sites at the planned unit count or level of affordability. Although the City must plan for housing development, it does not directly build, or require to be built, any housing. Instead, the identification of housing sites is intended to plan for and encourage housing, and its development by property owners and developers is largely dependent on market forces and (in the case of affordable housing) available subsidies. Regardless, development of new housing units under the HEU would promote coordinated land use patterns within the City, and would conform to the City's revised zoning allowances, in response to the ABAG's RHNA allocation and State law, which requires the City to identify sufficient housing sites to accommodate the City's RHNA allocation.

As with the development assessed in the *ConnectMenlo* EIR, development under the HEU would be required to comply with applicable City policies, regulations, and development standards governing scenic quality. New development that could occur under the HEU would generally occur in areas that currently accommodate commercial/industrial uses, mixed uses, and/or multifamily housing; and other areas that are visually appropriate for increased development

intensities. New development under the HEU would generally not affect areas with a high degree of scenic value. As discussed in the *ConnectMenlo* EIR, potential future development Citywide, if needed, would be subject to the City's existing architectural control process, in accordance with Section 16.68.020 of the Zoning Ordinance and would be required to comply with objective design standards outlined in the Zoning Ordinance

Based upon each of these considerations, implementation of the HEU would not have a substantial adverse effect on a scenic vista, and the impact would therefore be **less than significant**.

Mitigation: None required.

Impact AES-2: Implementation of the HEU would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway. ***(Less than Significant Impact)***

The *ConnectMenlo* EIR noted that an approximately one-mile segment of I-280 running along the southern boundary of the City had been designated a State Scenic Highway by Caltrans. The EIR noted that the new potential development envisioned as part of the ConnectMenlo vision would be located substantially distant from the designated highway segment and that these locations would not be located within the I-280 viewshed. The EIR further noted that any future development within the viewshed would be subject to the City's existing architectural control process, in accordance with the City's Zoning Ordinance (described above under Section 4.1.3), and would be required to comply with applicable design standards outlined in the existing Zoning Ordinance. In addition, policies within the City's General Plan would require local planning and development decisions to consider impacts to aesthetic resources, including impacts related to scenic resources in the I-280 viewshed. The EIR concluded that these policies and regulations would serve to minimize potential adverse impacts to aesthetic resources and impacts to scenic resources in the I-280 viewshed would be less than significant.

As noted on page 4.1-1 of the *ConnectMenlo* EIR, when Caltrans made the Scenic Highway designation for I-280, it described that scenic value of the roadway as follows: "The motorist is offered middle-ground forest and mountain vistas, background water and mountain panoramas, and enclosed lake and mountain ridge views as the route traverses the environmentally fragile valley created by the San Andreas Earthquake Fault." That description of the highway's scenic characteristics has not been altered since the highway was designated. Of note, the description of the defining characteristics of the highway referred to "forest and mountain vistas, background water and mountain panoramas, and enclosed lake and mountain ridge views" that lie west of the freeway. These features are not present on the east side of the freeway in the City of Menlo Park. Views from the freeway looking east are comprised of urban and suburban uses, which are not contributors to the highway's scenic values. Motorists looking east along this segment currently see ornamental landscaping adjacent to the freeway in the near-view, along with the overpass structures associated with the Sand Hill Road Interchange. In the middle-view, at least in those areas where views are not blocked by roadside ornamental landscaping, motorists see multi-story

residential, office, and commercial structures typical of urban development. In other words, views from the freeway into the City are unremarkable and do not possess scenic qualities. Those areas along the freeway that do possess scenic qualities lie to the west, outside of the City limits and outside the City's jurisdiction. It thus follows that development occurring in the City to the east of the freeway would not affect the scenic values that contributed to the highway's designation.

In addition, the same determinations reached in the ConnectMenlo EIR still apply to any future development that could occur in the City within the viewshed of I-280. Any future development within the viewshed would be subject to the City's existing architectural control processes, in accordance with the City's Zoning Ordinance, and would be required to comply with applicable design standards outlined in the Zoning Ordinance. In addition, policies within the City's General Plan would still require local planning and development decisions to consider impacts to aesthetic resources, including impacts related to scenic resources in the I-280 viewshed. These policies and regulations would serve to minimize potential adverse impacts to aesthetic resources and impacts to scenic resources in the I-280 viewshed. Ultimately, any future development in the City within the I-280 viewshed would be similar to and consistent with the types of urban development that are already present in the area.

Based upon each of these considerations, implementation of the HEU would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway. Accordingly, the impact would be **less than significant**.

Mitigation: None required.

Impact AES-3: Implementation of the HEU would not substantially degrade the existing visual character or quality of public views of the site and its surroundings or conflict with applicable zoning and other regulations governing scenic quality. *(Less than Significant Impact)*

The *ConnectMenlo* EIR found that the project would not substantially degrade the existing visual character or quality of public views of the site and its surroundings or conflict with applicable zoning and other regulations governing scenic quality. The EIR identified that the subareas of the Bayfront Area where the potential new development under the project would be concentrated is either already developed and/or underutilized, and/or in close proximity to existing development in the Bayfront Area. The EIR found that future building form and massing may be greater than existing conditions in these subareas, but would not necessarily degrade the existing character of the Bayfront Area and subsequently Menlo Park as a whole.

The EIR noted that change in the existing setting does not necessarily equate to degradation of the visual character and overall quality of the site and surroundings. The EIR identified that implementation of the project would allow continued development and redevelopment throughout the City under existing zoning regulations, and more intense development in the Bayfront Area under new zoning regulations within the Bayfront Area subareas. The analysis stated that, while more intense development with taller and larger buildings could occur in the Bayfront Area, the

future development in the Bayfront Area would not result in a substantial change to the existing visual character of the Bayfront Area or its surroundings. Potential future development under the project would create a shift in uses from light industrial and business park uses to office, technology, research and development, life sciences, and mixed-use with multi-family residential and commercial, and involve notable changes in building intensity and height from 35 feet to 120 feet. However, given the existing commercial, industrial, and residential uses surrounding the areas of potential new growth, the EIR identified that the development of future projects would continue to be compatible with the existing visual character and quality of the Bayfront Area and its surroundings.

In addition, the EIR identified that all potential future development in the City would be subject to the City's existing architectural control process, in accordance with Section 16.68.020 of the Zoning Ordinance and would be required to comply with applicable design standards outlined in the Zoning Ordinance. In addition, the EIR found that the General Plan goals and policies listed above in Section 4.1.3 and as discussed under Impact AES-1 would serve to minimize potential adverse impacts on aesthetic resources. Specifically, Policy LU-2.1 requires new residential development to possess high-quality design that is compatible with the scale, look, and feel of the surrounding neighborhood and that respects the City's residential character. Policy LU-2.3 requires mixed-use projects with residential units to be allowed only when project design addresses potential compatibility issues such as traffic, parking, light spillover, dust, odors, and transport and use of potentially hazardous materials. Policy LU-2.8 requires property owners to maintain buildings, yards, and parking lots in a clean and attractive condition. Policy LU-4.3 requires that parking, traffic, and other impacts of mixed-use and nonresidential development on adjacent uses be limited, and promotes high-quality architectural design and effective transportation options. Policy LU-6.8 encourages extensive and appropriate landscaping in public and private development to maintain the City's tree canopy and to promote sustainability and healthy living, particularly through increased trees and water-efficient landscaping in large parking areas and in the public right-of-way. Policy OSC-1.14 requires that conservation and scenic areas be protected from deterioration or destruction by vandalism, private actions or public actions. Policy OSC-1.15 requires that Heritage Trees be protected, including during construction activities through enforcement of the Heritage Tree Ordinance (Chapter 13.24 of the Municipal Code). Accordingly, the EIR determined that impacts to visual character would be less than significant, and no mitigation would be required.

As with the development assessed in the *ConnectMenlo* EIR, development under the HEU would be required to comply with applicable City policies, regulations, and any objective development standards governing scenic quality. New development that could occur under the HEU would generally be in areas that currently accommodate commercial/industrial uses, mixed uses, and/or multifamily housing, and other areas that are visually appropriate for increased development intensities. New development under the HEU would generally not affect areas with a high degree of scenic value. As discussed in the *ConnectMenlo* EIR, potential future development Citywide would be subject to the City's existing architectural control process, in accordance with Section 16.68.020 of the Zoning Ordinance and would be required to comply with objective design standards outlined in the Zoning Ordinance.

Based upon each of these considerations, implementation of the HEU would not substantially degrade the existing visual character or quality of public views or conflict with applicable zoning and other regulations governing scenic quality, and the impact would therefore be **less than significant**.

Mitigation: None required.

Impact AES-4: Implementation of the HEU would not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area. (Less than Significant Impact)

The *ConnectMenlo* EIR found that the project would not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area. The EIR identified that the project would modify land uses, zoning, and density in the Bayfront Area, which in turn would intensify related lighting sources in the Bayfront Area and adjacent land uses. In addition to new building, security, and lighting for parking areas, buildout of the Bayfront Area would also include lighting aimed at properly illuminating the overall Bayfront Area. Because the project allows higher intensity development in the Bayfront Area, the EIR identified that implementation would likely result in larger buildings with more exterior glazing (i.e., windows and doors) that could result in new sources of glare. Despite the new and expanded sources of nighttime illumination and glare, the EIR found that the project would not be expected to generate a substantial increase in light and glare.

In addition, the EIR identified general best management practices that require lighting that is context sensitive in style and intensity required under the California Green Building Standards Code of the California Code of Regulations, Title 24, Part 11. The analysis identified that new development in the Bayfront Area would also be required to comply with General Plan policies that ensure new land uses do not generate excessive light levels that would spill on to adjacent sensitive receptors, and reduce light and glare spillover from future development to surrounding land uses. For example, Policy LU-2.3 requires that the City allow mixed-use projects with residential units if the project design addresses potential compatibility issues such as light spillover. Policy LU-4.3 requires the City to limit parking, traffic, and other impacts of mixed-use and nonresidential development on adjacent uses, and promote high-quality architectural design and effective transportation options. Policy LU-6.8 requires the City to encourage extensive and appropriate landscaping in public and private development to maintain the City's tree canopy, which would buffer new development with landscaping and trees. Policy OSC-1.15 requires the protection of Heritage Trees, including during construction activities, through enforcement of the Heritage Tree Ordinance (Chapter 13.24 of the Municipal Code). The preservation of mature trees with substantial tree canopies would diffuse the overall amount of light generated by new development and glare generated by windows of multistory buildings in the areas of Menlo Park with mature trees. Accordingly, the EIR determined that impacts related to adverse light and glare would be less than significant, and no mitigation would be required.

As with the development assessed in the *ConnectMenlo* EIR, development under the HEU would modify land uses, zoning, and density in areas where new housing would be developed, which in turn would intensify related lighting sources on the housing sites and adjacent land uses. In addition, new building, security, and lighting for parking areas would be required. Because the HEU allows higher intensity development in areas where new housing would be developed, implementation of the HEU would likely result in larger buildings with more exterior glazing (i.e., windows and doors) that could result in new sources of glare. Despite the new and expanded sources of nighttime illumination and glare, the implementation of the HEU would not be expected to generate a substantial increase in light and glare because affected areas already contain street lights and developed uses.

As with the development assessed in the *ConnectMenlo* EIR, development under the HEU would be required to comply with applicable City policies and development standards designed to minimize adverse light and glare. New development that could occur under the HEU would generally occur in areas that currently accommodate commercial/industrial uses, mixed uses, multifamily housing, and/or other areas that are visually appropriate for increased development intensities. As discussed in the *ConnectMenlo* EIR, potential future development Citywide, if needed, would be subject to the City's existing architectural control process, in accordance with Section 16.68.020 of the Zoning Ordinance and would be required to comply with objective design standards outlined in the Zoning Ordinance. In addition, as is the case with development assessed in the *ConnectMenlo* EIR, development under the HEU would incorporate best management practices that require lighting that is context sensitive in style and intensity required under the California Green Building Standards Code of the California Code of Regulations, Title 24, Part 11.

Based upon each of these considerations, implementation of the HEU would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area, and the impact would therefore be **less than significant**.

Mitigation: None required.

Cumulative Impacts

This section presents an analysis of the cumulative effects of the HEU in combination with other past, present, and reasonably foreseeable future development that could cause cumulatively significant impacts. Significant cumulative impacts related to aesthetics could occur if the incremental impacts of the HEU combined with the incremental impacts of cumulative development would be significant, and if the HEU's contribution would be considerable. Cumulative development projections for 2040 are included in the project description and described in Section 4.0.3, *Cumulative Impacts*.

Impact AES-5: Implementation of the HEU would not combine with other past, present, and reasonably foreseeable projects to result in significant cumulative impacts with respect to aesthetics. (*Less than Significant Impact*)

The *ConnectMenlo* EIR evaluated cumulative effects to take into account growth projected by the project within the City boundary and Sphere of Influence (SOI), in combination with impacts from projected growth in the rest of San Mateo County and the surrounding region, as forecast by ABAG. Impacts from cumulative growth were considered in the context of their consistency with regional planning efforts. Within this context, the EIR found that significant impacts, including those associated with scenic resources, visual character, and increased light and glare would generally be site-specific and would not contribute to cumulative impacts after implementation of the General Plan policies and the applicable provisions of the Municipal Code.

Because of the developed nature of the overall study area and Bayfront Area, the EIR determined that future development under the project, in combination with other new development, would not negatively impact the visual character of the City. The EIR found that individual developments would continue to be subject to General Plan policies and Municipal Code provisions related to aesthetics, including potential project-level design review requirements. Additionally, as part of the approval process, potential new development under the project would be subject to architectural review and subject to design standards, as applicable, to ensure that the development is aesthetically pleasing and compatible with adjoining land uses. With these development review mechanisms in place, the EIR determined that approved future development under the project would not be anticipated to create substantial impacts to visual resources. Therefore, the EIR determined that cumulative impacts related to aesthetics would be less than significant, and no mitigation would be required.

As with the development assessed in the *ConnectMenlo* EIR, development under the HEU would be subject to General Plan policies and Municipal Code provisions related to aesthetics, including potential project-level design review requirements. With these development review mechanisms in place, future development under the HEU would not be anticipated to create substantial impacts to visual resources.

Based upon these considerations, implementation of the HEU would not be cumulatively considerable, and the impact would therefore be **less than significant**.

Mitigation Measure: None required.

4.1.5 References

City of Menlo Park. 2016a. *City of Menlo Park General Plan*. Available online: https://www.menlopark.org/146/General-Plan. Accessed February 23, 2022.

City of Menlo Park. 2016b. *Draft EIR for ConnectMenlo: General Plan Land Use & Circulation Elements and M-2 Area Zoning Update*. Available online: https://www.menlopark.org/1013/Environmental-Impact-Report. Accessed February 23, 2022.

California Department of Transportation (Caltrans), 2022. California State Scenic Highways. Available online: https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways. Accessed May 3, 2022.

4.2 Air Quality

4.2.1 Introduction

This section evaluates the effects of the Housing Element Update (HEU) on air quality, focusing on changes to the *ConnectMenlo* EIR (certified in 2016) that may result in new or more severe impacts, and describes any mitigation measures needed to address any such impacts.

Findings of the *ConnectMenlo* Final EIR

Air quality impacts of the *ConnectMenlo* project were analyzed in Section 4.2 of the *ConnectMenlo* Draft EIR. The *ConnectMenlo* Final EIR determined that the project would have the following impacts with respect to air quality:

- AQ-1: Implementation of the proposed project would not conflict with or obstruct implementation of the applicable air quality plan. (*Less than Significant Impact*)

- AQ-2a: Despite implementation of the proposed project policies as identified in Chapter 4.2, Air Quality, Table 4.2-8, criteria air pollutant emissions associated with the proposed project would cause a substantial net increase in emissions that exceeds the Bay Area Quality Management District (BAAQMD) regional significance thresholds. (*Significant and Unavoidable Impact, with Mitigation*)

- AQ-2b: Despite implementation of the proposed project policies, criteria air pollutant emissions associated with proposed project construction activities would generate a substantial net increase in emissions that exceeds the BAAQMD regional significance thresholds. (*Significant and Unavoidable Impact, with Mitigation*)

- AQ-3a: Warehousing operations could generate a substantial amount of diesel particulate matter (DPM) emissions from off-road equipment use and truck idling. In addition, some warehousing, research and development, and industrial facilities may include use of transport refrigeration units (TRUs) for cold storage that could expose sensitive receptors to substantial pollutant concentrations. (*Less than Significant Impact, with Mitigation*)

- AQ-3b: Placement of new sensitive land uses near major sources of air pollution could be exposed to elevated concentrations of air pollutants. (*Less than Significant Impact, with Mitigation*)

- AQ-4: Implementation of the proposed project would not create or expose a substantial number of people to objectionable odors. (*Less than Significant Impact*)

- AQ-5: Despite implementation of the General Plan policies, criteria air pollutant emissions associated with the General Plan would generate a substantial net increase in emissions that exceeds the BAAQMD regional significance thresholds. (*Significant and Unavoidable Impact, with Mitigation*)

Notice of Preparation Comments

The Notice of Preparation (NOP) for the SEIR was circulated on December 23, 2021 and a scoping meeting was held on January 24, 2022. The NOP and the comments received during the

public comment period can be found in **Appendix A** of this SEIR. Comments relevant to air quality included a request that the SEIR include a scenario with massively reduced parking so that the degree of VMT and air quality impacts are considered with comparison of different parking assumptions.

Information Sources

The primary sources of information referenced in this section included those listed below. Please note that a full list of references for this topic can be found at the end of this section.

- City of Menlo Park General Plan (2016a).
- *ConnectMenlo* Draft EIR (2016b).
- The Bay Area Air Quality Management District (BAAQMD) California Environmental Quality Act (CEQA) Air Quality Guidelines (2017a);
- The BAAQMD Final 2017 Clean Air Plan (2017b); and
- The Office of Environmental Health Hazard Assessment (OEHHA) health risk assessment methodology (2015).

4.2.2 Environmental Setting

The following section focuses on differences in the environmental setting from what was published in the *ConnectMenlo* EIR. Draft EIR Section 4.2, *Air Quality*, evaluated effects to air quality. There, Section 4.2.1, *Environmental Setting*, described the climate and air pollution applicable to this topic, and that description is still current for this SEIR. The following is supplemental setting information to support the evaluation of air quality impacts of the HEU.

Climate and Meteorology

Meteorology, wind patterns, temperature, precipitation, wind circulation, and inversions of the San Francisco Bay Area Air Basin (SFBAAB) are discussed in the *ConnectMenlo* EIR and are still current for this SEIR.

Air Pollutants of Concern

Air pollutants of concern within the SFBAAB include criteria air pollutants and toxic air contaminants (TACs), discussed in the *ConnectMenlo* EIR, and are still current for this SEIR. In the *ConnectMenlo* EIR, a description of each of the criteria air pollutants and their known health effects are presented which include: carbon monoxide (CO), reactive organic gases (ROG), nitrogen oxides (NO_X), sulfur dioxide (SO_2), suspended particulate matter (PM_{10} and $PM_{2.5}$), ozone, and lead.

Air Quality Index

The U.S. EPA developed the Air Quality Index (AQI) scale to make the public health impacts of air pollution concentrations easily understandable. The AQI, much like an air quality "thermometer," translates daily air pollution concentrations into a number on a scale between 0

and 500. The numbers in the scale are divided into six color-coded ranges, with numbers 0–300 as outlined below:

- **Green (0-50)** indicates "good" air quality. No health impacts are expected when air quality is in the green range.
- **Yellow (51-100)** indicates air quality is "moderate." Unusually sensitive people should consider limited prolonged outdoor exertion.
- **Orange (101–150)** indicates air quality is "unhealthy for sensitive groups." Active children and adults, and people with respiratory disease, such as asthma, should limit outdoor exertion.
- **Red (151–200)** indicates air quality is "unhealthy." Active children and adults, and people with respiratory disease, such as asthma should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion.
- **Purple (201–300)** indicates air quality is "very unhealthy." Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit outdoor exertion.

The AQI numbers refer to specific amounts of pollution in the air and are based on the federal air quality standards for ozone, CO, NO_2, SO_2, PM_{10}, and $PM_{2.5}$. In most cases, the federal standard for these air pollutants corresponds to the number 100 on the AQI chart. If the concentration of any of these pollutants rises above its respective standard, it can be unhealthy for the public. In determining the air quality forecast, local air districts use the anticipated concentration measurements for each of the major pollutants, convert them into AQI numbers, and determine the highest AQI for each zone in a district. Readings below 100 on the AQI scale would not typically affect the health of the general public (although readings in the moderate range of 50 to 100 may affect unusually sensitive people). Levels above 300 rarely occur in the United States, and readings above 200 have not occurred in the SFBAAB in decades, with the exception of the October 2017 and November 2018 wildfires north of San Francisco and the August/September 2020 complex wildfires that occurred throughout the SBFBAAB (BAAQMD, 2017c).

Wildfires are occurring with increasing frequency in California and the Bay Area as the climate changes. Since 2000, 18 of the state's 20 largest wildfires and 18 of the state's 20 most destructive fires on record have occurred (Cal Fire, 2022a; Cal Fire, 2022b). As a result of these fires in Bay Area counties (Napa and Sonoma) and counties north and east of the Bay Area (e.g., Butte, Lassen, Plumas, and Shasta), the AQI in the Bay Area reached the "very unhealthy" and "hazardous" designations, ranging from values of 201 to above 350. During those periods, the BAAQMD issued "Spare the Air" alerts and recommended that individuals stay inside with windows closed and refrain from significant outdoor activity.

AQI statistics over recent years indicate that air quality in the SFBAAB is predominantly in the "Good" or "Moderate" categories and healthy on most days for most people. Historical BAAQMD data indicate that the air basin experienced air quality in the red level (unhealthy) on 25 days between 2018 and 2020. As shown in **Table 4.2-1**, the air basin had a total of 77 red-level or orange-level (unhealthy or unhealthy for sensitive groups) days between 2018 and 2020.

A number of these days are attributable to the increasing frequency of wildfires. This table also shows that the air basin experienced a total of 6 purple level (very unhealthy) days in between 2018 and 2020.

TABLE 4.2-1
AIR QUALITY INDEX STATISTICS FOR THE SAN FRANCISCO BAY AREA AIR BASIN

AQI Statistics for Air Basin	Number of Days by Year		
	2018	2019	2020
Unhealthy for Sensitive Groups (Orange)	8	10	34
Unhealthy (Red)	8	0	17
Very Unhealthy (Purple)	5	0	1

SOURCE: BAAQMD, 2021.

Toxic Air Contaminants

In addition to criteria air pollutants, plans and individual projects may directly or indirectly emit toxic air contaminants (TACs). TACs are airborne substances that can cause short-term (acute) and/or long-term (chronic and/or carcinogenic, i.e., cancer-causing) adverse human health effects (i.e., injury or illness). Human health effects of TACs can include birth defects, neurological damage, cancer, and death. There are hundreds of different types of TACs with varying degrees of toxicity that may be emitted from a variety of common sources including gasoline stations, automobiles, diesel engines, dry cleaners, industrial operations, and painting operations. Thus, individual TACs vary greatly in the health risk they present; and at a given level of exposure, one TAC may pose a hazard that is many times greater than another.

Unlike criteria air pollutants, TACs do not have ambient air quality standards but instead are regulated by the BAAQMD using a risk-based approach to determine which sources and pollutants to control as well as the degree of control. A health risk assessment is an analysis in which human health exposure to toxic substances is estimated and considered together with information regarding the toxic potency of the substances to provide quantitative estimates of the risks.[1] Exposure assessment guidance published by the BAAQMD in January 2016 adopts the assumption that residences would be exposed to air pollution 24 hours per day, 350 days per year, for 30 years (BAAQMD, 2020a). Therefore, assessments of air pollutant exposure to residents typically result in the greatest adverse health outcomes of all population groups.

Although not a TAC, exposures to $PM_{2.5}$ are strongly associated with mortality, respiratory diseases, and reductions in lung development in children, and other endpoints such as hospitalization for cardiopulmonary disease (San Francisco Department of Public Works, 2008). In addition to $PM_{2.5}$, diesel particulate matter (DPM) is also of concern. CARB identified DPM as

[1] In general, a health risk assessment is required if the air district concludes that projected emissions of a specific air toxic compound from a proposed new or modified source suggest a potential public health risk. The applicant of the project that would emit TACs is required to conduct a health risk assessment for the source in question. Such an assessment generally evaluates chronic, long-term effects, estimating the increased risk of cancer as a result of exposure to one or more TACs.

a TAC in 1998, primarily based on evidence demonstrating cancer effects in humans (CARB, 1998). The estimated cancer risk from exposure to diesel exhaust is much higher than the risk associated with any other TAC routinely measured in the region.

Despite notable emission reductions since CARB's 2000 Diesel Risk Reduction Plan (CARB 2000), CARB recommends that proximity to sources of DPM emissions (e.g., a freeway) be considered in the siting of new sensitive land uses. CARB notes that these recommendations are advisory and should not be interpreted as defined "buffer zones," and that local agencies must balance other considerations, including transportation needs, the benefits of urban infill, community economic development priorities, and other quality of life issues. With careful evaluation of exposure, health risks, and affirmative steps to reduce risk where necessary, CARB's position is that infill development, mixed use, higher density, transit-oriented development, and other concepts that benefit regional air quality can be compatible with protecting the health of individuals at the neighborhood level (CARB, 2005).

Air Pollution Sources

Air pollution sources contributing to emissions within the City and near the HEU planning areas include sources described below.

Stationary Sources

The BAAQMDs inventory of permitted stationary sources of emissions indicates that there are dozens of permitted stationary emission sources present within or near the HEU area (BAAQMD, 2020b). These permitted stationary sources are primarily standby generators, gasoline stations, and other facilities such as auto body shops.

Roadway Traffic Emissions

Motor vehicles are responsible for a large share of pollution, especially in California. Vehicle tailpipe emissions contain diverse forms of particles and gases and also contribute to particles by generating road dust and through tire wear.

The BAAQMD guidance indicates that roadways with volumes exceeding 10,000 average annual daily traffic may impact sensitive receptors if they are located within 1,000 feet of any sensitive receptor. This traffic contributes to elevated concentrations of $PM_{2.5}$ near the roadway, DPM if heavy trucks are present, and other contaminants emitted from motor vehicles. The 2040 roadway counts were obtained from the City of Menlo Park's interactive map[2] and the data indicates 16 roadways within the City have more than 10,000 average annual daily traffic including Bayshore Freeway (US-101), El Camino Real, Sand Hill Road, and Willow Road (City of Menlo Park 2019).

[2] This map is available through the City of Menlo Park, at https://www.menlopark.org/1543/Traffic-volume-data.

Existing Ambient Air Quality

Criteria Air Pollutants

The region's air quality monitoring network measures the ambient concentrations of criteria air pollutants at various locations in the SFBAAB. There is one active air quality monitoring station near Menlo Park, located approximately 2 miles northwest from the City of Menlo Park at 897 Barron Avenue in Redwood City, California. **Table 4.2-2** shows the most recent monitoring data for four criteria air pollutants including ozone, $PM_{2.5}$, and NO_2, for the years 2018 through 2020. Table 4.2-2 does not include CO or SO_2 as these are not pollutants of concern for the region. The SFBAAB attains the CO standard due to decreasing emissions over the last several years from improved vehicle fuel efficiency. Monitors are not required for SO_2 in the SFBAAB, as it has never been designated as non-attainment for SO_2. The Redwood City station does not monitor PM_{10}, therefore PM_{10} data from the San Jose-Jackson Street station was used. The table also compares the measured pollutant concentrations to the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) for each of the criteria air pollutants of concern. Concentrations shown in bold indicate an exceedance of the standard for the air basin.

Compliance with the standards is on a regional basis, as opposed to the city level. In the SFBAAB, compliance is demonstrated by ongoing measurements of pollutant concentrations at more than 30 air quality monitoring stations operated by the BAAQMD in all nine Bay Area counties. An exceedance of an ambient air quality standard at any one of the stations counts as a regional exceedance.

Odorous Emissions

Odors are generally regarded as an annoyance rather than a health hazard. The ability to detect odors varies considerably among the population and is subjective. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors. Odor impacts should be considered for any proposed new odor sources located near existing receptors, as well as any new sensitive receptors located near existing odor sources. Odor sources typically include wastewater treatment plants, landfills, confined animal facilities, composing stations, food manufacturing plants, refineries, and chemical plants (BAAQMD, 2017ba)

Sensitive Receptors

Sensitive receptors were described in the *ConnectMenlo* EIR; additional information regarding locations of sensitive receptors near the HEU areas is included here. There are a variety of sensitive receptors that are located in the City and the HEU planning areas including residential uses, schools, daycares, hospitals, and convalescent homes. Many sensitive receptors, including the Taft Elementary School, Belle Haven School, Beechwood School, The Peninsula Schools, Laurel School Upper Campus, Menlo-Atherton High School, Gina's Day Care, and Carosel Child Care are also located in proximity to the City of Menlo Park's major highways, US-101, SR-82, and SR-84, which generate high pollutant levels from automobile traffic.

TABLE 4.2-2
SUMMARY OF AIR QUALITY MONITORING DATA (2018-2020)[a]

Pollutant	Applicable Standard	Number of Days Standards Were Exceeded and Maximum Concentrations Measured		
		2018	2019	2020
Ozone				
Days 1-Hour State Standard Exceeded		0	0	1
State Maximum 1-Hour Concentration (ppm)	>0.09 ppm[b]	0.067	0.083	**0.098**
Days 8-hour State/National Standard Exceeded		0	2	1
National Maximum 8-hour Concentration (ppm)	>0.07 ppm[b,c]	0.050	**0.077**	**0.078**
Respirable Particulate Matter (PM_{10}) [a]				
Days 24-hour National Standard Exceeded		0	0	0
National Maximum 24-hour Concentration (µg/m^3)	>150 µg/m^3[c]	115.4	75.4	134.9
Days 24-hour State Standard Exceeded		4	4	10
State Maximum 24-hour Concentration (µg/m^3)	>50 µg/m^3[b]	**121.8**	**77.1**	**137.1**
State Annual Average (µg/m^3)	>20 µg/m^3[b]	**23.1**	19.1	--
Fine Particulate Matter ($PM_{2.5}$)				
Days 24-hour National Standard Exceeded		13	0	9
National Maximum 24-hour Concentration (µg/m^3)	>35 µg/m^3[c]	**120.9**	29.5	**124.1**
National Annual Average (µg/m^3)	>12 µg/m^3[b,c]	10.6	7.0	9.8
Nitrogen Dioxide (NO_2)				
Days 1-hour National Standard Exceeded		0	0	0
National Maximum 1-hour Concentration (ppm)	>0.1 ppm[c]	0.077	0.055	0.046

NOTES:
Bold values are in excess of applicable standard.
ppm = parts per million.
µg/m^3 = micrograms per cubic meter.

a The Redwood City, CA station is the closest monitoring station to the HEU planning areas. The station does not collect PM10 data, therefore data from the nearest station with PM10 monitoring used. This station is the San Jose – Jackson station located at 158B Jackson Street. State and national statistics may differ for the following reasons: State statistics are based on California approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers (https://www.arb.ca.gov/adam/topfour/topfourdisplay.php).
b State standard, not to be exceeded.
c National standard, not to be exceeded.

SOURCE: CARB, 2022b; U.S. EPA, 2022.

4.2.3 Regulatory Setting

The following section focuses on any changes to the regulatory setting that have occurred since certification of the *ConnectMenlo* EIR. Draft EIR Section 4.2, *Air Quality*, evaluated effects to air quality. There, Section 4.2.1.3, *Regulatory Framework*, described regulations applicable to this topic, and that description is still current for this SEIR, except as noted below.

Federal

The *ConnectMenlo* EIR provides information on the Clean Air Act (CAA) and NAAQS. Under Section 4.2.1.3, Table 4.2-2 provides the San Francisco Bay Area air basin attainment statuses. The NAAQS standards and SFBAAB's statuses are still current for this SEIR.

State

The *ConnectMenlo* EIR provides information on the Clean Air Act (CAA) and CAAQS. Under Section 4.2.1.3, Table 4.2-2 provides the SFBAAB attainment statuses. The CAAQS and SFBAAB's statuses are still current for this SEIR. The following is supplemental state regulatory information to support the evaluation of air quality impacts of the HEU.

Off-road Diesel Emissions

The CARB In-Use Off-Road Diesel-Fueled Fleets Regulation (Off-Road Regulation) applies to all self-propelled off-road diesel vehicles 25 horsepower or greater used in California and most two-engine vehicles (except on-road two-engine sweepers). This includes vehicles that are rented or leased (rental or leased fleets). CARB's goal is to gradually reduce state-wide construction vehicle emissions through turnover, repower, or retrofits. New engine emissions requirements were grouped into tiers based on the year in which the engine was built (CARB 2022c). In 2014, new engines were required to meet Tier 4 Final standards, which to date are the most stringent emissions standards for off-road vehicle engines. The goal of the In-Use Off-Road Diesel-Fueled Fleets Regulation is to reduce particulate matter (PM_{10} and $PM_{2.5}$) and NO_x emissions from off-road heavy-duty diesel vehicles in California (CARB 2022d). This regulation also limits idling to 5 minutes, requires a written idling policy for larger vehicle fleets, and requires that fleet operators provide information on their engines to CARB and label vehicles with a CARB-issued vehicle identification number.

CARB published the Air Quality and Land Use Handbook: A Community Health Perspective in April 2005, which recommends that proximity to sources of DPM emissions be considered in the siting of new sensitive land uses, as discussed in *ConnectMenlo*.

California Building and Energy Efficiency Standards (Title 24)

The California Energy Commission first adopted Energy Efficiency Standards for Residential and Nonresidential Buildings (California Code of Regulations Title 24, Part 6) in 1978 in response to a legislative mandate to reduce energy consumption in the state. Although not originally intended to reduce emissions of criteria pollutants or TACs, increased energy efficiency and reduced consumption of natural gas and other fuels would result in fewer criteria pollutant and TAC emissions from residential and non-residential buildings subject to the standard. The standards are updated periodically (typically every three years) to allow for the consideration and inclusion of new energy efficiency technologies and methods (California Energy Commission, 2018).

The Title 24, Part 6, standards became effective on January 1, 2017. The most recent update to the Title 24 energy efficiency standards (2019 standards) went into effect on January 1, 2020. The proposed project would adhere to the applicable version of Title 24 as conditions of approval for

subdivision maps, site development and planned development permits, grading permits, and demolition permits.

California Green Standards Building Code

Part 11 of the Title 24 Building Energy Efficiency Standards is referred to as the California Green Building Standards (CALGreen) Code. The CALGreen Code is intended to encourage more sustainable and environmentally friendly building practices, require low-pollution emitting substances that cause less harm to the environment, conserve natural resources, and promote the use of energy-efficient materials and equipment.

Since 2011, the CALGreen Code has been mandatory for all new residential and non-residential buildings constructed in the state. Such mandatory measures include energy efficiency, water conservation, material conservation, planning and design, and overall environmental quality. The CALGreen Code was most recently updated in 2019 to include new mandatory measures for residential and non-residential uses; the new measures took effect on January 1, 2020.

Regional

Bay Area Air Quality Management District Clean Air Plan

Since the publication of the *ConnectMenlo* EIR, the BAAQMD updated its Clean Air Plan. The BAAQMD *2017 Clean Air Plan: Spare the Air, Cool the Climate* was adopted on April 19, 2017 by the BAAQMD in cooperation with the Metropolitan Transportation Commission, the San Francisco Bay Conservation and Development Commission, and the Association of Bay Area Governments to provide a regional strategy to improve air quality within the SFBAAB and meet public health goals (BAAQMD, 2017d). The control strategy described in the 2017 Clean Air Plan includes a wide range of control measures designed to reduce emissions and lower ambient concentrations of harmful pollutants, safeguard public health by reducing exposure to air pollutants that pose the greatest health risk, and reduce greenhouse gas emissions (GHGs) to protect the climate.

The 2017 Clean Air Plan addresses four categories of pollutants: ground-level ozone and its key precursors, ROG and NO_X; PM, primarily $PM_{2.5}$, and precursors to secondary $PM_{2.5}$; air toxics; and GHG emissions. The control measures are categorized based on the economic sector framework including stationary sources, transportation, energy, buildings, agriculture, natural and working lands, waste management, and water measures.

BAAQMD Rules

The BAAQMD rules that would be most applicable to the subsequent projects were discussed in the *ConnectMenlo* EIR. However, BAAQMD recently updated its Best Available Control Technology (BACT) requirement for emergency generators greater than 1,000 horsepower (hp) to achieve EPA Tier 4 standards (BAAQMD, 2019).

Local

Menlo Park General Plan

The Menlo Park General Plan is a comprehensive long-range general plan for the physical development of the City of Menlo Park (City of Menlo Park, 2016a). The General Plan contains the current City of Menlo Park Housing Element, which was adopted in 2014 (City of Menlo Park, 2014). The various elements within the General Plan include goals and policies for the physical development of the City. Goals and policies related to air quality are listed below.

Goal LU-2: Maintain and enhance the character, variety and stability of Menlo Park's residential neighborhoods.

***Policy LU-2.3*:** Mixed Use Design. Allow mixed-use projects with residential units if project design addresses potential compatibility issues such as traffic, parking, light spillover, dust, odors, and transport and use of potentially hazardous materials.

Goal LU-6: Preserve open-space lands for recreation; protect natural resources and air and water quality; and protect and enhance scenic qualities.

Policy LU-6.9: Pedestrian and Bicycle Facilities. Provide well-designed pedestrian and bicycle facilities for safe and convenient multi-modal activity through the use of access easements along linear parks or paseos.

Goal LU-7: Promote the implementation and maintenance of sustainable development, facilities and services to meet the needs of Menlo Park's residents, businesses, workers, and visitors.

Policy LU-7.1: Sustainability. Promote sustainable site planning, development, landscaping, and operational practices that conserve resources and minimize waste.

Policy LU-7.9: Green Building. Support sustainability and green building best practices through the orientation, design, and placement of buildings and facilities to optimize their energy efficiency.

Goal CIRC-1: Provide and maintain a safe, efficient, attractive, user-friendly circulation system that promotes a healthy, safe, and active community and quality of life throughout Menlo Park.

Policy CIRC-1: Safe Routes to Schools. Support Safe Routes to School programs to enhance the safety of school children who walk and bike to school.

Goal CIRC-2: Increase accessibility for and use of streets by pedestrians, bicyclists, and transit riders.

Policy CIRC-2.7: Walking and Biking. Provide for the safe, efficient, and equitable use of streets by pedestrians and bicyclists through appropriate roadway design and maintenance, effective traffic law enforcement, and implementation of the City's Comprehensive Bicycle Development Plan and the El Camino Real/Downtown Specific Plan.

Policy CIRC-2.8: Pedestrian Access at Intersections. Support full pedestrian access across all legs of signalized intersections.

Policy CIRC-2.9: Bikeway System Expansion. Expand the Citywide bikeway system through appropriate roadway design, maintenance, effective traffic law enforcement, and implementation of the City's Comprehensive Bicycle Development Plan, and the El Camino Real/Downtown Specific Plan.

Policy CIRC-2.13: County Congestion Management. Work with the County Congestion Management Agency to implement the Countywide Congestion Management Program and Deficiency Plans for City and State facilities, and avoid adding any Menlo Park streets or intersections to the Countywide Congestion Management Program.

Policy CIRC-2.14: Impacts of New Development. Require new development to mitigate its impacts on the safety (e.g., collision rates) and efficiency (e.g., vehicle miles traveled (VMT) per capita) of the circulation system, by minimizing cut-through vehicle traffic on residential streets and speeding traffic; reducing the number of vehicle trips, providing bicycle, pedestrian, and transit connections, amenities and improvements in proportion with the scale of proposed projects; and facilitating appropriate or adequate response times and access for emergency vehicles.

Policy CIRC-2.15: Regional Transportation Improvements. Work with neighboring jurisdictions and appropriate agencies to identify and secure adequate funding for regional transportation improvements to improve transportation options and reduce congestion in Menlo Park and adjacent communities.

Goal CIRC-5: Support local and regional transit that is efficient, frequent, convenient, and safe.

Policy CIRC-5.1: Transit Service and Ridership. Promote improved public transit service and increased transit ridership, especially to employment centers, commercial destinations, schools, and public facilities.

Policy CIRC-5.2: Transit Proximity to Activity Centers. Promote the clustering of as many activities as possible within easy walking distance of transit stops, and locate any new transit stops as close as possible to housing, jobs, shopping areas, open space, and parks.

Policy CIRC-5.3: Rail Service. Promote increasing the capacity and frequency of commuter rail service, including Caltrain; protect rail rights-of-way for future transit service; and support efforts to reactivate the Dumbarton Corridor for transit, pedestrian, bicycle, and emergency vehicle use.

Policy CIRC-5.4: Caltrain Enhancements. Support Caltrain safety and efficiency improvements, such as positive train control, grade separation (with priority at Ravenswood Avenue), and electrification, provided that Caltrain service to Menlo Park increases and use of the rail right-of-way is consistent with the City's Rail Policy.

Policy CIRC-5.6: Bicycle Amenities and Transit. Encourage transit providers within San Mateo County to provide improved bicycle amenities to enhance convenience, including access to transit including bike share programs, secure storage at transit stations and on-board storage where feasible.

Policy CIRC-5.7: New Development. Ensure that new nonresidential, mixed use, and multiple-dwelling residential development provides associated needed transit service, improvements and amenities in proportion with demand attributable to the type and scale of the proposed development.

Goal CIRC-6: Provide a range of transportation choices for the Menlo Park community.

Policy CIRC-6.1: Transportation Demand Management. Coordinate Menlo Park's transportation demand management efforts with other agencies providing similar services within San Mateo and Santa Clara Counties.

Goal OSC-2: Provide Parks And Recreation Facilities. Develop and maintain a parks and recreation system to provide areas and facilities conveniently located, sustainable, properly designed and well-maintained to serve the recreation needs and promote healthy living of residents, workers and visitors to Menlo Park.

Policy OSC-2.7: Conservation of Resources at City Facilities. Reduce consumption of water, energy, landfilled waste, and fossil fuels in the construction, operations and maintenance of City owned and/or operated facilities.

Goal OSC-4: Promote Sustainability And Climate Action Planning. Promote a sustainable energy supply and implement the City's Climate Action Plan to reduce greenhouse gas emissions and improve the sustainability of actions by City government, residents, and businesses in Menlo Park. This includes promoting land use patterns that reduce the number and length of motor vehicle trips, and encouraging recycling, reduction and reuse programs.

Policy OSC-4.1: Sustainable Approach to Land Use Planning to Reduce Resource Consumption. Encourage, to the extent feasible, (1) a balance and match between jobs and housing, (2) higher density residential and mixed-use development to be located adjacent to commercial centers and transit corridors, and (3) retail and office areas to be located within walking and biking distance of transit or existing and proposed residential developments.

Policy OSC-4.2: Sustainable Building. Promote and/or establish environmentally sustainable building practices or standards in new development that would conserve water and energy, prevent stormwater pollution, reduce landfilled waste, and reduce fossil fuel consumption from transportation and energy activities.

Policy OSC-4.3: Renewable Energy. Promote the installation of renewable energy technology, such as, on residences and businesses through education, social marketing methods, establishing standards and/or providing incentives.

Policy OSC-4.4: Vehicles Using Alternative Fuel. Explore the potential for installing infrastructure for vehicles that use alternative fuel, such as electric plug in recharging stations.

Policy OSC-4.5: Energy Standards in Residential and Commercial Construction. Encourage projects to achieve a high level of energy conservation exceeding standards set forth in the California Energy Code for Residential and Commercial development.

Goal OSC-5: Ensure Healthy Air Quality And Water Quality. Enhance and preserve air quality in accord with State and regional standards, and encourage the coordination of total water quality management including both supply and wastewater treatment.

Policy OSC-5.3: Water Conservation. Encourage water-conserving practices in businesses, homes and institutions.

4.2.4 Environmental Impacts and Mitigation Measures

Scope of Analysis

The analysis in this SEIR describes impacts identified in the 2016 *ConnectMenlo* EIR, and describes how the impacts of the HEU would differ, as applicable.

Significance Thresholds

The thresholds used to determine the significance of impacts related to air quality are based on Appendix G of the *CEQA Guidelines*. Implementation of the HEU would have a significant impact on the environment if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Result in a cumulatively considerable net increase of any criteria air pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors); or
- Expose sensitive receptors to substantial pollutant concentrations; or
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Issues Not Discussed in Impacts

The *ConnectMenlo* Draft EIR Section 4.2.3, *Impact Discussion*, evaluated effects to air quality. There, Impact AQ-2, evaluated the proposed project's potential to violate applicable air quality standards. In that impact determination, the proposed project's operational emissions were quantified and compared to BAAQMD's thresholds of significance for project level impacts. These thresholds are only applicable to project level assessments and therefore will not be applied to the plan level HEU, although this SEIR does consider the potential that future multifamily development projects allowed by the HEU may exceed the BAAQMD's project-level thresholds.

Methodology and Assumptions

The following analysis is based on guidance provided in the 2017 BAAQMD CEQA Air Quality Guidelines (BAAQMD, 2017b). The BAAQMD guidelines identify different approaches to analyzing plans versus projects. The discussion below presents a plan-level analysis to address implementation of the HEU and associated infrastructure needed to support additional residential development in the City. Specifically, this section starts with an assessment of consistency with the Clean Air Plan by comparing the HEU's consistency with the strategy of reducing pollutant emissions from vehicle-miles traveled (VMT) by channeling future growth into urban communities where goods and services are close at hand and people have a range of viable transportation options. This section then evaluates criteria pollutants by comparing VMT increase to population increase. For health risk, the plan level analysis describes the BAAQMD's guidance, which calls for examining the impact of the environment on the project (i.e., how would existing sources of TAC and $PM_{2.5}$ affect new residents), and provide this information to

inform the HEU, recognizing that the focus of CEQA is impacts of the project on the environment.[3] The analysis also assesses the addition of any odor sources anticipated as part of the plan.

In addition to assessing potential air quality impacts resulting from the HEU at a plan level as required by the BAAQMD guidance, the analysis considers the potential for significant impacts as a result of subsequent projects that may be constructed under the HEU. The analysis includes a qualitative discussion of criteria pollutants that may result from construction and operation of specific projects. A qualitative discussion of health risks that may result from construction and operation of specific projects is also provided.

While the exact timing of development under the HEU is unknown and will ultimately be market driven, this analysis is based on the assumption that the projected development will occur by the year 2040 for this planning horizon. This analysis is based on projected land uses, traffic trips, and associated VMT information provided in the transportation analysis prepared by Hexagon Transportation Consultants, Inc. (see also Section 4.14 of this SEIR, *Transportation*).

Impacts and Mitigation Measures

Impacts

Impact AQ-1: Implementation of the HEU would not conflict with or obstruct implementation of the applicable air quality plan. (*Less than Significant*)

The *ConnectMenlo EIR* found the HEU would not hinder BAAQMD's implementation of the 2010 Bay Area Clean Air Plan. Changes to the City's General Plan proposed as part of the HEU would build on the changes adopted in November 2016, when the Land Use and Circulation Elements were comprehensively updated as part of the *ConnectMenlo* General Plan Update. The *ConnectMenlo EIR* assessed impacts of both residential and non-residential growth. The HEU would add additional residential growth only.

The most recently adopted air quality plan for the SFBAAB is the 2017 Clean Air Plan (BAAQMD, 2017d) (Clean Air Plan). The Clean Air Plan is a road map that demonstrates how the SFBAAB will implement all feasible measures to reduce ozone precursors (ROG and NO_X) and reduce transport of ozone and its precursors to neighboring air basins, in accordance with the requirements of the California Clean Air Act. It also provides a control strategy to reduce PM, TACs, and GHGs. In determining consistency with the Clean Air Plan, this analysis considers whether the project would:

- Support the primary goals of the Clean Air Plan;
- Include applicable control measures of the Clean Air Plan; and
- Avoid disrupting or hindering implementation of control measures identified in the Clean Air Plan.

[3] This is pursuant to the *California Building Industry Association v. Bay Area Air Quality Management District* case decided in 2015.

The primary goals of the Clean Air Plan are to protect air quality and public health at the regional and local scale and protect the climate by reducing regional criteria air pollutant emissions and reducing local air quality-related health risks (by meeting the CAAQS and NAAQS). To meet these goals, the Clean Air Plan includes 85 control measures aimed at reducing air pollutants in the SFBAAB (BAAQMD, 2017d). These control measures are grouped into the following sectors: stationary (industrial) sources, transportation, energy, buildings, agriculture, natural and working lands, and waste management. The vast majority of the control measures included in the Clean Air Plan do not apply directly to the HEU and its related subsequent projects because they target facilities or land uses that do not currently exist and would not be permitted in the HEU area (e.g., energy generation, waste management, agricultural, forest or pasture lands); vehicles or equipment that would not be employed in the HEU area (e.g., airplanes, farming equipment); and/or involve rulemaking or other actions under the jurisdiction of agencies not directly involved with design and approval of the Plan and its related actions. For example, the Agriculture, Natural and Working Lands, and Water measures address emissions sources not applicable to the HEU, but rather the BAAQMD's own programs and regional air quality planning, and are less applicable to local agencies' decisions and projects. In addition, 40 of these measures address stationary sources (such as oil refineries and cement kilns, and large boilers used in commercial and industrial facilities) and will be implemented by the BAAQMD using its permit authority and are therefore not suited to implementation through local planning efforts.

In summary, the majority of the control measures identified in the Clean Air Plan fall under the implementation responsibility of the BAAQMD and would not be directly applicable to the development of the HEU. However, under the HEU, construction of dense multifamily housing would support the implementation of transportation-, energy-, building-, waste-, and water conservation-related measures discussed in the Clean Air Plan and would not hinder its implementation. The relevant sectors are discussed further below.

Transportation Control Measures

The Transportation Control Measures concern improving transit systems, improving efficiency of the region's transportation system, encouraging residents and employees to exhibit "sustainable transportation behavior," improving bicycle and pedestrian facilities, and supporting high-density growth. Parts of the housing element will provide multifamily housing near downtown Menlo Park (although other multifamily housing would be situated in areas outside of the downtown), which would support the implementation of the following Transportation Control Measures included in the Clean Air Plan:

- TR 3: Local and Regional Bus Service;
- TR 4: Local and Regional Rail Service;
- TR 5: Transit Efficiency and Use;
- TR 9: Bicycle and Pedestrian Access and Facilities; and
- TR 10: Land Use Strategies.

Parts of the housing developed under the HEU would generally be concentrated in areas that are serviced by local and regional bus service, as well as regional rail services, which would

contribute to increased transit use and efficiency within the region. Furthermore, there are some proposed housing areas that would be developed under the HEU that would generally place residents near existing bikeways and pedestrian pathways. This applies to the majority of sites, but would not apply to every site. The HEU would also support TR 10: Land Use Strategies, as development that would have a higher density near transit facilities than what is currently planned for those areas. This up-zoning would increase resident access to public services and transit, which would reduce VMT per capita, thereby reducing air quality emissions.

Energy Control Measures

The HEU would also, through implementation of existing local, regional, and state policies, further the Clean Air Plan's Energy Control Measures. The focus of the Energy Control Measures included in the Clean Air Plan is to decrease the amount of electricity consumed in the SFBAAB, as well as decreasing the carbon intensity of the electricity used. More specifically, the Energy Control Measures included in the Clean Air Plan include:

- EN 1: Decarbonize Electricity Production; and
- EN 2: Decrease Electricity Demand.

Development under the HEU would be required to comply with the most recent applicable standards included in Title 24, Part 6 (Building Energy Efficiency Standards for Residential and Nonresidential Buildings) and Title 24, Part 11 (CALGreen Code) of the California Code of Regulations. These standards are meant to reduce energy use and improve energy efficiency of development.

Buildings Control Measures

The Clean Air Plan includes four Buildings Control Measures to improve the energy efficiency of existing buildings, promote the use of electricity and on-site renewable energy in existing and new buildings, and to ensure that new construction is designed to achieve zero net GHG emissions. The Buildings Control Measures that would be applicable to the HEU include:

- BL 1: Green Buildings;
- BL 2: Decarbonize Buildings; and
- BL 4: Urban Heat Island Mitigation.

As discussed above, development under the HEU would be required to comply with the requirements included in the Title 24 Building Energy Efficiency Standards and the CALGreen Code. Implementation of Title 24, Part 6 and Title 24, Part 11 of the California Code of Regulations would lead to energy-related improvements that would reduce emissions.

Waste Management Control Measures

The waste management sector generates GHG emissions from landfills and composting facilities, as well as a variety of air pollutants from waste decomposition in landfills and composting operations. The Waste Management Control Measures are meant to reduce or capture methane emissions from landfills and composting facilities, divert organic materials from landfills, and

increase waste diversion rates through efforts to reduce, reuse, and recycle. The Waste Management Control Measures that would be supported by the HEU include the following:

- WA 3: Green Waste Diversion; and
- WA 4: Recycling and Waste Reduction.

Development resulting from the HEU would be serviced by a waste hauler that offers residential and commercial composting services and that would be required to comply with the requirements of the California Integrated Waste Management Act and AB 341. Therefore, the HEU would support the applicable Waste Management Control Measures of the Clean Air Plan.

Water Conservation Control Measures

Water use generates criteria air pollutant and toxic air contaminant emissions; therefore, the 2017 Clean Air Plan includes measures to reduce emissions from the water sector by encouraging water conservation, limiting GHG emissions from publicly owned treatment works (POTWs), and promoting the use of biogas recovery systems. The only Water Conservation Control Measure that would be applicable to development under the HEU is:

- WR 2: Support Water Conservation.

As discussed under the Building Control Measures, the HEU would be required to implement the requirements of the CALGreen Code which includes residential mandatory measures to improve water efficiency and conservation.

Conclusion

Overall, the HEU would generally result in dense multifamily housing with many units being located close to transit and/or bicycle/pedestrian facilities, and would support the primary goals of the Clean Air Plan through continued implementation of numerous existing regulations that have been established for new developments throughout the City of Menlo Park. Thus, the HEU would support the goal of the Clean Air Plan to protect public health. The impact would be **less than significant**.

Mitigation Measures: None required.

Impact AQ-2: Implementation of the HEU would result in a cumulatively considerable net increase of criteria air pollutants for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (*Significant and Unavoidable Impact, with Mitigation*).

The *ConnectMenlo* EIR compared the VMT and population increases anticipated from the plan under Impact AQ-1, along with Clean Air Plan consistency, and concluded that the impact would be less than significant. For this SEIR, the comparison of anticipated VMT and population increases has been assessed under Impact AQ-2, as the 2017 BAAQMD's CEQA Guidance has established a plan-level threshold of projected VMT or vehicle trip increase less than or equal to

projected population increase for evaluating criteria air pollutants and precursors (BAAQMD, 2017b).

Additionally, Impact AQ-2 considers the potential for future development projects allowed by the HEU to result in emissions in excess of the BAAQMD's project-level thresholds. Future construction and operational emissions from development under the *ConnectMenlo* EIR were found to be significant and unavoidable after mitigation, and this SEIR reaches the same conclusion with a modified approach.

The significance of a plan's emissions of criteria air pollutants is first based on an evaluation of growth in VMT and population. For a proposed plan to result in less-than-significant criteria air pollutants impact, an analysis must demonstrate that the plan's growth in VMT would not exceed the plan's population growth. This analysis is presented below, followed by a discussion regarding the likelihood that subsequent development projects allowed by the HEU could exceed project-specific emission thresholds during construction and/or operation.

Growth in Vehicle Miles Traveled Compared to Growth in Population

As discussed in Section 3.0, *Project Description*, population growth projected for the HEU is 17,522 residents for the year 2040, which includes pending projects, ADUs, and additional residential units that are part of the HEU. Additional growth is anticipated by the year 2040 (see Table 3-5).

To compare the population and VMT increases as a result of the HEU, this analysis compared population and VMT estimates presented for the 2040 Cumulative year with and without the HEU. The population of Menlo Park would increase approximately 20.9 percent, from the 2040 No Project scenario to the 2040 HEU at full buildout, as shown in **Table 4.2-4**.

TABLE 4.2-4
HEU VMT VERSUS POPULATION GROWTH

	2040 No Project	2040 HEU	Difference between No Project and HEU	% Increase
Population[a]	52,762	63,810	11,048	20.9%
VMT[b]	914,343	1,055,405	141,062	15.4%

NOTES:
a Population increase based on the assumption of 2.57 persons per household, which is consistent with the City's transportation model.
b VMT data provided by Hexagon Transportation Consultants, and represents VMT on all City roads.

Based on the output from the travel demand model, daily VMT associated with the HEU would increase by approximately 141,062 VMT from the 2040 No Project scenario of approximately 914,343, as shown in Table 4.2-4. This represents a growth of approximately 15.4 percent attributable to the HEU. Because the growth in VMT would be less than the growth in population, the HEU would result in a ***less-than-significant*** impact with respect to regional criteria air pollutants using BAAQMD's plan-level threshold.

Operational Emissions

Subsequent projects that could occur under the HEU would generate vehicle trips and other operational emissions, such as those from landscape maintenance activities, painting, and the use of consumer products. Sufficient detail about subsequent projects is not currently known. However, the BAAQMD established screening criteria in Table 3-1 of its CEQA Air Quality Guidelines to determine if operational emissions from projects would result in a cumulatively considerable net increase in criteria air pollutants (BAAQMD, 2017b).

With transportation-related emissions of ROG decreasing over time with stricter controls on air pollution, the relative importance of emissions from consumer products, which are mostly ROG, has increased. Studies estimate that consumer products now contribute as much to urban air pollution as tailpipe emissions from vehicles despite the fact that people use a lot more fuel than they use consumer products—about 15 times more by weight (Fell, 2018).

To ensure that criteria pollutant emissions from operations of multifamily development projects allowed by the HEU do not result in significant criteria pollutant emissions, **Mitigation Measure AQ-2** would require projects that exceed the operational screening criteria included in the BAAQMD's CEQA Air Quality Guidelines (Table 3-1) to complete a detailed air quality assessment to determine whether criteria air pollutant emissions would exceed significance thresholds. Mitigation Measure AQ-2 would also require developments under the HEU to implement specified emission reduction measures if significance thresholds for criteria pollutants are exceeded**.**

Construction Emissions

Construction of future development projects allowed by the HEU would result in criteria air pollutant emissions, which cannot be quantified without project-specific information (e.g., construction equipment and schedule). However, it is clear that construction of new residential buildings would generate fugitive dust from earthmoving and truck travel over unpaved surfaces. In addition, heavy construction equipment and trucks would emit exhaust pollutants. This would be a temporary impact, but would have the potential to exceed significant emissions thresholds.

To ensure that criteria pollutant emissions from construction of development projects allowed by the HEU do not result in significant criteria pollutant emissions, Mitigation Measure AQ-2 would require the use of best management practices to reduce fugitive dust. Mitigation Measure AQ-2, would also require each residential development project that exceeds the screening sizes included in the BAAQMD's CEQA Air Quality Guidelines (Table 3-1) to prepare a quantitative analysis to determine if criteria air pollutant emissions are below significance thresholds and to implement specified emission reduction measures if significance thresholds for criteria pollutants are exceeded**.**

> **Mitigation Measure AQ-2: Emission Reduction Measures.**
>
> The following mitigation measures are recommended to reduce criteria air pollutant emissions from multifamily housing developments under the HEU.
>
> a) [AQ-2b1 from *ConnectMenlo* with clarifying amendments]: As part of the City's development approval process, the City shall require applicants for future

development projects to comply with the current Bay Area Air Quality Management District's basic control measures for reducing construction emissions of PM_{10} (Table ~~8-1~~8-2, Basic Construction Mitigation Measures Recommended for All Proposed Projects, of the BAAQMD CEQA Guidelines).

b) [AQ-2b2 from *ConnectMenlo* EIR with clarifying amendments]: Prior to issuance of building permits, development project applicants that are subject to CEQA and exceed the screening sizes in the BAAQMD's CEQA Guidelines shall prepare and submit to the City of Menlo Park a technical assessment evaluating potential project construction-related air quality impacts. The evaluation shall be prepared in conformance with the BAAQMD methodology in assessing air quality impacts. If construction-related criteria air pollutants are determined to have the potential to exceed the BAAQMD thresholds of significance, as identified in the BAAQMD CEQA Guidelines, the City of Menlo Park shall require that applicants for new development projects incorporate emission reduction ~~mitigation~~ measures to reduce air pollutant emissions during construction activities to below the~~se~~ thresholds of significance (see for example ~~e.g.~~, Table ~~8-2~~8-3, Additional Construction Mitigation Measures Recommended for Projects with Construction Emissions Above the Threshold of the BAAQMD CEQA Guidelines, or applicable construction mitigation measures subsequently approved by BAAQMD).[4] These identified measures shall be incorporated into all appropriate construction documents (e.g., construction management plans) submitted to the City and shall be verified by the City's Building Division and/or Planning Division

c) In the event that a project-specific analysis finds that the project could result in significant construction criteria air pollutant emissions that exceed significance thresholds, the project sponsor shall implement the following emission reduction measures to the degree necessary to reduce the impact to less than significance thresholds, and shall implement other feasible measures as needed to reduce the impact to less than the significance thresholds.

    1. Diesel off-road equipment shall have engines that meet the Tier 4 Final off-road emission standards, as certified by CARB, as required to reduce the emissions to less than the thresholds of significance shown in Table 2-1 of the BAAQMD CEQA Guidelines (BAAQMD, 2017b). This requirement shall be verified through submittal of an equipment inventory that includes the following information: (1) Type of Equipment, (2) Engine Year and Age, (3) Number of Years Since Rebuild of Engine (if applicable), (4) Type of Fuel Used, (5) Engine HP, (6) Verified Diesel Emission Control Strategy (VDECS) information if applicable and other related equipment data. A Certification Statement is also required to be made by the Contractor for documentation of compliance and for future review by the BAAQMD as necessary. The Certification Statement must state that the Contractor agrees to compliance and acknowledges that a violation of this requirement shall constitute a material breach of contract.

       The City may waive the equipment requirement above only under the following unusual circumstances: if a particular piece of off-road equipment

[4] Table 8-3 was previously numbered at Table 8-2 in BAAQMD's 2011 guidance document, as recorded in the ConnectMenlo EIR.

with Tier 4 Final standards is technically not feasible or not commercially available; the equipment would not produce desired emissions reduction due to expected operating modes; installation of the equipment would create a safety hazard or impaired visibility for the operator; or there is a compelling emergency need to use other alternate off-road equipment. If the City grants the waiver, the contractor shall use the next cleanest piece of off-road equipment available.

2. The project sponsor shall require the idling time for off-road and on-road equipment be limited to no more than 2 minutes, except as provided in exceptions to the applicable state regulations regarding idling for off-road and on-road equipment. Legible and visible signs shall be posted in multiple languages (English, Spanish, Chinese) in designated queuing areas and at the construction site to remind operators of the 2-minute idling limit.

d) [AQ-2a from *ConnectMenlo* EIR with clarifying amendments]: Prior to issuance of building permits, development project applicants that are subject to CEQA and exceed the screening sizes in the Bay Area Air Quality Management District's (BAAQMD) CEQA Guidelines shall prepare and submit to the City of Menlo Park a technical assessment evaluating potential project operation-phase-related air quality impacts. The evaluation shall be prepared in conformance with the BAAQMD methodology in assessing air quality impacts. If operational-related criteria air pollutants are determined to have the potential to exceed the BAAQMD thresholds of significance, as identified in BAAQMD's CEQA Guidelines, the City of Menlo Park Community Development Department shall require that applicants for new development projects incorporate emission reduction ~~mitigation~~ measures to reduce air pollutant emissions during operational activities to below the thresholds of significance.

Significance After Mitigation: With implementation of Mitigation Measure AQ-2(a), construction dust impacts of subsequent projects would be reduced to less than significant with mitigation by incorporating best management practices promulgated by the BAAQMD. With implementation of Mitigation Measures AQ-2(b) through AQ-2(d) it cannot be stated with certainty that construction and operational criteria air pollutant impacts associated with all subsequent projects would be reduced to less-than-significant levels. However, as discussed above, only large construction projects that exceed the screening sizes in Table 3-1 of the Air Quality CEQA Guidelines, projects with substantial ground disturbance, specialty construction equipment, or compressed and highly intensive construction schedules would be expected to exceed emissions significance thresholds. Nevertheless, due to this uncertainty, criteria pollutant emissions from construction and operation of subsequent projects that could be developed under the HEU would be **significant and unavoidable with mitigation**.

Impact AQ-3: Implementation of the HEU would not expose sensitive receptors to substantial pollutant concentrations. ***(Less than Significant with Mitigation)***

CO Hotspots

The *ConnectMenlo* EIR addressed two types of pollutant concentrations: CO hotspots and TACs. Areas of vehicle congestion can create CO hotspots with the potential to exceed the state ambient

air quality standards. The *ConnectMenlo* EIR found that the developments under the project were consistent with C/CAG's 2013 Congestion Management Program and therefore localized air quality impacts related to pollutant concentrations from mobile-source emissions would be less than significant.

The land use and circulation elements of the HEU SEIR, as they apply to residential development, are the same as those contained within the *ConnectMenlo* EIR. The general goals, policies, and programs would require local planning and development decisions to consider impacts to air quality, including the potential for CO hotspots. Therefore, proposed development under the HEU would be consistent with C/CAG's 2021 Congestion Management Program (San Mateo County, 2021), and localized air quality impacts related to pollutant concentrations from mobile-source emissions would be **less than significant**.

Toxic Air Contaminants: Siting of Sensitive Receptors

The *ConnectMenlo* EIR evaluated impacts of the environment on the proposed project, although it was stated to be "not a CEQA issue." Placement of new sensitive receptors near major sources of TACs and $PM_{2.5}$ could expose people to substantial pollutant concentrations. With general plan policies and mitigation, the *ConnectMenlo* EIR found the impact to be less than significant.

The BAAQMD significance criteria for exposure to sensitive receptors from health risks due to emissions of TAC and $PM_{2.5}$ resulting from adoption of a plan considers the following:

- Presence of sensitive receptors around existing and planned sources of TACs (including adopted Risk Reduction Plan areas) and;
- Presence of sensitive receptors within 500 feet from all freeways and high volume roadways

According to these criteria, impacts would be significant if the HEU would introduce sensitive receptors in the vicinity of existing and planned sources of TACs, such as freeways and high volume roadways. However, in the *California Building Industry Association v. Bay Area Air Quality Management District* case decided in 2015, the California Supreme Court held that CEQA does not generally require lead agencies to consider how existing environmental conditions might impact a project's users or residents. Nonetheless, this analysis considers the potential for new receptors to be exposed to TAC emissions from existing TAC sources for informational purposes.

The housing opportunity sites and land use strategy sites are dispersed across the City, some of which would place new sensitive receptors near an existing source of TACs. High Volume Roadways, as defined by BAAQMD, are freeways or arterial roadways with greater than 10,000 vehicles per day (BAAQMD, 2017b). The 2040 roadway counts were obtained from the City of Menlo Park's interactive map and the following are classified as major roadways or highways (City of Menlo Park 2019).

- Alameda De Las Pulgas
- Alpine Road
- Oak Grove Avenue
- Ravenswood Avenue

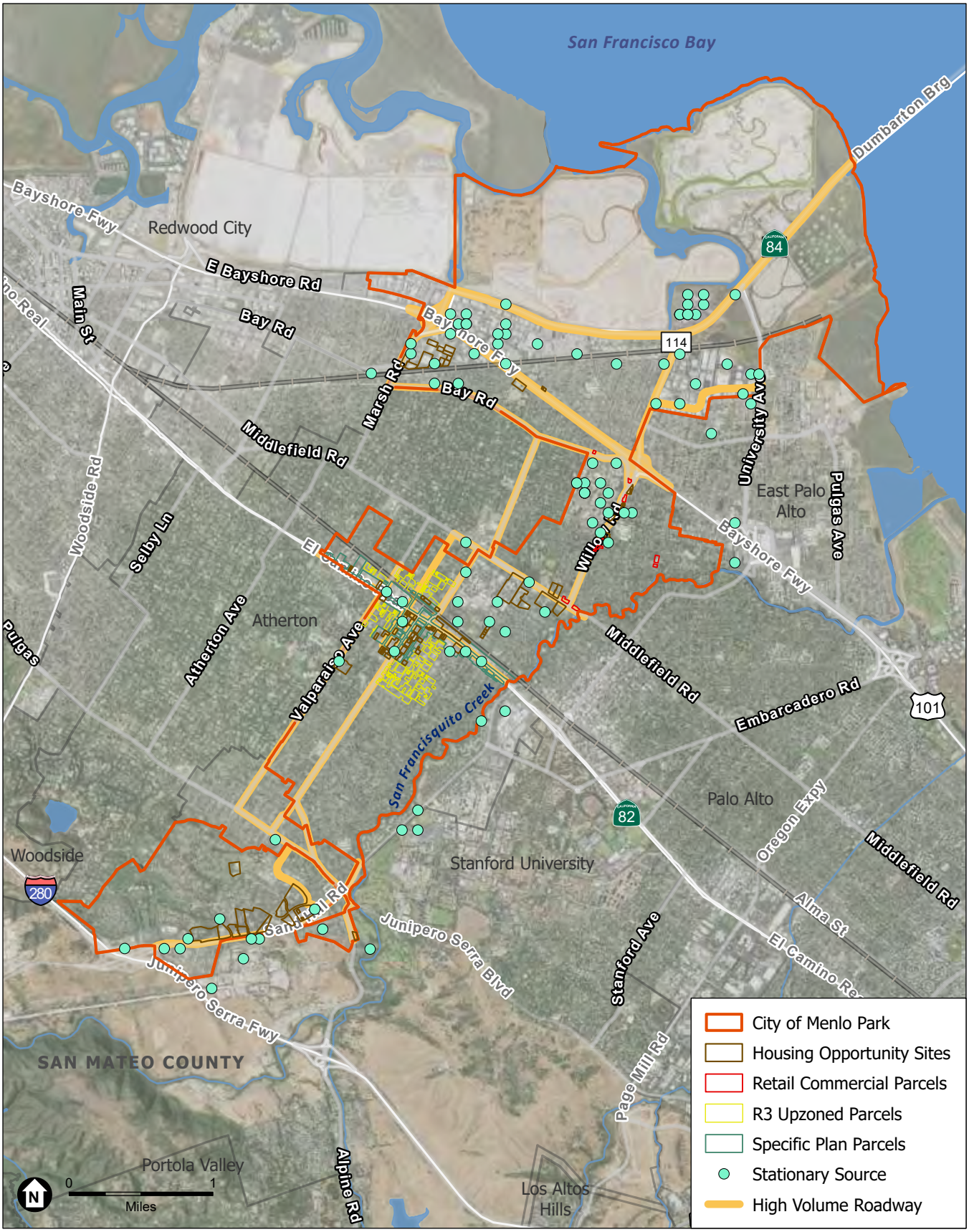
- Bay Road
- Bayfront Expressway
- Bayshore Freeway
- El Camino Real
- Marsh Road
- Middlefield Road
- Sand Hill Road
- Santa Cruz Avenue
- Sharon Park Drive
- Valparaiso Avenue
- Willow Road
- O'Brien Drive

In addition to the TACs from existing mobile sources, other sources of TACs include permitted stationary sources such as gas dispensing facilities, emergency generators, and other industrial sources located throughout the City. For purposes of planning, **Figure 4.2-1, Existing Sources of TAC Emissions,** presents the high volume roadways and permitted stationary sources throughout the City of Menlo Park.

Health Risks from HEU Future Development Projects

The *ConnectMenlo* EIR analyzed various industrial and commercial processes (e.g., heavy trucks, off-road equipment, and TRUs) allowed under that general plan update, and their associated TAC emissions. Only TACs from operations of non-residential land uses were considered. The impact was found to be less than significant with mitigation; however, the mitigation measure only applies to non-residential operational emissions and therefore is not applicable to the HEU in this SEIR.

Construction and operation of multifamily development projects allowed by the HEU could expose existing sensitive receptors near the sites to levels of TACs and $PM_{2.5}$ that could lead to potentially significant health risk impacts. As discussed under Impact AQ-2, projects that are below the BAAQMD screening sizes are not expected to have a significant impact from criteria pollutant emissions. However, for health risks, the severity of the impact depends on the proximity of the emissions-generating activity to sensitive receptors, meteorological conditions, and the duration of exposure, making screening infeasible. Therefore, a health risk assessment would be required to determine whether health risk levels associated with construction of a specific project would exceed significance thresholds of 10 in one million cancer risk and 0.3 $\mu g/m^3$ annual $PM_{2.5}$ concentrations at nearby sensitive receptors.



SOURCE: Esri, 2022; City of Menlo Park, 2022; M-Group, 2022; ESA, 2022

Menlo Park Housing Element Update EIR

Figure 4.2-1
Existing Sources of TAC Emissions

ESA

Operational emissions would be predominantly generated by new vehicle trips, expected to be mainly gasoline-powered passenger vehicles, which do not emit a substantial amount of TACs. However, vehicles emitting fugitive $PM_{2.5}$ in the form of road dust, brake wear, and tire wear, could exceed BAAQMD's $PM_{2.5}$ concentration significance threshold. In general, only a large volume of traffic on a roadway adjacent to residences would have the potential to exceed the annual $PM_{2.5}$ concentration threshold.

Because subsequent projects under the HEU could exceed the health risk significance thresholds, **Mitigation Measure AQ-3**, presented below would require subsequent projects within 1,000 feet of sensitive receptors to undergo a project-level assessment at the time the project is proposed.

Mitigation Measure AQ-3: Health Risk Reduction Measures.

a) [AQ-3b from *ConnectMenlo* with amendments]: Applicants for residential and other sensitive land use projects (e.g., hospitals, nursing homes, day care centers) in Menlo Park within 1,000 feet of a major sources of toxic air contaminants (TACs) (e.g., warehouses, industrial areas, freeways, and roadways with traffic volumes over 10,000 vehicle per day), as measured from the property line of the project to the property line of the source/edge of the nearest travel lane, shall submit a health risk assessment (HRA) to the City of Menlo Park prior to future discretionary Project approval. The HRA shall be prepared in accordance with policies and procedures of the State Office of Environmental Health Hazard Assessment (OEHHA) and the Bay Area Air Quality Management District. The latest OEHHA guidelines shall be used for the analysis, including age sensitivity factors, breathing rates, and body weights appropriate for children ages 0 to 16 years. If the HRA shows that the incremental cancer risk exceeds ten in one million ($10E^{-06}$), $PM_{2.5}$ concentrations exceed 0.3 $\mu g/m^3$, or the appropriate noncancer hazard index exceeds 1.0, the applicant will be required to identify and demonstrate that mitigation measures are capable of reducing potential cancer and non-cancer risks to an acceptable level (i.e., below ten in one million or a hazard index of 1.0), including appropriate enforcement mechanisms. Measures to reduce risk may include but are not limited to:

- Air intakes located away from high volume roadways and/or truck loading zones.
- Heating, ventilation, and air conditioning systems of the buildings provided with appropriately sized maximum efficiency rating value (MERV) filters.

Measures identified in the HRA shall be included in the environmental document and/or incorporated into the site development plan as a component of the proposed project. The air intake design and MERV filter requirements shall be noted and/or reflected on all building plans submitted to the City and shall be verified by the City's Building Division and/or Planning Division.

Project sponsors proposing multifamily development projects within 1,000 feet of sensitive receptors, including residences, schools, day care centers, and hospitals, shall prepare a project-level health risk assessment at the time the project is proposed. In lieu of a project-level health risk assessment, a comparison of the project with other similar-sized projects located a similar distance from receptors and with a similar type of development (e.g., bedroom counts) where a quantitative analysis has been conducted and were found to not exceed the BAAQMD health risk thresholds can be used to demonstrate less than significant health risk impacts. The selection of

comparison projects shall be subject to preapproval by the City. If the comparison does not show the project will have the same or less impact, a project-level health risk assessment is required.

In the event that a project-level health risk assessment finds that the project could result in health risks that exceed significance thresholds, the project sponsor shall implement the clean construction equipment requirement of Mitigation Measure AQ-2(c) to the degree necessary to reduce the impact to less than significance thresholds, and shall implement other feasible measures as needed to reduce the impact to less than the significant thresholds.

Significance After Mitigation: Implementation of Mitigation Measure AQ-3, would reduce TAC emissions from off-road, diesel construction equipment. Tier 4 Final off-road engines emit 80 to 90 percent less DPM than Tier 2 engines. This mitigation measure would be implemented to the extent necessary (e.g., all Tier 4 final construction equipment) to reduce construction health risk impacts associated with all subsequent development projects to less-than-significant levels and would require additional emission reduction measures if necessary. With implementation of Mitigation Measures AQ-3, health risk impacts from construction and operation of subsequent projects that could be developed under the HEU would be **less than significant with mitigation**.

Impact AQ-4: Implementation of the HEU would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people. ***(Less than Significant)***

The *ConnectMenlo* EIR analyzed odors and found the project to be less than significant.

During construction of the developments that may occur as a result of the HEU, the use of diesel-powered vehicles and equipment could temporarily generate localized odors; however, these odors would cease upon completion of construction, and would therefore not result in a significant odor impact. The BAAQMD CEQA Guidelines identify land uses that have the potential to generate continuous odorous impacts and odor complaints during operation. These land uses include wastewater treatment plants, landfills, confined animal facilities, composing stations, food manufacturing plants, refineries, and chemical plants (BAAQMD, 2017b). Development under the HEU would be residential and would not include land uses that are identified by the BAAQMD as common odor sources. Therefore, the HEU would have a **less-than-significant** impact with respect to odor sources.

Mitigation: None required.

Cumulative Impacts

This section presents an analysis of the cumulative effects of the HEU in combination with other past, present, and reasonably foreseeable future development that could cause cumulatively significant impacts. Significant cumulative impacts related to air quality could occur if the incremental increase in air pollutant emissions attributable to the HEU plus cumulative

development would be significant (greater than BAAQMD significance thresholds), and if the HEU's contribution is considerable.

The geographic scope for cumulative effects on air quality is the SFBAAB.

The SFBAAB is a nonattainment area for both the federal and state ozone standards; therefore, a cumulative air quality impact already exists. Additional emissions of ozone precursors NO_X or ROG over threshold amounts would further degrade air quality related to ozone. Impact AQ-2 evaluates whether the HEU's contribution to this significant impact would be considerable and concludes that the impact would be significant and unavoidable after mitigation. For this reason, no further analysis of cumulative criteria pollutants is necessary.

Similarly, the *ConnectMenlo* EIR found air pollutant emissions associated with the proposed project would result in a cumulatively considerable contribution to air quality impacts. The *ConnectMenlo* EIR did not look at cumulative sources exposure to sensitive receptors nor to odors.

Impact AQ-5: Implementation of the HEU, in conjunction with cumulative sources, would not result in exposure of sensitive receptors to a cumulatively considerable increase in levels of fine particulate matter ($PM_{2.5}$) and TACs under cumulative conditions. ***(Less than Significant Impact)***

The largest existing source of TACs and $PM_{2.5}$ near any of the HEU sites is the Bayshore Freeway (US-101). Those existing emissions result in cancer risks and annual average $PM_{2.5}$ concentrations that exceed the BAAQMD's cumulative thresholds at locations within 500 feet of Bayshore Freeway. Other major roadways, as listed under Impact AQ-3, may also exceed the BAAQMD's cumulative thresholds at locations within 500 feet. These cumulative thresholds are:

- Cancer risk probability > 100 in one million;
- Chronic, non-cancer hazard index > 10;
- Acute, non-cancer hazard index > 10; and
- Annual average $PM_{2.5}$ concentration > 0.8 $\mu g/m^3$.

Both cumulative traffic volumes in the 2040 No Project condition and HEU-related traffic will incrementally increase the existing emissions and health risks resulting from Bayshore Freeway and other major roadways that are above the thresholds of significance, resulting in a cumulatively significant impact.

However, given that the vast majority of the cumulative impact is from existing sources, that an extremely small percentage of the total risk would be attributed to the HEU, and that the HEU's risks would be below project-level significance thresholds with mitigation (as discussed in Impact AQ-3), the project's contribution to the cumulative impact would not be considerable, and this impact from the HEU would be **less than significant**.

Mitigation: None required.

Impact AQ-6: Implementation of the HEU, when combined with other past, present, or reasonably foreseeable projects, would not combine with other sources of odors that would adversely affect a substantial number of people. *(Less than Significant)*

Impact AQ-4 describes the potential of odorous emissions from the HEU. Development under the HEU would be residential and would not include land uses that are identified by the BAAQMD as common odor sources. Therefore, operation the HEU would not generate odors and there is no potential for the HEU to combine with cumulative projects to result in a significant cumulative odor impact, as there are no major sources of odors in the vicinity. Therefore, this impact would be less than significant.

Mitigation: None required.

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4.3 Biological Resources

4.3.1 Introduction

This section evaluates the effects of the Housing Element Update (HEU) on biological resources, focusing on changes to the *ConnectMenlo* EIR (certified in 2016) that may result in new or more severe impacts, and describes any mitigation measures needed to address any such impacts. The evaluation of biological resources includes a "study area" that encompasses the HEU housing opportunity sites and the land use strategy sites (see **Figure 3-3** in Chapter 3 of this SEIR for an overview map of the HEU sites), plus a 150-foot buffer to account for potential project-related indirect impacts to regulated biological resources. These combined areas and buffer comprise the "HEU study area" as assessed in this section.

Findings of the *ConnectMenlo* Final EIR

Biological resources impacts of the *ConnectMenlo* project were analyzed in Section 4.3 of the *ConnectMenlo* Draft EIR. The *ConnectMenlo* Final EIR determined that the project would have the following impacts with respect to biological resources:

- BIO-1: Impacts to special-status species or the inadvertent loss of bird nests in active use, which would conflict with the federal Migratory Bird Treaty Act (MBTA) and California Fish and Game Code (CFGC), could occur as a result of new development potential in the Bayfront Area and from existing and ongoing development potential in the remainder of the City if adequate controls are not implemented. (*Less than Significant Impact, with Mitigation*)
- BIO-2: Impacts to coastal salt marsh vegetation in the baylands, and possibly areas of riparian scrub and woodland along San Francisquito Creek and other drainages in the study area could occur as a result of new development potential in the Bayfront Area and from existing and ongoing development potential in the remainder of the City if adequate controls are not implemented. (*Less than Significant Impact, with Mitigation*)
- BIO-3: Implementation of the proposed project could result in direct and indirect impacts to wetland habitat if adequate controls are not implemented. (*Less than Significant Impact, with Mitigation*)
- BIO-4: Implementation of the proposed project could result in impacts on the movement of fish and wildlife, wildlife corridors, or wildlife nursery sites if adequate controls are not implemented. (*Less than Significant Impact, with Mitigation*)
- BIO-5: Implementation of the proposed project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (*Less than Significant Impact*)
- BIO-6: Impacts to sensitive habitat in the Stanford Habitat Conservation Plan (HCP) area could occur as a result of existing development potential in the study area that is located within the Stanford HCP area if adequate controls are not implemented. (*Less than Significant Impact, with Mitigation*)
- BIO-7: Implementation of the proposed project in combination with past, present, and reasonably foreseeable projects, would result in significant cumulative impacts with respect to biological resources. (*Less than Significant Impact, with Mitigation*)

Notice of Preparation Comments

The Notice of Preparation (NOP) for the SEIR was circulated on December 23, 2021 and a scoping meeting was held on January 24, 2022. The NOP and the comments received during the public comment period can be found in **Appendix A** of this SEIR. No comments relating to biological resources were received during the NOP period.

Information Sources

The primary sources of information referenced in this section included those listed below. Please note that a full list of references for this topic can be found at the end of this section.

- City of Menlo Park General Plan (2016a).
- *ConnectMenlo* Draft EIR (2016b).
- Subscription-based biological resource databases including the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB), California Native Plant Society (CNPS) Rare Plant Inventory, and a U.S. Fish and Wildlife (USFWS) Information for Planning and Consultation Official Species List (USFWS, 2022a).
- Historic and current aerial imagery available on Google Earth (2021).

4.3.2 Environmental Setting

Section 4.3.1.2 of the *ConnectMenlo* EIR provides a discussion of the urbanized and natural environment, special-status plant and animal species, sensitive habitats and wildlife dispersal corridors within the EIR's study area, which encompassed all lands within the Menlo Park City limits. The Environmental Setting discussion, below, is limited to updates to the analysis in the *ConnectMenlo* EIR resulting from the refined boundaries of the HEU study area.

Urbanized and Natural Environment[1]

The *ConnectMenlo* EIR indicated that 59 percent of the Menlo Park project area[2] is urbanized, including buildings, roadways and ornamental landscaping, and 28 percent is open waters and tidelands of San Francisco Bay (the Bay). The remaining 13 percent consists of grasslands, riparian woodlands, oak woodlands, and marshlands. Specifically, the EIR discusses the following natural communities:

- Grassland.
- San Francisquito Creek.
- Oak woodland.

[1] The discussion regarding the natural and urbanized environment in the *ConnectMenlo* EIR is based on the summary of biological resources presented in the Menlo Park General Plan Open Space/Conservation, Noise and Safety Elements.

[2] In the *ConnectMenlo* EIR, the project area was 25.6 square miles and encompassed the City limits of Menlo Park, it's Sphere of Influence (SOI), and portions of Palo Alto, East Palo Alto, Atherton, and unincorporated San Mateo County. An SOI is a planning boundary outside of an agency's legal boundary (i.e., City limit line) that designates the agency's probable future boundary and service area.

- Coastal salt marsh and salt ponds.
- Tidal mudflats.

No portions of San Francisquito Creek, the oak woodland within Saint Patrick's Seminary, and the foothill grasslands on the City's southwestern border are located within any of the housing opportunity or land use strategy sites, and only very limited portions of these habitats are within the larger HEU study area. There are no coastal salt marsh, salt ponds, and tidal mudflat natural communities present in any portion of the HEU study area. Two portions of the HEU study area are located adjacent to San Francisquito Creek, but both are very small (approximately 400 linear feet, 100 feet of which are separated from the creek by Woodland Avenue) and are 4 miles upstream from coastal salt marsh, salt ponds, and tidal mudflat.

Special-Status Species

The *ConnectMenlo* EIR included a summary table of special-status species reported in the CNDDB to have occurred in the *ConnectMenlo* project area;[3] however, a species potential-to-occur analysis was not included in the *ConnectMenlo EIR*. Therefore, an updated list of special-status plant and wildlife species that may occur in the HEU study area was developed by reviewing the species list included in the *ConnectMenlo EIR* in the context of the current HEU study area and querying subscription-based biological resources databases for current data. The CNDDB (CDFW, 2022) and CNPS (2022) Rare Plant Inventory were queried based on a search of the Palo Alto 7.5-minute U.S. Geological Survey quadrangle. The USFWS *Official List of Federal Endangered and Threatened Species that Occur in or May Be Affected by the Projects* (USFWS 2022a) was queried based on the project area (refer to **Appendix B** of this SEIR, *Plant and Wildlife Species Lists for the Project Area*, for database reports). The results of these queries, as well as species identified in the *ConnectMenlo* EIR, were analyzed for their potential to occur in the HEU study area, as shown in **Table 4.3-1**, *Special-Status Species Potential to Occur in the HEU Study Area*.

Species that are not expected to occur because of the absence of suitable habitat, because the HEU study area is outside of the species' known range, or because the species is believed to be extinct, were excluded from the analysis and are listed below in **Table 4.3-2**, *Special-Status Species Included in the ConnectMenlo* EIR *Not Expected to Occur in the HEU Study Area*.

[3] These species are summarized in Table 4.3-1, *Special-status Species in Menlo Park Vicinity* of the *ConnectMenlo* EIR.

TABLE 4.3-1
SPECIAL-STATUS SPECIES POTENTIAL TO OCCUR IN THE HEU STUDY AREA

Common and Scientific Name	Listing Status	Habitat Requirements	Potential to Occur in HEU Study Area
Plants			
Congdon's tarplant *Hemizonia parryi* ssp. *congdonii*	--/--/1B.1	Terraces, swales, floodplains, grassland, disturbed sites.	**Low.** Limited disturbed sites and grassland within study area. No CNDDB records from study area.
Animals			
Cooper's hawk *Accipiter cooperii*	--/WL, §3503.5 /--	Nests in riparian areas and oak woodlands, and hunts songbirds at woodland edges. Increasingly common in neighborhood trees; tolerates human disturbance.	**High.** Suitable nesting habitat is present in riparian woodland, oak woodland, and neighborhood trees. No CNDDB occurrences within the study area.
Sharp-shinned hawk *Accipiter striatus*	--/WL, §3503.5 /--	Nests in dense groves of usually midsized conifers, in the tops of live oaks, and sometimes deciduous trees. Usually on hilltops or hillsides, near grasslands or chaparral, but typically not water. Hunts songbirds along edge habitat.	**High.** Suitable nesting habitat is present in oak woodland in the project study area. No CNDDB occurrences within the study area.
California tiger salamander *Ambystoma californiense*	FT/CT/--	Vernal or temporary pools in annual grasslands, or open stages of woodlands. Typically, adults use mammal burrows during periods of dormancy during the non-breeding season.	**Low.** Marginally suitable habitat in and adjacent to San Francisquito Creek reaches within the study area. CNDDB record from within San Francisquito Creek from 2002.
Pallid bat *Antrozous pallidus*	--/CSC/ WBWG: High	A wide variety of habitats is occupied, including grasslands, shrublands, woodlands, and forests from sea level up through mixed conifer forests. The species is most common in open, dry habitats with rocky areas for roosting. Roosts in buildings, caves, tree hollows, crevices, mines, and bridges.	**Moderate.** Suitable roosting habitat present in tree crevices and bridge joints in riparian corridor and tree crevices in oak woodland/grassland. No CNDDB occurrences from study area.
Western burrowing owl *Athene cunicularia*	--/CSC/--	Open grasslands and shrublands where perches and ground squirrel burrows are available. Also found in barren lots, median strips, undeveloped housing parcels in urban environments where burrows are present.	**Low.** Limited suitable habitat could be present in the study area in the grasslands south of Sand Hill Road and Saint Patrick's Seminary, and in a few barren lots. No CNDDB records exist from the study area.
Western pond turtle *Emys marmorata*	--/CSC/--	Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. May enter brackish water. Requires basking sites and suitable upland habitat for egg-laying. Nest sites most often characterized as having gentle slopes (<15%) with little vegetation or sandy banks. Primarily in foothills and lowlands.	**Moderate.** Suitable habitat is present in the study area within San Francisquito Creek. An historic CNDDB record is present from the creek.
Loggerhead shrike *Lanius ludovicianus*	--/CSC/--	Open country with short vegetation and well-spaced shrubs or low trees, particularly those with spines or thorns. Agricultural fields, pastures, old orchards, riparian areas, desert scrublands, savannas, prairies, golf courses, and cemeteries.	**Low.** The species is typically observed in large open grasslands, which are very limited in the study area. No CNDDB records within the study area.
Western red bat *Lasiurus blossevillii*	--/CSC/ WBWG: High	Habitats include forests and woodlands from sea level up through mixed conifer forests. Feeds over a wide variety of habitats including grasslands, shrublands, open water, open woodlands and forests, and croplands. Solitary rooster in tree foliage. May hibernate in leaf litter.	**Moderate.** Suitable roosting habitat present in oak woodland. No CNDDB occurrences from the study area.

TABLE 4.3-1 (CONT.)
SPECIAL-STATUS SPECIES POTENTIAL TO OCCUR IN THE HEU STUDY AREA

Common and Scientific Name	Listing Status	Habitat Requirements	Potential to Occur in HEU Study Area
Hoary bat *Lasiurus cinereus*	--/--/ WBWG: Medium	Prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for foraging. Roosts in dense foliage of medium to large trees. Feeds primarily on moths; requires water.	**Low.** Lack of open habitat leaves only marginally suitable roosting habitat in the project study area. Most recent CNDDB occurrence from study area is from 1894.
Yuma myotis *Myotis yumanensis*	--/--/ WBWG: Low-Medium	Wide variety of habitats below 8,000-foot elevation. Optimal habitats are open forests and woodland with sources of water over which to feed. Adult males typically solitary roosters. Roost in buildings, under bridges, and in tree crevices, caves and mines.	**Moderate.** Suitable roosting habitat present in tree crevices bridge joints in riparian woodland and oak woodland/grassland. No CNDDB occurrences from the study area.
San Francisco dusky-footed woodrat *Neotoma fuscipes annectens*	--/CSC/--	Regional subspecies with range limited to San Francisco Bay Area. Inhabits forests with moderate canopy cover and brushy understory.	**Low.** Suitable habitat present but woodrat nests not observed during tree surveys in 2017 and 2018 (SFJPA, 2019).
Steelhead, Central California Coast DPS[4] *Oncorhynchus mykiss*	FT/--/--	Requires cold, freshwater streams with suitable gravel for spawning. Rears in rivers and tributaries to the San Francisco Bay.	**Present.** Steelhead are known to occur within San Francisquito Creek year-round; however, stream reaches upstream of US 101 are typically dry once precipitation ends in spring (SFJPA, 2019).
California red-legged frog *Rana draytonii*	FT/CSC/--	Streams, freshwater pools, and ponds with overhanging vegetation. Also found in woods adjacent to streams. Requires permanent or ephemeral water sources such as reservoirs and slow moving streams and needs pools of >0.5 m depth for breeding.	**Moderate.** Suitable habitat is present in freshwater portions of San Francisquito Creek. One CNDDB record from San Francisquito Creek near Jasper Ridge (outside study area), possibly extirpated.

NOTES:

Potential to Occur Categories:

- No potential = The study area is outside of the species' known range or does not support suitable habitat for the species. Species identified as unlikely to occur are not addressed further in the habitat assessment.
- Low = The study area is within the known range of the species; however, the species is presumed to be extirpated from the study area or region or only marginally suitable habitat is present within the study area.
- Moderate = The study area is within the known range of the species and suitable habitat is present within the study area; but there are few or no recent documented occurrences of the species within an appropriate distance of the study area (this will depend on the species' mobility).
- High = The study area is within the known range of the species and suitable habitat is present within the study area, and there are recent documented occurrences of the species within an appropriate distance of the study area (this will depend on the species' mobility).

Listing Status Codes:

Federal:

FT = Federally threatened

State:

CSC = California Species of Special Concern
WL = Watch list
§3503.5 = Protection for nesting species of Falconiformes (hawks) and Strigiformes (owls

Other:

California Native Plant Society (CNPS) California Rare Plant Ranks (CRPR):
1A = Presumed extirpated in California; Rare or extinct in other parts of its range.
1B = Rare, threatened, or endangered throughout range; Most species in this rank are endemic to California.
2A = Extirpated in California, but common in other parts of its range.
2B = Rare, threatened, or endangered in California but common in other parts of its range.
.1 = Seriously endangered in California.
.2 = Fairly endangered in California.
WBWG = Western Bat Working Group:
Low = Stable population.
Medium = Need more information about the species, possible threats, and protective actions to implement.
High= Imperiled or at high risk of imperilment.

SOURCE: ESA, 2022.

[4] DPS = Distinct Population Segment.

TABLE 4.3-2
SPECIAL-STATUS SPECIES INCLUDED IN THE CONNECTMENLO EIR NOT EXPECTED TO OCCUR IN THE HEU STUDY AREA

Common and Scientific Name	Listing Status	Habitat Requirements	Reason Not Expected to Occur
Plants			
Point Reyes bird's-beak *Chloropyron maritimum* ssp. *palustre*	--/--/1B.2	Coastal salt marsh.	No suitable habitat in the study area. No CNDDB records in study area.
Lost thistle *Cirsium praeteriens*	--/--/1A	Habitat unknown.	Presumed extinct. Most recent CNDDB record from study area is from 1901.
San Francisco collinsia *Collinsia multicolor*	--/--/1B.2	Moist, shady scrub, forest.	No suitable habitat in the study area. CNDDB observation from study area is from 1893 and is presumed extirpated.
Western leatherwood *Dirca occidentalis*	--/--/1B.2	Mixed evergreen forest to chaparral, generally in fog belt and on north or northeast facing slopes.	No suitable habitat in the study area. Most recent CNDDB record from study area is from 1931.
Hoover's button celery *Eryngium aristulatum* var. *hooveri*	--/--/1B.1	Vernal pools.	No suitable habitat in the study area. Most recent CNDDB record from study area is from 1907.
Slender-leaved pondweed *Stuckenia filiformis*	--/--/--	Shallow, clear water of lakes, drainage channels.	No suitable habitat in the study area. Most recent CNDDB record from study area is from 1899.
Animals			
Western snowy plover *Charadrius alexandrinus nivosus*	FT/CSC/--	Nest on coasts and estuaries on dune-backed beaches and salt pans at lagoons/estuaries.	No suitable habitat and no CNDDB records in the study area.
Northern harrier *Circus hudsonius*	--/CSC/--	Nests in coastal freshwater and saltwater marshes, nest and forages in grasslands.	No suitable habitat and no CNDDB records in the study area.
Santa Cruz kangaroo rat *Dipodomys venustus venustus*	--/*/--	Endemic to the Santa Cruz Sandhills, a sand chaparral community found only on outcrops of Zayante sand soil in the central portion of Santa Cruz County.	No suitable habitat in the study area and outside of species' known range. One CNDDB record from study area from 1908, listed as possibly extirpated.
Salt marsh harvest mouse *Reithrodontomys raviventris*	FE/CE, FP/--	Saline emergent marshlands with dense pickleweed. Will forage in adjacent grasslands.	No suitable habitat and no CNDDB records in the study area.
Salt marsh wandering shrew *Sorex vagrans halicoetes*	--/CSC/--	Mid-elevation salt marsh habitats with dense pickleweed; requires driftwood and other objects for nesting cover. Restricted to southern and northwestern San Francisco Bay.	No suitable habitat and no CNDDB records in the study area.
American badger *Taxidea taxus*	--/CSC/--	Grasslands, savannas, deserts, timberline mountain meadows.	No suitable habitat in the study area. Most recent CNDDB record from study area is from 1894. Species is known from Jasper Ridge Biological Preserve, approximately 2 miles away.

TABLE 4.3-2 (CONT.)
SPECIAL-STATUS SPECIES INCLUDED IN THE CONNECTMENLO EIR NOT EXPECTED TO OCCUR IN THE HEU STUDY AREA

Common and Scientific Name	Listing Status	Habitat Requirements	Reason Not Expected to Occur
San Francisco garter snake *Thamnophis sirtalis tetrataenia*	FE/CE, FP/--	Most often observed in the vicinity of standing water; ponds, lakes, marshes, and sloughs. Temporary ponds and seasonal bodies of water are also used. Banks with emergent and bankside vegetation are preferred and used for cover. Restricted to San Francisco Peninsula south to Rancho del Oso State Park in Santa Cruz County.	No suitable habitat in the study area.

NOTES:

Federal:

FE = Federally endangered
FT = Federally threatened

State:

CE = California endangered
CT = California threatened
FP = Fully protected
CSC = California Species of Special Concern
* = listed on CDFW Special Animals List

Other:

California Native Plant Society (CNPS) California Rare Plant Ranks (CRPR):
1A = Presumed extirpated in California; Rare or extinct in other parts of its range.
1B = Rare, threatened, or endangered throughout range; Most species in this rank are endemic to California.
2A = Extirpated in California, but common in other parts of its range.
2B = Rare, threatened, or endangered in California but common in other parts of its range.
.1 = Seriously endangered in California.
.2 = Fairly endangered in California.

SOURCE: ESA

Critical Habitat

USFWS can designate critical habitat for species that have been listed as threatened or endangered. *Critical habitat* is defined in Federal Endangered Species Act Section 3(5)(A) as those lands (or waters) within a listed species' current range that contain the physical or biological features that are considered essential to its conservation. Critical habitat was not addressed in the *ConnectMenlo* EIR; however, no designated critical habitat occurs within the study area (USFWS, 2022b).

Sensitive Natural Communities

The *ConnectMenlo* EIR identifies two "sensitive habitat types" within the HEU planning area: coastal salt marsh and oak woodland. The HEU study area does not include coastal salt marsh. None of the HEU housing opportunity or land use strategy sites, and only a very limited portion of the HEU study area, include oak woodland. This small area within the larger study area occurs at the southwest edge of Saint Patrick's Seminary.

Sensitive natural communities, designated by various resource agencies such as CDFW, or in local policies and regulations, are generally considered to have important functions or values for wildlife and/or are recognized as declining in extent or distribution; and are considered threatened enough to warrant some level of protection. CDFW tracks communities of conservation concern through its *California Sensitive Natural Community List* (CDFW, 2022). Natural communities with ranks of S1 to S3 are considered sensitive natural communities, to be addressed in the environmental review processes of CEQA and its equivalents. There are several sensitive natural communities that include oak tree alliances among oak species that could be present in the HEU study area in Saint Patrick's Seminary**.**

Wildlife Corridors

The *ConnectMenlo* EIR identifies the shoreline and open waters of the Bay, as well as San Francisquito Creek, as potential wildlife corridors. No portion of the HEU study area is within the shoreline band or open waters of the Bay; however, San Francisquito Creek is within the HEU study area and is considered a wildlife corridor.

4.3.3 Regulatory Setting

The following section focuses on any changes to the regulatory setting that have occurred since certification of the *ConnectMenlo* EIR. Draft EIR Section 4.3, *Biological Resources*, evaluated effects to biological resources. There, Section 4.3.1.1, *Regulatory Framework*, described regulations applicable to this topic, and that description is still current for this SEIR, with the additions noted below.

Federal

The Federal Endangered Species Act (FESA), the Migratory Bird Treaty Act (MBTA), and the Magnuson-Stevens Fishery Conservation and Management Act are the primary federal planning, treatment, and review mechanisms for biological resources in the study areas. Each is summarized below.

Endangered Species Act

USFWS and the National Marine Fisheries Service (NMFS) are the designated federal agencies responsible for administering the FESA. The FESA defines species as "endangered" and "threatened" and provides regulatory protection for any species thus designated. FESA Section 9 prohibits the "take" of species listed by USFWS as threatened or endangered. As defined in the FESA, *taking* means "… to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in such conduct." Recognizing that take cannot always be avoided, FESA Section 10(a) includes provisions for takings that are incidental to, but not the purpose of, otherwise lawful activities.

FESA Section 7(a)(2) requires all federal agencies, including USFWS, to evaluate projects authorized, funded, or carried out by federal agencies with respect to any species proposed for listing or already listed as endangered or threatened and the species' critical habitat, if any is proposed or designated. Federal agencies must undertake programs for the conservation of endangered and threatened species and are prohibited from authorizing, funding, or carrying out any action that would jeopardize a listed species or destroy or modify its "critical habitat."

As defined in the FESA, "individuals, organizations, states, local governments, and other non-federal entities are affected by the designation of critical habitat only if their actions occur on federal lands, require a federal permit, license, or other authorization, or involve federal funding."

No federally listed species are expected in the HEU study area.

Migratory Bird Treaty Act

The MBTA is the domestic law that affirms and implements a commitment by the United States to four international conventions (with Canada, Mexico, Japan, and Russia) for the protection of a shared migratory bird resource. Unless and except as permitted by regulations, the MBTA makes it unlawful at any time, by any means, or in any manner to intentionally pursue, hunt, take, capture, or kill migratory birds anywhere in the United States. The law also applies to the intentional disturbance and removal of nests occupied by migratory birds or their eggs during the breeding season.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Act of 1976 (U.S. Code Title 16, Sections 1801−1884 [16 USC 1804–1884]), as amended in 1996 and reauthorized in 2007, is intended to protect fisheries resources and fishing activities within 200 miles of shore. Conservation and management of U.S. fisheries, development of domestic fisheries, and phasing out of foreign fishing activities are the main objectives of the Magnuson-Stevens Act. The Magnuson-Stevens Act provided NMFS with legislative authority to regulate U.S. fisheries in the area between 3 and 200 miles offshore and established eight regional fishery management councils that manage the harvest of the fish and shellfish resources in these waters.

The Magnuson-Stevens Act defines essential fish habitat (EFH) as those waters and substrate that support fish spawning, breeding, feeding, or maturation. The Magnuson-Stevens Act requires that NMFS, the regional fishery management councils, and federal agencies taking an action that may

affect managed fish species covered under the Magnuson-Stevens Act identify EFH and protect important marine habitat and habitat for fish that migrate up rivers from the ocean to spawn (e.g., salmon).

The regional fishery management councils, with assistance from NMFS, are required to develop and implement Fishery Management Plans. These plans delineate EFH and management goals for all managed fish species, including some fish species that are not protected under the Magnuson-Stevens Act. Federal agency actions that fund, permit, or carry out activities that may adversely affect EFH are required under Magnuson-Stevens Act Section 305(b), in conjunction with required Section 7 consultation under FESA, to consult with NMFS regarding potential adverse effects of their actions on EFH and to respond in writing to NMFS's recommendations.

State

In addition to CEQA, the primary state planning, treatment, and review mechanisms for biological resources in the study areas are the California Endangered Species Act (CESA), California Fish and Game Code (CFGC) Sections 5050, 5515, 3511, and 4700 (fully-protected species), 1600–1603 and 3503, 3503.5, and 3511, the Native Plant Protection Act, and the Oak Woodland Conservation Act. Each is summarized below.

California Endangered Species Act

The CESA closely parallels the conditions of the FESA; however, it is administered by CDFW. CESA prohibits the take of plant and animal species that the California Fish and Game Commission has designated as either threatened or endangered in California. "Take" in the context of this regulation means to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill a listed species (CFGC section 86). The take prohibitions also apply to candidates for listing under CESA. However, section 2081 of the act allows the department to issue permits for the minor and incidental take of species by an individual or permitted activity listed under the act. Unlike FESA, species that are candidates for state listing are granted the same protections as listed species under CESA.

In accordance with the requirements of CESA, an agency reviewing a project within its jurisdiction must determine whether any state-listed endangered or threatened species could be present in the study areas. The agency also must determine whether the project could have a potentially significant impact on such species. In addition, the department encourages informal consultation on any project that could affect a candidate species.

No state listed species are expected in the HEU study area.

California Fish and Game Code

Fully Protected Species

Certain species are considered fully protected, meaning that the CFGC explicitly prohibits all take of individuals of these species except take permitted for scientific research. Fully protected amphibians and reptiles, fish, birds, and mammals are listed in sections 5050, 5515, 3511, and 4700, respectively.

Sections 1600–1603

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California that supports fish or wildlife resources are subject to the regulatory authority of CDFW under CFGC Sections 1600–1603. Under the CFGC, a stream is defined as a body of water that flows at least periodically, or intermittently, through a bed or channel having banks and supporting fish or other aquatic life. Included are watercourses with surface or subsurface flows that support or have supported riparian vegetation. Specifically, CFGC Section 1603 governs private-party individuals, and CFGC Section 1601 governs public projects.

CDFW jurisdiction in altered or artificial waterways is based on the value of those waterways to fish and wildlife. CDFW must be contacted by the public or private party for a streambed alteration agreement for any project that might substantially affect a streambed or wetland. CDFW has maintained a "no net loss" policy regarding potential impacts and has required replacement of lost habitats.

Sections 3503, 3503.5, and 3513

Under CFGC section 3503, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by the code or any regulation made pursuant thereto. CFGC section 3503.5 prohibits take, possession, or destruction of any birds in the orders Falconiformes (hawks) or Strigiformes (owls), or of their nests and eggs. Migratory non-game birds are protected under section 3800, whereas other specified birds are protected under section 3505. CFGC section 3513 adopts the federal definition of migratory bird take, which is defined by the U.S. Department of the Interior under provisions of the MBTA. Section 3513 does not prohibit the incidental take of birds if the underlying purpose of the activity is not to take birds. In addition, CDFW has issued an advisory that affirms that California law prohibits incidental take of migratory birds.[5]

Native Plant Protection Act

State listing of plant species began in 1977 with the passage of the California Native Plant Protection Act, which directed CDFW to carry out the legislature's intent to "preserve, protect, and enhance endangered plants in this State." The act gave the California Fish and Game Commission the power to designate native plants as endangered or rare and to require permits for collecting, transporting, or selling such plants. CESA expanded on the original native plant protection act and enhanced legal protection for plants. CESA established threatened and endangered species categories and grandfathered all rare animals—but not rare plants—into the act as threatened species. Thus, three listing categories for plants are employed in California: rare, threatened, and endangered.

Oak Woodlands Conservation Act

The California Oak Woodlands Conservation Act[6] of 2001 acknowledges the importance of private land stewardship to the conservation of the state's valued oak woodlands. This Act

[5] CDFW, CDFW and California Attorney General Xavier Becerra Advisory Affirming California's Protections for Migratory Birds, November 29, 2018, https://nrm.dfg.ca.gov/.

[6] California Fish and Game Code Section 1360 et seq.

established the California Oak Woodlands Conservation Program, which aims to conserve oak woodlands existing in the state's working landscapes by providing education and incentives to private landowners. The program provides technical and financial incentives to private landowners to protect and promote biologically functional oak woodlands.

Under the *ConnectMenlo* EIR, an oak woodland was identified at Saint Patrick's Seminary in central Menlo Park. Although this parcel is within the HEU study area, it is not within any of the HEU housing opportunity or land use strategy sites.

Local

Menlo Park General Plan

The Menlo Park General Plan is a comprehensive long-range general plan for the physical development of the City of Menlo Park (City of Menlo Park, 2016a). The General Plan contains the current City of Menlo Park Housing Element, which was adopted in 2014 (City of Menlo Park, 2014). The various elements within the General Plan include goals and policies for the physical development of the City. Goals and policies related to Biological Resources are listed below.

Goal LU-4: Promote the development and retention of business uses that provide goods or services needed by the community that generate benefits to the City and avoid or minimize potential environmental and traffic impacts.

***Policy LU-4.5*: Business Uses and Environmental Impacts.** Allow modifications to business operations and structures that promote revenue generating uses for which potential environmental impacts can be mitigated.

Goal LU-6: Preserve open-space lands for recreation; protect natural resources and air and water quality; and protect and enhance scenic qualities.

Policy LU-6.5: **Open Space Retention**. Maximize the retention of open space on larger tracts (e.g., portions of the St. Patrick's Seminary site) through means such as rezoning consistent with existing uses, clustered development, acquisition of a permanent open space easement, and/or transfer of development rights.

Policy LU-6.6: **Public Bay Access**. Protect and support public access to the Bay for the scenic enjoyment of open water, sloughs, and marshes, including restoration efforts, and completion of the Bay Trail.

Policy LU-6.7: **Habitat Preservation**. Collaborate with neighboring jurisdictions to preserve and enhance the Bay, shoreline, San Francisquito Creek, and other wildlife habitat and ecologically fragile areas to the maximum extent possible.

Policy LU-6.8: **Landscaping in Development**. Encourage extensive and appropriate landscaping in public and private development to maintain the City's tree canopy and to promote sustainability and healthy living, particularly through increased trees and water-efficient landscaping in large parking areas and in the public right-of-way.

Policy LU-6.10: **Stanford Open Space Maintenance**. Encourage the maintenance of open space on Stanford lands within Menlo Park's unincorporated sphere of influence.

Policy LU-6.11: **Baylands Preservation**. Allow development near the Bay only in already developed areas.

Goal OSC-1: Maintain, Protect and Enhance Open Space and Natural Resources

***Policy OSC-1.1*: Natural Resources Integration with Other Use.** Protect Menlo Park's natural environment and integrate creeks, utility corridors, and other significant natural and scenic features into development plans.

***Policy OSC-1.2*: Habitat for Open Space and Conservation Purposes.** Preserve, protect, maintain, and enhance water, water-related areas, and plant and wildlife habitat for open space and conservation purposes.

***Policy OSC-1.3*: Sensitive Habitats.** Require new development on or near sensitive habitats to provide baseline assessments prepared by qualified biologists, and specify requirements relative to the baseline assessments.

***Policy OSC-1.4*: Habitat Enhancement.** Require new development to minimize the disturbance of natural habitats and vegetation, and require revegetation of disturbed natural habitat areas with native or non-invasive naturalized species.

***Policy OSC-1.5*: Invasive, Non-Native Plant Species.** Avoid the use of invasive, non-native species, as identified on the lists of invasive plants maintained at the California Invasive Plant Inventory and United States Department of Agriculture invasive and noxious weeds database, or other authoritative sources, in landscaping on public property.

***Policy OSC-1.6*: South Bay Salt Pond Restoration Project and Flood Management Project.** Continue to support and participate in Federal and State efforts related to the South Bay Salt Pond Restoration Project and flood management project. Provide public access to the Bay for the scenic enjoyment and recreation opportunities as well as conservation education opportunities related to the open Bay, the sloughs, and the marshes.

***Policy OSC-1.7*: San Francisquito Creek Joint Powers Authority.** Continue efforts through San Francisquito Creek Joint Powers Authority to enhance the value of the creek as a community amenity for trails and open space, conservation and educational opportunities.

***Policy OSC-1.8*: Regional Open Space Preservation Efforts.** Support regional and sub-regional efforts to acquire, develop, and maintain open space conservation lands.

***Policy OSC-1.9*: Federal, State, and County Open Space and Conservation Programs.** Make maximum use of federal, state, and county programs wherever possible in all matters concerned with open space and conservation.

***Policy OSC-1.10*: Public Education and Stewardship.** Promote public education, environmental programs, and stewardship of open space and natural resources conservation.

***Policy OSC-1.11*: Sustainable Landscape Practices.** Encourage the enhancement of boulevards, plazas and other urban open spaces in high-density and mixed-use residential developments, commercial and industrial areas with landscaping practices that minimize water usage.

***Policy OSC-1.12*: Landscaping and Plazas.** Include landscaping and plazas on public and private lands, and well-designed pedestrian and bicycle facilities in areas of intensive non-vehicular activity. Require landscaping for shade, surface runoff, or to obscure parked cars in extensive parking areas.

***Policy OSC-1.13*: Yard and Open Space Requirements for New Development.** Ensure that required yard and open spaces are provided for as part of new multi-family residential, mixed-use, commercial and industrial development.

***Policy OSC-1.14*: Protection of Conservation and Scenic Areas.** Protect conservation and scenic areas from deterioration or destruction by vandalism, private actions or public actions.

City of Menlo Park Heritage Tree Ordinance

The City's Heritage Tree Ordinance requires property owners within the City of Menlo Park to use reasonable efforts to maintain and preserve all heritage trees, including during ground disturbing, demolition, and construction activities. Heritage trees are defined as 1) all trees other than oaks that have a trunk with a circumference of 47.1 inches (diameter of 15 inches) or more, measured 54 inches above natural grade, 2) an oak tree that is native to California and has a trunk with a circumference of 31.4 inches (diameter of 10 inches) or more, measured 54 inches above natural grades, and 3) a tree or group of trees of historical significance, special character or community benefit, specifically designated by resolution of the City Council. Work within the tree protection zone, defined as an area 10 times the diameter of a heritage tree, requires a tree protection plan prior to issuance of a permit for grading or construction. Removal or major pruning of a heritage tree requires a permit from the City of Menlo Park. The removal of heritage trees necessitates replanting replacement trees to maintain the City's urban forest canopy.

Stanford University Habitat Conservation Plan

Stanford University in partnership with USFWS developed a Habitat Conservation Plan (HCP) to maintain populations of species covered under the FESA inhabiting land owned by Stanford University (Stanford University, 2013). The HCP sets forth goals and objectives that aim to enhance and protect listed species' habitat, including riparian vegetation, creeks, grasslands, and seasonal wetlands. The HCP and Final Environmental Impact Statement was published in November 2012 and the HCP was updated in March 2013. The conservation goals and objectives set forth by the HCP apply to all land owned by Stanford University which totals 8,180 acres in four cities: Palo Alto, Menlo Park, Woodside, and Portola Valley. Portions of Menlo Park and unincorporated San Mateo County are located within the Stanford University HCP area, but none of the HEU housing opportunity sites or land use strategy sites are located within the HCP area.

4.3.4 Environmental Impacts and Mitigation Measures

Scope of Analysis

The analysis in this SEIR describes impacts identified in the 2016 *ConnectMenlo* EIR, and describes how the impacts of the HEU would differ, as applicable.

Significance Thresholds

The thresholds used to determine the significance of impacts related to biological resources are based on Appendix G of the *CEQA Guidelines*. Implementation of the HEU would have a significant impact on the environment if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service.
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service.
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Issues Not Discussed in Impacts

There are no adopted or approved local, regional, or state habitat conservation plans applicable to the HEU study area; therefore, the following significance threshold does not apply to the HEU and is not discussed further:

- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Methodology and Assumptions

The impact analysis is based on the resources, references, and data collection methods identified in Section 4.3.1, *Introduction*. At a program level, the analysis addresses potential direct and indirect impacts from construction or operation of the residential projects and associated infrastructure that could be constructed if the HEU is implemented, defined as follows:

- *Direct impacts* are those that could occur at the same time and place as project implementation, such as the removal of habitat as a result of ground disturbance.
- *Indirect impacts* are those that could occur either at a later time or at a distance from the project areas, but that are reasonably foreseeable, such as the loss of an aquatic species as a result of upstream effects on water quality or quantity.

Direct and indirect impacts on biological resources may vary in duration; they may be temporary, short term, or long term.

The analysis considers the potential impacts of the HEU's implementation and the development of new housing on suitable habitat, special-status species, sensitive natural communities, wetlands, and wildlife corridors using the significance criteria listed above, within the context of the *ConnectMenlo* EIR.

Impacts and Mitigation Measures

Impacts

Impact BIO-1: Implementation of the HEU would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service. (*Less than Significant Impact, with Mitigation*)

The *ConnectMenlo* EIR determined that the proposed project would primarily occur in urbanized areas where special-status species would not be expected to occur; however, the EIR identified the Bayfront Area as a location where several special-status species associated with coastal salt marsh, salt ponds, and tidal mudflats are documented. The EIR identified additional special-status species that have the potential to occur elsewhere in the EIR's study area, and addressed bird species protected under the MBTA and CFGC, which can occur in natural and urbanized environments. The refinement of the HEU housing opportunity and land use strategy sites has eliminated certain habitat types and associated special-status species from the analysis, including those present in coastal salt marsh, salt ponds, and tidal mudflats. However, as described in Section 4.3.2, above, special-status species and MBTA-protected birds have the potential to occur in the San Francisquito Creek riparian corridor, oak woodlands, and even in the urban environment; therefore, the analysis and conclusion in the *ConnectMenlo* EIR remains relevant.

As described in the *ConnectMenlo* EIR, adoption of the General Plan Land Use (LU) Element as part of the proposed project served to minimize potential adverse impacts on special-status species. The proposed project included zoning regulations consistent with General Plan Program LU-6.D, which requires new buildings to employ bird-safe design elements, which would provide protections to birds during the operational phase of the proposed project. In addition, the City of Menlo Park's Bird-Friendly Design Guidelines (Ordinance No. 1024) requires the project design to comply with six bird-friendly design standards for new construction. However, even with these policies in place, the *ConnectMenlo* EIR concluded that construction- and operation-related impacts to special-status species or the inadvertent loss of active bird nests, which would conflict with the MBTA and CFGC, could occur as a result of new development potential and would be a **potentially significant impact**.

These same findings are also applicable to the HEU, and therefore the mitigation prescribed in the *ConnectMenlo* EIR is also prescribed for the HEU. That measure is as follows:

Mitigation Measure BIO-1: Project-Specific Baseline Biological Resources Assessments.

Prior to individual project approval, the City shall require project applicants to prepare and submit project-specific baseline biological resources assessments on sites containing natural habitat with features such as mature and native trees or unused structures that could support special-status species and other sensitive biological resources, and common birds protected under Migratory Bird Treaty Act (MBTA) and California Fish and Game Code (CFGC). The baseline biological resources assessment shall be prepared by a qualified biologist. The biological resource assessment shall provide a determination on whether any sensitive biological resources are present on the property, including jurisdictional wetlands and waters, essential habitat for special-status species, and sensitive natural communities. If sensitive biological resources are determined to be present, appropriate measures, such as preconstruction surveys, establishing no-disturbance zones during construction, and applying bird-safe building design practices and materials, shall be developed by the qualified biologist to provide adequate avoidance or compensatory mitigation if avoidance is infeasible. Where jurisdictional waters or federally and/or State-listed special-status species would be affected, appropriate authorizations shall be obtained by the project applicant, and evidence of such authorization provided to the City prior to issuance of grading or other construction permits. An independent peer review of the adequacy of the biological resource assessment may be required by the City, if necessary, to confirm its adequacy.

Significance After Mitigation: Implementation of Mitigation Measure BIO-1 would reduce impacts to special-status species and birds protected by the MBTA and CFGC by requiring preparation of project-specific baseline biological resources assessments by a qualified biologist for future projects on HEU housing sites containing natural features such as mature and native trees or unused structures that could support special-status species and birds protected under the MBTA, prior to individual project approval. If sensitive biological resources are determined to be present, appropriate avoidance and minimization measures would be developed by the qualified biologist. Therefore, implementation of this mitigation measure would reduce potential impacts to special-status species and birds protected by the MBTA and CFGC to a l**ess than significant impact, with mitigation**.

Impact BIO-2: Implementation of the HEU would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service. (*Less than Significant Impact, with Mitigation*)

The *ConnectMenlo* EIR determined that construction-related direct and indirect impacts could occur as a result of converting natural resources to developed properties, including reducing the size or function of existing habitat, and increasing the area of impervious surfaces, thereby increasing stormwater runoff and potentially degrading aquatic habitat. In addition, the EIR determined that temporary direct impacts could occur in cases where natural habitat is disturbed during construction and subsequently restored as part of the project. The refinement of the HEU housing opportunity and land use strategy sites has eliminated coastal salt marsh, identified as a

sensitive habitat in the *ConnectMenlo* EIR; however, riparian habitat and oak woodlands, the latter being a potential CDFW sensitive natural community, remain in the HEU study area.

As described in the *ConnectMenlo* EIR, several policies in the General Plan would serve to protect and enhance riparian habitat and sensitive natural communities in the HEU study area, including Policy OSC-1.2, *Habitat for Open Space and Conservation Purposes*, OSC-1.4, *Habitat Enhancement*, and OSC-1.7, *San Francisquito Creek Joint Powers Authority*. However, even with these policies in place, the *ConnectMenlo* EIR concluded that construction- and operation-related impacts to riparian habitat and sensitive natural communities could occur as a result of new development potential and the impact would therefore be a **potentially significant impact**.

> **These same findings are also applicable to the HEU, and therefore the mitigation prescribed in the *ConnectMenlo* EIR is also prescribed for the HEU. That measure is as follows: Mitigation Measure BIO-2: Implement Mitigation Measure BIO-1.**
>
> **Significance After Mitigation:** Implementation of Mitigation Measure BIO-1 would reduce construction- and operation-related impacts to riparian habitat and sensitive natural communities by requiring preparation of project-specific baseline biological resources assessments by a qualified biologist for future projects prior to individual project approval. The biological resource assessment would provide a determination on whether any riparian habitat or other sensitive natural communities are present on the property. If present, appropriate avoidance and minimization measures would be developed by the qualified biologist to minimize and avoid impacts or provide compensatory mitigation if avoidance is infeasible. Therefore, implementation of this mitigation measure would reduce potential impacts to riparian habitat and sensitive natural communities to a **less than significant impact, with mitigation**.

Impact BIO-3: Implementation of the HEU would not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. (*Less than Significant Impact, with Mitigation*)

The *ConnectMenlo* EIR determined that the proposed project could result in direct loss or modification to existing wetlands and unvegetated other waters, including streams, as well as indirect impacts due to water quality degradation. Potential impacts included erosion and sedimentation that could result from construction grading and ground disturbance, and the inadvertent introduction of deleterious materials into wetlands and waters. The refinement of the HEU housing opportunity and land use strategy sites has eliminated several wetlands and other waters identified in the *ConnectMenlo* EIR; however, San Francisquito Creek, a potentially jurisdictional water, remains in the HEU study area. The *ConnectMenlo* EIR concluded that construction-related impacts to wetlands and waters could occur as a result of new development potential and would be a **potentially significant impact**.

These same findings are also applicable to the HEU, and therefore the mitigation prescribed in the *ConnectMenlo* EIR is also prescribed for the HEU. That measure is as follows:

Mitigation Measure BIO-3: Implement Mitigation Measure BIO-1.

Significance After Mitigation: Implementation of Mitigation Measure BIO-1 would reduce construction- and operation-related impacts to wetlands and waters by requiring preparation of project-specific baseline biological resources assessments by a qualified biologist for future projects prior to individual project approval. The biological resource assessment would provide a determination on whether any potential jurisdictional wetlands or waters are present on the property. If present, appropriate avoidance and minimization measures would be developed by the qualified biologist to minimize and avoid impacts or provide compensatory mitigation if avoidance is infeasible. Therefore, implementation of this mitigation measure would reduce potential impacts to jurisdictional wetlands and waters to a **less than significant impact, with mitigation**.

Impact BIO-4: Implementation of the HEU would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory corridors, or impede the use of native wildlife nursery sites. (*Less than Significant Impact, with Mitigation*)

The *ConnectMenlo* EIR found that the proposed project could result in reduction in natural habitat that could serve as a wildlife corridor in the EIR's study area. The refinement of the HEU housing opportunity and land use strategy sites planning area has eliminated the open water and coastal salt marsh habitats, which provide movement corridors for wildlife from the planning area; however, San Francisquito Creek, a riparian movement corridor remains in the HEU study area.

The *ConnectMenlo* EIR concluded that construction- and operation-related impacts to wildlife movement corridors could occur as a result of new development potential and would be a **potentially significant impact**.

These same findings are also applicable to the HEU, and therefore the mitigation prescribed in the *ConnectMenlo* EIR is also prescribed for the HEU. That measure is as follows:

Mitigation Measure BIO-4: Implement Mitigation Measure BIO-1.

Significance After Mitigation: Implementation of Mitigation Measure BIO-1 would reduce construction- and operation-related impacts to wildlife movement corridors by requiring preparation of project-specific baseline biological resources assessments by a qualified biologist for future projects prior to individual project approval. The biological resource assessment would provide a determination on whether any important wildlife movement corridors are present on undeveloped lands where development is proposed. If present, appropriate avoidance and minimization measures would be developed by the qualified biologist to minimize and avoid impacts or provide compensatory mitigation if avoidance is infeasible. Therefore, implementation of this mitigation measure would reduce potential impacts to wildlife movement corridors to a **less than significant impact, with mitigation**.

Impact BIO-5: Implementation of the HEU would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (*Less than Significant Impact*)

The *ConnectMenlo* EIR determined that the City of Menlo Park proposes to make amendments to the General Plan and the Zoning Ordinance to maintain internal consistency with the General Plan concurrent with updating the Housing Element and, therefore, the HEU would not conflict with local policies and ordinances protecting biological resources. Furthermore, with adherence to General Plan goals and policies in the Land Use Element and Section II, Open Space/Conservation (OSC), or the Open Space/Conservation, Noise and Safety Elements listed in BIO-1 and the City's Tree Preservation Ordinance, as well as to with Municipal Code Chapters 12.44, Water-Efficient Landscaping and 13.4, Heritage Trees, no conflicts with local plans and policies are anticipated, resulting in a less than significant impact.

These same findings apply to the HEU. As with the *ConnectMenlo* project, adoption of the HEU would also include amendments to the General Plan and the Zoning Ordinance to maintain internal consistency with the General Plan. The same established regulatory requirements would also apply. As such, the impact of the HEU would be identical to the *ConnectMenlo* project, and the impact would be **less than significant**.

Mitigation Measure: None required.

Cumulative Impacts

This section presents an analysis of the cumulative effects of the HEU in combination with other past, present, and reasonably foreseeable future projects that could cause cumulatively considerable impacts. Significant cumulative impacts related to biological resources could occur if the incremental impacts of the HEU were combined with the incremental impacts of one or more of the cumulative projects or cumulative development projections for 2040 included in the project description and described in Section 4.0.3, *Cumulative Impacts*.

Impact BIO-6: Implementation of the HEU in combination with past, present, and reasonably foreseeable projects, would not result in significant cumulative impacts with respect to biological resources.

Significant cumulative impacts related to biological resources could occur if the incremental impacts of the project combined with the incremental impacts of one or more of the cumulative projects would cause the project to have a cumulatively considerable impact on special-status species, wetlands or other waters of the U.S., or other biological resources protected by federal, state, or local regulations or policies (based on the significance criteria and thresholds presented earlier). This analysis considers whether the incremental contribution of the HEU's implementation to this cumulative impact would be considerable. Both conditions must apply for a project's cumulative effects to be significant.

The geographic scope of potential cumulative impacts on biological resources encompasses the HEU housing opportunity and land use strategy sites and biologically linked areas that share the

San Francisquito Creek watershed and greater San Francisco Bay. Historic development in the region has already caused substantial adverse cumulative changes to biological resources in the HEU study area and the City of Menlo Park generally. This includes the engineering of portions of the San Francisquito Creek watershed to allow urban development over and around these waterways, and the loss of the riparian corridors and floodplains to urban encroachment.

The *ConnectMenlo* EIR analyzed cumulative impacts at a high level without specific identification of cumulative projects or housing unit projections. The *ConnectMenlo* EIR found that the potential impacts of the proposed project on biological resources would be site-specific and the overall cumulative effect would be dependent on the degree to which native vegetation (e.g., native grasslands, oak woodlands, riparian woodland), populations of special-status plant or animal species, and wetland features are protected on a particular development site. Importantly, the refinement of the HEU housing site opportunity and land use strategy has resulted in lower potential for housing development to occur in natural habitats. The HEU housing sites are concentrated in urbanized areas and no parcels are proposed within natural habitats such as coastal salt marsh, salt ponds, tidal marsh, oak woodland or grassland; therefore, potential cumulative impacts to biological resources are reduced under the HEU planning area relative to what was analyzed in the *ConnectMenlo* EIR.

Regardless, cumulative impacts are analyzed here in the context of Section 4.0.3, *Cumulative Impacts*; specifically, regional household and population projections presented in Plan Bay Area 2040, which represents estimates of likely new housing construction and population and employment growth through 2040, which is also the horizon year used in the analysis in the *ConnectMenlo* EIR. The 2040 cumulative (maximum buildout) projects from the *ConnectMenlo* EIR totaled 19,880 residential units; whereas, the updated 2040 cumulative projections including the current HEU planning area totals 24,829 residential units.

Special-Status Species and Birds Protected by the MBTA and CFGC

Construction within the HEU housing opportunity and land use strategy sites could result in direct impacts on nesting birds and special-status roosting bats due to tree removal or trimming. Indirect construction-related impacts on nesting birds, roosting bats, and other special-status species could include construction noise, vibration, and human activity near active bird nests, bat roosts and special-status species sheltering, breeding, and foraging habitat within riparian habitat, oak woodlands, and neighborhood street trees (i.e., nesting habitat for Cooper's hawks) during construction of multi-family residences.

Cumulative projects could potentially indirectly impact nesting birds and special-status species due to clearing and grubbing, and increased noise, vibration and/or visual disturbance during construction, which could cause nest/roost failure or abandonment, or disrupt sheltering, breeding, and foraging in adjacent habitat, such as San Francisquito Creek, by special-status species. These cumulative projects would be required to comply with applicable regulatory requirements protecting biological resources, the City of Menlo Park's Tree Protection Ordinance, and project-specific mitigation measures (where applicable) similar to those of the HEU.

The HEU, in combination with cumulative projects, could result in a significant cumulative impact on nesting birds and special-status species during construction. However, with implementation of **Mitigation Measure BIO-1**, implementation of the HEU would not result in a considerable contribution to cumulative impacts; therefore, the cumulative impact would be **less than significant**.

Riparian Habitat, Jurisdictional Waters, and Wildlife Corridors

Construction within the HEU housing opportunity and land use strategy sites could result in direct impacts to riparian habitat (a category of jurisdictional waters and a wildlife corridor) due to vegetation removal or trimming. Indirect construction-related impacts on riparian habitat could include equipment leaks, refueling, or improper storage or containment causing harmful material (e.g., concrete truck washout, sediment) to enter San Francisquito Creek, especially during the rainy season.

Cumulative projects could potentially impact riparian and jurisdictional waters in the same manner that construction within the HEU housing opportunity and land use strategy sites could result in direct and indirect construction-related impacts. However, cumulative projects would also be required to comply with applicable regulatory requirements protecting biological resources, the City of Menlo Park's Tree Protection Ordinance, and project-specific mitigation measures (where applicable), similar to those of the HEU.

The HEU, in combination with cumulative projects, could result in a **potentially significant impact** on riparian habitat, jurisdictional waters, and wildlife corridors during construction. However, with implementation of Mitigation Measures **BIO-2, BIO-3**, and **BIO-4**, implementation of the HEU would not result in a considerable contribution to cumulative impacts to these resources; therefore, the cumulative impact would be **less than significant, with mitigation**.

4.3.5 References

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4.4 Cultural Resources

4.4.1 Introduction

This section evaluates the effects of the Housing Element Update (HEU) on cultural resources, including historic architectural resources, historic-era archaeological resources, pre-contact archaeological resources, and human remains, focusing on changes to the *ConnectMenlo* EIR (certified in 2016) that may result in new or more severe impacts, and describes any mitigation measures needed to address any such impacts. Below, the Environmental Setting portion of this section includes descriptions of existing conditions relevant to cultural resources. Further below, existing plans and policies relevant to cultural resources associated with implementation of the HEU are provided in the Regulatory Setting section. Finally, the impact discussion evaluates potential impacts to cultural resources that could result from implementation of the HEU in the context of existing conditions.

The HEU's impacts on tribal cultural resources are evaluated separately in Section 4.15 *Tribal Cultural Resources* of this Draft SEIR.

The term *indigenous*, rather than *prehistoric*, is used as a synonym for Native American (except when quoting), while *pre-contact* is used as a chronological adjective to refer to the period prior to Euroamerican arrival in Menlo Park. *Indigenous* and *pre-contact* are often, but not always, synonymous, since the former refers to a cultural affiliation and the latter chronological.

Findings of the *ConnectMenlo* Final EIR

Cultural resources impacts of the *ConnectMenlo* project were analyzed in Section 4.4 of the *ConnectMenlo* Draft EIR. Please note that impacts to paleontological resources or unique geological features (CULT-3), are addressed in Section 4.6, *Geology and Paleontological Resources*, of this SEIR, and impacts to tribal cultural resources (CULT-5) are addressed in Section 4.15, *Tribal Cultural Resources*, of this SEIR. Both of these changes were made based on revisions to the CEQA Guidelines Appendix G Checklist since the *ConnectMenlo* EIR was certified. The *ConnectMenlo* Final EIR determined that the project would have the following impacts with respect to cultural resources, including historic architectural resources, historic-era and pre-contact archaeological resources, and human remains:

- CULT-1: Implementation of the proposed project would not cause a substantial adverse change in the significance of a historical resource. (*Less than Significant Impact, with Mitigation*)

- CULT-2: Implementation of the proposed project would not cause a substantial adverse change in the significance of an archaeological resource pursuant to 15064.5. (*Less than Significant Impact, with Mitigation*)

- CULT-4: Implementation of the proposed project would not disturb any human remains, including those interred outside of formal cemeteries. (*Less than Significant Impact, with Mitigation*)

- CULT-6: Implementation of the proposed project, in combination with past, present and reasonably foreseeable projects, would result in a significant cumulative impact with respect to cultural resources. (*Less than Significant Impact, with Mitigation*)

Notice of Preparation Comments

The Notice of Preparation (NOP) for the SEIR was circulated on December 23, 2021, and a scoping meeting was held on January 24, 2022. The NOP and the comments received during the public comment period can be found in **Appendix A** of this SEIR. The City received scoping comments from the Native American Heritage Commission (NAHC) which recommended, pursuant to SB 18 and AB 52, that the City conduct consultation with tribes that are affiliated with the City of Menlo Park. The NAHC also recommended that the City conduct a cultural resources records search of the California Historical Resources Information System (CHRIS) and that an archaeological inventory survey report be prepared along with a search of the NAHC's Sacred Lands File (SLF).

Information Sources

The primary sources of information referenced in this section included those listed below. Please note that a full list of references for this topic can be found at the end of this section.

- City of Menlo Park General Plan (2016a).
- *ConnectMenlo* EIR (2016b).
- City of Menlo Park Housing Element, 2015-2023 (2014).

4.4.2 Environmental Setting

The *ConnectMenlo* DEIR provided a brief overview of the City's history including pre-contact history and the Ohlone people, the arrival of the Spanish missionaries, the origins of the City's name, incorporation, major milestones such as the founding of Stanford University and the establishment of Silicon Valley, and growth throughout the 19th and 20th centuries.

The project area for the *ConnectMenlo* EIR was limited to the Bayfront area of the City whereas the HEU includes the entire City, so the discussion below has been broadened to consider additional areas of the City.

Architectural Setting

Menlo Park is an architecturally diverse city with areas dictated by use, location, and era of development. The downtown commercial area is centrally located and is surrounded by residential and mixed-use neighborhoods. The following provides a brief overview of these commonly recognized areas/neighborhoods with regard to their development and current architectural settings.

Downtown Menlo Park

The area known as Downtown Menlo Park is located southwest of El Camino Real and is centered on Santa Cruz Avenue. The boundaries are Valparaiso Avenue on the northwest, El Camino Real on the northeast, Fremont Street and Arbor Road to the southwest, and Middle Avenue to the southeast. Largely built out by at least 1948, the area was dominated by single family residential with the commercial buildings constrained on, or close to, El Camino Real. It is currently comprised primarily of low-rise commercial buildings on Santa Cruz Avenue and El Camino Real that are surrounded by single and multi-family residential buildings. The area includes a variety of architectural styles with construction dates potentially spanning every decade of the 20th century as well as the early 21st century.

Allied Arts/Stanford Park

The area known as Allied Arts, or Stanford Park, is adjacent to Downtown Menlo Park on the southeast and is a primarily residential neighborhood. The boundaries are Middle Avenue on the northwest, El Camino Real on the northeast, San Francisquito Creek on the southeast, and Arbor Road on the southwest. The neighborhood is dominated by one- and two-story, single-family homes with multi-family homes sprinkled throughout, and a concentration of commercial and larger apartment buildings along El Camino Real. Largely built out by at least 1948, the area includes a variety of architectural styles with construction dates potentially spanning every decade of the 20th century as well as the early 21st century.

Bayfront Area

Menlo Park's Bayfront Area is located on the east end of the City adjacent to the San Francisco Bay. This area is dominated by parks/open space and office buildings, but also includes light industrial and commercial uses. The Bayfront is currently transitioning from this mix to one that includes office/R&D, commercial, and multi-family residential uses.

Belle Haven

The area known as Belle Haven is northeast of US-101 and centered around the Belle Haven Elementary School on Ivy Drive. The neighborhood is triangular with the railroad right-of-way on the north (just north of Terminal and Hamilton Avenues), US-101 on the southwest, and Willow Road on the southeast. It is primarily a residential neighborhood established in the 1940s and 1950s. By 1948 the streets had been laid out and a few dozen homes had been built.[1] The neighborhood was nearly completely built out by 1956 including the elementary school. The single-family homes are mostly single-story, wood frame, Minimal Traditional or Ranch style buildings. Willow Road is a commercial and multi-family home corridor. Ivy Drive is a boulevard with lanes of traffic divided by a landscaped median; few homes front Ivy Drive with the majority fronting the streets that branch off of Ivy Drive. A large complex of contemporary, three-story apartment homes is located on the north side of Hamilton Avenue east of Henderson Avenue.

[1] Historicaerials.com, 1948 topo map, accessed April 13, 2022.

Central Menlo

The area known as Central Menlo is southwest of Downtown Menlo Park and Allied Arts. It is bounded by Valparaiso Avenue to the northwest; Johnson Street, Fremont Street, and Arbor Road to the northeast; San Francisquito Creek to the southeast; and Vine Street, Cloud Avenue, and North Lemon Avenue to the southwest. By 1948 most of the roads were in place and a small percentage of the homes had been built. By 1956 the neighborhood was almost completely built out. This residential neighborhood is dominated by one- and two-story, Ranch style, single family homes with some Classical Revival styled homes present.

Felton Gables

The area known as Felton Gables is a small neighborhood of single-family homes north of Downtown Menlo Park. The neighborhood is bounded by Holbrook Palmer Park to the northwest, Encinal Elementary School to the northeast, Encinal Avenue to the southeast, and the railroad right-of-way to the southwest. The majority of the homes appear to have been constructed in the 1930s, 1940s, and 1950s and were designed in the Ranch and Cottage styles.

Linfield Oaks

The area known as Linfield Oaks is primarily a mid-19th century residential neighborhood northeast of downtown Menlo Park. The neighborhood is bounded by Middlefield Road to the northeast; Alma Street to the southwest; San Francisquito Creek to the southeast; and Burgess Drive to the northwest. The 1948 aerial shows the area as undeveloped and by 1956 the neighborhood appeared to be nearly completely built out. The area is dominated by single- and multi-family residential buildings with non-residential uses concentrated along Middlefield Road.

Sharon Heights

The area known as Sharon Heights is a mid-20th century residential neighborhood at the southwestern end of Menlo Park. It is bounded by Sand Hill Road on the south; Santa Cruz Avenue and Altschul Avenue on the northeast; and Trinity Drive and the Sharon Heights Golf and Country Club on the northwest. This residential neighborhood includes the Sharon Heights Golf and Country Club as well as commercial and office uses along Sand Hill Road. The neighborhood includes both single- and multi-family homes that appear to date primarily to the 1960s.

Suburban Park/Lorelei Manor/Flood Park

The area known as the Flood Triangle is north of Downtown Menlo Park, is triangular in shape, and includes three subareas knowns as Suburban Park, Lorelei Manor, and Flood Park. The area is bounded by Bay Road to the south, US-101 to the northwest, and Marsh Road to the northwest. The neighborhood includes both single- and multi-family homes that appear to date from a wide range of decades in the early- to mid-20th century. It appears to have been largely built-out by 1948. Architectural styles include Ranch and Minimal Traditional.

The Willows

The area known as The Willows is located northeast of Downtown Menlo Park and is a residential neighborhood. The area is bounded by Middlefield Road to the southwest, San

Francisquito Creek to the south, Willow Road to the west, US-101 and East O'Keefe Street to the north, and Euclid Avenue to the east. While the street grid is established and a scattering of homes are present in aerial photography from 1948, by 1956 the neighborhood appears to have been nearly fully developed. The neighborhood consists of one- and two-story homes in a variety of mid-century styles including Ranch, Minimal Traditional, and Spanish Revival.

Previously Identified Cultural Resources

For the purposes of this section, cultural resources are defined as physical evidence of a place of past human activity, including sites, objects, landscapes, or structures of significance to a group of people traditionally associated with it. Archaeological resources can be both pre-contact and historic-era and consist of cultural resources which are on the surface or in the subsurface. Historic resources are historic-era (i.e., 50 years old or older) buildings or structures that have been determined as significant and eligible for, or listed on, the National Register of Historic Places (National Register) and/or California Register of Historical Resources (California Register) and/or designated protected by the City's Historic Site District zoning (Menlo Park Municipal Code Chapter 16.54). Planning documents often evaluated potential resources that are 45 years old or older in order to account for the gap between the planning effort and the implementation.

ESA completed a records search at the Northwest Information Center (NWIC) of the California Historical Resources Information System on February 8, 2022 (File No. 21-1256). The review included the limits of the City of Menlo Park but focused on the potential housing opportunity and land use strategy sites for the HEU. Previous surveys, studies, and site records were accessed. Records were also reviewed in the Built Environment Resources Directory (BERD) for San Mateo County, which contains information on places of recognized historical significance including those evaluated for listing in the National Register, the California Register, the California Inventory of Historical Resources, California Historical Landmarks, and California Points of Historical Interest. The purpose of the records search was to (1) determine whether known cultural resources have been recorded within the project vicinity; (2) assess the likelihood for unrecorded cultural resources to be present based on historical references and the distribution of nearby sites; and (3) develop a context for the identification and preliminary evaluation of cultural resources.

Identified Historic Resources

The following provides a list of previously identified historic resources as determined through previous evaluations as well those listed on the National Register, California Register, as California Historical Landmarks, as Points of Historical Interest, and/or zoned locally within the Historic Site District zone. The City of Menlo Park does not maintain a local register of historic resources. The reconnaissance survey in March 2022 provided important information on the current general architectural setting of the City, however, it did not verify the previously identified historic resources or identify any additional resources since evaluation was outside of the scope of this effort.

TABLE 4.4-1
PREVIOUSLY IDENTIFIED HISTORIC RESOURCES

Name of Property (if applicable)	Location	Status [a]	Date of Construction	Notes	Source
Menlo Park Railroad Station	1100 Merrill Avenue	California Historical Landmark, NRHP-listed	1867	P-41-000169	NWIC, MPHA, *ConnectMenlo*
Flood Park	215 Bay Road	5S1, California Point of Historical Interest	c. 1937	P-41-001515/MPHRI #091175	NWIC, *ConnectMenlo*
	603-607 College Avenue (APN 071-412-170)		1948	P-41-002253	NWIC
	612 Partridge (APN 071-412-250)		c.1910-25	P-41-002254	NWIC
Menlo Park VA	795 Willow Road	NRHP-listed			NRHP
El Rancho Supermarket Plaza/All American Market	812 Willow Road		1950	P-41-002286	NWIC
	928 Willow Road		1946	P-41-002331	NWIC
	1022 Alma Street (APN 061-412-450)	6Z	c.1950	P-41-002488/#948	NWIC
	1257 Mills Street (APN 061-402-100)	6L	1898	P-41-002489/#955	NWIC
The Menlo Theatre/The Guild Theatre	949 El Camino Real (APN 071-288-570)	5S3	1924	P-41-002699	NWIC
Menlo Clock Works	961 El Camino Real (APN 071-288-210)	5S3	1920	P-41-002700	NWIC
John Duff House	849-851 El Camino Real	3S	1899	P-41-002701	NWIC, BERD
Gale House	Palo Alto Quad; UTM: 572430E, 4144690N		1870s	C-362	NWIC
James Valentine Coleman House	Palo Alto Quad; UTM: 573820E, 4146800N	California Point of Historical Interest	1870s	C-365	NWIC, *ConnectMenlo*
Menlo Gate House/Barron-Lathan-Hopkins Gate Lodge	555 Ravenswood Ave	NRHP-listed, California Point of Historical Interest	1864	C-393	NWIC, MPHA, *ConnectMenlo*
No. 2 Portola Journey's End/historic site	Intersection of E. Creek Dr and Alma St	California Historical Landmark	1769		MPHA, *ConnectMenlo*
No. 939 Twentieth Century Folk Art Environments - CAPIDRO	262 Princeton Rd	1CL, 3S, SHL-0939-0001	1932		MPHA
Church of the Nativity	210 Oak Grove Ave	NRHP-listed, California Point of Historical Interest	1872, 1887		MPHA, *ConnectMenlo*
	3860 Alameda de las Pulgas (APN 074-112-500)	5S1	1928		BERD
The Barn Woodshop/ Heliopolis	Arbor Road	3D	1880		BERD
	641 Arbor Road (APN 071-262-080)	3S	1917		BERD
Allied Arts Guild	75 Arbor Road	3S	1930		BERD
Weaving, Apparel and Children's Shops	75 Arbor Road	3D	1930		BERD

TABLE 4.4-1 (CONTINUED)
PREVIOUSLY IDENTIFIED HISTORIC RESOURCES

Name of Property (if applicable)	Location	Status [a]	Date of Construction	Notes	Source
Tea Room, Galleries	75 Arbor Road	3D	1930		BERD
	799 Berkeley Ave (APN 062-160-570)	5S1	1920		BERD
	315 Central Ave (APN 062-353-200)	5S1	1910		BERD
	2145 Clayton Dr (APN 074-112-030)	5S1	1934		BERD
	2158 Clayton Dr (APN 074-111-030)	5S1	1938		BERD
	901 Coleman Ave (APN 062-263-060)	5S1	1928		BERD
Holy Trinity Episcopal Church	1220 Crane St (APN 071-093-190)	3S, Historic Site District Zone (local)	1886		BERD, *ConnectMenlo*
	1050 Creek Dr (APN 071-421-090)	5S1	1930		BERD
	1064 Creek Dr (APN 071-421-100)	5S1	1932		BERD
Doughty's Meat Market	1162 El Camino Real (APN 061-441-100)	5S1	1910	Demolition proposed	BERD
Martin J. McCarthy Groceries	1170 El Camino Real (APN 061-441-100)	5S1	1905		BERD
K.L. Plumbing	1265 El Camino Real (APN 071-103-080)	5S1	1925		BERD
The Oasis	241 El Camino Real (APN 071-413-360)	3S	1917		BERD
	207 Felton Dr (APN 061-322-120)	5S1	1940		BERD
	300 Felton Dr (APN 061-310-210)	5S1	1939		BERD
	466 Felton Dr (APN 061-321-070)	5S1	1939		BERD
The Gale House	417 Glenwood Ave (APN 061-401-010)	3S	1892		BERD
	727 Harvard Ave (APN 071-434-050)	5S1	1914		BERD
	1261 Laurel St (APN 061-401-090)	5S1	1905		BERD
	300 Lennox Ave (APN 061-323-180)	5S1	1927		BERD
	699 Menlo Oaks Dr (APN 062-140-120)	3S	1916		BERD
	700 Menlo Oaks Dr (APN 062-182-101)	5S1	1912		BERD
	931 Menlo Oaks Dr (APN 062-150-180)	5S1	1916		BERD
	950 Middle Rd (APN 071-302-290)	5S1	1916		BERD
Menlo Park Firehouse	300 Middlefield Rd (APN 062-460-100)	5S1	1899		BERD
St. Patrick's Seminary	320 Middlefield Rd (APN 062-460-090)	3S	1898		BERD
	1249 Mills St (APN 061-402-110)	5S1	1898		BERD
	1320 Mills St (APN061-401-280)	5S1	1890		BERD
Edgar Mills/ Bright Eagle Estate	1040 Noel Dr (APN 061-411-090)	3S, Historic Site District Zone (local)	1869		BERD, *ConnectMenlo*
	369 O'Connor St (APN 063-463-520)	5S1	1922		BERD

TABLE 4.4-1 (CONTINUED)
PREVIOUSLY IDENTIFIED HISTORIC RESOURCES

Name of Property (if applicable)	Location	Status [a]	Date of Construction	Notes	Source
	1680 Oak Ave (APN 071-180-080)	5S1	1939		BERD
Church of the Nativity	210 Oak Grove Ave (APN 061-360-030)	1S	1872		BERD
Corpus Christi Monastery	215 Oak Grove Ave (APN 061-382-170)	5S1	1926		BERD
	424 Oak Grove Ave (APN 061-401-150)	3S	1895		BERD
James Valentine Coleman Mansion	Peninsula Way (APN 062-181-050)	3S, NRHP- listed, California Point of Historical Interest	1882		BERD, *ConnectMenlo*
Maloney House	1108 Pine St (APN 061-382-310)	5S1	1907		BERD
	102 Pope St (APN 062-354-250)	5S1	1907		BERD
	117 Pope St (APN 062-352-180)		1910		BERD
	125 Pope St (APN 062-352-160)		1907		BERD
	202 Pope St (APN 062-353-010)		1910		BERD
	302 Pope St (APN 062-363-150)		1910		BERD
Holy Trinity Parish Home	330 Ravenswood Ave (APN 061-384-030)	5S1	1914		BERD
	800 Ringwood Ave (APN 062-150-040)	3S	1915		BERD
McKendry House	244 Robin Way (APN 062-304-110)	5S1			BERD
San Antonio Street District	San Antonio St	3S	1880		BERD
	1425 San Antonio St (APN 061-422-460)	3D	1890		BERD
	1428 San Antonio St (APN 061-421-260)	3D	1898		BERD
	1444 San Antonio St (APN 061-421-330)	3D	1894		BERD
	1451 San Antonio St (APN 061-421-100)	3D	1894		BERD
	2104 Sand Hill Rd (APN 074-120-100)	5S1	1902		BERD
	114 Santa Margarita Ave (APN 062-272-610)	5S1	1889		BERD
	957 University Dr (APN 071-272-430)	5S1	1927		BERD
Douglass Hall (now Stent Family Hall) within Menlo School	50 Valparaiso Ave (APN 070-360-080)	7P (State Point of Historical Interest)			BERD
Larrecou House	925 Valparaiso Ave (APN 071-082-160)	5S1	1927		BERD
Golden State	600 Willow Rd (APN 113-400-000)	5S1	1937		BERD

NOTES: MPHRI – Menlo Park Historic Resources Inventory, MPHA – Menlo Park Historical Association, NRHP – National Register of Historic Places, BERD – Built Environment Resource Directory

a. California Historical Resources Status Codes, https://ohp.parks.ca.gov/pages/1069/files/chrstatus%20codes.pdf

SOURCE: NWIC Records Search, 2022; BERD, https://ohp.parks.ca.gov/?page_id=30338, March 3, 2020; ConnectMenlo EIR, 4.4 Cultural Resources Section, 2016b.

Of the 74 potential housing opportunity sites, one includes a National Register-listed property, 10 are vacant (no buildings are present), and 24 have buildings that are historic-era that have not yet been evaluated. The National Register-listed property is the Menlo Park Department of Veterans Affairs Medical Center complex at 795 Willow Road. Additionally, it is likely that there are additional age-eligible historic resources outside of the housing opportunity sites, but within the boundary of the City.

Identified Archaeological Resources

The NWIC records search indicated that three pre-contact archaeological resources are recorded within the potential housing opportunity sites and 25 additional archaeological resources are recorded within the Menlo Park City boundary. **Table 4.4-3** describes the three archaeological resources within the potential housing opportunity sites.

TABLE 4.4-2
PREVIOUSLY RECORDED ARCHAEOLOGICAL RESOURCES

Name/Type of Resource	Location	Source	Description	Eligibility
ACS-93-14-2 (P-41-000279/ CA-SMA-337H)	345 Middlefield Road (APN 062-390-700)	NWIC	Historic – various features associated with late 19th – mid-20th century occupation.	Determined not eligible for the National Register by Section 106 consensus; Not evaluated for the California Register
ACS-93-14-3 (P-41-000280/ CA-SMA-338H)	345 Middlefield Road (APN 062-390-700)	NWIC	Historic – late 19th – 20th century refuse deposits	Determined not eligible for the National Register by Section 106 consensus; Not evaluated for the California Register
ACS-93-14-1 (P-41-000316/ CA-SMA-336H)	345 Middlefield Road (APN 062-390-700)	NWIC	Historic – sheet refuse scatter of late 19th – mid-20th century artifacts, historic landscape architecture.	Determined not eligible for the National Register by Section 106 consensus; Not evaluated for the California Register

SOURCE: NWIC, 2022

All of the previously recorded archaeological resources within the potential housing opportunity sites have been determined not eligible for the National Register, but have not been evaluated for the California Register. There are also 25 additional archaeological resources recorded outside of the potential housing opportunity sites, but within the boundary of the City that may be impacted by housing approved by the HEU outside of the potential opportunity sites. Some of these sites include human remains and therefore, it is likely that there are archaeological resources that are eligible for the California Register and/or the National Register, if evaluated within the Menlo Park City boundaries.

4.4.3 Regulatory Setting

The following section focuses on any changes to the regulatory setting that have occurred since certification of the *ConnectMenlo* EIR. Draft EIR Section 4.4, *Cultural Resources*, evaluated effects to cultural resources, including historic architectural resources, historic-era and pre-contact archaeological resources, and human remains. There, Section 4.4.1.1, *Regulatory Framework*, described regulations applicable to this topic, and that description is still current for this SEIR.

Local

Menlo Park General Plan

The Menlo Park General Plan is a comprehensive long-range general plan for the physical development of the City of Menlo Park (City of Menlo Park, 2016a). The General Plan contains the current City of Menlo Park Housing Element, which was adopted in 2014 (City of Menlo Park, 2014). The various elements within the General Plan include goals and policies for the physical development of the City. Goals and policies related to cultural resources are listed below.

Goal LU-7: Promote the implementation and maintenance of sustainable development, facilities and services to meet the needs of Menlo Park's residents, businesses, workers, and visitors.

***Policy LU-7.8 Cultural Resource Preservation*:** Promote preservation of buildings, objects, and site with historic and/or cultural significance.

Goal OSC-3: Protect and Enhance Historic Resources.

Policy OSC-3.1: Prehistoric or Historic Cultural Resources Investigation and Preservation: Preserve historical and cultural resources to the maximum extent practical.

Policy OSC-3.2: Prehistoric or Historic Cultural Resources Protection: Require significant historic or prehistoric artifacts be examined by a qualified consulting archaeologist or historian for appropriate protection and preservation, and to ensure compliance with local, State and Federal regulations.

Policy OSC-3.3: Archaeological or Paleontological Resources Protection: Protect prehistoric or historic cultural resources either on site or through appropriate documentation as a condition of removal. Require that when a development project has sufficient flexibility, avoidance and preservation of the resource shall be the primary mitigation measure, unless the City identifies superior mitigation. If resources are documented, undertake coordination with descendants and/or stakeholder groups, as warranted.

Policy OSC-3.4: Prehistoric or Historic Cultural Resources Found During Construction: Require that if cultural resources, including archaeological or paleontological resources, are uncovered during grading or other on-site excavation activities, construction shall stop until appropriate mitigation is implemented.

Policy OSC-3.5: Consultation with Native American Tribes: Consult with those Native American tribes with ancestral ties to the Menlo Park City limits regarding General Plan Amendments and land use policy changes.

Policy OSC-3.6: Identification of Potential Historic Resources: Identify historic resources for the historic district in the Zoning Ordinance and require design review of proposals affecting historic buildings.

4.4.4 Environmental Impacts and Mitigation Measures

Scope of Analysis

The analysis in this SEIR describes impacts identified in the 2016 *ConnectMenlo* EIR, and describes how the impacts of the HEU would differ, as applicable.

Significance Thresholds

The thresholds used to determine the significance of impacts related to cultural resources are based on Appendix G of the *CEQA Guidelines*. Implementation of the HEU would have a significant impact on the environment if it would:

- Cause a substantial adverse change in the significance of a historical resource pursuant to Public Resources Code §15064.5.
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to Public Resources Code §15064.5.
- Disturb any human remains, including those interred outside of formal cemeteries.

Methodology and Assumptions

This is a program-level SEIR that considers the potential impacts from implementing the HEU. While the HEU would be applicable Citywide, special focus was given to the HEU housing opportunity sites. Impacts on cultural resources are evaluated using the criteria listed above and based on information included in the City of Menlo Park General Plan (2016a) and the *ConnectMenlo* EIR (2016b). Impacts to architectural historic resources were also informed by the *ConnectMenlo* Baseline Survey Report and a reconnaissance survey conducted in March 2022 by a qualified architectural historian.

Impacts and Mitigation Measures

Impacts

Impact CR-1: Implementation of the HEU could cause a substantial adverse change in the significance of an architectural historic resource pursuant to CEQA Guidelines Section 15064.5. (*Significant and Unavoidable Impact, with Mitigation*)

The *ConnectMenlo* EIR evaluated potential impacts to historical resources including historic buildings. It determined that although general plan polices were in place to identify and protect historic buildings, there was still a potential for future development to cause a significant impact on historical resources. Mitigation Measure CULT-1 was prescribed, which required evaluation and recordation of buildings more than 50 years old, and required that the character-defining features of buildings deemed eligible for the California Register of Historical Resources to be preserved. The measure essentially precludes demolition of eligible structures, which was unlikely to present a substantial constraint on development in the Bayfront Area since the area was determined to contain no such structures. Development under the HEU, however, has the potential to result in more severe impacts since it covers the entire City of Menlo Park, whereas the *ConnectMenlo* EIR was restricted to the Bayfront Area. As described above in the *Environmental Setting*, of the 74 potential housing opportunity sites, one includes a National

Register-listed property[2], 10 are vacant (no buildings are present), and 24 have buildings that are historic-era that have not yet been evaluated. It is also likely that there are additional historic resources outside of the housing opportunity sites, but within the boundary of the City. Furthermore, in the future additional sites and buildings may qualify for consideration (i.e., 45 years old or older) as historic resources.

The primary purpose of the HEU is to comply with the requirements of State law by updating goals, policies, objectives, and implementation programs for the preservation, improvement, and development of housing, and providing a list of viable development sites to meet the City's RHNA requirement plus a buffer. As has already been noted, the City has identified housing opportunity sites and land use strategy sites for new multifamily housing. Modification or demolition of buildings associated with physical development that could occur under the HEU could result in damage to or destruction of architectural historic resources, which would constitute a significant impact.

As detailed in the *Regulatory Setting* above, and previously in the *ConnectMenlo* EIR, there are a number of federal, state, and local regulations in place to protect architectural historic resources. CEQA requires lead agencies to determine, prior to approval, if a project would have a significant adverse effect on historical resources and requires the lead agency to prescribe any feasible mitigation measures that would reduce significant impacts.

In addition, the General Plan includes policies and implementation programs designed to identify and protect architectural historic resources. For instance, General Plan Goal OSC-3 and its associated policies call for the identification, recognition, and protection of significant resources in the City.

While the aforementioned regulations and policies to protect architectural historic resources are aimed at protecting resources by requiring projects to identify and mitigate impacts to potential architectural historic resources, there remains the potential for construction activities to damage or destroy architectural historic resources. Accordingly, mitigation measures are prescribed below to require that individual projects evaluate all buildings 45 years old and older. If the building(s) are determined to be eligible for listing on the California Register of Historical Resources, then the project would be required to conform to the Secretary of the Interior's Standards for the Treatment of Historic Properties. Application of the *ConnectMenlo* EIR Mitigation Measure CULT-1 would preclude demolition, which is not feasible for all projects given the State-mandated requirement to plan for the RHNA and allow and encourage housing development, and State law restrictions on the City's ability to deny or reduce the density of housing project, so is therefore not prescribed for the HEU.

Mitigation Measure CR-1a: Identify Architectural Historic Resources.

Prior to any demolition work or significant alterations to any building or structure that is 45 years old or older, the City shall ensure that a qualified architectural historian who

[2] As indicated previously in Section 4.4.2, the NRHP-listed property is the Menlo Park Department of Veterans Affairs Medical Center complex at 795 Willow Road. Proposals have been advanced to place housing on undeveloped portions of the site, or in parking areas. No direct impacts to listed structures are proposed at the site.

meets the Secretary of the Interior's Professional Qualification Standards evaluate the building or structure for eligibility for listing in the National Register, California Register, and for local eligibility.

Mitigation Measure CR-1b: Identify Character-Defining Features.

Prior to any demolition work or significant alterations initiated at a known historical resource or a resource identified via implementation of Mitigation Measure CR-1a, the City shall ensure that a qualified architectural historian who meets the Secretary of the Interior's Professional Qualification Standards identifies character-defining features of each historical resource. Despite being presumed or having been previously determined eligible for listing in the National Register and/or California Register, character-defining features of the historical resources that would be demolished or may be significantly altered may not have been explicitly or adequately identified. According to guidance from the National Park Service, a historical resource "must retain… the essential physical features [i.e., character-defining features] that enable it to convey its historic identity. The essential physical features are those features that define both *why* a property is significant…and *when* it was significant" (National Park Service, 1997). The identification of character-defining features is necessary for complete documentation of each historical resource as well as appropriate public interpretation and salvage plans.

Mitigation Measure CR-1c: Document Architectural Historic Resources Prior to Demolition or Alteration.

Prior to any demolition work or significant alterations initiated of a known historical resource or a resource identified via implementation of Mitigation Measures CR-1a, the City shall ensure that a qualified architectural historian who meets the Secretary of the Interior's Professional Qualification Standards thoroughly documents each building and associated landscaping and setting. Documentation shall include still photography and a written documentary record of the building to the National Park Service's standards of the Historic American Buildings Survey (HABS) or the Historic American Engineering Record (HAER), including accurate scaled mapping and architectural descriptions. If available, scaled architectural plans will also be included. Photos include large-format (4"x5") black-and-white negatives and 8"x10" enlargements. Digital photography may be substituted for large-format negative photography if archived locally. The record shall be accompanied by a report containing site-specific history and appropriate contextual information. This information shall be gathered through site-specific and comparative archival research and oral history collection as appropriate. Copies of the records shall be submitted to the Northwest Information Center at Sonoma State University.

Significance After Mitigation: Housing development planned under the HEU could result in the demolition or significant alteration of historical resources, which would constitute a substantial adverse change in the significance of the resources. While the mitigation measures included above would require identification and documentation of the resources, they would not fully mitigate these actions to a less-than-significant level if these resources were permanently lost. Therefore, even with implementation of Measures CR-1a, CR-1b, and CR-1c the impact would be **significant and unavoidable**.

Impact CR-2: Implementation of the HEU would not cause a substantial adverse change in the significance of an archaeological historical resource or a unique archaeological resource pursuant to CEQA Guidelines Section 15064.5. (*Less than Significant Impact, with Mitigation*)

The *ConnectMenlo* EIR did not identify any archaeological resources within the City, but did identify Native American remains in their study area. The *ConnectMenlo* EIR found that it was 'highly improbable' that archaeological deposits dating to the pre-contact or historic era exist on the locations that were identified for future development, which was focused on the Bayfront portion of the City. The *ConnectMenlo* EIR stated that the General Plan goals and policies (described above) and compliance with federal, State, and local laws and regulations would protect recorded and unrecorded archaeological deposits in the study area by providing for the early detection of potential conflicts between development and resource protection, and by preventing or minimizing the material impairment of the ability of archaeological deposits to convey their significance through excavation or preservation. However, the *ConnectMenlo* EIR does note that there is the potential for unrecorded archaeological resources to be significantly impacted.

To address this potential significant impact, the *ConnectMenlo* EIR recommended Mitigation Measure CULT-2a:

> If a potentially significant subsurface cultural resource is encountered during ground disturbing activities on any parcel in the City, all construction activities within a 100-foot radius of the find shall cease until a qualified archaeologist determines whether the resource requires further study. All developers in the study area shall include a standard inadvertent discovery clause in every construction contract to inform contractors of this requirement. Any previously undiscovered resources found during construction activities shall be recorded on appropriate California Department of Parks and Recreation (DPR) forms and evaluated for significance in terms of the California Environmental Quality Act (CEQA) criteria by a qualified archaeologist. If the resource is determined significant under CEQA, the qualified archaeologist shall prepare and implement a research design and archaeological data recovery plan that will capture those categories of data for which the site is significant. The archaeologist shall also perform appropriate technical analyses; prepare a comprehensive report complete with methods, results, and recommendations; and provide for the permanent curation of the recovered resources. The report shall be submitted to the City of Menlo Park, Northwest Information Center (NWIC), and State Historic Preservation Office (SHPO), if required.

And Mitigation Measure CULT-2b was recommended to address impacts to archaeological resources without proper tribal consultation:

> As part of the City's application approval process and prior to project approval, the City shall consult with those Native American Tribes with ancestral ties to the Menlo Park City limits regarding General Plan Amendments in the City and land use policy changes. Upon receipt of an application for [a] proposed project that requires a General Plan Amendment or land use policy change, the City shall submit a request for a list of Native

> American Tribes to be contacted about the proposed project to the Native American Heritage Commission (NAHC). Upon receipt of the list of Native American Tribes from the NAHC, the City shall submit a letter to each Tribe on the provided list requesting consultation with the Native American Tribe about the proposed project via the via the [sic] City's preferred confirmation of receipt correspondence tracking method (e.g., Federal Express, United States Postal Service Certified Mail, etc.).

The *ConnectMenlo* mitigation measures do not conform to current best practices with respect to inadvertent discovery of archaeological resources and human remains. For instance, measure CULT-2a presents protocol that may increase the potential impact to cultural resources because it does not allow for project redesign, capping of the resource, or other preservation methods besides data recovery. Nor does the mitigation measure require tribal involvement in determining the disposition of pre-contact or indigenous inadvertent discoveries. Therefore, this SEIR presents new mitigation measures to address inadvertent discovery during project construction, which would replace the original mitigation measures from *ConnectMenlo*.

As described above in the *Environmental Setting*, a records search of the potential housing opportunity and land use strategy sites and the wider Menlo Park City boundary identified previously recorded archaeological resources. Given the long history of pre-contact and historic-era human occupation, the City is considered sensitive for the presence of subsurface pre-contact, Native American, and historic-era cultural resources and human remains.

Archaeological resources have the potential to contain intact deposits of artifacts, associated features, and burials that could contribute to the regional pre-contact or historic record and be of substantial importance to members of the local and regional community. Ground disturbance associated with physical development that could occur under the HEU could result in damage to or destruction of these resources, which would constitute a **potentially significant impact**.

While the aforementioned regulations and policies described in the *ConnectMenlo* EIR and under the HEU provide some protection for archaeological resources, there remains the potential for ground-disturbing construction activities to inadvertently damage or destroy archaeological resources, which may cause a significant impact. The new measures below establish a project review process for cultural resources, require projects to identify and mitigate impacts to historical resources prior to ground disturbance, and address tribal involvement during the inadvertent discovery of indigenous cultural materials during project construction. The measures also provide for training of construction personnel to ensure that they know when and how to initiate inadvertent discovery measures should the need arise.

> **Mitigation Measure CR-2a. Cultural Resources Study Requirements.**
>
> The City shall ensure that a cultural resources records search is performed at the Northwest Information Center (NWIC) of the California Historical Resources Information System for the project area for multi-family development projects arising from the HEU that require ground disturbance (i.e., excavation, trenching, grading, etc.). To receive project approval, an archaeologist meeting the U.S. Secretary of the Interior's Standards (SOIS) for Archeology must review the results and identify if the project

would potentially impact cultural resources. If the archaeologist determines that known cultural resources or potential archaeologically sensitive areas may be impacted by the project, a pedestrian survey must be conducted under the supervision of a SOIS-qualified archaeologist of all accessible portions of the project area, if one has not been completed within the previous five years. Additional research, including subsurface testing, monitoring during construction, and/or a cultural resources awareness training may be required to identify, evaluate, and mitigate impacts to cultural resources, as recommended by the SOIS-qualified archaeologist. If avoidance is not feasible, the City shall consult with California Native American tribes identified by the Native American Heritage Commission (NAHC) to be affiliated with Menlo Park for the purposes of tribal consultation under Chapter 905, California Statutes of 2004 (if the resource is pre-contact or indigenous) to determine treatment measures to avoid, minimize, or mitigate any potential impacts to the resource pursuant to PRC Section 21083.2 and CEQA Guidelines Section 15126.4. This shall include documentation of the resource and may include data recovery (according to PRC Section 21083.2), if deemed appropriate, or other actions such as treating the resource with culturally appropriate dignity and protecting the cultural character and integrity of the resource (according to PRC Section 21084.3). A cultural report detailing the results of the research shall be prepared and submitted for review by the City and a final draft shall be submitted to the NWIC. Once the report has been approved by the City, the City may issue appropriate permits.

Mitigation Measure CR-2b. Inadvertent Discovery of Cultural Resources.

If pre-contact or historic-era archaeological resources are encountered during project construction and implementation, the project applicant shall halt all construction activities within 100 feet and notify the City. Pre-contact archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil (“midden”) containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-era materials might include stone, concrete, or adobe footings and walls; filled wells or privies; and deposits of metal, glass, and/or ceramic refuse. An archaeologist meeting the U.S. Secretary of the Interior’s Standards (SOIS) for Archeology shall inspect the findings and work shall be stopped within 100 feet of the potential archaeological resource until the material is either determined by the archaeologist to not be an archaeological resource or appropriate treatment has been enacted, with appropriate consultation, as needed.

If the City determines that the resource qualifies as a historical resource or a unique archaeological resource (as defined pursuant to the CEQA Guidelines) and that the project has potential to damage or destroy the resource, mitigation shall be implemented in accordance with PRC Section 21083.2 and CEQA Guidelines Section 15126.4, with a preference for preservation in place. If preservation in place is feasible, this may be accomplished through one of the following means: (1) siting improvements to completely avoid the archaeological resource; (2) incorporating the resource into a park or dedicated open space, by deeding the resource into a permanent conservation easement; (3) capping and covering the resource before building the project on the resource site after the resource has been thoroughly studied by a SOIS qualified archaeologist and a report written on the findings.

If preservation in place is not feasible, the City shall consult with California Native American tribes identified by the Native American Heritage Commissions (NAHC) to be affiliated with Menlo Park for the purposes of tribal consultation under Chapter 905, California Statutes of 2004 (if the resource is pre-contact or indigenous) to determine treatment measures to avoid, minimize, or mitigate any potential impacts to the resource pursuant to PRC Section 21083.2, and CEQA Guidelines Section 15126.4. This shall include documentation of the resource and may include data recovery (according to PRC Section 21083.2), if deemed appropriate by the archaeologist, in consultation with the City, or other actions such as treating the resource with culturally appropriate dignity and protecting the cultural character and integrity of the resource (according to PRC Section 21084.3).

Significance After Mitigation: Implementation of Mitigation Measures CR-2a and CR-2b would reduce the potential impact to a **less-than-significant** level because all projects with ground-disturbance would be reviewed by an SOIS qualified archaeologist and any potential archaeological resources identified would be evaluated and treated appropriately, including consulting with Native American representatives.

Impact CR-3: Implementation of the HEU could disturb human remains, including those interred outside of formal cemeteries. (*Less than Significant, with Mitigation*)

The *ConnectMenlo* EIR found that there was the potential for human remains to exist within City boundaries and for human remains to be encountered during project construction. As stated by the *ConnectMenlo* EIR, there are State laws that establish a formal procedure in the event of the inadvertent discovery of human remains. The *ConnectMenlo* EIR found that the disturbance of human remains would constitute a significant impact because descendant communities may ascribe religious or cultural significance to the remains.

To address this potential significant impact, the *ConnectMenlo* EIR recommended Mitigation Measure CULT-4. This mitigation is sufficient to address potential impacts to human remains from implementation of the HEU, although a few revisions have been made to provide additional clarity. Therefore, the mitigation measure has been re-numbered CR-3 to match the conventions in this SEIR.

Mitigation Measure CR-3. Inadvertent Discovery of Human Remains.

Procedures of conduct following the discovery of human remains have been mandated by Health and Safety Code Section 7050.5, Public Resources Code Section 5097.98 and the California Code of Regulations Section 15064.5 (CEQA). According to the provisions in CEQA, if human remains are encountered, the project applicant shall ensure that all work in the immediate vicinity of the discovery shall cease and necessary steps are taken to ensure the integrity of the immediate area. The San Mateo County Coroner shall be notified immediately. The Coroner shall then determine whether the remains are Native American. If the Coroner determines the remains are Native American, the Coroner shall notify the NAHC within 24 hours, who will, in turn, notify the person the NAHC identifies as the Most Likely Descendant (MLD) of any human remains. Further actions shall be determined, in part, by the desires of the MLD. The MLD has 48 hours to make recommendations regarding the disposition of the remains following notification from the

NAHC of the discovery. If the MLD does not make recommendations within 48 hours, the landowner shall, with appropriate dignity, reinter the remains in an area of the property secure from further disturbance.

Significance After Mitigation: Implementation of Mitigation Measures CR-3 (formerly Mitigation Measure CULT-4 of the *ConnectMenlo* EIR), would reduce the potential impact to human remains to a **less-than-significant** level because all laws and regulations regarding the inadvertent discovery of human remains would be followed.

Cumulative Impacts

This section presents an analysis of the cumulative effects of the HEU in combination with other past, present, and reasonably foreseeable future development that could cause cumulatively significant impacts. Significant cumulative impacts related to cultural resources could occur if the incremental impacts of the HEU combined with the incremental impacts of cumulative development would be significant, and if the HEU's contribution would be considerable. Cumulative development projections for 2040 are included in the project description and described in Section 4.0.3, *Cumulative Impacts*.

Impact CR-4: Implementation of the HEU, in combination with past, present and reasonably foreseeable projects, would result in a significant cumulative impact with respect to historic architectural resources (*Significant and Unavoidable Impact, with Mitigation*), and less than significant cumulative impacts for archaeological resources and human remains (*Less than Significant Impact, with Mitigation*).

This section presents an analysis of the cumulative effects of the HEU in combination with other past, present, and reasonably foreseeable future projects that could cause cumulatively considerable impacts. Significant cumulative impacts related to cultural resources could occur if the incremental impacts of the HEU combined with the incremental impacts of one or more of the cumulative projects or cumulative development projections included in the project description and described in Section 4.0.3, *Cumulative Impacts*.

The geographic context for the analysis of cumulative architectural historic resources, archaeological resources, and human remains impacts is cumulative development in the City of Menlo Park.

Historic Architectural Resources

Future development under the HEU as well as other development within the City of Menlo Park could potentially impact architectural historic resources. The cumulative effect of this future development is the continued loss of significant architectural historic resources. Potential future development increases the likelihood that additional architectural historic resources could be lost, so it is therefore possible that cumulative development could result in the demolition or destruction of significant architectural historic resources. The loss of these resources would result in a significant impact, and impacts associated with the HEU would be considered cumulatively considerable, resulting in a **significant impact**.

Implementation of General Plan policies LU-7 and OSC 3.6 and Mitigation Measures CR-1a through CR-1c, which would require previously unevaluated historic-era resources be evaluated, character-defining features of historic resources be identified, and documentation of those significant historic resources that would be altered or demolished, would reduce the severity of impacts associated with the HEU, but they would remain significant. As a result, the significant impact would be considered cumulatively considerable and a **significant and unavoidable** cumulative effect.

> **Mitigation Measures:** Implement **Mitigation Measures CR-1a, CR-1b, CR-1c**.
>
> **Significance After Mitigation:** Future housing development under the HEU and cumulative projects could result in the demolition or significant alteration of historical resources, which would constitute a substantial adverse change in the significance of those resources. While the mitigation measures included above would require identification and documentation of the resources, they would not fully mitigate these actions to a less-than-significant level if these resources were permanently lost. Therefore, even with implementation of Measures CR-1a, CR-1b, and CR-1c the impact would be **significant and unavoidable**.

Archaeological Resources and Human Remains

Future development in the City under the HEU and cumulative projects could include excavation and grading that could potentially impact archaeological resources and human remains that may be present. The cumulative effect of this future development is the continued loss of cultural remains. Potential future development increases the likelihood that additional archaeological resources could be uncovered, so it is therefore possible that cumulative development could result in the demolition or destruction of unique archaeological resources, which could contribute to the erosion of the pre-contact record of the City and the wider region. However, implementation of Mitigation Measures CR-2a, CR-2b, and CR-3 would effectively mitigate these effects. These measures would require a SOIS qualified archaeologist to conduct a review of multi-family development projects arising from the HEU that require ground disturbance prior to construction, the cessation of activities in the vicinity of finds, and tribal consultation if indigenous resources are inadvertently identified during project construction.

> **Mitigation Measure:** Implement **Mitigation Measures CR-1a, CR-1b, CR-1c, CR-2a, CR-2b, CR-3.**
>
> **Significance After Mitigation:** Implementation of Mitigation Measures CR-2a, CR-2b, and CR-3 would establish protocol to identify, evaluate, and address any potential impacts to previously unknown archaeological and tribal cultural resources and would establish appropriate protocol to protect cultural resources and human remains if they are inadvertently discovered during project construction. With implementation of these mitigation measures, any cumulative potential impacts to archaeological resources and human remains would be reduced to a **less-than-significant** level.

4.4.5 References

City of Menlo Park. 2014. *City of Menlo Park Housing Element, 2015-2023*. Available online: https://beta.menlopark.org/files/sharedassets/public/community-development/documents/adopted-housing-element-2015-2023_20141202185715361 9.pdf. Accessed February 23, 2022.

City of Menlo Park. 2016a. *City of Menlo Park General Plan*. Available online: https://www.menlopark.org/146/General-Plan. Accessed February 23, 2022.

City of Menlo Park. 2016b. *Draft EIR for ConnectMenlo: General Plan Land Use & Circulation Elements and M-2 Area Zoning Update*. Available online: https://www.menlopark.org/1013/Environmental-Impact-Report. Accessed February 23, 2022.

National Parks Service. *National Register Bulletin: How to Apply the National Register Criteria for Evaluation*. 1997.

4.5 Energy

4.5.1 Introduction

Preparation of the 2016 *ConnectMenlo* EIR predated the inclusion of energy as a topic in Appendix G of the CEQA Guidelines. While some elements of energy use were evaluated in Section 4.14, *Utilities and Service Systems*, of that EIR, the issues discussed were considerably different from those now evaluated under the revised Appendix G checklist. Therefore, this section does not evaluate the HEU's impacts against those evaluated in the *ConnectMenlo* EIR, as has been the case for other sections of this SEIR.

Notice of Preparation Comments

The Notice of Preparation (NOP) for the SEIR was circulated on December 23, 2021 and a scoping meeting was held on January 24, 2022. The NOP and the comments received during the public comment period can be found in **Appendix A** of this SEIR. No comments relating to energy were received during the NOP comment period.

Information Sources

The primary sources of information referenced in this section included those listed below. Please note that a full list of references for this topic can be found at the end of this section.

- City of Menlo Park General Plan (2016a).
- *ConnectMenlo* Draft EIR (2016b).
- City of Menlo Park Climate Action Plan (2020).

4.5.2 Environmental Setting

State Energy Profile

In 2019, total energy usage in California was 7,802 trillion British thermal units (Btu) (the most recent year for which these specific data are available), which equates to an average of 198 million Btu per capita per year. These figures place California second among the 50 states in total energy use and 50th in per-capita consumption. Of California's total energy usage, the breakdown by sector is roughly 39.4 percent transportation, 23.1 percent industrial, 18.8 percent commercial, and 18.7 percent residential. Electricity and natural gas in California are generally consumed by stationary users such as residences and commercial and industrial facilities, whereas petroleum-based fuel consumption is generally accounted for by transportation-related energy use (United States Energy Information Administration [USEIA], 2022).

California relies on a regional power system composed of a diverse mix of natural gas, renewable, hydroelectric, coal, and nuclear gas generation resources. Approximately 70 percent of the electrical power needed to meet California's demand is produced in the state; the balance, approximately 30 percent, is imported from the Pacific Northwest and the Southwest. In 2020, California's in-state electricity use was derived from natural gas (48 percent); coal (< 1 percent); large hydroelectric resources (9 percent); nuclear sources (9 percent); renewable resources that

include geothermal, biomass, small hydroelectric resources, wind, and solar (33 percent) (CEC, 2022a). **Table 4.5-1** summarizes the statewide and regional usage.

TABLE 4.5-1
EXISTING ANNUAL STATE AND REGIONAL ENERGY USE

Source	Amount
Electricity (State/PG&E)[a]	279,510 GWh / 78,519 GWh
Natural Gas (State/PG&E)[a]	1,232,858,394 MMBtu / 450,746,500 MMBtu
Gasoline (Statewide/San Mateo County)[b]	12,572 million gallons / 238 million gallons
Diesel (Statewide/ San Mateo County)[b]	3,559 million gallons / 26 million gallons

NOTES:
MMBtu = million British thermal units; MWh = megawatt-hours; PG&E = Pacific Gas and Electric Company.
SOURCES: [a] CEC, 2022b; [b] CEC, 2020a

Electricity

Electricity, as a consumptive utility, is a man-made resource. The production of electricity requires the consumption or conversion of resources—including water, wind, oil, gas, coal, solar, geothermal, and nuclear resources—into useable energy. The delivery of electricity involves several system components for distribution and use. Electricity is distributed through a network of transmission and distribution lines commonly called a power grid.

Energy capacity, or electrical power, is generally measured in watts (W), while energy use is measured in watt-hours. For example, if a light bulb has a capacity rating of 100 W, the energy required to keep the bulb on would be 100 watt-hours. If ten 100 W bulbs were on for 1 hour, the energy required would be 1,000 watt-hours or 1 kilowatt-hour. On a utility scale, the capacity of a generator is typically rated in megawatts (MW), which is 1 million watts, while energy usage is measured in megawatt-hours (MWh) or gigawatt-hours, which is one billion watt-hours.

Residents and businesses in Menlo Park have the option to choose between Pacific Gas & Electric (PG&E) or Peninsula Clean Energy (PCE) as a provider to supply their power. By default, consumers in San Mateo County are enrolled in PCE's "ECOplus" power supply, which is made up of 50-percent renewable power. PCE customers can also choose to opt-up to PCE's "ECO100" which includes 100 percent renewable energy. (City of Menlo Park, 2022a). See **Table 4.5-2,** which summarizes PCE's power mix.

Although PCE procures this power, it is delivered through PG&E's electricity distribution system. Consumers can also opt to keep PG&E as their energy provider, discussed further below. As discussed in the *ConnectMenlo* EIR, Pacific Gas and Electric Company's (PG&E's) electricity distribution system consists of electric distribution lines and interconnected transmission lines. The electricity is generated from various sources including coal-fired power plants, nuclear power plants, hydro-electric dams, wind turbines, and photovoltaic plants. PG&E provides electrical and natural gas services to approximately 16 million people (PG&E, 2022a). PG&E produces and purchases energy from a mix of conventional and renewable generating sources. Approximately 31 percent of PG&E's 2020 electricity purchases were from renewable sources, as shown in

Table 4.5-2 (PG&E, 2022b). Refer to **Table 4.5-1** for a summary of electricity use in the state and PG&E service area.

TABLE 4.5-2
PCE & PG&E POWER CONTENT LABELS

Energy Resources	PCE ECOplus	PCE ECO100	PG&E Base Plan
Eligible Renewables[a]	51.7%	100.0%	30.6%
Biomass & Biowaste	*11.5%*	*0.0%*	*2.6%*
Geothermal	*2.9%*	*0.0%*	*2.6%*
Eligible Hydroelectric	*0.9%*	*0.0%*	*1.2%*
Solar	*29.7%*	*50.0%*	*15.9%*
Wind	*6.7%*	*50.0%*	*8.3%*
Coal	0.0%	0.0%	0.0%
Large Hydroelectric	46.7%	0.0%	10.1%
Natural Gas	0.0%	0.0%	16.4%
Nuclear	1.1%	0.0%	42.8%
Other	0.1%	0.0%	0.0%
Unspecified Power[b]	0.4%	0.0%	0.0%
TOTAL	100.0%	100.0%	100.0%

NOTES:

a The eligible renewable percentage above does not reflect Renewables Portfolio Standard (RPS) compliance, which is determined using a different methodology.
b Unspecified power is electricity that has been purchased through open market transactions and is not traceable to a specific generation source.

SOURCES: CEC, 2020c; CEC, 2020d.

Natural Gas

Natural gas is a combustible mixture of simple hydrocarbon compounds (primarily methane) that is used as a fuel source. Natural gas consumed in California is obtained from naturally occurring reservoirs and delivered through high-pressure transmission pipelines. Natural gas provides almost one-third of California's total energy requirements and is measured in terms of both cubic feet and Btu.

PG&E's natural gas pipe delivery system includes distribution pipelines and transportation pipelines that deliver gas originating from gas fields in California, the U.S. Southwest, the U.S. Rocky Mountains, and Canada to storage facilities, and eventually to individual businesses or residences. PG&E provides natural gas transportation services to "core" customers and to "non-core" customers (industrial, large commercial, and natural gas–fired electric generation facilities) that are connected to its gas system in its service territory. Core customers can purchase natural gas procurement service (natural gas supply) from either PG&E or non-utility third-party gas procurement service providers (referred to as "core transport agents"). When core customers purchase gas supply from a core transport agent, PG&E still provides gas delivery, metering, and billing services to those customers. When PG&E provides both transportation and procurement services, PG&E refers to the combined service as "bundled" natural gas service.

PG&E does not provide procurement service to non-core customers, who must purchase their gas supplies from third-party suppliers. PG&E offers backbone gas transmission, gas delivery (local transmission and distribution), and gas storage services as separate and distinct services to its non-core customers. Access to PG&E's backbone gas transmission system is available for all natural gas marketers and shippers, as well as non-core customers. PG&E also delivers gas to off-system customers (i.e., outside of PG&E's service territory) and to third-party natural gas storage customers. 2020 natural gas usage for the state and the PG&E service region are also shown in Table 4.5-1.

Transportation Energy

In 2021, 11.5 billion gallons of gasoline and 2.6 billion gallons of diesel fuel were consumed in California (CDTFA, 2022a; CDTFA, 2022b). Petroleum-based fuels currently account for more than 85 percent of ground transportation fuel use in California (USEIA, 2021).

The State is now working on developing flexible strategies to reduce petroleum used. Over the last decade, California has implemented several policies, rules, and regulations to improve vehicle efficiency, increase the development and use of alternative fuels, reduce air pollutants and GHG emissions from the transportation sector, and reduce vehicle miles traveled (VMT). Accordingly, total gasoline consumption in California has declined. According to fuel sales data from the California Energy Commission (CEC), fuel consumption in San Mateo County was approximately 238 million gallons of gasoline and 26 million gallons of diesel fuel in 2020 (CEC, 2020a). Refer to Table 4.5-1 for a summary of statewide fossil fuel consumption in 2020.

4.5.3 Regulatory Setting

Federal

Corporate Average Fuel Economy Standards

Established by the U.S. Congress in 1975, the Corporate Average Fuel Economy (CAFE) standards reduce energy consumption by increasing the fuel economy of cars and light trucks. The National Highway Traffic Safety Administration (NHTSA) and U.S. Environmental Protection Agency (USEPA) jointly administer the CAFE standards. Congress has specified that CAFE standards must be set at the "maximum feasible level" with consideration given to (1) technological feasibility; (2) economic practicality; (3) effect of other standards on fuel economy; and (4) the need for the nation to conserve energy.[1]

Fuel-efficiency standards for medium- and heavy-duty trucks have been jointly developed by EPA and NHTSA. The Phase 1 heavy-duty truck standards applied to combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles for model years 2014–2018, and required a reduction in fuel consumption by 6 to 23 percent over the 2010 baseline, depending on the vehicle type (USEPA, 2011). EPA and NHTSA have also adopted the Phase 2 heavy-duty truck standards, which cover model years 2021–2027 and require the phase-in of a 5 to 25 percent

1 For more information on the CAFE standards, refer to https://www.nhtsa.gov/laws-regulations/corporate-average-fuel-economy.

reduction in fuel consumption over the 2017 baseline, depending on the compliance year and vehicle type (USEPA, 2016).

In September 2019, USEPA finalized the Safer Affordable Fuel-Efficient Vehicles Rule Part One: One National Program and announced its decision to withdraw the Clean Air Act preemption waiver granted to the State of California in 2013 (USEPA & NHTSA, 2019). In March, 2022, the USEPA reinstated California's waiver restoring the State's authority to set and enforce more stringent standards than the federal government, including California's greenhouse gas emission standards and zero emission vehicle mandate.[2]

State

Senate Bill 1389

Senate Bill (SB) 1389 (PRC Sections 25300–25323) requires the CEC to prepare a biennial integrated energy policy report that assesses major energy trends and issues facing the electricity, natural gas, and transportation fuel sectors in California, and to provide policy recommendations to conserve resources; protect the environment; ensure reliable, secure, and diverse energy supplies; enhance the state economy; and protect public health and safety (PRC Section 25301(a)).

The 2019 Integrated Energy Policy Report provides the results of CEC assessments on a variety of energy issues facing California:

- Energy efficiency;
- Strategies related to data for improved decisions in the Existing Buildings Energy Efficiency Action Plan;
- Building energy efficiency standards;
- The impact of drought on California's energy system;
- Achieving 50 percent renewables by 2030;
- The California Energy Demand Forecast;
- The Natural Gas Outlook;
- The Transportation Energy Demand Forecast;
- Alternative and Renewable Fuel and Vehicle Technology Program benefits updates;
- An update on electricity infrastructure in Southern California;
- An update on trends in California sources of crude oil;
- An update on California nuclear plants; and

[2] California State Motor Vehicle Pollution Control Standards; Advanced Clean Car Program; Reconsideration of a Previous Withdrawal of a Waiver of Preemption; Notice of Decision, 87 Fed. Reg. 14,332 (Mar. 14, 2022), https://www.federalregister.gov/documents/2022/03/14/2022-05227/california-state-motor-vehicle-pollution-control-standards-advanced-clean-car-program.

- Other energy issues.

Senate Bill 32

In 2016, Governor Jerry Brown signed SB 32 and its companion bill, AB 197. SB 32 and AB 197 amended Health and Safety Code Division 25.5 and established a new climate pollution reduction target of 40 percent below 1990 levels by 2030, with provisions to ensure that the benefits of state climate policies reach into disadvantaged communities. Refer to Section 4.7, *Greenhouse Gas Emissions*, for additional details regarding these statutes.

Senate Bills 1078, 107, and 100, and Executive Order S-14-08

The State of California adopted standards to increase the percentage of electricity that retail sellers, including investor-owned utilities and community choice aggregators, must provide from renewable resources. The standards are referred to as the Renewables Portfolio Standard (RPS). The standards reduce use of non-renewable energy sources, thereby reducing GHG emissions and other negative impacts that are associated with use of non-renewable, finite energy sources. The legislation requires utilities to increase the percentage of electricity obtained from renewable sources to 33 percent by 2020 and 50 percent by 2030.

On September 10, 2018, Governor Brown signed SB 100, which further increased the California RPS and requires retail sellers and local publicly owned electric utilities to procure eligible renewable electricity for 44 percent of retail sales by December 31, 2024; 52 percent by December 31, 2027; and 60 percent by December 31, 2030. SB 100 also specifies that CARB should plan for 100 percent eligible renewable energy resources and zero-carbon resources by December 31, 2045.

CPUC and the CEC jointly implement the RPS program. The responsibilities of the CPUC are to: (1) determine annual procurement targets and enforce compliance; (2) review and approve the renewable energy procurement plan of each investor-owned utility; (3) review contracts for RPS-eligible energy; and (4) establish the standard terms and conditions used in contracts for eligible renewable energy (CPUC, 2022). Refer to Section 4.7, *Greenhouse Gas Emissions*, for additional details regarding this program.

California Building Standards Code (Title 24, Parts 6 and 11)

The California Building Energy Efficiency Standards for Residential and Nonresidential Buildings (California Code of Regulations [CCR] Title 24, Part 6) were adopted to ensure that building construction and system design and installation achieve energy efficiency and preserve outdoor and indoor environmental quality. The current California Building Energy Efficiency Standards (Title 24 standards) are the 2019 Title 24 standards, which became effective on January 1, 2020. These standards include requirements for solar photovoltaic systems in all new homes, requirements for newly constructed healthcare facilities that were previously not included, the encouragement of demand response and light-emitting diode (LED) technology for both residential and nonresidential buildings, and the use of more efficient air filters to trap hazardous particulates (CEC, 2020b).

The current (2019) version of the California Green Building Standards Code (CCR Title 24, Part 11) is commonly referred to as the CALGreen Code. The 2019 CALGreen Code includes mandatory measures for non-residential development related to site development, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality (California Building Standards Commission, 2019). The 2019 Energy Code includes provisions for smart residential photovoltaic systems, updated thermal envelope standards (preventing heat transfer from the interior to exterior and vice versa), residential and nonresidential ventilation requirements, and nonresidential lighting requirements. The 2019 Energy Code aims to reduce energy use in new homes by requiring that all new homes include individual or community solar photovoltaic systems or community shared battery storage systems that achieve equivalent time-dependent value energy use reduction.

On August 11, 2021, the CEC adopted the 2022 Energy Code. In December, it was approved by the California Building Standards Commission for inclusion into the California Building Standards Code. The 2022 Energy Code encourages efficient electric heat pumps, establishes electric-ready requirements for new homes, expands solar photovoltaic and battery storage standards, strengthens ventilation standards, and more. Buildings whose permit applications are applied for on or after January 1, 2023, must comply with the 2022 Energy Code.

Assembly Bill 1493

In 2019, the transportation sector accounted for approximately 40 percent of carbon dioxide equivalent (CO_2e) emissions in California (CARB, 2021a). AB 1493 (commonly referred to as the Pavley regulations), enacted on July 22, 2002, requires CARB to set GHG emissions standards for new passenger vehicles, light-duty trucks, and other vehicles manufactured in and after 2009 whose primary use is non-commercial personal transportation. Phase I of the legislation established standards for model years 2009–2016 and Phase II established standards for model years 2017–2025 (CARB, 2013; USEPA, 2012). Refer to Section 4.7, *Greenhouse Gas Emissions*, for additional details regarding this regulation.

California Air Resources Board Advanced Clean Trucks Program

On June 25, 2020, CARB adopted the Advanced Clean Trucks rule, which requires truck manufacturers to transition from diesel vehicles to electric zero-emission vehicles beginning in 2024, with the goal of reaching 100 percent zero-emission vehicles by 2045. The goal of the legislation is to help California meet its climate targets of a 40 percent reduction in GHG emissions and a 50 percent reduction in petroleum use by 2030, and an 80 percent reduction in GHG emissions by 2050.

Truck manufacturers will be required to sell zero-emission vehicles as an increasing percentage of their annual sales from 2024 through 2035. Companies with large distribution fleets (50 or more trucks) will be required to report information about their existing fleet operations in an effort to identify future strategies for increasing zero-emission fleets statewide (CARB, 2021b).

Zero-emission vehicles are two to five times more energy efficient than diesel vehicles, and the Advanced Clean Trucks rule will reduce GHG emissions with the co-benefit of reducing dependence on petroleum fuels.

California Environmental Quality Act

Under CEQA (PRC Section 21100(b)(3)), EIRs are required to discuss the potential significant energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy. If the analysis of a proposed project shows that the project may result in significant environmental effects due to the wasteful, inefficient, or unnecessary use of energy, or wasteful use of energy resources, then the EIR must identify mitigation measures to address that energy use. This analysis should include the project's energy use for all project phases and components, including transportation-related energy, during construction and operation. In addition to building code compliance, other relevant considerations may include project size, location, orientation, equipment use, and any renewable energy features that could be incorporated into the project (CEQA Guidelines Section 15126.2(b)).

CEQA Guidelines Appendix F lists the energy-related topics that should be analyzed in an EIR, and more specifically identifies the following topics for consideration in the evaluation of energy impacts in an EIR, to the extent the topics are applicable or relevant to the proposed project:

- The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project, including construction, operation, maintenance, and/or removal. If appropriate, the energy intensiveness of materials may be discussed.
- The effects of the project on local and regional energy supplies and on requirements for additional capacity.
- The effects of the project on peak and base-period demands for electricity and other forms of energy.
- The degree to which the project complies with existing energy standards.
- The effects of the project on energy resources.
- The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.[3]

The effects of the project relevant to each of these issues are addressed later in this section of this SEIR.

Regional

Plan Bay Area

The Metropolitan Transportation Commission (MTC) is the federally recognized Metropolitan Planning Organization for the nine-county Bay Area, which includes San Mateo County. On July 18, 2013, *Plan Bay Area* was jointly approved by ABAG's Executive Board and the MTC (MTC & ABAG, 2013). On July 26, 2017, the MTC adopted *Plan Bay Area 2040*, a focused update that builds upon the growth pattern and strategies developed in the original *Plan Bay Area*, but with updated planning assumptions that incorporate key economic, demographic, and financial trends since the original plan was adopted (MTC & ABAG, 2017). Further, in October 2021, MTC and ABAG adopted *Plan Bay Area 2050*, which is now the official long-range plan that addresses

[3] CEQA Guidelines Appendix F(II)(C).

housing, the economy, transportation, and the environment in the Bay Area through the implementation of 35 strategies, including those that address energy use both directly and indirectly through the promotion of greener buildings and use of alternative modes of transportation (MTC & ABAG, 2021).

Local

Menlo Park General Plan

The Menlo Park General Plan is a comprehensive long-range general plan for the physical development of the City of Menlo Park (City of Menlo Park, 2016a). The General Plan contains the current City of Menlo Park Housing Element, which was adopted in 2014 (City of Menlo Park, 2014). The various elements within the General Plan include goals and policies for the physical development of the City. Goals and policies related to energy are listed below.

Goal LU-7: Promote the implementation and maintenance of sustainable development, facilities and services to meet the needs of Menlo Park's residents, businesses, workers, and visitors.

Policy LU-7.9: Green Building. Support sustainability and green building best practices through the orientation, design, and placement of buildings and facilities to optimize their energy efficiency in preparation of State zero-net energy requirements for residential construction in 2020 and commercial construction in 2030.

Goal OSC-2: Provide parks and recreation facilities.

Policy OSC-2.7: Conservation of Resources at City Facilities. Reduce consumption of water, energy, landfilled waste, and fossil fuels in the construction, operations and maintenance of City owned and/or operated facilities.

Goal OSC-4: Promote sustainability and climate action planning.

Policy OSC-4.3: Sustainable Approach to Land Use Planning to Reduce Resource Consumption. Encourage, to the extent feasible, (1) a balance and match between jobs and housing, (2) higher density residential and mixed-use development to be located adjacent to commercial centers and transit corridors, and (3) retail and office areas to be located within walking and biking distance of transit or existing and proposed residential developments.

Policy OSC-4.2: Sustainable Building. Promote and/or establish environmentally sustainable building practices or standards in new development that would conserve water and energy, prevent stormwater pollution, reduce landfilled waste, and reduce fossil fuel consumption from transportation and energy activities.

Policy OSC-4.3: Renewable Energy. Promote the installation of renewable energy technology, such as, on residences and businesses through education, social marketing methods, establishing standards and/or providing incentives.

Policy OSC-4.4: Energy Standards in Residential and Commercial Construction. Encourage projects to achieve a high level of energy conservation exceeding standards set forth in the California Energy Code for Residential and Commercial development.

> ***Policy OSC-4.10: Energy Upgrade California.*** Consider actively marketing and providing additional incentives for residents and businesses to participate in local, State, and/or Federal renewable or energy conservation programs.

Menlo Park Climate Action Plan and Progress Report

As discussed in Section 4.7, *GHG Emissions*, the City Council adopted the Climate Action Plan (CAP) in 2019. The CAP includes strategies to reduce GHG emissions generated within Menlo Park; however, many of the GHG reduction strategies included in the CAP would also support energy conservation within the City. The CAP strategies that are applicable to energy conservation are listed below.

- Explore policy/program options to convert 95 percent of existing buildings to all-electric by 2030.
- Set Citywide goals for increasing electric vehicles to 100 percent of new vehicles by 2025 and decreasing gasoline sales 10 percent a year from a 2018 baseline.
- Expand access to electric vehicle (EV) charging for multifamily and commercial properties.
- Reduce vehicle miles traveled (VMT) by 25 percent or an amount recommended by the Complete Streets Commission.
- Eliminate the use of fossil fuels from municipal operations.

Menlo Park Reach Codes

On September 24, 2019, the Reach Codes Ordinance (Municipal Code Chapter 12.16) was approved by the City Council that includes local amendments to the State Building Code which took effect on January 1, 2020. The Reach Codes include the following requirements for new residential buildings (City of Menlo Park, 2022b):

- Low rise residential buildings (three stories or less) are required to have electric fuel source for space heating, water heating, and clothes dryers; however, stoves may use natural gas if desired. Pre-wiring for electric appliances is required where natural gas appliances are used.
- High rise residential buildings (greater than three stories) are required to be all-electric with some exceptions.
- High rise residential buildings are required to produce a minimum amount of on-site solar based on the square footage of the building.

4.5.4 Environmental Impacts and Mitigation Measures

Scope of Analysis

Preparation of the 2016 *ConnectMenlo* EIR predated the inclusion of energy as a topic in Appendix G of the CEQA Guidelines. While some elements of energy use were evaluated in Section 4.14, *Utilities and Service Systems*, of that EIR, the issues discussed were considerably different from those now evaluated under the revised Appendix G checklist. Therefore, this section does not evaluate the HEU's impacts against those evaluated in the *ConnectMenlo* EIR, as

has been the case for other sections of this SEIR. For purposes of this SEIR, the HEU's effects as measured against the thresholds defined in the Appendix G checklist as described below.

Significance Thresholds

The thresholds used to determine the significance of impacts related to energy are based on Appendix G of the *CEQA Guidelines*. Implementation of the HEU would have a significant impact on the environment if it would:

- Cause wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation;
- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

Methodology and Assumptions

This analysis considers the State CEQA Guidelines Appendix G thresholds, as described above, in determining whether the HEU's implementation would result in the inefficient, wasteful, or unnecessary use of energy. The evaluation is based on a review of regulations and their applicability to the HEU. As discussed earlier, there are several plans and policies at the federal, state and local levels to increase energy conservation and the use of renewable energy. Consistency of the HEU with these regulations would also ensure that the HEU would not result in the inefficient, wasteful, or unnecessary use of energy.

Impacts and Mitigation Measures

Impact EN-1: Implementation of the HEU would not result in wasteful, inefficient, or unnecessary consumption of energy resources during project construction and operation. (*Less than Significant Impact*)

Construction and operation of the housing facilitated by the HEU and rezoning of parcels to allow for greater densities than currently allowed within the City would increase energy consumption within the City, as described below. Future development facilitated by the HEU would be subject to City permitting requirements and may also involve project-level environmental review.

Construction

Energy use during future housing construction would primarily occur in association with fuel use for construction equipment and vehicle operation. Energy use would vary throughout the construction period of projects based on the construction activities being performed and would cease upon the completion of construction. Fuels used for construction would typically include diesel and gasoline; use of natural gas and electricity would be minimal.

Heavy-duty equipment associated with construction during development allowed by the HEU would rely on diesel fuel, as would vendor trucks involved in delivery of materials to the individual construction sites and haul trucks exporting demolition material or other materials off site. Construction workers would travel to and from each of the parcels within each of the development sites throughout the duration of construction. Construction worker trips in light-duty vehicles would primarily be gasoline-powered. All development proposed under the HEU would

be subject to CARB's In-Use Off-Road Diesel Vehicle Regulation that applies to certain off-road diesel engines, vehicles, or equipment greater than 25 horsepower. The regulation (1) imposes limits on idling, requires a written idling policy, and requires a disclosure when selling vehicles; (2) requires all vehicles to be reported to CARB (using the Diesel Off-Road Online Reporting System) and labeled; (3) restricts the adding of older vehicles into fleets starting on January 1, 2014; and (4) requires fleets to reduce their emissions by retiring, replacing, or repowering older engines or installing Verified Diesel Emission Control Strategies (i.e., exhaust retrofits). The fleet must either show that its fleet average index was less than or equal to the calculated fleet average target rate, or that the fleet has met the Best Achievable Control Technology requirements.

Construction activities would use fuel-efficient equipment consistent with federal and state regulations, such as fuel efficiency regulations in CARB's Pavley Phase II standards; the anti-idling regulation in 13 CCR Section 2485; and fuel requirements for stationary equipment in 17 CCR Section 93115 (concerning the Airborne Toxic Control Measures). In accordance with 13 CCR Sections 2485 and 2449, idling by commercial vehicles over 10,000 pounds and off-road equipment over 25 horsepower would be limited to a maximum of five minutes. The intent of these regulations is to reduce construction emissions; however, compliance with the anti-idling and emission reduction regulations discussed above would also result in fuel savings from the more efficient use of equipment.

The diesel and gasoline use for construction activities would be temporary and constitute a small fraction of the regional usage; therefore, the construction energy demand of the HEU would be within the infrastructure service capabilities of regional suppliers and would not require additional local or regional capacity.

Overall, construction activities associated with development allowed by the HEU would not be unusual compared to overall local and regional demand for energy resources and would not involve characteristics that require equipment that would be less energy-efficient than at comparable construction sites in the region or state. Therefore, the HEU would not result in the inefficient, wasteful, or unnecessary consumption of energy during construction. Therefore, impacts would be less than significant, and no mitigation is required.

Operation

Future housing development would require electricity for building operation (e.g., appliances, lighting, air conditioning) and natural gas for various purposes including but not limited to, space heating, water heating and cooking appliances. Prior to development at individual parcel sites, applicants would be required to ensure that proposed development would meet Title 24 requirements applicable at that time, as required by state regulations through their plan review process. Title 24 reduces energy use in residential and commercial buildings through progressive updates to both the Green Building Standards Code (Title 24, Part 11) and the Energy Efficiency Standards (Title 24, Part 6). Title 24 standards are updated periodically (every 3 years). Provisions added to Title 24 over the years include consideration and incorporation of new energy efficiency technologies and methods for building features such as space conditioning, water heating, and lighting, as well as construction waste diversion goals. Additionally, some standards

focus on larger energy-saving concepts such as reducing loads at peak periods and seasons, improving the quality of energy-saving installations, and performing energy system inspections.

Past updates to the Title 24 standards have proven effective in reducing building energy use; the 2013 update to the energy efficiency standards was estimated to reduce energy consumption in residential buildings by 25 percent relative to the 2008 standards (CEC, 2012). The current 2019 Title 24 standards further reduce energy use compared to the 2016 standards, with single-family residential savings of 79 percent for electricity and 9 percent for natural gas. For low-rise multi-family buildings, savings are 79 percent for electricity and 5 percent for natural gas by requiring photovoltaic (PV) systems for new low-rise residential buildings under three stories (CEC, 2018).

As discussed in Section 4.5.3, *Regulatory Setting*, the City of Menlo Park adopted Reach Codes for new residential development that would reduce natural gas use, increase electricity use, and increase on-site solar energy production. Specifically, new low rise residential buildings (three stories or less) are required to have electric fuel for space heating, water heating, and clothes dryers; new high rise residential buildings (four stories and greater) are required to be all electric and produce a minimum amount of on-site solar energy (City of Menlo Park, 2022b). Ultimately, at least in the Bay Area, the move towards all-electrification is also driven by the Bay Area Air Quality Management District's (BAAQMD) updated threshold that stipulates that any new natural gas use in the District constitutes a significant impact that cannot be mitigated. As a result, and as discussed in section 4.7, *Greenhouse Gas Emissions*, subsequent housing development projects proposed under the HEU will implement Mitigation Measure GHG-1a, which states that future development under the HEU shall not be eligible for exceptions from the "all electric" requirement in the City's Reach Codes. This measure would ensure that all future projects proposed for development under the HEU would be consistent with the BAAQMD's updated GHG thresholds.

With respect to vehicle usage, vehicle trips generated by housing development allowed by the HEU would increase the use of transportation fuels, primarily gasoline and diesel. Enhanced fuel economies realized pursuant to federal and state regulatory actions such as increasingly stringent CAFE/Pavley standards for vehicle fuel efficiency, and transition of vehicles to alternative energy sources (e.g., electricity, natural gas, biofuels, hydrogen cells) would decrease future gasoline fuel demands per VMT. Additionally, the location of the many parcels identified for development by the HEU that are proximate to regional and local transit facilities reduces VMT within the region, acting to also reduce regional vehicle energy demands. Therefore, transportation energy consumption would not be considered inefficient, wasteful, or otherwise unnecessary and the HEU would be consistent with regulations to reduce transportation energy use.

Conclusion

Compliance with the regulatory requirements in place and cited above and also discussed under **Impact EN-2,** below, energy use associated with the construction and operation of housing facilitated by the HEU would not be considered unnecessary and wasteful. Therefore, impacts would be **less than significant**.

Though the HEU would not generate a significant impact with respect to energy use, Mitigation Measure AQ-2c, presented in Section 4.2, *Air Quality*, of this SEIR, requires the use of cleaner construction equipment meeting the USEPA's Tier 4 Final standards if subsequent projects proposed as part of the HEU are found to generate construction emissions in excess of BAAQMD's project-level construction thresholds. Newer equipment meeting the Tier 4 Final standards would also be more energy efficient compared to older equipment, which would further reduce energy use during construction.

Mitigation Measure: None required.

Impact EN-2: Implementation of the HEU would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. (*Less than Significant Impact*).

Construction

All development proposed under the HEU would be subject to CARB's In-Use Off-Road Diesel Vehicle Regulation that applies to certain off-road diesel engines, vehicles, or equipment greater than 25 horsepower. The regulation (1) imposes limits on idling, requires a written idling policy, and requires a disclosure when selling vehicles; (2) requires all vehicles to be reported to CARB (using the Diesel Off-Road Online Reporting System) and labeled; (3) restricts the adding of older vehicles into fleets starting on January 1, 2014; and (4) requires fleets to reduce their emissions by retiring, replacing, or repowering older engines or installing Verified Diesel Emission Control Strategies (i.e., exhaust retrofits). The fleet must either show that its fleet average index was less than or equal to the calculated fleet average target rate, or that the fleet has met the Best Achievable Control Technology requirements.

Construction activities would use fuel-efficient equipment consistent with federal and state regulations, such as fuel efficiency regulations in CARB's Pavley Phase II standards; the anti-idling regulation in 13 CCR Section 2485; and fuel requirements for stationary equipment in 17 CCR Section 93115 (concerning the Airborne Toxic Control Measures). In accordance with 13 CCR Sections 2485 and 2449, idling by commercial vehicles over 10,000 pounds and off-road equipment over 25 horsepower would be limited to a maximum of five minutes. The intent of these regulations is to reduce construction emissions; however, compliance with the anti-idling and emission reduction regulations discussed above would also result in fuel savings from the more efficient use of equipment.

Operation

Implementation of development allowed by the HEU would occur between 2023 and 2040. Thus, further energy use reductions beyond the current 2019 standards can be anticipated from future Title 24 code revision cycles, as building permits are issued at future dates corresponding to those code updates. Goals and policies encouraged by the City, including those set forth in the City's General Plan; as well as adherence to the City's Reach Codes also support increased energy conservation in new development, such as that which would occur under the HEU. These requirements would increase onsite energy generation, decrease the amount of energy required for building operation, and ensure that building energy use related to development facilitated by

the HEU would not be inefficient or wasteful and would comply with applicable regulations and energy efficiency goals.

In addition, as part of the RPS program detailed earlier, electric utilities including investor-owned utilities and community choice aggregators are required to increase the percentage of electricity provided from renewable resources. Though the RPS program does not necessarily increase energy efficiency, implementation of this program reduces use of non-renewable energy sources. The legislation requires utilities to increase the percentage of electricity obtained from renewable sources to 33 percent by 2020 and 50 percent by 2030. SB 100 furthered these standards to require electric utilities to procure eligible renewable electricity for 44 percent of retail sales by 2024, 52 percent by 2027, and 60 percent by December 2030. SB 100 also specifies that CARB should plan for 100 percent eligible renewable energy resources and zero-carbon resources by December 31, 2045. CPUC and the CEC jointly implement the RPS program and PG&E and PCE, the electric utility providers to the City of Menlo Park, are required to adhere to these standards and deadlines. As such, housing developed as part of the HEU would be consistent with these regulations.

Conclusion

As development under the HEU would be required to implement the regulatory requirements discussed above, construction and operation of housing facilitated by the HEU would be consistent with all applicable plans, policies and regulations developed to encourage energy conservation and renewable energy use. The impact would be **less than significant.**

Though the HEU would not generate a significant impact with respect to compliance with state or local plans for renewable energy or energy efficiency, future development under the HEU would implement Mitigation Measures GHG-1a and GHG-1b. As discussed in section 4.7, *Greenhouse Gas Emissions,* subsequent housing development projects proposed under the HEU will implement Mitigation Measure GHG-1a, which states that future development under the HEU shall not be eligible for exceptions from the “all electric” requirement in the City’s Reach Codes, and Mitigation Measure GHG-1b, which states that subsequent development under the HEU would be comply with the EV charging requirements in the most recently adopted version of CALGreen Tier 2 at the time the building permit application is filed. These measures ensure that all future projects proposed for development under the HEU would be consistent with the BAAQMD’s updated GHG thresholds and would further reduce use of gasoline and diesel fuels during operation.

Mitigation Measure: None required.

Cumulative Impacts

This section presents an analysis of the cumulative effects of the HEU in combination with other past, present, and reasonably foreseeable future development that could cause cumulatively significant impacts. Significant cumulative impacts related to energy could occur if the incremental impacts of the HEU combined with the incremental impacts of cumulative development would be significant, and if the HEU’s contribution would be considerable.

Cumulative development projections for 2040 are included in the project description and described in Section 4.0.3, *Cumulative Impacts*.

Cumulative impacts of the HEU related to the wasteful, inefficient, or unnecessary consumption of energy during construction and operation and the potential to conflict with or obstruct adopted energy conservation plans or violate energy efficiency standards would be the same as discussed for the project above. Energy consumption effects related to individual projects are localized and would not combine with similar effects in other locations. However, contributed growth in the City of Menlo Park and throughout PG&E and PCE's service areas could contribute to ongoing increases in demand for electricity and natural gas, which are discussed below.

Impact EN-3: Implementation of the HEU, in conjunction with cumulative development in the City, would not result in energy use that would be considered wasteful and unnecessary, or conflict with or obstruct a state or local plan for renewable energy or energy efficiency under cumulative conditions. *(Less than significant)*

The HEU, in conjunction with cumulative development in the City, would increase housing in an already developed area and result in increased energy consumption. Potential impacts to energy resources from future development would be site-specific and would require applications for development permits that would be evaluated on a case-by-case basis. Additionally, any future development would be subject to compliance with all federal, state, and local requirements for energy efficiency, including the California Energy Code Building Energy Efficiency Standards (CCR Title 24, Part 6), the CALGreen Code (CCR Title 24, Part 11), and SB 743. Consequently, future development, including development facilitated by the HEU, would not result in significant environmental impacts from the wasteful, inefficient, or unnecessary consumption of energy resources during construction or operation; and would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Therefore, the cumulative energy impact would be **less than significant.**

Mitigation Measure: None required.

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4.6 Geology and Paleontological Resources

4.6.1 Introduction

This section evaluates the effects of the Housing Element Update (HEU) relative to geology and paleontological resources, focusing on changes to the *ConnectMenlo* EIR (certified in 2016) that may result in new or more severe impacts, and describes any mitigation measures needed to address any such impacts.

Findings of the *ConnectMenlo* Final EIR

Geology impacts of the *ConnectMenlo* project were analyzed in Section 4.5, *Geology, Soils, and Seismicity*, of the *ConnectMenlo* Draft EIR. Paleontological resources impacts were analyzed in Section 4.4, *Cultural Resources*. The Final *ConnectMenlo* EIR determined that the project would have the following impacts with respect to geology and paleontological resources:

- GEO-1: Implementation of the proposed project would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking; seismic-related ground failure, including liquefaction; or landsliding. *(Less than Significant Impact*)

- GEO-2: Implementation of the proposed project would not result in substantial soil erosion or the loss of topsoil. *(Less than Significant Impact*)

- GEO-3: Implementation of the proposed project would not result in a significant impact related to development on unstable geologic units and soils or result in lateral spreading, subsidence, liquefaction, or collapse. *(Less than Significant Impact*)

- GEO-4: Implementation of the proposed project would not create substantial risks to property as a result of its location on expansive soil, as defined by Section 1803.5.3 of the California Building Code. *(Less than Significant Impact*)

- GEO-5: Implementation of the proposed project would have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater. *(Less than Significant Impact*)

- GEO-6: Implementation of the proposed project, in combination with past, present, and reasonably foreseeable projects, would result in less-than-significant cumulative impacts with respect to geology, soils, and seismicity. *(Less than Significant*)

- CULT-3: Implementation of the proposed project would not directly or indirectly affect a unique paleontological resource or site, or unique geologic feature. *(Less than Significant Impact, with Mitigation*)

Notice of Preparation Comments

The Notice of Preparation (NOP) for the SEIR was circulated on December 23, 2021 and a scoping meeting was held on January 24, 2022. The NOP and the comments received during the public comment period can be found in **Appendix A** of this SEIR. Comments relevant to geology

and paleontological resources included concern over the seismic ability of soft-story structures in the event of an earthquake, and the resulting displacement of residents after the failure of such buildings.

Information Sources

The primary sources of information referenced in this section included those listed below. Please note that a full list of references for this topic can be found at the end of this section.

- City of Menlo Park General Plan Open Space/Conservation, Noise and Safety Elements (2013).
- City of Menlo Park General Plan Housing Element (2014).
- City of Menlo Park General Plan (2016a).
- Draft *ConnectMenlo* EIR (2016b).

4.6.2 Environmental Setting

The *ConnectMenlo* EIR (City of Menlo Park, 2016b) described geology and paleontological resources conditions as they existed at the time of the EIR's preparation.

The *ConnectMenlo* EIR noted that no mapped active earthquake faults run within the City limits. Thus, surface fault rupture is not considered a significant hazard within the City. This condition has not changed. Therefore, this topic is not considered further.

The *ConnectMenlo* EIR noted that the City could be subject to seismic shaking and seismic-induced ground failures (e.g., liquefaction, lateral spreading, and landslides). The EIR cited that compliance with the Alquist-Priolo Earthquake Fault Zoning Act of 1972, the Seismic Hazards Mapping Act of 1990, the California Building Code (CBC), and General Plan goals, policies and programs would ensure that structures are built to withstand seismic shaking and seismic-induced ground failures. This finding remains applicable to the HEU, as discussed further below.

The *ConnectMenlo* EIR noted that development projects could be subject to erosion and loss of topsoil. The EIR cited that compliance with existing regulatory requirements, such as implementation of erosion control measures as specified in the City of Menlo Park Engineering Division's Grading and Drainage Control Guidelines, would reduce impacts from erosion and the loss of topsoil. This finding remains applicable to the HEU, as discussed further below.

The *ConnectMenlo* EIR noted that unstable geologic and soil units, and expansive soils are known to be present within the City limits. The EIR cited that compliance with the Seismic Hazards Mapping Act of 1990, the California Building Code (CBC), and General Plan goals, policies and programs would ensure that unstable geologic and soil units and expansive soils are removed or treated, where such units could cause damage to structures. This finding remains applicable to the HEU, as discussed further below.

The *ConnectMenlo* EIR noted that development under the project would not require the use of septic tanks or alternative waste water disposal systems. This condition has not changed and would remain applicable to the HEU. Therefore, this topic is not considered further.

The *ConnectMenlo* EIR noted that although no known fossils or unique paleontological resources or unique geologic features are present within the City limits, geological formations underlying Menlo Park have the potential for containing paleontological resources. In addition, there could be fossils of potential scientific significance that have not yet been found or recorded in paleontological resource databases. The EIR noted that the General Plan includes goals, policies and programs to protect paleontological resources. In addition, the EIR provided a mitigation measure describing the required response in the event that excavation uncovers a paleontological resource, as discussed further below. This finding remains applicable to the HEU, as discussed further below.

Existing Conditions

The discussion below describes the existing and baseline conditions relative to hazards and hazardous materials, based on the information provided in the *ConnectMenlo* EIR (City of Menlo Park 2016). None of the conditions summarized below are known to have changed since the *ConnectMenlo* EIR's certification.

Faults and Seismicity

Faults

The City of Menlo Park, as with the San Francisco Bay area, is susceptible to earthquakes and seismic shaking due to the presence of active faults in the region. The closest and most prominent active fault near the City area is the San Andreas Fault System, located about 2.5 miles west of the southwest boundary of the City limits. Other active earthquake faults in the region include the Monte Vista Fault (about 3 miles to the south), the Hayward Fault (about 13 miles to the northeast, the Calaveras Fault (approximately 19 miles to the east, and the San Gregorio Fault (about 13 miles to the southwest). No mapped active earthquake faults pass within the City limits. Thus, surface fault rupture is not considered a significant hazard within the City limits.

Seismicity and Ground Shaking

The severity of ground shaking depends on several variables such as earthquake magnitude, hypocenter proximity, local geology including the properties of unconsolidated sediments, groundwater conditions, and topographic setting. In general, ground shaking hazards are most pronounced in areas that are underlain by loosely consolidated soil and sediment.

When earthquake faults within the Bay Area's nine-county area were considered, the U.S. Geological Survey (USGS) estimated that the probability of a magnitude (M) 6.7 or greater earthquake over the next 30 years at 62 percent. Individually, the forecasted probability for each individual fault to produce an M 6.7 or greater seismic event over the next 30 years is estimated at 27 percent for the Hayward Fault, 21 percent for the San Andreas Fault, 11 percent for the Calaveras Fault, and ten percent for the San Gregorio Fault. Earthquakes of this magnitude can create ground accelerations severe enough to cause major damage to structures and foundations not designed to resist the forces generated by earthquakes. Underground utility lines are also

susceptible where they lack sufficient flexibility to accommodate the seismic ground motion. In the event of a M 7.9 earthquake on the San Andreas Fault, the seismic forecasts presented on the Association of Bay Area Governments' interactive GIS website [developed by a cooperative working group that included the USGS and the California Geologic Survey (CGS)] suggest that most parts of the City are expected to experience "very strong" shaking, whereas certain foothill areas and areas near the Dumbarton Bridge, which enters the City on the northeast edge, are expected to experience "violent" shaking.

The April 1906 earthquake on the San Andreas Fault, estimated between M 7.7 and 8.3, was the largest seismic event in recent history that affected the City. More recently, the M 6.9 Loma Prieta earthquake of October 1989 on the San Andreas Fault caused significant damage throughout the Bay Area.

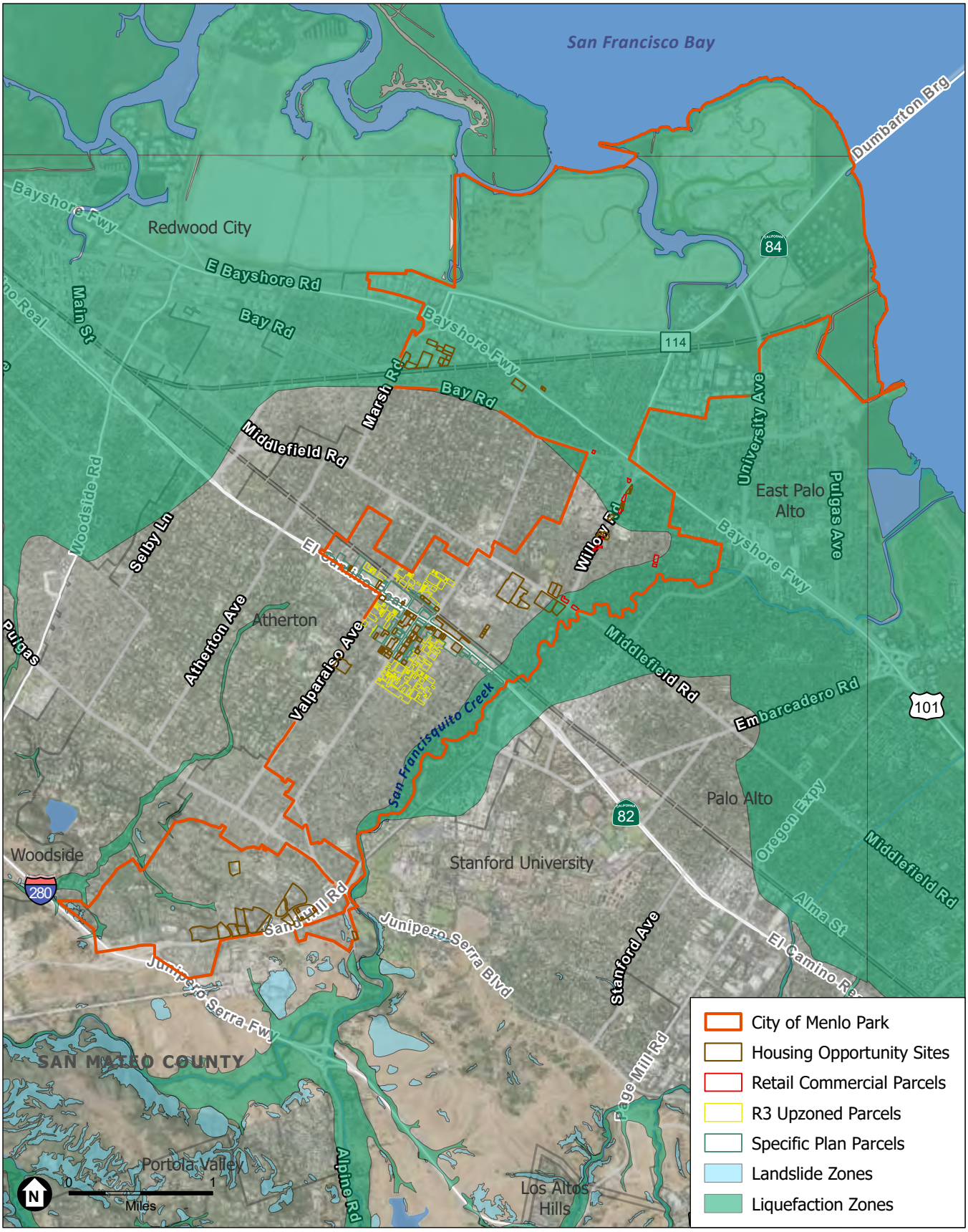
Liquefaction

Liquefaction typically occurs in areas where moist, fine-grained, cohesionless sediment or fill materials are subjected to strong, seismically-induced ground shaking. Under certain circumstances, the ground shaking can temporarily transform an otherwise solid material to a fluid state. Structures in areas that experience liquefaction may subside and suffer major structural damage. Liquefaction is most often triggered by seismic shaking, but it can also be caused by improper grading, landslides, or other factors. In dry soils, seismic shaking may cause soil to consolidate rather than flow, a process known as densification.

Liquefaction potential within the City limits ranges from very low in the southern hill areas to very high in the Baylands area, as shown on **Figure 4.6-1, Landslide and Liquefaction Zones**. Close to San Francisco Bay, in the northeastern most part of the City, the prevailing soil type is known as "Bay Mud," which consists of silty clay, sand, gravel, peat, and shell fragments. These low-lying areas that front the bay are particularly susceptible to liquefaction. According to hazard maps published by the CGS, the northeast part of the City and areas flanking San Francisquito Creek to the northwest, have been designated as liquefaction hazard zones. In the southern parts of the City, the prevailing soil type often consists of alluvium that lies atop the sandstone, chert, shale, and limestone of the Late Jurassic to Early Cretaceous Franciscan Formation. These areas are considered to have a low susceptibility to liquefaction.

Landslides

Landslides are gravity-driven movements of earth materials that may include rock, soil, unconsolidated sediment, or combinations of such materials. The rate of landslide movement can vary considerably. Some move rapidly as in a soil or rock avalanche, while other landslides creep or move slowly for extended periods of time. The susceptibility of a given area to landslides depends on many variables, although the general characteristics that influence landslide hazards are well understood. As shown on Figure 4.6-1, almost all of the mapped areas susceptible to landslides are located southwest and outside of the City limits. The only potential housing opportunity site that includes a small area susceptible to landsliding is located along Sand Hill Road (APN 074270170, located on the north side of the "S" in Sand Hill Road on Figure 4.6-1).



SOURCE: Esri, 2022; CGS, 2021; M-Group, 2022; ESA, 2022

Menlo Park Housing Element Update EIR

Figure 4.6-1
Landslide and Liquefaction Zones

ESA

Land Subsidence

Subsidence hazards are known to be present in the City limits in the Baylands area and adjacent fill areas that occupy the northeastern-most part of the City. Historical subsidence has been attributed to the highly compressible nature of the underlying fill and sediments. Historical groundwater overdraft in the Menlo Park-Palo Alto area, notably from the 1920s through the mid-1960s, has been the cause of settlement in much of the City. From the late 1960s on, imported water from the Hetch Hetchy Aqueduct to the east has all but replaced groundwater as a source of drinking water. Groundwater levels have risen in response, and the subsidence hazards associated with overdraft and hydro-compaction were effectively halted as of 1969.

Expansive Soil

Expansive soils are subject to volume changes from changes in moisture content: swelling with increases in moisture; shrinkage with decreases in moisture. The shrinking and swelling can damage foundations and other infrastructure. Expansive soils are typically very fine-grained with a high to very high percentage of clay. Linear extensibility soil tests are often used to identify expansive soils, wherein soil sample volume/length changes in response to reduced moisture content. The Natural Resource Conservation Service (NRCS) uses linear extensibility to measure expansiveness. The plasticity index is one of the methods used in the CBC to determine if a soil is expansive; a plasticity index (PI) of 15 or higher is considered expansive. This soil behavior has the potential to cause damage to buildings, roads, and other structures.

As discussed in the *ConnectMenlo* EIR, a 1991 NRCS soil survey of San Mateo County provided an overview of the soil types present in the City soils as well as their physical and engineering properties. The study, whose extent embraced the southernmost part of San Mateo County including the City of Menlo Park, broadly identified three major soil associations in the City: 1) the Accelerator-Fagan association soils, typically comprised of deep, well-drained loams or clay loams that are most prevalent in the southern foothills; 2) the Botella complex soils that are generally composed of deep or very deep, well drained clay loams, and predominantly found in the central part of the City; and 3) and Urban Land-Orthents, very deep, poorly drained, texturally heterogeneous soils that have been used for fill in a (proportionally) smaller area along the Baylands edge. The Accelerator-Fagan association soils and Botella complex soils include clays that could be susceptible to expansion.

The NRCS county-wide soil survey notwithstanding, the shrink-swell potential at a given project within the City may often be highly site-specific, requiring careful geotechnical investigation prior to project design and construction. For example, soils on the northeastern Baylands edge, as in the vicinity of the Facebook East and West Campus project, are known to be clay-rich and poorly drained, and are likely to possess high shrink-swell potential. Elsewhere in the City, soil test data in the USDA's Web Soil Survey (a nationwide data repository) shows soil plasticity index values of 10 to 12, suggesting low to moderate shrink-swell potential at those locations.

Paleontological Resources

Paleontological resources, or fossils, are any evidence of past life, including remains, traces, and imprints of once-living organisms preserved in rocks and sediments and provide information

about the history of life on earth dating back billions of years ago. According to the Society of Vertebrate Paleontology (SVP, 2010), significant paleontological resources include fossils of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils. Fossils are nonrenewable paleontological resources that are afforded protection by federal, State, and local environmental laws and regulations. Accordingly, the potential of a particular area to produce a valuable paleontological resource is largely dependent on the geologic age and origin of the underlying rocks. The natural geology of the City is comprised of Pleistocene-age (10,000 to 2.6 million years ago) alluvial fan deposits and Holocene-age (less than 10,000 years ago) levee deposits. These geologic deposits are likely to underlie the artificial fill or disturbed soil located directly under the urbanized and developed areas of the City, which is typical of urbanized areas. A summary of each of the three areas is described below.

Artificial Fill

Artificial fill is an engineered mixture of sand, silt and gravel used to prepare areas for urban development and are sourced from natural geologic deposits, but have been excavated, reworked, and transported to their present location. Artificial fill would not comprise any significant fossil records that could contribute to science or natural history, and would not contain unique or significant paleontological resources.

Holocene Levee Deposits

Holocene levee deposits are loose, moderately to well-sorted sandy or clayey silt that border stream channels, usually both banks, and slope away to flatter flood plains and basins. Holocene-age (less than 10,000 years ago) deposits are considered too young to have fossilized the remains of organisms (fossilization processes take place over millions of years). These alluvial deposits contain vertebrate and invertebrate fossils of extant, modern taxa, which are generally not considered significant paleontological resources. In addition, there is no record of fossils from such young deposits within San Mateo County in the University of California Museum of Paleontology collections database.

Pleistocene Alluvium

Pleistocene alluvium is characterized by sequences of sand, silt, and gravel that form gently sloping surfaces. These deposits originated from modern stream courses, which now deposit their sediment loads closer to the bay and in narrow stream valleys. Stabilized alluvial fan deposits are old enough to have stiffened and preserved the remains of Pleistocene organisms and therefore could have high potential for producing paleontologically significant resources.

The University of California Museum of Paleontology database records show that similar deposits have yielded vertebrate fossils at eight different locations in San Mateo County. These include fossils from a bison, mammoth, camel, horse, sloth and moose, as well as one bird species. The fossils were found in locations along the Pacific coast as well as along Skyline Drive in South San Francisco and along Middlefield Road in the City of Palo Alto, south of Menlo Park. There are no records within the City of Menlo Park. Generally, the presence and extent of paleontological resources beneath the City is not fully unknown, but based on the lack of recorded occurrences, the potential for occurrence is considered low.

4.6.3 Regulatory Setting

The following section focuses on any changes to the regulatory setting that have occurred since certification of the *ConnectMenlo* EIR in 2016. Draft EIR Section 4.5, *Geology, Soils, and Seismicity*, evaluated effects relative to geology, soils, and seismicity. There, Section 4.5.1.1, *Regulatory Framework*, described regulations applicable to this topic, and that description is still current for this SEIR, except as noted below. Draft EIR Section 4.4, *Cultural Resources*, evaluated effects relative to paleontological resources. There, Section 4.4.1.1, *Regulatory Framework*, described regulations applicable to this topic, and that description is still current for this SEIR, except as noted below.

State

California Building Code

The version of the California Building Code cited in the *ConnectMenlo* EIR is 2013. The current version is dated 2019 and is scheduled to be updated again in 2022. However, the updates are not anticipated to substantially affect the analysis of geology and paleontological resources.

CEQA Paleontological Resources Regulations

Paleontological resources are afforded protection by environmental legislation set forth under CEQA. Appendix G of the CEQA Guidelines provides guidance relative to significant impacts on paleontological resources, indicating that a project would have a significant impact on paleontological resources if it would disturb or destroy a unique paleontological resource or site or unique geologic feature. Section 5097.5 of the California Public Resources Code specifies that any unauthorized removal of paleontological remains is a misdemeanor. Further, California Penal Code Section 622.5 sets the penalties for damage or removal of paleontological resources.

Local

Menlo Park General Plan

The Menlo Park General Plan is a comprehensive long-range general plan for the physical development of the City of Menlo Park (City of Menlo Park, 2016a). The General Plan contains the current City of Menlo Park Housing Element, which was adopted in 2014 (City of Menlo Park, 2014) and the current City of Menlo Park Open Space/Conservation, Noise, and Safety Elements, which was adopted in 2013 (City of Menlo Park, 2013). The various elements within the General Plan include goals and policies for the physical development of the City. Goals and policies related to geology, soils, seismicity, and paleontological resources are listed below.

> **Goal LU-7**: Promote the implementation and maintenance of sustainable development, facilities and services to meet the needs of Menlo Park's residents, businesses, workers, and visitors.
>
> > ***Policy LU-7.7***: ***Hazards***. Avoid development in areas with seismic, flood, fire and other hazards to life or property when potential impacts cannot be mitigated.

Goal S-1: ***Assure a Safe Community***. Minimize risk to life and damage to the environment and property from natural and human-caused hazards, and assure community emergency preparedness and a high level of public safety services and facilities.

Policy S-1.1: ***Location of Future Development***. Permit development only in those areas where potential danger to the health, safety and welfare of the residents of the community can be adequately mitigated.

Policy S-1.3: ***Hazard Data and Standards***. Integrate hazard data (geotechnical, flood, fire, etc.) and risk evaluations into the development review process and maintain, develop and adopt up-to-date standards to reduce the level of risk from natural and human-caused hazards for all land use.

Policy S-1.5: ***New Habitable Structures***. Require that all new habitable structures to incorporate adequate hazard mitigation measures to reduce identified risks from natural and human-caused hazards.

Policy S-1.7: ***California Building Standards Code***. Encourage the reduction of seismically vulnerable buildings and buildings susceptible to other hazards through enforcement of the California Building Standards Code and other programs.

Policy S-1.13: ***Geotechnical Studies***. Require site-specific geologic and geotechnical studies for land development or construction in areas of potential land instability as shown on the State and/or local geologic hazard maps or identified through other means.

Policy S-1.14: ***Potential Land Instability***. Prohibit development in areas of potential land instability identified on State and/or local geologic hazard maps, or identified through other means, unless a geologic investigation demonstrates hazards can be mitigated to an acceptable level as defined by the State of California.

Goal OSC-3: **Protect and Enhance Historic Resources**. Protect and enhance cultural and historical resources for their aesthetic, scientific, educational, and cultural values.

Policy OSC-3.3: ***Archaeological or Paleontological Resources Protection***. Protect prehistoric or historic cultural resources either on site or through appropriate documentation as a condition of removal. Require that when a development project has sufficient flexibility, avoidance and preservation of the resource shall be the primary mitigation measure, unless the City identifies superior mitigation. If resources are documented, undertake coordination with descendants and/or stakeholder groups, as warranted.

Policy OSC-3.4: ***Prehistoric or Historic Cultural Resources Found During Construction***. Require that if cultural resources, including archaeological or paleontological resources, are uncovered during grading or other on-site excavation activities, construction shall stop until appropriate mitigation is implemented.

Menlo Park Municipal Code

The City of Menlo Park Municipal Code, organized by title, chapter, and section, contains all ordinances for Menlo Park. Title 12, Buildings and Construction, includes regulations relevant to geology and seismic events in Menlo Park.

Menlo Park Municipal Code Chapter 12.04, Adoption of Codes

Under Chapter 12.04, Adoption of Codes, the City has adopted all parts of the most recent triennial publication of the California Code of Regulations, Title 24 except Part 9, California Fire Code. Together, they are referred to as the building code of the City. In addition, Chapters 12.06 through 12.18 of the City of Menlo Park Municipal Code implement certain amendments to the City's building code.

Menlo Park Land Development Guidelines

The City of Menlo Park Department of Public Works, Engineering Division, has a variety of development-related guidelines that govern new residential and commercial construction, additions to existing buildings, and redevelopment projects. The guidelines prescribe construction-related and post-construction stormwater control and treatment measures (including Best Management Practices [BMPs], underground detention systems, vegetated swales, bioretention basins, and the like) that are intended to reduce stormwater runoff and prevent sediment and pollutants from entering the City's storm drain system and creeks, as well as San Francisco Bay.

The guidelines also set forth submittal requirements for landscaping plans, and grading and drainage plans. Pursuant to the Engineering Division's grading guidelines, grading and drainage plans are required for construction projects where more than 500 square feet of a given lot will be changed from pervious areas to impervious cover (i.e., buildings, paved areas). The guidelines also require the inclusion of site plans showing the existing and proposed improvements, including the proposed storm drain and utility systems, frontage improvements, and irrigation designs. The grading and drainage plans must include erosion and sedimentation control details, and an Impervious Area Worksheet that evaluates changes to pervious and impervious areas.

4.6.4 Environmental Impacts and Mitigation Measures

Scope of Analysis

The analysis in this SEIR describes impacts identified in the 2016 *ConnectMenlo* EIR, and describes how the impacts of the HEU would differ, as applicable.

Significance Thresholds

The thresholds used to determine the significance of impacts related to geology and paleontological resources are based on Appendix G of the *CEQA Guidelines*. Implementation of the HEU would have a significant impact on the environment if it would:

- Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault
  - Strong seismic ground shaking

  - Seismic-related ground failure, including liquefaction
  - Landslides
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in onsite or offsite landslide, lateral spreading, subsidence (i.e., settlement), liquefaction, or collapse;
- Be located on expansive[1] soil creating direct or indirect substantial risks to life or property;
- Have soils incapable of adequately supporting the use of septic tanks or alternative reclaimed water disposal systems where sewers are not available for the disposal of reclaimed water; and
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Issues Not Discussed in Impacts

The HEU would have no impact to the following topics based on its characteristics, its geographical location, and underlying site conditions. Therefore, these topics are not addressed further in this document for the following reasons:

- ***Location on a known active earthquake fault.*** As discussed in Section 4.6.2, *Environmental Setting, Summary of ConnectMenlo EIR*, there are no known active faults within the City of Menlo Park. This condition has not changed. Therefore, this significance criterion is not applicable to the HEU and is not discussed further.
- ***Use of septic tanks or alternative wastewater disposal systems.*** As discussed in Section 4.6.2, *Environmental Setting, Summary of ConnectMenlo EIR*, the City is served by a long-developed sanitary sewer system and development of the HEU housing would not require the use of septic tanks or alternative waste water disposal systems. This condition has not changed. Therefore, this significance criterion is not applicable to the HEU and is not discussed further.

Methodology and Assumptions

This environmental analysis of the potential impacts related to geology and paleontological resources is based on a review of literature and database research, and the Menlo Park planning documents referenced above.

Development in the City, including development allowed by the HEU, is regulated by the various laws, regulations, and policies summarized above in Section 4.6.3, *Regulatory Setting*. Compliance with applicable federal, state, and local laws and regulations is assumed in this analysis and local and state agencies would be expected to continue to enforce applicable requirements to the extent that they do so now. Note that compliance with many of the regulations is a condition of permit approval.

[1] The CBC, based on the International Building Code and the now defunct Uniform Building Code, no longer includes a Table 18-1-B. Instead, Section 1803.5.3 of the CBC describes the criteria for analyzing expansive soils.

A significant impact would occur if, after considering the features described in the Project Description and the required compliance with regulatory requirements, future development allowed by the HEU would create a significant hazard or meet other criteria listed above. For those impacts considered to be significant, mitigation measures are proposed to reduce the identified impacts.

The structural elements of the development allowed by the HEU would undergo appropriate design-level geotechnical evaluations prior to final design and construction. Implementing the regulatory requirements in the CBC and City codes and ensuring that all buildings and structures constructed in compliance with the law is the responsibility of the project engineers and building officials. The geotechnical engineer, as a registered professional with the State of California, is required to comply with the CBC and local codes while applying standard engineering practice and the appropriate standard of care for the particular region in California, which, in the case of the development allowed by the HEU, is the City of Menlo Park.[2] The California Professional Engineers Act (Building and Professions Code Sections 6700-6799), and the Codes of Professional Conduct, as administered by the California Board of Professional Engineers and Land Surveyors, provides the basis for regulating and enforcing engineering practice in California. The local building officials are typically with the local jurisdiction (i.e. the City of Menlo Park) and are responsible for inspections and ensuring CBC and local code compliance prior to approval of the building permit.

Impacts and Mitigation Measures

Impact GEO-1: The project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong ground shaking or seismically induced ground failure, including landslides, liquefaction, and lateral spreading. (*Less than Significant Impact*)

The *ConnectMenlo* EIR determined that the required compliance with numerous existing laws, regulations, and General Plan policies that govern the required geotechnical testing of geotechnical conditions at building sites and the development of geotechnical recommendations to address seismic shaking and seismic-induced ground failures would ensure structures are designed to withstand seismic shaking and seismic-induced ground failures. Accordingly, the EIR determined that implementation of the project would result in *less-than-significant* impacts with respect to the seismic shaking and seismic-induced ground failures. These same findings apply to implementation of the HEU, as discussed below.

Construction

Until constructed, the housing would not be present and would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong ground shaking or seismically induced ground failure, including landslides, liquefaction, and lateral spreading. This impact would be **less than significant**.

[2] A geotechnical engineer (GE) specializes in structural behavior of soil and rocks. GEs conduct soil investigations, determine soil and rock characteristics, provide input to structural engineers, and provide recommendations to address problematic soils.

Operation

As discussed above in Section 4.6.2, *Environmental Setting*, *Seismicity and Ground Shaking*, and as discussed in the *ConnectMenlo* EIR, the City of Menlo Park, as with the San Francisco Bay area, is susceptible to earthquakes, seismic shaking, and seismic-induced ground failures (e.g., landslides, liquefaction, and lateral spreading) due to the presence of active faults in the region. While the development of housing allowed by the HEU would not directly or indirectly cause an earthquake and associated damage, new housing would be subject to the adverse effects of seismic shaking and seismic-induced ground failures.

The *ConnectMenlo* EIR cited that compliance with the Alquist-Priolo Earthquake Fault Zoning Act of 1972, the Seismic Hazards Mapping Act of 1990, the California Building Code (CBC), City building codes, and General Plan goals, policies and programs would ensure that geotechnical investigations are conducted on housing opportunity and land use strategy sites to evaluate site geotechnical conditions and provide recommendations to address soils and geologic units susceptible to seismic-induced ground failures. In addition, compliance with the Seismic Hazards Mapping Act of 1990, the California Building Code (CBC), City building codes, and General Plan goals, policies and programs would ensure that structures are built to withstand seismic shaking and seismic-induced ground failures.

Future development allowed by the HEU, as part of the City's project approval process, would require compliance with the numerous laws and regulations discussed above that govern the construction of housing, which would render this impact **less than significant**.

Mitigation Measure: None required.

Impact GEO-2: The project would not result in substantial soil erosion or the loss of topsoil. (*Less than Significant Impact*)

The *ConnectMenlo* EIR determined that the required compliance with numerous existing laws, regulations, and General Plan policies that govern construction activities and the design of erosion prevention measures would prevent substantial soil erosion or the loss of topsoil. Accordingly, the EIR determined that implementation of the project would result in *less-than-significant* impacts with respect to substantial soil erosion or the loss of topsoil. These same findings apply to implementation of the HEU, as discussed below.

Construction

Construction of housing provided for under the HEU would have the potential to result in soil erosion during excavation, grading, trenching, and soil stockpiling if runon or runoff is not adequately controlled. Because the overall footprint of construction activities for many development projects would exceed one acre and as cited in the *ConnectMenlo* EIR, all projects would be required to comply with the *NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction and Land Disturbance Activities* (Order 2009-0009-DWQ, NPDES No. CAS000002; as amended by Orders 2010-0014-DWQ and 2012-006-DWQ) (Construction General Permit) and the local stormwater ordinances, described above in Section

4.6.3, *Regulatory Setting*. These State and local requirements were developed to ensure that stormwater is managed and erosion is controlled on construction sites. The Construction General Permit requires preparation and implementation of a SWPPP, which requires applications of BMPs to control runon and runoff from construction work sites. The BMPs would include, but would not be limited to, physical barriers to prevent erosion and sedimentation, construction of sedimentation basins, limitations on work periods during storm events, use of infiltration swales, protection of stockpiled materials, and a variety of other measures that would substantially reduce or prevent erosion from occurring during construction. With compliance with existing state and local regulations, impacts associated with soil erosion or loss of topsoil during construction would be **less than significant**.

Operation

The *ConnectMenlo* EIR cited erosion control measures specified in the City of Menlo Park Engineering Division's Grading and Drainage Control Guidelines that would reduce impacts from erosion and the loss of topsoil to the extent practicable. Examples of these erosion control measures that would be incorporated into the design of housing opportunity and land use strategy sites include hydroseeding or short-term biodegradable erosion control blankets; vegetated swales, silt fences, or other inlet protection at storm drain inlets; postconstruction inspection of drainage structures for accumulated sediment; and post-construction clearing of debris and sediment from these structures. In addition, construction of housing would be required to incorporate BMPs from the City's development-related guidelines that prescribe construction-related stormwater control and treatment measures that are intended to reduce stormwater runoff and prevent erosion. Finally, the anticipated residential construction would be concentrated on sites that are already developed and/or underutilized. For this reason, development would be unlikely to result in limited soil erosion or loss of topsoil.

Future development of the housing opportunity and land use strategy sites, as part of the City's project approval process, would require compliance with the above-summarized laws and regulations that govern the construction and operation of housing, which would render this impact **less than significant**.

Mitigation Measure: None required.

Impact GEO-3: The project would not be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in onsite or offsite landslide, lateral spreading, subsidence (i.e., settlement), liquefaction, or collapse. (*Less than Significant Impact*)

The *ConnectMenlo* EIR determined that the required compliance with numerous existing laws, regulations, and General Plan policies that govern the required geotechnical testing of geotechnical conditions at building sites and the development of geotechnical recommendations to address unstable geologic and soils units and ensure that unstable geologic and soil units are either removed, treated, or designed to address unstable geologic and soils units. Accordingly, the EIR determined that implementation of the project would result in *less-than-significant* impacts

with respect to the unstable geologic and soils units. These same findings apply to implementation of the HEU, as discussed below.

Construction

Until constructed, housing to be constructed as provided for under the HEU would not be susceptible to damage from unstable geologic or soils units. This impact would be **less than significant**.

Operation

As discussed above in Section 4.6.2, *Environmental Setting, Landslides*, one of the housing inventory sites along Sand Hill Road has a portion of the site mapped as susceptible to landslides. As discussed in the *ConnectMenlo* EIR, and above under Impact GEO-1, the design of housing would be required to comply with the requirements of the California Building Code (CBC), City building codes, and General Plan goals, policies and programs that would require conducting a geotechnical investigation to identify geotechnical issues, such as a landslide-susceptible area, and provide recommendations to address such conditions. The recommendations could include removal of the landslide, stabilization of the landslide-susceptible area, or placement of the housing in an area away from the landslide-susceptible area. Future development of housing opportunity and land use strategy sites provided for under the HEU, as part of the City's project approval process, would require compliance with the above-summarized laws and regulations that govern the construction of housing, which would render this impact **less than significant**.

As discussed above in Section 4.6.2, *Environmental Setting, Land Subsidence*, and discussed in the *ConnectMenlo* EIR, subsidence and settlement has not occurred in the City limits since 1969. The construction and operation of housing would not include the extraction of groundwater or oil, two potential causes of land subsidence or collapse. Therefore, the construction and operation of housing under the HEU would not cause subsidence or settlement and this impact would be **less than significant**.

Mitigation Measure: None required.

Impact GEO-4: The project would not be located on expansive soil creating direct or indirect substantial risks to life or property. (*Less than Significant Impact*)

The *ConnectMenlo* EIR determined that the required compliance with numerous existing laws, regulations, and General Plan policies that govern the required geotechnical testing of geotechnical conditions at building sites and the development of geotechnical recommendations to address expansive soils would ensure that expansive soils are either removed or treated to avoid potential damage from expansive soils. Accordingly, the EIR determined that implementation of the project would result in *less-than-significant* impacts with respect to the expansive soils. These same findings apply to implementation of the HEU, as discussed below.

Construction and Operation

As discussed above in Section 4.6.2, *Environmental Setting, Expansive Soil*, and discussed in the *ConnectMenlo* EIR, expansive soils may be present on any of the housing opportunity and land use strategy sites that provided for under the HEU. As discussed in the *ConnectMenlo* EIR, and above under Impact GEO-1, the design of housing would be required to comply with the requirements of the California Building Code (CBC), City building codes, and General Plan goals, policies and programs that would require conducting a geotechnical investigation to identify geotechnical issues, such as expansive soils, and provide recommendations to address such conditions, such as removal or treatment of the expansive soil. Future development of housing opportunity and land use strategy sites, as part of the City's project approval process, would require compliance with the above-summarized laws and regulations that govern the construction of housing, which would render this impact **less than significant**.

Impact GEO-5: The project would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. (*Less than Significant Impact, with Mitigation*)

As discussed above in Section 4.6.2, *Environmental Setting, Paleontological Resources*, and discussed in the *ConnectMenlo* EIR, no known fossils or unique paleontological resources or unique geologic features are known within the City limits. However, the Pleistocene alluvium geological formation that underlies portions of Menlo Park has the potential for containing paleontological resources. It is possible that ground-disturbing construction could reach significant depths below the ground surface and damage or destroy paleontological resources.

The existing Housing Element, which would be updated and adopted as part of the HEU, and the Open Space/Conservation Element contain General Plan goals, policies, and programs that would require local planning and development decisions to consider impacts to paleontological resources, as summarized in the *ConnectMenlo* EIR Section 4.4, *Cultural Resources, Regulatory Framework*, and the above Section 4.6.3, *Regulatory Setting, Local*. The relevant federal, State, and local laws and General Plan goals and policies would serve to minimize potential adverse impacts on paleontological resources.

Compliance with existing federal, State, and local laws and regulations, and the aforementioned General Plan policies listed above would protect unrecorded paleontological resources within the City limits by providing for the early detection of potential conflicts between development and resource protection, and by preventing or minimizing the material impairment of the ability of paleontological resources to convey their significance through excavation or preservation. However, where future development requires substantial excavation that could reach significant depths below the ground surface where no such excavation has previously occurred, unrecorded fossils of potential scientific significance could exist. Should this type of construction occur under the housing projects provided for under the HEU, damage to, or destruction of, unknown paleontological resources could result and impacts could be **potentially significant**.

The *ConnectMenlo* EIR prescribed Mitigation Measure CULT-3 to address this impact. These same requirements apply to the development of housing under the HEU, but the measure has been renumbered to conform to subsequent changes in CEQA Guidelines Appendix G that moved discussion of this topic from cultural resources to geology and paleontological resources. Accordingly, to reduce the impact to less than significant, the project applicants for housing opportunity and land use strategy sites that disturb previously undisturbed soil and geologic units shall implement **Mitigation Measure GEO-5, Discovery of Paleontological Resources**, as described below.

> **Mitigation Measure GEO-5, Discovery of Paleontological Resources**: In the event that fossils or fossil bearing deposits are discovered during ground disturbing activities, excavations within a 50-foot radius of the find shall be temporarily halted or diverted. Ground disturbance work shall cease until a City-approved qualified paleontologist determines whether the resource requires further study. The paleontologist shall document the discovery as needed in accordance with Society of Vertebrate Paleontology standards (Society of Vertebrate Paleontology 2010), evaluate the potential resource, and assess the significance of the find under the criteria set forth in CEQA Guidelines Section 15064.5. The paleontologist shall notify the appropriate agencies to determine procedures that would be followed before construction activities are allowed to resume at the location of the find. If avoidance is not feasible, the paleontologist shall prepare an excavation plan for mitigating the effect of construction activities on the discovery. The excavation plan shall be submitted to the City of Menlo Park for review and approval prior to implementation, and all construction activity shall adhere to the recommendations in the excavation plan.
>
> **Significance after Mitigation:** Implementation of Mitigation Measure GEO-5 would provide a mechanism to stop work in the event that a paleontological resource is discovered and enable an evaluation of the discovery by a qualified paleontologist. The paleontologist would be qualified to determine the significance of the find, and would prepare and implement an excavation plan to preserve the paleontological resource, if significant. Implementation of this mitigation measure would reduce the significance of the impact to **Less than Significant Impact, with Mitigation.**

Cumulative Impacts

This section presents an analysis of the cumulative effects of the development of housing provided for under the HEU in combination with other past, present, and reasonably foreseeable future projects that could cause cumulatively considerable impacts. Significant cumulative impacts related to geology and paleontological resources could occur if the incremental impacts of the housing provided for under the HEU combined with the incremental impacts of one or more of the cumulative projects or cumulative development projections for 2040 included in the project description and described in Section 4.0.3, *Cumulative Impacts*.

As previously discussed, housing provided for under the HEU would have no impact with respect to fault rupture, septic tanks and alternate wastewater disposal systems, or unique geological resources. Accordingly, implementation of the HEU would not contribute to cumulative impacts related to these topics and they are not discussed further.

The geographic area affected by the housing opportunity and land use strategy sites provided for under the HEU and its potential to contribute to cumulative impacts varies based on the environmental resource under consideration. The geographic scope of analysis for cumulative geologic and paleontological resource impacts encompasses the housing opportunity and land use strategy sites provided for under the HEU and their immediately adjacent areas. This is because impacts relative to geologic hazards are generally site-specific. For example, the effect of erosion would tend to be limited to the localized area of a project and could only be cumulative if erosion occurred as the result of two or more adjacent projects that spatially overlapped.

The timeframe during which housing opportunity and land use strategy sites provided for under the HEU could contribute to cumulative geologic hazards and paleontological resources includes the construction and operations phases. For housing opportunity and land use strategy sites provided for under the HEU, the operations phase is permanent. However, similar to the geographic limitations discussed above, it should be noted that impacts relative to geologic hazards are generally time-specific. Geologic hazards could only be cumulative if two or more geologic hazards occurred at the same time, while also overlapping at the same location.

Impact GEO-6: Implementation of the HEU, when combined with other past, present, or reasonably foreseeable projects, would not contribute considerably to cumulative impacts relative to geology and paleontological resources. ***(Less than Significant, with Mitigation)***

Cumulative Impacts During Construction

Significant cumulative impacts related to geologic hazards or paleontological resources could occur if the incremental impacts of housing opportunity and land use strategy sites provided for under the HEU combined with the incremental impacts of one or more of the cumulative projects to substantially increase risk that people or the environment would be exposed to geologic hazards.

If housing opportunity and land use strategy sites provided for under the HEU and cumulative projects are constructed at the same time, the erosion effects could be cumulatively significant, if stormwater runoff from the sites were not controlled. However, the State Construction General Permit would require each project to prepare and implement a SWPPP. The SWPPPs would describe BMPs to control runoff and prevent erosion for each project. Through compliance with this requirement, the potential for erosion impacts would be reduced. The Construction General Permit has been developed to address cumulative conditions arising from construction throughout the state, and is intended to maintain cumulative effects of projects subject to this requirement below levels that would be considered significant. For example, two adjacent construction sites would be required to implement BMPs to reduce and control the release of sediment and/or other pollutants in any runoff leaving their respective sites. The runoff water from both sites would be required to achieve the same action levels, measured as a maximum amount of sediment or pollutant allowed per unit volume of runoff water. Thus, even if the runoff waters were to combine after leaving the sites, the sediments and/or pollutants in the combined runoff would still be at concentrations (amount of sediment or pollutants per volume of runoff water) below action levels and would not be cumulatively considerable (**less than significant**).

Until constructed, housing opportunity and land use strategy sites provided for under the HEU and cumulative projects would not be present and would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong ground shaking or seismically induced ground failure (i.e., landslides, liquefaction, and lateral spreading), unstable geologic units, or expansive soils. This impact would not be cumulatively considerable (**less than significant)**.

If housing opportunity and land use strategy sites provided for under the HEU and cumulative projects are constructed at the same time, each could encounter, damage, and destroy paleontological resources, and impacts could be **potentially significant**. However, as with the HEU housing opportunity and land use strategy sites, cumulative projects would also be required to implement mitigation similar to Mitigation Measure GEO-5, *Discovery of Paleontological Resources*, described above under Impact GEO-5, and the impact would not be cumulatively considerable (**less than significant**).

> **Mitigation:** See **Mitigation Measure GEO-5, Discovery of Paleontological Resources**, described above under Impact GEO-5.
>
> **Significance after Mitigation:** Implementation of Mitigation Measure GEO-5 would provide a mechanism to stop work in the event that a paleontological resource is discovered and enable an evaluation of the discovery by a qualified paleontologist. The paleontologist would be qualified to determine the significance of the find, and would prepare and implement an excavation plan to preserve the paleontological resource, if significant. Implementation of this mitigation measure would reduce the significance of the impact to **Less than Significant Impact, with Mitigation**, and the impact would not be cumulatively considerable.

Cumulative Impacts During Operations

Seismically induced groundshaking, liquefaction and lateral spreading, and expansive soils could cause structural damage to housing opportunity and land use strategy sites provided for under the HEU and cumulative projects. State and local building regulations and standards, described in the Section 4.6.3, *Regulatory Setting*, have been established to address and reduce the potential for such impacts to occur. The housing opportunity and land use strategy sites provided for under the HEU and cumulative projects would be required to comply with applicable provisions of these laws and regulations. Through compliance with these requirements, the potential for impacts would be reduced or prevented. As explained in the Regulatory Setting, the purpose of the CBC and local ordinances is to regulate and control the design, construction, quality of materials, use/occupancy, location, and maintenance of all buildings and structures within its jurisdiction; by design, it is intended to reduce the cumulative risks from buildings and structures. Therefore, based on compliance with these requirements, the incremental impacts of housing opportunity and land use strategy sites provided for under the HEU combined with impacts of other cumulative projects in the area would not cause a significant cumulative impact related to seismic-induced groundshaking, liquefaction and lateral spreading, or expansive soils and the contribution of housing opportunity and land use strategy sites provided for under the HEU to cumulative effects would not be cumulatively considerable (**less than significant)**.

Mitigation: None required.

4.6.5 References

City of Menlo Park. 2013. *City of Menlo Park General Plan Open Space/Conservation, Noise and Safety Elements*. Adopted May 21.

City of Menlo Park. 2016a. *City of Menlo Park General Plan*. Available online: https://www.menlopark.org/146/General-Plan. Accessed February 23, 2022.

City of Menlo Park. 2016b. *Draft EIR for ConnectMenlo: General Plan Land Use & Circulation Elements and M-2 Area Zoning Update*. June 1.

City of Menlo Park. 2014. *City of Menlo Park Housing Element, 2015-2023*. Adopted April 1.

Society of Vertebrate Paleontology (SVP), 2010. *Standard Procedures for the assessment and mitigation of adverse impacts to paleontological resources*

4.7 GHG Emissions

4.7.1 Introduction

This section evaluates the effects of the Housing Element Update (HEU) on environmental impacts from greenhouse gas (GHG) emissions, focusing on changes to the *ConnectMenlo* EIR (certified in 2016) that may result in new or more severe impacts, and describes any mitigation measures needed to address any such impacts. The section provides a description of the existing conditions relevant to GHG emissions, a summary of regulations, existing plans and policies relevant to GHG emissions associated with implementation of the HEU and an impact discussion evaluating potential impacts to GHG emissions that could result from implementation of the HEU in the context of existing conditions.

Findings of the *ConnectMenlo* Final EIR

GHG impacts of the *ConnectMenlo* project were analyzed in Section 4.6 of the *ConnectMenlo* Draft EIR. The *ConnectMenlo* Final EIR determined that the project would have the following impacts with respect to GHGs:

- GHG-1: The proposed project would result in a substantial increase in greenhouse gas (GHG) emissions from existing conditions by the proposed General Plan horizon year 2040 and would not achieve the 2040 efficiency target, which is based on a trajectory to the 2050 goal of an 80 percent reduction from 1990 levels pursuant to Executive Order (EO) S-03-05. Additional state and federal actions are necessary to ensure that state and federally regulated sources (i.e., sources outside the City's jurisdictional control) take similar aggressive measures to ensure deep cuts needed to achieve the 2050 target. (*Significant and Unavoidable Impact, with Mitigation*)

- GHG-2: While the proposed project supports progress toward the long-term goals identified in EO B-30-15 and EO S-03-05, it cannot yet be demonstrated that Menlo Park will achieve GHG emission reductions that are consistent with a 40 percent reduction below 1990 levels by 2030 or an 80 percent reduction below 1990 levels by the year 2050, based on existing technologies and currently adopted policies and programs. (*Significant and Unavoidable Impact, with Mitigation*)

Notice of Preparation Comments

The Notice of Preparation (NOP) for the SEIR was circulated on December 23, 2021 and a scoping meeting was held on January 24, 2022. The NOP and the comments received during the public comment period can be found in **Appendix A** of this SEIR. There was one comment relevant to GHGs which appreciated the inclusion of climate change in the objectives and technical issues to be studied in the SEIR.

Information Sources

The primary sources of information referenced in this section include those listed below. A complete list of references for this topic can be found at the end of this section.

- City of Menlo Park General Plan (2016a).

- *ConnectMenlo* Draft EIR (2016b).
- California Air Resources Board (CARB) Scoping Plan Update (2017).
- City of Menlo Park Climate Action Plan (2020).
- City of Menlo Park Climate Action Plan Progress Report (2021).
- BAAQMD Justification Report: CEQA Thresholds for Evaluating the Significance of Climate Impacts from land Use Projects (2022).

4.7.2 Environmental Setting

The following section focuses on changes to the environmental setting since the publication of the *ConnectMenlo* EIR. As part of Section 4.6, *Greenhouse Gas Emissions* of the *ConnectMenlo* EIR, Section 4.2.1, *Environmental Setting* included an introduction to the science behind climate change, the various GHGs that contribute to climate change, and the impacts of climate change specifically to California. These topics remain current and applicable to the analysis included in this SEIR. The section below provides updates to the setting information as presented in the *ConnectMenlo* EIR and as applicable to the HEU and includes updated GHG inventories for the U.S., California, San Francisco Bay Area and the City of Menlo Park.

United States GHG Emissions

In 2019, the United States emitted about 6,558 million metric tons (MMT) of CO_2e ($MMTCO_2e$), with 76 percent of those emissions coming from fossil fuel combustion for electricity, heat and transportation. Of the major sectors nationwide, transportation accounts for the highest amount of GHG emissions (approximately 29 percent), followed by electricity (25 percent), industry (23 percent), commercial and residential energy use (13 percent), and agriculture (9 percent). Between 1990 and 2017, total GHG emissions rose by 1.8 percent, but emissions have generally decreased since peaking in 2007 (United States Environmental Protection Agency [USEPA], 2021).

California GHG Emissions Inventory

The California Air Resources Board (CARB) compiles GHG inventories for the state. Based on the 2019 GHG inventory data (i.e., the latest year for which data are available from CARB), emissions from GHG emitting activities statewide were 418.1 $MMTCO_2e$ (CARB, 2021a). Between 1990 and 2021, the population of California grew by approximately 10 million from 29.6 to 39.5 million (California Department of Finance [CDF], 2022a). This represents an increase of approximately 34 percent from 1990 population levels. In addition, the California economy, measured as gross state product, grew from $773 billion in 1990 to $3.14 trillion in 2019, representing an increase of approximately 306 percent (more than three times the 1990 gross state product) in today's dollars (CDF, 2022b).

Despite the population and economic growth, CARB's 2019 statewide inventory indicated that California's net GHG emissions in 2019 were 13 $MMTCO_2e$ below 1990 levels, which is the 2020 GHG reduction target codified in California Health and Safety Code Division 25.5, also

known as the Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32). **Table 4.7-1** identifies and quantifies statewide anthropogenic GHG emissions and sinks (e.g., carbon sequestration due to forest growth) in 1990 and 2019. As shown in the table, the transportation sector is the largest contributor to statewide GHG emissions at approximately 39.7 percent in 2019.

TABLE 4.7-1
CALIFORNIA GHG EMISSIONS INVENTORY

Category	Total 1990 Emissions Using IPCC SAR ($MMTCO_2e$)	Percent of Total 1990 Emissions	Total 2019 Emissions Using IPCC AR4 ($MMTCO_2e$)	Percent of Total 2019 Emissions
Transportation	150.7	35%	166.1	40%
Electric Power	110.6	26%	58.8	14%
Commercial & Residential Fuel Use	44.1	10%	43.8	11%
Industrial	103.0	24%	88.2	21%
Recycling and Waste[a]	—	—	8.9	2%
High GWP/Non-Specified[b]	1.3	<1%	20.6	5%
Agriculture/Forestry	23.6	6%	31.8	8%
Forestry Sinks	-6.7	-2%	—[c]	—
Net Total (IPCC SAR)	**426.6**	**100%**[e]	**—**	**—**
Net Total (IPCC AR4)[d]	**431**	**100%**[e]	**429.4**	**100%**[e]

NOTES:

AR4 = Fourth Assessment Report; GWP = global warming potential; IPCC = Intergovernmental Panel on Climate Change; $MMTCO_2e$ = million metric tons of carbon dioxide equivalents; SAR = Second Assessment Report

a Included in other categories for the 1990 emissions inventory.
b High GWP gases are not specifically called out in the 1990 emissions inventory.
c Revised methods under development (not reported for 2019).
d CARB revised the state's 1990-level GHG emissions using GWPs from the IPCC AR4.
e Total of individual percentages may not add up to 100% due to rounding

SOURCES: CARB, 2007; CARB, 2021a.

Bay Area GHG Emissions

Based on 2015 data, in the nine-county San Francisco Bay Area, GHG emissions from the transportation sector represent the largest source of the Bay Area's GHG emissions at 41 percent, followed by the stationary industrial sources at 26 percent, electricity generation and co-generation at 14 percent, and fuel use (primarily natural gas) by buildings at 10 percent. The remaining 8 percent of emissions is composed of fluorinated gas emissions and emissions from solid waste and agriculture. According to the BAAQMD, of the total transportation emissions in 2015, on-road sources accounted for approximately 87 percent, while off-road sources accounted for the remainder (BAAQMD, 2017).

City of Menlo Park Emissions Inventory

The City completed an inventory of its 2005 communitywide GHG emissions, which serves as its baseline. Citywide GHG emissions in 2005 were estimated to be 349,284 $MTCO_2e$. In 2019,

communitywide emissions in the City of Menlo Park had reduced to 253,371 $MTCO_2e$, almost 27.5 percent below 2005 emissions (City of Menlo Park, 2021). **Table 4.7-2** presents a sector-by-sector summary of GHG emissions.

TABLE 4.7-2
CITY OF MENLO PARK EMISSIONS BY SECTOR

Sector	GHG Emissions as $MTCO_2e$ per year		
	2005	2019	% of 2019 Total
Transportation	137,618	122,029	48.2
Building Energy Use: Natural Gas	102,305	104,358	41.2
Building Energy Use: Electricity	87,600	20,962	8.3
Solid Waste	21,760	6,022	2.4
Total	349,284	253,371	100.0

NOTES:
$MTCO_2e$ = metric tons of carbon dioxide equivalents
SOURCE: City of Menlo Park, 2021.

Despite recent overall reductions (11.3 percent relative to 2005 baseline), fossil fuel (gasoline and diesel) vehicle travel continues to be the largest source of GHG emissions in Menlo Park. In 2019, transportation related emissions were 122,029 $MTCO_2e$ (48.2 percent of the communitywide total). In 2016, all electricity customers in the City of Menlo Park began being automatically enrolled in Peninsula Clean Energy (PCE) service which resulted in a reduction of 24,689 $MTCO_2e$ in a single year (2016-2017). PCE is a community-controlled, not-for-profit, joint powers agency formed as a Community Choice Aggregation (CCA) program by San Mateo County and its cities and towns. By default, consumers in San Mateo County are enrolled in PCE's "ECOplus" power supply, which provides carbon-free electricity made up of 50 percent renewable power. PCE customers can also choose to opt-up to PCE's "ECO100" which includes carbon-free and 100 percent renewable energy.

In 2019, natural gas use for building energy was the second largest contributor to communitywide emissions (41.2 percent of the communitywide total). The solid waste category reflects emissions related to total community waste sent to landfill reported to California Department of Resources Recycling and Recovery (CalRecycle). In 2019, solid waste related emissions were 6,022 tons (2.38 percent of the communitywide total).

4.7.3 Regulatory Setting

The following section focuses on any changes to the regulatory setting that have occurred since certification of the *ConnectMenlo* EIR. Draft EIR Section 4.6, *Greenhouse Gas Emissions*, evaluated effects to GHGs. There, Section 4.6.1.2, *Regulatory Framework*, described regulations applicable to GHGs, and that description is still current for this SEIR, except as noted below.

Federal

Update to Vehicle Emissions Standards

In August 2018, EPA and the NHTSA proposed maintaining the 2020 corporate average fuel economy (CAFE) and CO_2 standards for model years 2021 through 2026. The estimated CAFE and CO_2 standards for model year 2020 are 43.7 miles per gallon (mpg) and 204 grams of CO_2 per mile for passenger cars and 31.3 mpg and 284 grams of CO_2 per mile for light trucks, projecting an overall industry average of 37 mpg, as compared to 46.7 mpg under the standards issued in 2012. In September 2019, EPA finalized the Safer Affordable Fuel-Efficient Vehicles Rule Part One: One National Program and announced its decision to withdraw the Clean Air Act preemption waiver granted to the State of California in 2013 (USEPA & NHTSA, 2019). In March, 2022, the USEPA reinstated California's waiver restoring the State's authority to set and enforce more stringent standards than the federal government, including California's greenhouse gas emission standards and zero emission vehicle mandate.[1]

State

CEQA Guidelines

The CEQA Guidelines are embodied in the California Code of Regulations (CCR), Title 14, beginning with Section 15000. The current CEQA Guidelines Section 15064.4 states that "a lead agency shall make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate, or estimate the amount of GHG emissions resulting from a project." Section 15064.4 further states:

> *A lead agency should consider the following factors, when determining the significance of impacts from greenhouse gas emissions on the environment:*
>
> *(1) The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;*
>
> *(2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.*
>
> *(3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions (see e.g., section 15183.5(b)).*

The CEQA Guidelines also state that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program (including plans or regulations for the reduction of GHG emissions) that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located (CEQA Guidelines Section 15064(h)(3)).

[1] California State Motor Vehicle Pollution Control Standards; Advanced Clean Car Program; Reconsideration of a Previous Withdrawal of a Waiver of Preemption; Notice of Decision, 87 Fed. Reg. 14,332 (Mar. 14, 2022), https://www.federalregister.gov/documents/2022/03/14/2022-05227/california-state-motor-vehicle-pollution-control-standards-advanced-clean-car-program.

The CEQA Guidelines do not require or recommend a specific analytical method or provide quantitative criteria for determining the significance of GHG emissions, nor do they set a numerical threshold of significance for GHG emissions. Section 15064.7(c) clarifies that "when adopting or using thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence."

When GHG emissions are found to be significant, CEQA Guidelines Section 15126.4(c) includes the following direction on measures to mitigate GHG emissions:

> *Consistent with Section 15126.4(a), lead agencies shall consider feasible means, supported by substantial evidence and subject to monitoring or reporting, of mitigating the significant effects of greenhouse gas emissions. Measures to mitigate the significant effects of greenhouse gas emissions may include, among others:*
>
> *(1) Measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency's decision.*
>
> *(2) Reductions in emissions resulting from a project through implementation of project features, project design, or other measures.*
>
> *(3) Off-site measures, including offsets that are not otherwise required, to mitigate a project's emissions.*
>
> *(4) Measures that sequester greenhouse gases.*
>
> *(5) In the case of the adoption of a plan, such as a general plan, long range development plan, or plans for the reduction of greenhouse gas emissions, mitigation may include the identification of specific measures that may be implemented on a project-by project basis. Mitigation may also include the incorporation of specific measures or policies found in an adopted ordinance or regulation that reduces the cumulative effect of emissions.*

State of California Executive Orders

EO S-1-07 and Update to the Low Carbon Fuel Standard

Executive Order (EO) S-1-07, signed by Governor Schwarzenegger in 2007 established a low carbon fuel standard (LCFS) with a goal to reduce the carbon intensity of transportation fuels sold in California by at least 10 percent by 2020.

In September 2018, CARB extended the LCFS program to 2030, making significant changes to the design and implementation of the program, including a doubling of the carbon intensity reduction to 20 percent by 2030.

EO B-16-12

In March 2012, Governor Brown issued an EO establishing a goal of 1.5 million zero-emission vehicles (ZEVs) on California roads by 2025. In addition to the ZEV goal, EO B-16-12 stipulated that by 2015 all major cities in California would have adequate infrastructure and be "zero-emission vehicle ready"; that by 2020 the state would have established adequate infrastructure to support 1 million ZEVs; that by 2050, virtually all personal transportation in the state will be

based on ZEVs; and that GHG emissions from the transportation sector will be reduced by 80 percent below 1990 levels.

EO B-48-18

On January 26, 2018, Governor Brown issued an EO establishing a goal of 5 million ZEVs on California roads by 2030.

EO B-55-18

On September 10, 2018, Governor Brown signed EO B-55-18, committing California to total, economy-wide carbon neutrality by 2045. EO B-55-18 directs CARB to work with relevant state agencies to develop a framework to implement and accounting to track progress toward this goal. AB 1395 would codify this carbon neutral target.

EO N-79-20

On September 23, 2020, Governor Newsom signed EO N-79-20, which sets new statewide goals for phasing out gasoline-powered cars and trucks in California. EO N-79-20 requires that 100 percent of in-state sales of new passenger cars and trucks are to be zero-emission by 2035; 100 percent of in-state sales of medium- and heavy-duty trucks and busses are to be zero-emission by 2045 where feasible; and 100 percent of off-road vehicles and equipment sales are to be zero-emission by 2035 where feasible.

State of California Policy and Legislation

Senate Bills 1078 and 107

SB 1078 (Chapter 516, Statutes of 2002) required retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010.

Senate Bill 32

In 2016, SB 32 and its companion bill AB 197 amended Health and Safety Code Division 25.5, establishing a new climate pollution reduction target of 40 percent below 1990 levels by 2030, and included provisions to ensure that the benefits of state climate policies reach disadvantaged communities.

Update to the Climate Change Scoping Plan

CARB approved the 2017 Climate Change Scoping Plan Update (2017 Scoping Plan Update) in December 2017. The 2017 Scoping Plan Update outlines the proposed framework of action for achieving the 2030 GHG target of 40 percent reduction in GHG emissions relative to 1990 levels (CARB, 2017). Through a combination of data synthesis and modeling, CARB determined that the target statewide 2030 emissions limit is 260 $MMTCO_2e$, and that further commitments will need to be made to achieve an additional reduction of 50 $MMTCO_2e$ beyond current policies and programs. The cornerstone of the 2017 Scoping Plan Update is an expansion of the cap-and-trade program to meet the aggressive 2030 GHG emissions goal and ensure achievement of the 2030 limit set forth by EO B-30-15.

In the 2017 Scoping Plan Update, CARB recommends statewide targets of no more than 6 $MTCO_2e$ per capita by 2030 and no more than 2 $MTCO_2e$ per capita by 2050. CARB acknowledges that because the statewide per-capita targets are based on the statewide GHG emissions inventory that includes all emissions sectors in the state, it is appropriate for local jurisdictions to derive evidence-based local per-capita goals based on local emissions sectors and growth projections.

To demonstrate how a local jurisdiction can achieve its long-term GHG goals at the community plan level, CARB recommends developing a geographically specific GHG reduction plan (i.e., climate action plan) consistent with the requirements of CEQA Section 15183.5(b). A so-called "CEQA-qualified" GHG reduction plan, once adopted, can provide local governments with a streamlining tool for project-level environmental review of GHG emissions, provided there are adequate performance metrics for determining project consistency with the plan. Absent conformity with such a plan, CARB recommends "that projects incorporate design features and GHG reduction measures, to the degree feasible, to minimize GHG emissions. Achieving no net additional increase in GHG emissions, resulting in no contribution to GHG impacts, is an appropriate overall objective for new development." While acknowledging that recent land use development projects in California have demonstrated the feasibility to achieve zero net additional GHG emissions (e.g., Newhall Ranch Resource Management and Development Plan), the 2017 Scoping Plan Update states that:

> *Achieving net zero increases in GHG emissions, resulting in no contribution to GHG impacts, may not be feasible or appropriate for every project, however, and the inability of a project to mitigate its GHG emissions to net zero does not imply the project results in a substantial contribution to the cumulatively significant environmental impact of climate change under CEQA. Lead agencies have the discretion to develop evidence-based numeric thresholds (mass emissions, per capita, or per service population) consistent with this Scoping Plan, the State's long-term GHG goals, and climate change science…To the degree a project relies on GHG mitigation measures, CARB recommends that lead agencies prioritize on-site design features that reduce emissions, especially from VMT [vehicle miles traveled], and direct investments in GHG reductions within the project's region that contribute potential air quality, health, and economic co-benefits locally.*

Cap-and-Trade Program

Initially authorized by the California Global Warming Solutions Act of 2006 (AB 32), and extended through the year 2030 with the passage of AB 398 (2017), the California Cap-and-Trade Program is a core strategy that the state is using to meet its GHG reduction targets for 2020 and 2030, and ultimately achieve an 80 percent reduction from 1990 levels by 2050. CARB designed and adopted the California Cap-and-Trade Program to reduce GHG emissions from "covered entities"[2] (e.g., electricity generation, petroleum refining, cement production, and large industrial facilities that emit more than 25,000 $MTCO_2e$ per year), setting a firm cap on statewide GHG emissions and employing market mechanisms to achieve reductions.[3] Under the Cap-and-Trade Program, an

2 "Covered entity" means an entity in California that has one or more of the processes or operations and has a compliance obligation as specified in Subarticle 7 of the Cap-and-Trade Regulation; and that has emitted, produced, imported, manufactured, or delivered in 2008 or any subsequent year more than the applicable threshold level specified in section 95812(a) of the Regulation.

3 17 CCR 95800–96023.

overall limit is established for GHG emissions from capped sectors. The statewide cap for GHG emissions from the capped sectors commenced in 2013. The cap declines over time. Facilities subject to the cap can trade permits to emit GHGs.[4]

The Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG) address these goals in *Plan Bay Area 2040*, which identifies Priority Development Areas (PDAs) near transit options to reduce the use of on-road vehicles. By focusing and incentivizing future growth in PDAs, *Plan Bay Area 2040* demonstrates how the nine-county Bay Area can reduce per-capita CO_2 emissions by 16 percent by 2035 (MTC, ABAG, 2017). In a March 2018 hearing, CARB approved revised targets: to reduce per-capita emissions 10 percent by 2020 and 19 percent by 2035 (CARB, 2018).

Advanced Clean Cars Program

In January 2012, pursuant to Recommended Measures T-1 and T-4 of the Scoping Plan, CARB approved the Advanced Clean Cars Program, a new emissions-control program for model years 2017 through 2025. In response to a midterm review of the standards in March 2017, CARB directed staff to begin working on post-2025 model year vehicle regulations (Advanced Clean Cars II) to research additional measures to reduce air pollution from light-duty and medium-duty vehicles. Additionally, as described earlier, in September 2020, Governor Newsom signed EO N-79-20 that established a goal that 100 percent of California sales of new passenger car and trucks be zero-emission by 2035 and directed CARB to develop and propose regulations toward this goal. The primary mechanism for achieving these targets for passenger cars and light trucks is the Advanced Clean Cars II Program.

Mobile Source Strategy

In May 2016, CARB released the updated Mobile Source Strategy that demonstrates how the state can simultaneously meet air quality standards, achieve GHG emission reduction targets, decrease health risk from transportation emissions, and reduce petroleum consumption over the next 15 years. The strategy promotes a transition to zero-emission and low-emission vehicles, cleaner transit systems and reduction of vehicle miles traveled (VMT). The Mobile Source Strategy calls for 1.5 million ZEVs (including plug-in hybrid electric, battery-electric, and hydrogen fuel cell vehicles) by 2025 and 4.2 million ZEVs by 2030. The strategy also calls for more-stringent GHG requirements for light-duty vehicles beyond 2025 as well as GHG reductions from medium-duty and heavy-duty vehicles and increased deployment of zero emission trucks primarily for class 3 through 7 “last mile” delivery trucks in California. Statewide, the Mobile Source Strategy would result in a 45 percent reduction in GHG emissions from mobile sources and a 50 percent reduction in the consumption of petroleum-based fuels (CARB, 2016).

Similar to the 2016 Mobile Source Strategy, the 2020 Strategy is a framework that identifies the levels of cleaner technologies necessary to meet the many goals and high-level regulatory concepts that would allow the State to achieve the levels of cleaner technology. The 2020 Strategy will inform the development of other planning efforts including the State

4 See generally 17 CCR 95811 and 95812.

Implementation Plan (SIP) which will translate the concepts included into concrete measures and commitments for specific levels of emissions reductions, the 2022 Climate Change Scoping Plan (2022 Scoping Plan Update), and Community Emissions Reduction Plans (CERPs) required for communities selected as a part of CARB's Community Air Protection Program. Central to all of these planning efforts, and CARB actions on mobile sources going forward, will be environmental justice as CARB strives to address longstanding environmental and health inequities from elevated levels of toxics, criteria pollutants, and secondary impacts of climate change (CARB, 2021b). The 2020 Mobile Source Strategy illustrates that an aggressive deployment of ZEVs will be needed for the State to meet federal air quality requirements and the State's climate change targets.

Senate Bill 743

In 2013, Governor Brown signed SB 743, which added Public Resources Code Section 21099 to CEQA. SB 743 changed the way that transportation impacts are analyzed in Transit Priority Areas (TPAs) under CEQA, better aligning local environmental review with statewide objectives to reduce GHG emissions, encourage infill mixed-use development in designated priority development areas, reduce regional sprawl development, and reduce VMT in California.

As required under SB 743, OPR developed potential metrics to measure transportation impacts that may include, but are not limited to, VMT, VMT per capita, automobile trip generation rates, or automobile trips generated. The new VMT metric is intended to replace the use of automobile delay and level of service as the metric to analyze transportation impacts under CEQA.

In its 2018 *Technical Advisory on Evaluating Transportation Impacts in CEQA*, OPR recommends different thresholds of significance for projects depending on land use types (OPR, 2018). For example, residential and office space projects must demonstrate a VMT level that is 15 percent less than that of existing development to determine whether the mobile-source GHG emissions associated with the project are consistent with statewide GHG reduction targets. With respect to retail land uses, any net increase of VMT may be sufficient to indicate a significant transportation impact.

Senate Bill 350

SB 350, the Clean Energy and Pollution Reduction Act of 2015 (Chapter 547, Statutes of 2015), was approved by Governor Brown on October 7, 2015. SB 350 increased the standards of the California Renewable Portfolio Standards (RPS) program by requiring that the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources be increased from 33 percent to 50 percent by December 31, 2030. The act requires the State Energy Resources Conservation and Development Commission to establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in existing electricity and natural gas final end uses of retail customers by January 1, 2030.

Senate Bill 100

On September 10, 2018, Governor Brown signed SB 100, establishing that 100 percent of all electricity in California must be obtained from renewable and zero-carbon energy resources by

December 31, 2045. SB 100 also creates new standards for the RPS goals that were established by SB 350 in 2015. Specifically, the law increases the percentage of energy that both investor-owned utilities and publicly owned utilities must obtain from renewable sources from 50 percent to 60 percent by 2030. Incrementally, these energy providers must also have a renewable energy supply of 33 percent by 2020, 44 percent by 2024, and 52 percent by 2027. The updated RPS goals are considered achievable, because many California energy providers are already meeting or exceeding the RPS goals established by SB 350.

Senate Bill 1383 (Short-Lived Climate Pollutants)

SB 1383, enacted in 2016, requires statewide reductions in short-lived climate pollutants across various industry sectors. The climate pollutants covered under SB 1383 include methane, fluorinated gases, and black carbon—all GHGs with a much higher warming impact than CO_2 and with the potential to have detrimental effects on human health. SB 1383 requires CARB to adopt a strategy to reduce methane by 40 percent, hydrofluorocarbon gases by 40 percent, and anthropogenic black carbon by 50 percent below 2013 levels by 2030. The methane emissions reduction goals include a 75 percent reduction in the level of statewide disposal of organic waste from 2014 levels by 2025.

State of California Building Codes

California Building and Energy Efficiency Standards (Title 24)

The California Energy Commission (CEC) first adopted Energy Efficiency Standards for Residential and Nonresidential Buildings (CCR Title 24, Part 6) in 1978 in response to a legislative mandate to reduce energy consumption in the state. Although the standards were not originally intended to reduce GHG emissions, increased energy efficiency and reduced consumption of electricity, natural gas, and other fuels would result in fewer GHG emissions from residential and non-residential buildings subject to the standard. The standards are updated periodically (typically every three years) to allow for the consideration and inclusion of new energy efficiency technologies and methods. The current Title 24, Part 6 standards (2019 standards; CEC, 2018) were made effective on January 1, 2020.

On August 11, 2021, the CEC adopted the 2022 Energy Code and was approved by the California Building Standards Commission for inclusion into the California Building Standards Code (CEC, 2022). The 2022 Energy Code encourages efficient electric heat pumps, establishes electric-ready requirements for new homes, expands solar photovoltaic and battery storage standards, strengthens ventilation standards, and more. Buildings whose permit applications are applied for on or after January 1, 2023, must comply with the 2022 Energy Code. The 2022 Update includes measures that will reduce energy use in single family, multifamily, and nonresidential buildings. These measures will:

1. Affect newly constructed buildings by adding new prescriptive and performance standards for electric heat pumps for space conditioning and water heating, as appropriate for the various climate zones in California;
2. Require photovoltaic (PV) and battery storage systems for newly constructed multifamily and selected nonresidential buildings;

3. Update efficiency measures for lighting, building envelope, HVAC; and
4. Make improvements to reduce the energy loads of certain equipment covered by (i.e., subject to the requirements of) the Energy Code that perform a commercial process that is not related to the occupant needs in the building (such as refrigeration equipment in refrigerated warehouses, or air conditioning for computer equipment in data processing centers).

California Green Buildings Standards Code

Part 11 of the Title 24 Building Energy Efficiency Standards is referred to as the California Green Building Standards Code (CALGreen Code). The CALGreen Code is intended to encourage more sustainable and environmentally friendly building practices, require low-pollution-emitting substances that cause less harm to the environment, conserve natural resources, and promote the use of energy-efficient materials and equipment. CALGreen covers a number of fields, with regulations encompassing energy efficiency, water conservation, sustainable building materials, site design, and air quality.

Since 2011, the CALGreen Code has been mandatory for all new residential and non-residential buildings constructed in the state. Such mandatory measures include energy efficiency, water conservation, material conservation, planning and design, and overall environmental quality. The CALGreen Code is reviewed and updated on a three-year cycle.

The CALGreen Code was most recently updated in 2019 to include new mandatory measures for residential and non-residential uses; the new measures took effect on January 1, 2020 (California Building Standards Commission [CBSC], 2019). The 2019 standards prescribe EV charging requirements for residential and non-residential buildings.

The 2022 CALGreen update simplifies the code and its application in several ways. It offers new voluntary prerequisites for builders to choose from, such as battery storage system controls and heat pump space, and water heating, to encourage building electrification. While the 2019 CALGreen Code only requires provision of EV Capable spaces with no requirement for chargers to be installed at multifamily dwellings, the 2022 CALGreen code mandates chargers (California Housing and Community Development, n.d).

Regional

Bay Area Air Quality Management District

The Bay Area Air Quality Management District (BAAQMD) is the regional government agency that regulates stationary sources of air pollution in the nine San Francisco Bay Area counties. BAAQMD regulates GHG emissions through the following plans, programs, and guidelines.

Clean Air Plan

BAAQMD and other air districts prepare clean air plans in accordance with the federal and state Clean Air Acts. On April 19, 2017, the BAAQMD Board of Directors adopted the 2017 *Clean Air Plan: Spare the Air, Cool the Climate*, an update to the 2010 Clean Air Plan (BAAQMD, 2017). The Clean Air Plan is a comprehensive plan that focuses on the closely related goals of protecting public health and protecting the climate. Consistent with the state's GHG reduction

targets, the plan lays the groundwork for a long-term effort to reduce Bay Area GHG emissions 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050.

BAAQMD Climate Protection Program

BAAQMD established a climate protection program to reduce pollutants that contribute to global climate change and affect air quality in the San Francisco Bay Area Air Basin. The climate protection program includes measures that promote energy efficiency, reduce VMT, and develop alternative sources of energy, all of which assist in reducing GHG emissions and reducing air pollutants that affect the health of residents. BAAQMD also seeks to support current climate protection programs in the region and to stimulate additional efforts through public education and outreach, technical assistance to local governments and other interested parties, and promotion of collaborative efforts among stakeholders.

BAAQMD CEQA Air Quality Guidelines

The BAAQMD CEQA Air Quality Guidelines were prepared to assist in the evaluation of air quality impacts of projects and plans proposed in the Bay Area. The guidelines also include recommended assessment methods for air toxics, odors, and GHG emissions. The 2017 update to the BAAQMD CEQA Guidelines includes significance thresholds for GHG emissions based on the emission reduction goals for 2020 articulated by the California Legislature in AB 32. In April 2022, in response to SB 32 and 2017 Scoping Plan Update targets for 2030 and EO B-15 target for carbon neutrality no later than 2045, the BAAQMD adopted updated CEQA significance thresholds for GHGs (BAAQMD, 2022). For land use development projects, the BAAQMD recommends using the approach endorsed by the California Supreme Court in *Center for Biological Diversity v. Department of Fish & Wildlife* (2015) (62 Cal.4th 204), which evaluates a project based on its effect on California's efforts to meet the State's long-term climate goals. As the Supreme Court held in that case, a project that would be consistent with meeting those goals can be found to have a less-than-significant impact on climate change under CEQA. If a project would contribute its "fair share" of what will be required to achieve those long-term climate goals, then a reviewing agency can find that the impact will not be significant because the project will help to solve the problem of global climate change (62 Cal.4th 220–223). Applying this approach, the BAAQMD recommends that new land use development projects incorporate the BAAQMD-identified design elements to do their "fair share" of implementing the goal of carbon neutrality by 2045 (discussed more under *Significance Thresholds* below).

Alternately, a local government may prepare a qualified GHG reduction strategy that is consistent with AB 32 goals. If a project is consistent with an adopted qualified GHG reduction strategy and general plan that addresses the project's GHG emissions, it can be presumed that the project will not have significant GHG emissions under CEQA (BAAQMD, 2022).

Metropolitan Transportation Commission/Association of Bay Area Governments

Sustainable Communities Strategy—Plan Bay Area

MTC is the federally recognized Metropolitan Planning Organization for the nine-county Bay Area which has adopted Plan Bay Area which includes the region's Sustainable Communities Strategy, as required under SB 375, and the 2040 Regional Transportation Plan. A central GHG reduction strategy of Plan Bay Area is the concentration of future growth in Priority Development

Areas (PDAs) and Transit Priority Areas (TPAs). To be eligible for PDA designation, an area must be within an existing community, near existing or planned fixed transit or served by comparable bus service, and planned for more housing. Many of the proposed HEU housing opportunity sites and land use strategy sites are located within a PDA that is centered in the downtown area around the City's Caltrain station and El Camino Real bus routes. A TPA is an area within 0.5 miles of an existing or planned major transit stop such as a rail transit station, a ferry terminal served by transit, or the intersection of two or more major bus routes (MTC & ABAG, 2013).

On July 26, 2017, MTC adopted *Plan Bay Area 2040*, a focused update that builds upon the growth pattern and strategies developed in the original Plan Bay Area but with updated planning assumptions that incorporate key economic, demographic, and financial trends since the original plan was adopted (MTC & ABAG, 2017).

On October 21, 2021, the MTC and the Executive Board of the ABAG jointly adopted Plan Bay Area 2050 and its related supplemental reports. Plan Bay Area 2050 connects the elements of housing, the economy, transportation and the environment through 35 strategies that will make the Bay Area more equitable for all residents and more resilient in the face of unexpected challenges. In the short-term, the plan's Implementation Plan identifies more than 80 specific actions for MTC, ABAG and partner organizations to take over the next five years to make headway on each of the 35 strategies (MTC & ABAG, 2021). It will be several years before the regional transportation model (and therefore county and local transportation models) are updated to reflect Plan Bay Area 2050; the models currently incorporate data from Plan Bay Area 2040.

Local

Menlo Park General Plan

The Menlo Park General Plan is a comprehensive long-range general plan for the physical development of the City of Menlo Park (City of Menlo Park, 2016a). The General Plan contains the current City of Menlo Park Housing Element, which was adopted in 2014 (City of Menlo Park, 2014). The various elements within the General Plan include goals and policies for the physical development of the City. Goals and policies related to GHGs and climate change are included in the Open Space/Conservation, Noise and Safety elements (City of Menlo Park, 2013) and are listed below.

> **Goal OSC4: Promote sustainability and climate action planning.** Promote a sustainable energy supply and implement the City's Climate Action Plan to reduce greenhouse gas emissions and improve the sustainability of actions by City government, residents, and businesses in Menlo Park. This includes promoting land use patterns that reduce the number and length of motor vehicle trips, and encouraging recycling, reduction and reuse programs.
>
> > ***Policy OSC4.1*: Sustainable Approach to Land Use Planning to Reduce Resource Consumption.** Encourage, to the extent feasible, (1) a balance and match between jobs and housing, (2) higher density residential and mixed-use development to be located adjacent to commercial centers and transit corridors, and (3) retail and office areas to be located within walking and biking distance of transit or existing and proposed residential developments.

***Policy OSC4.2*: Sustainable Building.** Promote and/or establish environmentally sustainable building practices or standards in new development that would conserve water and energy, prevent stormwater pollution, reduce landfilled waste, and reduce fossil fuel consumption from transportation and energy activities.

***Policy OSC4.3*: Renewable Energy.** Promote the installation of renewable energy technology, such as, on residences and businesses through education, social marketing methods, establishing standards and/or providing incentives.

***Policy OSC4.4*: Vehicles Using Alternative Fuel.** Explore the potential for installing infrastructure for vehicles that use alternative fuel, such as electric plug in recharging stations.

***Policy OSC4.5*: Energy Standards in Residential and Commercial Construction.** Encourage projects to achieve a high level of energy conservation exceeding standards set forth in the California Energy Code for Residential and Commercial development.

***Policy OSC4.6*: Waste Reduction Target.** Strive to meet the California State Integrated Waste Management Board per person target of waste generation per person per day through their source reduction, reuse, and recycling programs.

***Policy OSC4.7*: Waste Management Collaboration.** Continue to support and participate in efforts such as the South Bayside Waste Management Authority, which provides waste reduction, recycling, and solid waste programs and solutions.

***Policy OSC4.8*: Waste Diversion.** Develop and implement a zero waste policy, or implement standards, incentives, or other programs that would lead the community towards a zero waste goal.

***Policy OSC4.9*: Climate Action Planning.** Undertake annual review and updates, as needed, to the City's Climate Action Plan (CAP).

***Policy OSC4.10*: Energy Upgrade California.** Consider actively marketing and providing additional incentives for residents and businesses to participate in local, State, and/or Federal renewable or energy conservation programs.

Menlo Park Climate Action Plan and Progress Report

In order to address the significant threat to Menlo Park posed by climate change, the City Council in 2020 adopted the Climate Action Plan (CAP; City of Menlo Park, 2020) with a bold climate goal of zero carbon by 2030. The City aimed to achieve this goal through a 90 percent reduction in CO_2e emissions from 2005 levels, and elimination of the remaining 10 percent of CO_2e through direct carbon removal measures. An inventory of GHG emissions conducted in December 2019 revealed that emissions in Menlo Park reduced from 349,284 $MTCO_2e$ in 2005 to 284,378 $MTCO_2e$ of CO_2e in 2017, a reduction of 19 percent. The plan aimed to reduce community-wide emissions by an additional 71 percent or 249,447 $MTCO_2e$ for a total reduction of 90 percent from 2005 emissions by 2030.

The CAP presents researched strategies that may be implemented over the next few years by the City, its residents, and its businesses, that will help reduce GHG originating in Menlo Park, based on the findings of the City's GHG inventory analysis which is completed annually. The CAP will

be updated yearly as research continues to provide more emissions reduction data and as new technologies arise and economic conditions change.

Prior to the Covid-19 pandemic, the CAP subcommittee had identified three basic options for action: 1) a Bold Plan with 22 actions to be implemented over one year, 2) a Moderate Plan with 76 actions to be implemented over three years and 3) a Go Slow Plan with no specific actions other than to follow evolving state rules.

However, as a result of the pandemic and the City's shift in focus to protecting public health, the CAP approved in 2020 was a pared down plan and included only six of the highest impact actions presented below:

1. Explore policy/program options to convert 95 percent of existing buildings to all-electric by 2030.
2. Set Citywide goals for increasing electric vehicles to 100 percent of new vehicles by 2025 and decreasing gasoline sales 10 percent a year from a 2018 baseline.
3. Expand access to electric vehicle (EV) charging for multifamily and commercial properties.
4. Reduce vehicle miles traveled (VMT) by 25 percent or an amount recommended by the Complete Streets Commission.
5. Eliminate the use of fossil fuels from municipal operations.
6. Develop a climate adaption plan to protect the community from sea level rise and flooding.

The CAP as approved in 2020 falls short of the City's goal of reducing GHG emissions by 249,447 $MTCO_2e$ per year to achieve 90 percent reduction in the City's GHG emissions by 2030 when compared to 2005; the plan only addresses 40 percent of the additional 71 percent or 249,447 $MTCO_2e$ reductions originally envisioned for the plan required to achieve a total reduction of 90 percent from 2005 emissions by 2030. With the implementation of this plan, GHG emissions in the City would be 59 percent below 2005 levels by 2030.

Menlo Park Reach Codes

On September 24, 2019, the Reach Codes Ordinance (Municipal Code Chapter 12.16; City of Menlo Park, 2019) was approved by the City Council that includes local amendments to the State Building Code. As part of the Reach Codes, all new construction would be required to use electricity as the only fuel source for new buildings (no natural gas). This ordinance only applies to newly constructed buildings from the ground up, and does not include additions or remodels. Specifically, it would require:

1. New low rise residential buildings (three stories or less) to have electric fuel source for space heating, water heating and clothes dryers. Stoves may still use natural gas if desired. Pre-wiring for electric appliances is required where natural gas appliances are used.
2. New nonresidential and high-rise residential buildings to be all-electric with some exceptions and produce a minimum amount of on-site solar based on square footage. Exceptions include:
    - Life science buildings may appeal to use natural gas for space heating.

- Public agency owned and operated emergency operations centers (such as fire stations and police stations) may use natural gas.
- Nonresidential kitchens (such as for-profit restaurants and cafeterias) may appeal to use natural gas stoves.
- For all exceptions that are granted, natural gas appliance locations must be electrically pre-wired for future electric appliance installation.

The City's Reach Codes also include solar requirements:

- Less than 10,000 square feet of new building space requires a minimum of three kilowatt photovoltaic system;
- Greater than or equal to 10,000 square feet of new building space requires a minimum of five kilowatt photovoltaic system.

The City's EV charging requirements for residential projects vary depending on the number of units and whether the proposed project is new construction. These requirements are part of the California Green Building Standards Code amendments in Chapter 12.18 of the City's Municipal Code. For new residential buildings with more than two multifamily dwelling units including town-houses, the following are required at the time of construction:

- For each dwelling unit, installation of a listed raceway and wiring to accommodate a 208/240-volt dedicated branch circuit installed in accordance with the California Electric Code;
- Installation of EVSE in 15 percent of the total number of required EV charging spaces associated with the building inclusive of landscape reserve parking, for all types of parking facilities, but in no case less than one; and
- Installation of a branch circuit, wiring and receptacles sized to carry not less than a 40 amp, 240-volt load for EV charging at each structural column of any residential carports.

Calculations for the required number of EV spaces are to be rounded up to the nearest whole number.

Community Zero Waste Plan

Adopted in 2017, the Community Zero Waste Plan (City of Menlo Park, 2017) serves as a guiding policy that outlines strategies for the community to implement measures to significantly reduce waste while reinforcing proper waste disposal practices. Within the plan, zero waste is defined as 90 percent of waste being either recycled or composted. The Community Zero Waste Plan outlines a goal to recycle and/or compost at least 73 percent of waste by 2035. To achieve this goal, the City will need to reduce the amount of landfilled materials generated from an average 5.0 pounds per person per day (as of 2015) to 3.1 pounds per person per day.

Menlo Park residents are served by Recology San Mateo County for solid waste, recycling, and composting services.

4.7.4 Environmental Impacts and Mitigation Measures

Scope of Analysis

The analysis in this SEIR describes impacts identified in the 2016 *ConnectMenlo* EIR, and describes how the impacts of the HEU would differ, as applicable.

GHG emissions and global climate change represent cumulative impacts from human activities and development projects locally, regionally, statewide, nationally, and worldwide. GHG emissions from all of these sources cumulatively contribute to the significant adverse environmental impacts of global climate change. No single project could generate enough GHG emissions to noticeably change the global average temperature; instead, the combination of GHG emissions from past, present, and future projects around the world have contributed and will continue to contribute to global climate change and its associated environmental impacts. There are currently no established thresholds for assessing whether the GHG emissions of a project would be considered a cumulatively considerable contribution to global climate change; however, all reasonable efforts should be made to minimize a project's contribution to global climate change. In addition, while GHG impacts are recognized exclusively as cumulative impacts (California Air Pollution Control Officers Association [CAPCOA], 2008), GHG emissions impacts must also be evaluated on a project-level basis under CEQA. The method for evaluating GHG impacts in this SEIR uses a qualitative consistency determination of the proposed HEU with the BAAQMD's adopted project-level GHG thresholds as discussed below. This evaluation is considered in a cumulative context, and because the analysis of GHG emissions is only relevant in a cumulative context, a project-specific impact assessment is not required.

Significance Thresholds

The thresholds used to determine the significance of impacts related to GHG emissions are based on Appendix G of the *CEQA Guidelines*. Implementation of the HEU could have a significant impact on the environment if it would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

The CEQA Guidelines do not prescribe specific methods for performing an assessment, do not establish specific thresholds of significance, and do not mandate specific mitigation measures. Rather, the CEQA Guidelines emphasize the lead agency's discretion to determine the appropriate methods and thresholds of significance consistent with various factors prescribed by CEQA Guideline 15064.4. The State of California has not adopted emission-based thresholds for GHG emissions under CEQA. The Governor's Office of Planning and Research's Technical Advisory, titled *Discussion Draft CEQA and Climate Change Advisory* (OPR, 2018), states that:

> *[N]either the CEQA statute nor the CEQA Guidelines prescribe thresholds of significance or particular methodologies for perming an impact analysis. This is left to lead agency judgment and discretion, based upon factual data and guidance from*

> *regulatory agencies and other sources where available and applicable. Even in the absence of clearly defined thresholds for GHG emissions, such emissions must be disclosed and mitigated to the extent feasible whenever the lead agency determines that the project contributes to a significant, cumulative climate change impact.*

Furthermore, the advisory document indicates that "in the absence of regulatory standards for GHG emissions or other scientific data to clearly define what constitutes a 'significant impact,' individual lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice." Section 15064.7(c) of the CEQA Guidelines specifies that "when adopting thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies, or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence."

GHG Emissions

As lead agency, the City has discretion to choose thresholds of significance, including thresholds adopted or recommended by other agencies or recommended by experts, such as those recommended by the BAAQMD, provided the lead agency's decision to use such thresholds is supported by substantial evidence (OPR, 2018). The GHG impacts of the HEU are evaluated in this SEIR based on the BAAQMD's updated significance thresholds for GHG emissions adopted in April 2022 as part of its CEQA Guidelines Update. These thresholds address the SB 32 GHG reduction target and the EO B-55-18 carbon neutrality goal by 2045 and represent the most recent and best available science and information about GHG thresholds. The BAAQMD has also published the Justification Report in support of their new GHG thresholds (BAAQMD, 2022).

The recommended plan-level GHG thresholds adopted by the BAAQMD are as follows:

A. Meet State's goals to achieve emissions 40 percent below 1990 levels by 2030, and carbon neutrality by 2045; OR

B. Be consistent with a local GHG Reduction Strategy that meets the criteria under CEQA Guidelines section 15183.5(b).

The recommended project-level GHG thresholds adopted by the BAAQMD are as follows:

A. Projects must include, at a minimum, the following project design elements:

    1. Buildings

        a. The project will not include natural gas appliances or natural gas plumbing (in both residential and non-residential development)

        b. The project will not result in any wasteful, inefficient, or unnecessary electrical usage as determined by the analysis required under CEQA Section 21100(b)(3) and Section 15126.2(b) of the State CEQA Guidelines.

    2. Transportation

        a. Achieve compliance with EV requirements in the most recently adopted version of CALGreen Tier 2;

b. Achieve a reduction in project-generated VMT below the regional average consistent with the current version of the California Climate Change Scoping Plan (currently 15 percent);

OR

Meet a locally adopted Senate Bill 743 VMT target, reflecting the recommendations provided in the Governor's Office of Planning and Research's Technical Advisory on Evaluating Transportation Impacts in CEQA:

i. *Residential projects*: 15 percent below the existing VMT per capita

ii. *Office projects*: 15 percent below the existing VMT per employee

iii. *Retail projects*: no net increase in existing VMT

OR

B. Be consistent with a local GHG Reduction Strategy that meets the criteria under the CEQA Guidelines section 15183.5(b).

The BAAQMD's recommended thresholds of significance have been developed based on typical residential and commercial land use projects and typical long-term communitywide planning documents such as general plans and similar long-range development plans and would be applicable to future projects proposed under the HEU. The BAAQMD's adopted plan-level thresholds consider planning documents to have a less-than-significant climate impact if they demonstrate that GHG emissions from the jurisdiction will decline in accordance with California's GHG reduction targets of 40 percent below 1990 levels by 2030 and carbon neutrality by 2045 with the full implementation of the plan. This BAAQMD threshold reiterates the GHG reduction and carbon neutrality goals adopted by the State but does not provide a mechanism or metrics for plans to evaluate consistency with these goals.

A qualified GHG Reduction Strategy adopted by a local jurisdiction should include the following elements as described in the State CEQA Guidelines Section 15183.5(b)(1):

- Quantify GHG emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;
- Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable;
- Identify and analyze the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area;
- Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;
- Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels; and
- Be adopted in a public process following environmental review.

While the City of Menlo Park has adopted the 2030 Climate Action Plan, most recently amended in April 2021, the plan does not serve as a "qualified" GHG reduction plan to be used for the specific purpose of tiering and streamlining analysis of GHG emissions for subsequent projects that are consistent with the plan per CEQA Guidelines Section 15183.5. As a result, option (B) of the BAAQMD's plan-level thresholds would not be applicable.

Therefore, to ensure consistency with the State's GHG reduction goals, the BAAQMD's project-level thresholds detailed earlier have been used for this analysis. Specifically, option (A) of the project-level thresholds is used as the significance threshold in this SEIR. Applying the BAAQMD's updated project-level thresholds to the HEU analyzed in this SEIR evaluates the capacity for all future projects proposed for development under the HEU to contribute their fair share GHG emission reductions to achieving the State's goals to achieve emissions 40 percent below 1990 levels by 2030 and carbon neutrality by 2045, as stipulated in BAAQMD's adopted plan-level threshold (A). This is the same logic that the BAAQMD uses to determine the significance of project-level GHG emissions. In other words, if all future projects proposed for development under the HEU consume no natural gas (1)(a), avoid wasteful, inefficient, or unnecessary electrical usage (1)(b), comply with EV requirements in CALGreen Tier 2 (2)(a), and achieve the SB 743 target of 15 percent reduction in VMT per capita below the regional average (2)(b), then collectively all projects would have a less-than-significant impact on climate change and would be consistent with the statewide targets for 2030 and 2045, and the HEU itself would have a less-than-significant impact on climate change. The BAAQMD has provided the required substantial evidence for this argument in their justification report (BAAQMD, 2022). To summarize,

> If a project is designed and built to incorporate these design elements, then it will contribute its portion of what is necessary to achieve California's long-term climate goals—its "fair share"—and an agency reviewing the project under CEQA can conclude that the project will not make a cumulatively considerable contribution to global climate change. If the project does not incorporate these design elements, then it should be found to make a significant climate impact because it will hinder California's efforts to address climate change.

In summary, for purposes of this SEIR, a significant GHG impact would be identified if development allowed under the HEU does not incorporate the following performance standards adopted by the BAAQMD:

1. No natural gas to all projects proposed for development under the HEU;
2. Avoid wasteful, inefficient, or unnecessary electrical usage as determined by the analysis required under CEQA Section 21100(b)(3) and Section 15126.2(b) of the State CEQA Guidelines;
3. Compliance with EV requirements in the most recently adopted version of CALGreen Tier 2; and
4. Consistency with the SB 743 target of at least 15 percent reduction in VMT per capita below City-wide average. This amounts to 14.7 miles per resident, which is 85 percent of the 2040 City-wide average of 17.3 miles per resident.

Consistency with Plans, Policies, and Regulations for GHG Reduction

GHG impacts are also evaluated by assessing whether the HEU would conflict with applicable GHG reduction strategies and local actions approved or adopted by CARB, ABAG, and the City. As discussed in the Regulatory Setting, several plans and policies are in place to help the City, the Bay Area and the State reduce GHG emissions consistent with the State's emission reduction targets for 2030 and 2050. The 2017 Scoping Plan Update, ABAG's Plan Bay Area 2040, the City of Menlo Park Climate Action Plan, and City General Plan policies and goals all apply to the HEU and all are intended to reduce GHG emissions to meet the Statewide targets set forth in AB 32, as amended by SB 32. Thus, the significance of the HEU's GHG emissions is evaluated consistent with CEQA Guidelines Section 15064.4(b)(2) by considering whether the HEU would conflict with applicable plans, policies, and regulations adopted for the purpose of reducing GHG emissions, including CARB's 2017 Scoping Plan Update, SB 37 and E-3-05, Plan Bay Area 2040, the City of Menlo Park Climate Action Plan, the CALGreen Code and City Green Building Codes.

Impacts and Mitigation Measures

Impacts

Impact GHG-1: Implementation of the HEU would not generate greenhouse gas emissions, either directly or indirectly, that would have a significant impact on the environment. (*Less than Significant Impact, with Mitigation*)

The *ConnectMenlo* EIR determined that the proposed General Plan Update would result in a substantial increase in GHG emissions from existing conditions by the proposed General Plan horizon year 2040 and would not achieve the 2040 efficiency target, based on a trajectory to the 2050 goal of an 80 percent reduction from 1990 levels pursuant to EO S-03-05. The EIR determined that additional state and federal actions are necessary to ensure that state and federally regulated sources (i.e., sources outside the City's jurisdictional control) take similar aggressive measures to ensure the deep cuts needed to achieve the 2050 target. The *ConnectMenlo* EIR identified Mitigation measure GHG-1 requiring the City to update its Climate Action Plan prior to January 1, 2020 to address the GHG reduction goals and set targets to comply with EO B-30-15 and EO S-03-05 for GHG sectors that the City has direct or indirect jurisdictional control over. The City adopted the 2030 Climate Action Plan in July 2020.

GHG emissions from housing development allowed under the HEU and development of associated infrastructure to support that development would result in both direct and indirect emissions from construction and operational activities. Direct GHG emissions that would be generated during construction include emissions from the combustion of fuel (e.g., gasoline and diesel) in construction equipment and vehicles. Indirect GHG emissions during construction would be generated from electricity used to power any electric construction equipment, lighting at construction sites and for conveyance of water used for dust suppression activities. Upon completion of construction, housing projects would generate direct GHG emissions from area sources (such as landscaping equipment), on-road motor vehicle trips, and natural gas usage in homes. As detailed above, the City's Reach Codes prohibit natural gas in all new construction for space and water heating; however, the code allows certain exceptions for cooking appliances and

fireplaces in residences. Indirect operational GHG emissions would be generated from the increase in electricity use associated with building energy use along with water and wastewater treatment and conveyance.

For the evaluation of GHG impacts, the BAAQMD's updated GHG thresholds address the two main direct sources of GHG emissions in land use development projects: building energy use and motor vehicle trips.

Compliance with No Natural Gas Requirement

As detailed in the Regulatory Setting, the City of Menlo Park has adopted Reach Codes as part of Ordinance 1057. Reach Codes are amendments to the Energy and Green Building Standards Codes to reduce GHG emissions and include requirements beyond those required by the current Energy Code. Reach Codes adopted by the City in September 2019 require new low rise residential buildings (three stories or less) to have electric fuel source for space heating, water heating and clothes dryers. However, it allows cooking appliances to still use natural gas if desired. Pre-wiring for electric appliances is required where natural gas appliances are used. High-rise residential buildings are to be "all-electric" with no natural gas or propane plumbing installed within the building. These Reach Codes go beyond the requirements in the 2022 Update to the Title 24 standards that will go into effect on January 1, 2023. The Title 24 standards establish electric-ready requirements in new homes, but do not explicitly prohibit natural gas. Ultimately, however, the move towards all-electrification is also driven by the BAAQMD's updated threshold that stipulates that any new natural gas use in the District constitutes a significant impact that cannot be mitigated. Since the Reach Codes allow exceptions to the all-electric requirement for cooking appliances and fireplaces in residential buildings, the Reach Codes would not be consistent with this updated BAAQMD GHG threshold, which requires all-electric buildings with no exceptions. Therefore, though future development proposed under the HEU would be subject to the City's Reach Codes, they may not be consistent with the BAAQMD's threshold requirement for all-electric construction. As such, any project proposing natural gas usage (relying on the Reach Code exception) could result in a CEQA finding of a significant unavoidable impact (inconsistency with BAAQMD prohibition), which would therefore require that an EIR be prepared for the project. The City would then be required to establish a finding of overriding considerations to support project approval.

Avoid wasteful, inefficient, or unnecessary electrical usage

As discussed under Impact EN-1 of *Section 4.5, Energy* of this SEIR, development under the HEU would not result in wasteful, inefficient, or unnecessary use of electricity. Compliance with the all-electric requirement in the City's Reach Codes and Tier 2 EV Requirements in CALGreen discussed below would result in an increase in electricity use; however, as these requirements are in place to ensure that development proposed in the City and the region complies with the State's GHG reduction goals, the increase would not be considered wasteful, inefficient or unnecessary. In addition, the City's Reach Codes include requirements for onsite photovoltaic systems which would offset part of this increase. Compliance with Title 24 energy efficiency standards and the inherent location of many of the HEU sites in areas with access to transit would also ensure that electricity usage associated with building energy use and transportation would not be wasteful,

inefficient or unnecessary. Additionally, residents located near transit facilities who own electric cars would be expected to drive them less, thus requiring less electricity to recharge them.

Future housing development proposed as part of the HEU would be served by PCE, a CCA that provides electricity with at least 50 percent and up to 100 percent from renewable resources. Although using a CCA does not affect the amount of electricity used, the purpose of this requirement is to reduce electricity-related GHG emissions, which a CCA would lessen or avoid independent of the amount of electricity consumed.

Compliance with Tier 2 EV Requirements in CALGreen

The 2019 California Green Building Standards Code ("CALGreen", Title 24, Part 11) requires that new construction and major alterations include "EV Capable" parking spaces which have electrical panel capacity, a dedicated branch circuit, and a raceway to the EV parking spot to support future installation of charging stations. All new construction and qualifying additions or alterations must comply with mandatory 2019 CALGreen requirements.

In addition to the mandatory requirements, the 2019 CALGreen Code encourages local jurisdictions to raise the sustainable goals by publishing two "voluntary" tiers of additional requirements, referred to as Tier 1 and Tier 2. Tier 1 adds additional requirements beyond the mandatory measures. Tier 2 further increases the requirements. The CALGreen tiers are only mandatory where local ordinances have specifically adopted them. Tier 2 EV requirements for residential uses include the provision of at least 20 percent of the total parking spaces as "EV Capable."[5]

In October 2021, the CEC approved the 2022 CALGreen Building Standards Code which added to the 2019 CALGreen mandatory requirements. The 2022 CALGreen Code does not change the EV Capable percentages required for voluntary Tier 2 from the 2019 standards, but adds the requirement for chargers to be installed. For example, for multifamily buildings with 20 or more units, the 2022 CALGreen Code Tier 2 requires 15 percent of total parking spaces to have EVCS (Electric Vehicle Charging Stations) (California Housing and Community Development, n.d.).

The EV charging requirements in the City's Reach Codes go beyond mandatory 2019 CALGreen requirements. Multifamily residential buildings with more than two dwelling units are required to have at least one parking space per unit to be Level 2 EV Ready[6] and installation of EVSE in 15 percent of the total number of required EV charging spaces. These requirements in the City's Reach Codes exceed the EV Capable requirements set forth in the 2019 CALGreen Tier 2 standards and are consistent with the 2022 CALGreen Tier 2 standards. However, they may not be consistent with future CALGreen updates. According to the BAAQMD's adopted GHG thresholds, subsequent projects developed under the HEU would be required to show compliance with EV requirements in the version of CALGreen Tier 2 adopted at the time of project review. As discussed earlier, the CALGreen standards will continue to be updated on a triennial basis

5 "EV Capable" refers to a parking space that is linked to a listed electrical panel with sufficient capacity to provide at least 110/120 volts and 20 amperes to the parking space.

6 "Level 2 EV Ready" refers to a parking space served by a complete electrical circuit with 208/240 volt, 40-ampere capacity. The electric circuit would have sufficient capacity to support EV charging in the future when it is linked to the EV Ready space.

with evolving requirements for EV charging. Therefore, compliance with requirements in the City's Reach Codes would not ensure compliance with Tier 2 CALGreen requirements in future updates.

Consistency with SB 743 VMT Reduction Target of 15 percent below the regional average

As detailed earlier, with the adoption of SB 743, the State of California changed the method of traffic analysis required through CEQA for publicly- and privately-initiated projects. SB 743 requires project reviews under CEQA to evaluate the transportation impacts of new developments in terms of VMT, rather than on-road congestion and automobile delay. Based on the City's travel demand forecasting model, the analysis in Section 4.14, *Transportation*, estimates the VMT per resident generated upon complete implementation of the HEU in 2040 to be 13.0 miles per resident. The Citywide average for 2040 is estimated to be 17.3 miles per resident.

Based on these findings, the VMT generated per capita with the implementation of the HEU would be 25 percent below the Citywide average VMT per resident in 2040. Therefore, the HEU would exceed the 15 percent reduction requirement stipulated in the BAAQMD's updated GHG threshold for VMT.

Conclusion

Because the City's Reach Codes allow exceptions to the No Natural Gas standard, and do not ensure compliance with future updates to the CALGreen Tier 2 EV requirements, the HEU would not comply with BAAQMD's updated GHG thresholds, and thus would result in a **potentially significant impact** requiring mitigation. The measures listed below are therefore prescribed to address this impact.

> **Mitigation Measure GHG-1a: Enforce No Natural Gas Requirement.**
>
> Subsequent housing development projects proposed under the HEU shall not be eligible for exceptions from the "all electric" requirement in the City's Reach Codes.
>
> **Mitigation Measure GHG-1b: Enforce EV Charging Requirements in CALGreen Tier 2.**
>
> Subsequent housing development projects proposed under the HEU shall comply with EV charging requirements in the most recently adopted version of CALGreen Tier 2 at the time that a building permit application is filed.
>
> **Significance After Mitigation:** With the implementation of Mitigation Measures GHG-1a and GHG-1b, all future projects proposed for development under the HEU would be consistent with the BAAQMD's updated GHG significance thresholds. Compliance with these thresholds would mean that these projects would not generate GHG emissions either directly or indirectly, that would have a significant impact on the environment. Therefore, this impact is determined to be **less than significant with mitigation**.

Impact GHG-2: Implementation of the HEU would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. (*Less than Significant Impact, with Mitigation*)

The *ConnectMenlo* EIR found the General Plan Update to be consistent with the regional objectives of the *Plan Bay Area* and the City's Climate Action Plan. The policies and programs in the General Plan Update would ensure substantial progress toward the long-term GHG reductions goals for 2050. However, without a plan from CARB at the time to achieve the statewide GHG emissions goals established in EO S-03-05, additional state and federal measures were found to be necessary in addition to the local measures included in the General Plan Update, to achieve the more aggressive targets established for 2050 in EO S-03-05. Therefore, the EIR concluded that while the General Plan Update supports progress toward the long term-goals identified in EO B-30-15 and EO S-03-05, it could not be demonstrated that Menlo Park would achieve GHG emissions reductions consistent with a 40 percent reduction below 1990 levels by 2030 or an 80 percent reduction below 1990 levels by the year 2050 based on existing technologies and adopted policies and programs at the time. Therefore, this impact was found to be significant requiring mitigation. Nonetheless, even with the implementation of Mitigation measure GHG-1 in the EIR, the impact was found to be significant and unavoidable.

Consistency of the HEU with respect to CARB's 2017 Scoping Plan Update, Plan Bay Area 2040, the City's Climate Action Plan, CALGreen codes and the City's Reach Codes is discussed below.

CARB 2017 Scoping Plan Update, SB 32 and EO S-3-05

The 2017 Scoping Plan Update adopted by CARB establishes the framework for achieving the 2030 statewide GHG reduction target of 40 percent below 1990 levels. The 2017 Scoping Plan Update includes local actions that land use development projects and municipalities can implement to support the statewide goal. The 2017 Scoping Plan Update also illustrates in Figure 5 that achieving the 2030 target is consistent with progress toward achieving the 2050 level included in EO S-3-05 and that depending on the success in achieving the 2030 target, it may be possible to achieve the 2050 target earlier than EO S-3-05 (CARB, 2017). The BAAQMD's updated project-level GHG CEQA thresholds are designed to demonstrate consistency with CARB's 2017 Scoping Plan Update and the statewide goal of carbon neutrality by 2045 pursuant to EO B-55-13 for new projects and plans. As described under Impact GHG-1, with the implementation of Mitigation Measures GHG-1a and GHG-1b, the HEU would be consistent with all four design elements included in BAAQMD's updated GHG thresholds. Therefore, implementation of the HEU would also be consistent with the statewide emissions reduction goal for 2030 required by SB 32 and achieved through the 2017 Scoping Plan Update.

The 2017 Scoping Plan Update incorporates a broad array of regulations, policies, and state plans designed to reduce GHG emissions. Those that are applicable to the construction and operation of development under the HEU are listed in **Table 4.7-3**. Actions, plans, and programs that are not under the control or influence of local jurisdictions, such as the Cap-and-Trade program, are not included in the table.

TABLE 4.7-3
CONSISTENCY WITH APPLICABLE GHG REDUCTION ACTIONS IN 2017 SCOPING PLAN UPDATE

Sector / Source	Category / Description	Consistency Analysis
Energy and Water		
California Renewables Portfolio Standard (RPS) and SB 100	SB 100 requires that the proportion of electricity from renewable sources be 60 percent renewable power by 2030 and 100 percent renewable power by 2045.	**Consistent.** Electricity supplied to housing development proposed under the HEU would be provided by Peninsula Clean Energy (PCE) and Pacific Gas and Electric (PG&E). PCE and PG&E are required to comply with SB 100 and the RPS.
California Renewables Portfolio Standard and SB 350	SB 350 requires that the proportion of electricity from renewable sources be 50 percent renewable power by 2030 (superseded by SB 100). It also requires the state to double the energy efficiency savings in existing final end uses of electricity and natural gas by retail customers through energy efficiency and conservation.	**Consistent.** Electricity to development proposed as part of the HEU would be provided through PCE and PG&E. PCE and PG&E are required to comply with both the RPS and SB 350 and will meet these standards. PCE provides clean energy, including from sources such as wind and solar that are 100 percent carbon-free and is on target to provide 100 percent renewable energy by 2025.
California Building Efficiency Standards (CCR, Title 24, Part 6)	Energy Efficiency Standards for Residential and Nonresidential Buildings	**Consistent.** Buildings constructed under the HEU would be designed to comply with the most recent version of Title 24 Building Energy Efficiency Standards at the time of individual project review.
California Green Building Standards Code (CCR, Title 24, Part 11 - CALGreen)	California's Green Building Standards (CALGreen) Code includes energy and water efficiency requirements, as well as waste management and other design regulations that apply to residential and nonresidential buildings.	**Consistent.** Buildings constructed as part of the HEU would comply with mandatory CALGreen requirements. In addition, Mitigation Measure GHG-1b would go beyond mandatory CALGreen measures to require voluntary Tier 2 EV charging requirements for all housing developed under the HEU.
Senate Bill X7-7	The Water Conservation Act of 2009 sets an overall goal of reducing per capita urban water use by 20 percent by December 31, 2020. Each urban retail water supplier shall develop water use targets to meet this goal.	**Consistent.** Menlo Park Municipal Water (MPMW) and California Water Service Company (CWS) provide water to approximately 16,000 residents through 4,000 service connections, and would also supply water to development under the HEU. As the water suppliers to the City, MPMW and CWS are required to comply with SB X7-7 standards. In addition, CALGreen standards include requirements for water efficiency and conservation, which all future projects under the HEU would be required to comply with. Mandatory requirements include prescriptive requirements for flow rate for plumbing fixtures and metering devices.

TABLE 4.7-3 (CONT.)
CONSISTENCY WITH APPLICABLE GHG REDUCTION ACTIONS IN 2017 SCOPING PLAN UPDATE

Sector / Source	Category / Description	Consistency Analysis
Mobile Sources		
Advanced Clean Cars Program (ACC) and Mobile Source Strategy (MSS)	In 2012, CARB adopted the ACC program to reduce criteria pollutants and GHG emissions for model year vehicles 2015 through 2025. ACC requires the reduction of criteria pollutants and GHG emissions from light- and medium-duty vehicles. ACC also includes the ZEV regulation, which requires manufacturers to produce an increasing number of pure ZEVs (meaning battery electric and fuel cell electric vehicles), with provisions to also produce plug-in hybrid electric vehicles (PHEV) in the 2018 through 2025 model years. The Mobile Source Strategy (2016) calls for 1.5 million ZEVs (including plug-in hybrid electric, battery-electric, and hydrogen fuel cell vehicles) on the road by 2025, and 4.2 million ZEVs by 2030.	**Consistent.** These standards would apply to all vehicles used by future residents of housing development proposed under the HEU, and to construction workers traveling to and from the construction sites as required by CALGreen. In addition, Mitigation Measure GHG-1b would go beyond mandatory CALGreen regulatory requirements for EV charging infrastructure to require voluntary Tier 2 requirements for all development allowed under the HEU and would therefore accommodate future EV charging stations.
SB 375	SB 375 establishes mechanisms for the development of regional targets for reducing passenger vehicle GHG emissions. Under SB 375, CARB is required, in consultation with the state's Metropolitan Planning Organizations, to set regional GHG reduction targets for the passenger vehicle and light-duty truck sector for 2020 and 2035. CARB's current targets call for the Bay Area to reduce per-capita vehicular GHG emissions 10 percent by 2020 and 19 percent by 2035 from a 2005 baseline.	**Consistent.** Development under the HEU would be consistent with MTC and ABAG Plan Bay Area 2040 goals and objectives under SB 375 to implement "smart growth." The HEU identifies housing sites in infill locations with access to public transportation. Though some of the sites are better served by transit than others, there would be an overall per-capita decrease in reliance on automobiles with the implementation of the HEU, thereby reducing VMT and associated GHG emissions. Upon full implementation of the HEU in 2040, the residential VMT generated per capita under the HEU is projected to be 75 percent of the Citywide average. The baseline Citywide average is estimated to be 17.3 miles per resident in 2040. Based on the City's *ConnectMenlo* traffic model, the HEU would result in 13.0 miles per resident. This would be less than 14.7 miles per resident, which is 85 percent of the Citywide baseline as required by SB 375.
Solid Waste		
California Integrated Waste Management Act (IWMA) of 1989 and AB 341	IWMA requires all California cities to divert 50-percent of all solid waste from landfill disposal through source reduction, recycling, and composting activities. AB 341 sets a statewide goal for 75 percent disposal reduction by the year 2020.	**Consistent.** Recology San Mateo County is under contract with the City to provide solid waste and residential recycling services to the City of Menlo Park and is responsible for recycling and solid waste management in the City. These services would be supplied to all future housing developed under the HEU. The City's Community Zero Waste Plan outlines a goal to recycle and/or compost at least 73 percent of waste by 2035. To achieve this goal, the City will need to reduce the amount of landfilled materials generated to 3.1 pounds per person per day. Recology's services yield waste diversion results consistent with Citywide recycling targets.

As shown above, the HEU would implement all applicable actions identified in the 2017 Scoping Plan Update to reduce energy use, conserve water, reduce waste generation, promote EV use, and reduce vehicle travel consistent with statewide strategies and regulations. In addition, as detailed under Impact GHG-1, the HEU would be consistent with the BAAQMD's updated GHG significance thresholds which in turn mean that the HEU would be consistent with and contribute its fair share to the BAAQMD's GHG reductions required to meet the statewide GHG reduction goal for 2030 pursuant to SB 32 and the 2017 Scoping Plan Update.

Although the HEU would not meet the EO B-55-13 target of carbon neutrality by 2045, carbon neutrality is not a significance threshold for the purposes of this SEIR because carbon neutrality is not an adopted plan, policy, or regulation of the State that is applicable to the City. In fact, the 2017 Scoping Plan Update explicitly acknowledges and states that the inability to achieve carbon neutrality or net zero GHG emissions does not imply that a project contributes to a significant impact under CEQA (CARB, 2017):

> *Achieving net zero increases in GHG emissions, resulting in no contribution to GHG impacts, may not be feasible or appropriate for every project, however, and the inability of a project to mitigate its GHG emissions to net zero does not imply the project results in a substantial contribution to the cumulatively significant environmental impact of climate change under CEQA.*

As illustrated above in Table 4.7-3, the HEU would align with all applicable measures in the 2017 Scoping Plan Update and would therefore not conflict with achieving the SB 32 target or with making progress toward achieving the 2050 reductions included in EO S-3-05. The HEU makes progress towards carbon neutrality; however, its inability to achieve carbon neutrality by 2045 does not conflict with the 2017 Scoping Plan, and thus does not render the impact significant under CEQA.

Plan Bay Area 2040

Pursuant to SB 375, ABAG and the MTC adopted *Plan Bay Area 2040* to establish targets and strategies for meeting the region's needs for housing at all income levels, while reducing GHG emissions by private passenger cars and light-duty truck traffic. The core strategy of *Plan Bay Area 2040* is to encourage growth in existing communities along the existing transportation network, focusing new development in PDAs and TPAs in urbanized centers where more public transit and other mobility options are available to reduce the use of cars and light trucks. In addition to encouraging focused growth through significant transit and roadway performance investments, *Plan Bay Area 2040* directs funding to neighborhood active-transportation and complete-streets projects, climate initiatives, lifeline transportation and access initiatives, pedestrian and bicycle safety programs, and PDA planning. Many of the proposed HEU housing opportunity sites and land use strategy sites are located within a PDA. A majority of the HEU units would be located within close proximity to the Menlo Park Caltrain station, and/or could take advantage of the complementary land uses in the downtown area to reduce vehicular trip making and reduce vehicular trip length, both of which reduce VMT. As discussed under Impact 4.14-2 in Section 4.14, *Transportation*, of this SEIR, the HEU would generate fewer miles per capita when compared to the Citywide average and the Citywide residential VMT per capita

would decrease with the addition of the HEU. The HEU is therefore consistent with *Plan Bay Area 2040*.

Menlo Park Climate Action Plan

The purpose of the City of Menlo Park Climate Action Plan is to present researched strategies that will help the City reduce GHG emissions originating in Menlo Park, based on the findings of the City's GHG emissions inventory analysis which is completed annually. The plan provides strategies that may be implemented over the next few years by the City, its residents, and its businesses. The Climate Action Plan is a live document that will be updated yearly as research continues to provide more emissions reduction data and as new technologies arise and economic conditions change.

As detailed under the Regulatory Setting, due to the Covid-19 pandemic, the 2030 Climate Action Plan adopted in 2020 was a significantly pared down version of the earlier drafts that had considered more aggressive actions to reduce the City GHG emissions by 90 percent over 2005 levels by 2030. The 2030 Climate Action Plan identifies six high impact actions listed in **Table 4.7-4** below.

TABLE 4.7-4
CONSISTENCY WITH ACTIONS IN THE 2030 CLIMATE ACTION PLAN

Action	Description	Consistency Analysis
1- Explore policy/program options to convert 95 percent of existing buildings to all-electric by 2030	Two basic options: 1) Announce the “end of flow” of natural gas in the City by 2030 OR 2) Enact a “burn-out ordinance” requiring that when gas appliances expire, they must be replaced by electric (preferably high efficiency heat pump) alternatives; phase in for large commercial, small commercial, residential; may require follow-on compliance ordinance as current permit compliance for residential gas appliances is low; will require follow-up “cash-for-clunkers” program to achieve 2030 goal; relies on PCE subsidies to reduce or eliminate cost differential; may require use of UUT funds to cover additional cost differential for low-income residents. Extend burnout ordinance to expiring air conditioners, to be replaced with heat pumps, eliminating need for separate gas heating.	**Not Applicable.** The HEU would not affect any existing buildings.
2- Set Citywide goal for increasing EVs and decreasing gasoline sales	Announce and promote goals of 1) increasing the purchase of all new vehicles to be electric by 2025 and 2) reducing gasoline sales each year by 10%, based on the total reported in 2018. Track progress on both goals publicly on an annual basis.	**Consistent.** Housing development proposed under the HEU would be consistent with EV charging requirements in the City Reach Codes, which add requirements beyond the mandatory CALGreen requirements. In addition, Mitigation Measure GHG-1b would require that future housing projects under the HEU comply with the voluntary Tier 2 CALGreen standards, consistent with the BAAQMD’s GHG significance thresholds.

TABLE 4.7-4 (CONT.)
CONSISTENCY WITH ACTIONS IN THE 2030 CLIMATE ACTION PLAN

Action	Description	Consistency Analysis
3- Expand access to EV charging for multifamily and commercial properties	Install or assist building owners in installing EV chargers throughout the City, siting them preferably where they will be used during daylight hours (when solar electricity is abundant on our grid) and also where residents of multi-family housing can access them. Current project to explore and evaluate policy options for existing multifamily properties.	**Consistent.** Housing development proposed under the HEU would be consistent with EV charging requirements in the City Reach Codes, which add requirements beyond the mandatory CALGreen requirements. In addition, Mitigation Measure GHG-1b would require that future housing projects under the HEU comply with the voluntary Tier 2 CALGreen standards, consistent with the BAAQMD's GHG significance thresholds.
4- Reduce vehicle miles traveled (VMT) by 25% or an amount recommended by the Complete Streets Commission	Reduce VMT, especially by gasoline vehicles, through a two-pronged approach: 1) Change zoning to encourage higher density (esp. for housing) near transit 2) Make the City easier to navigate without a car by accelerating implementation of the Transportation Master Plan with an emphasis on developing a clear network of protected pedestrian/bike paths throughout town. Current projects underway that help achieve this goal: SB2 Housing grant, Transportation Management Plan, Transportation Management Association, and implementation of new VMT guidelines for new development	**Consistent.** Based on the transportation analysis, due to the location of the identified housing sites in proximity to commercial and employment uses, and transit facilities, the VMT per resident generated by the HEU would be 25 percent less than the City's baseline in 2040.
5- Eliminate the use of fossil fuels from municipal operations	Replace 100% of the following municipal assets with efficient electric substitutes for: 1) Gas pool heating equipment 2) Gas and diesel municipal fleet vehicles 3) Gas furnaces 4) Gas hot water heaters 5) Gas-powered gardening equipment.	**Not Applicable.** The HEU would not affect any municipal operations.
6- Develop a climate adaptation plan to protect the community from sea level rise and flooding	Develop a climate adaptation plan focused on protecting areas of the community vulnerable to sea level rise and flooding, as forecasted by the National Oceanic and Atmospheric Administration (NOAA) and California State agencies. Consider requiring developers to fund efforts to protect the community.	**Not Applicable.** To comply with this action, the City is separately updating the Safety Element in Menlo Park's General Plan, which was last updated in 2013, to bring it into compliance with recent changes in General Plan law, including SB 379 (Climate Adaptation and Resiliency). Safety Element Policy S1.28, for instance, calls for the City to consider sea level rise in siting new facilities or residences within areas that could be potentially affected.

CALGreen Code and City of Menlo Park Reach Codes

Development proposed under the HEU would be required to comply with the most recent update to the CALGreen Code. All projects under the HEU would also be required to comply with the City's Reach Codes that aim to achieve energy savings and GHG reductions beyond the State's minimum requirements. In addition, Mitigation Measures GHG-1a and GHG-1b would require all housing development under the HEU to be constructed as all-electric buildings with no exceptions and require projects to comply with Tier 2 EV charging requirements in the applicable CALGreen code at the time of individual project review.

Conclusion

The HEU would result in a new impact not identified in the *ConnectMenlo* Final EIR. However, with implementation of new Mitigation Measures GHG-1a and GHG-1b, the HEU would not conflict with the GHG reduction targets established by EO S-3-05, and SB 32, or the reduction measures identified in CARB's 2017 Scoping Plan. In addition, the HEU would not conflict with Plan Bay Area or the Menlo Park Climate Action Plan, and would be subject to measures in the CALGreen Code and the Menlo Park Reach Codes.

> **Mitigation:** Implement Mitigation Measures GHG-1a and GHG-1b.
>
> **Significance After Mitigation:** With the implementation of Mitigation Measures GHG-1a and GHG-1b, all subsequent housing projects proposed for development under the HEU would be consistent with the BAAQMD's updated GHG significance thresholds. Compliance with these thresholds would mean that these projects would not generate GHG emissions that would conflict with the State's GHG reduction goals or plans and policies in place to achieve these goals. Therefore, this impact would be considered **less than significant with mitigation**.

Cumulative Impacts

Global GHG emissions are inherently a cumulative concern that is understood for CEQA purposes to be an existing significant and adverse condition. Accordingly, the significance of GHG emissions in this analysis is determined based on whether such emissions would have a cumulatively considerable impact on global climate change. Although the geographic scope of cumulative impacts related to GHG emissions is global, this analysis focuses on the HEU's direct and/or indirect generation of GHG emissions on the region and the state. CAPCOA considers GHG impacts to be exclusively cumulative impacts, in that no single project could, by itself, result in a substantial change in climate (CAPCOA, 2008). Therefore, the evaluation of cumulative GHG impacts presented in this section considers whether the HEU would make a considerable contribution to cumulative emissions of GHG. Implementation of the HEU would result in a less than significant impact with mitigation. Implementation of Mitigation Measures GHG-1a and GHG-1b would ensure consistency with the State's 2030 GHG reduction goals. Therefore, the HEU's incremental impact relative to GHG emissions in the cumulatively context would also be **less than significant with mitigation**.

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4.8 Hazards and Hazardous Materials

4.8.1 Introduction

This section evaluates the effects of the Housing Element Update (HEU) relative to hazards and hazardous materials, focusing on changes to the *ConnectMenlo* EIR (certified in 2016) that may result in new or more severe impacts, and describes any mitigation measures needed to address any such impacts.

Please note that the evaluation of impacts associated with wildfire is presented in Section 4.17 of this SEIR, *Wildfire*.

Findings of the ConnectMenlo Final EIR

Hazards and hazardous materials impacts of the *ConnectMenlo* project were analyzed in Section 4.7 of the Draft *ConnectMenlo* EIR. The Final *ConnectMenlo* EIR determined that the project would have the following impacts with respect to hazards and hazardous materials:

- HAZ-1: Implementation of the proposed project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. *(Less than Significant Impact*)
- HAZ-2: Implementation of the proposed project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. *(Less than Significant Impact*)
- HAZ-3: Implementation of the proposed project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25-mile of an existing or proposed school. *(Less than Significant Impact*)
- HAZ-4: Implementation of the proposed project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25-mile of an existing or proposed school. *(Less than Significant Impact with Mitigation*)
- HAZ-5: The proposed project would not be located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport it results in a safety hazard for people residing or working in the study area. *(Less than Significant Impact*)
- HAZ-6: The proposed project would not be within the vicinity of a private airstrip and result in a safety hazard for people residing or working in the study area. *(No Impact*)
- HAZ-7: The proposed project would not impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. *(Less than Significant Impact*)
- HAZ-8: The proposed project would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. *(Less than Significant Impact*) Please note that the evaluation of impacts associated with wildfire is presented in Section 4.17 of this SEIR, *Wildfire*.

- HAZ-9: Implementation of the proposed project, in combination with past, present, and reasonably foreseeable projects, would result in significant cumulative impacts with respect to hazards and hazardous materials. *(Less than Significant Impact with Mitigation*)

Notice of Preparation Comments

The Notice of Preparation (NOP) for the SEIR was circulated on December 23, 2021, and a scoping meeting was held on January 24, 2022. The NOP and the comments received during the public comment period can be found in **Appendix A** of this EIR. No comments relating to hazards and hazardous materials were received during the NOP comment period.

Information Sources

The primary sources of information referenced in this section included those listed below. Please note that a full list of references for this topic can be found at the end of this section.

- Draft *ConnectMenlo* EIR (2016b).
- State Water Resources Control Board (SWRCB) and Department of Toxic Substances Control (DTSC) (2022).
- City of Menlo Park General Plan Open Space/Conservation, Noise and Safety Elements (2013).
- City of Menlo Park Land Use and Circulation Elements (2016a).

4.8.2 Environmental Setting

The *ConnectMenlo* EIR (City of Menlo Park, 2016b) described hazards and hazardous materials conditions as they existed at the time of the EIR's preparation. The number and status of hazardous materials release sites (i.e., sites with spills that could affect people and the environment) within the Menlo Park City limits has changed relative to the potential housing opportunity and land use strategy sites, as discussed further below.

The *ConnectMenlo* EIR noted that the only airport within two miles of the City limits is the Palo Alto Airport, but that the airport safety zone does not extend to within the City limits. This condition has not changed and none of the potential housing opportunity and land use strategy sites would be located within two miles of the airport.

The *ConnectMenlo* EIR noted that there are seven elementary, three middle, and one high school within the City limits of Menlo Park. This condition has not changed. The location of schools to the current list of hazardous materials release sites noted above is discussed further below.

The *ConnectMenlo* EIR noted that the proposed project would not include potential land use changes that would impair or physically interfere with the ability to implement the City's Emergency Operations Plan (EOP) or the City's Disaster Preparedness Manual. The EIR cited that General Plan goals, policies and programs would serve to minimize interferences with an adopted emergency response plan and these have not changed.

Existing Conditions

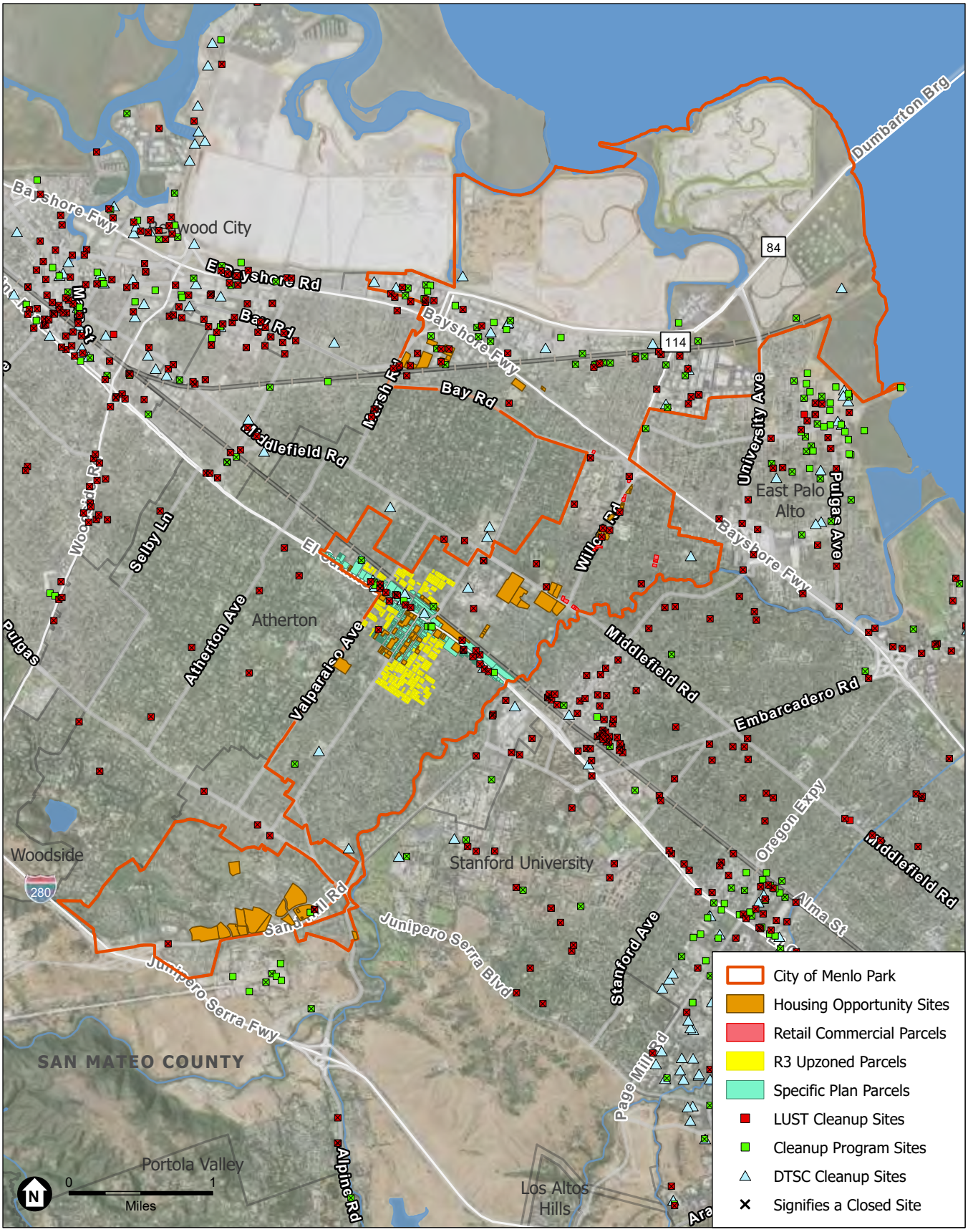
The discussion below describes the existing and baseline conditions relative to hazards and hazardous materials, and also describes conditions that have changed since the *ConnectMenlo* EIR was adopted in 2016.

Hazardous Materials Release Sites

Government Code § 65962.5 requires the State Water Resources Control Board (SWRCB) and Department of Toxic Substances Control (DTSC) to track and publish lists of active and recently closed sites where hazardous materials have been released (i.e., spilled) and regulatory agencies are requiring and overseeing cleanup. The SWRCB posts information for sites under their jurisdiction (i.e., more precisely under the jurisdiction of the local Regional Water Quality Control Board [RWQCBs]) on their GeoTracker website and the DTSC posts their site cases on their EnviroStor website. The two websites can be viewed simultaneously and comprise what is referred to as the Cortese List. Local agencies that oversee site investigation and cleanup also post their information to the GeoTracker and EnviroStor websites.

The types of cleanup sites on the SWRCB GeoTracker website include leaking underground storage tank (LUST) sites (i.e., non-military UST sites that have had an unauthorized release [i.e., leak or spill] of a hazardous substance, usually gasoline, diesel, and/or motor oil); and cleanup program sites (i.e., pesticide and fertilizer facilities, railyards, ports, equipment supply facilities, metals facilities, industrial manufacturing and maintenance sites, dry cleaners, bulk transfer facilities, refineries, mine sites, landfills, RCRA/CERCLA cleanups, and some brownfields). The cleanup sites listed on the DTSC EnviroStor website are more focused on hazardous waste facilities and sites with known contamination, typically mostly focused on soil and soil vapor contamination. DTSC also often regulates cleanups at leaking dry cleaner sites.

As described in the *ConnectMenlo* EIR and at that time, there were 26 listed active hazardous material release sites within the Menlo Park City limits. The Cortese List has been updated since then (SWRCB/DTSC 2022) and not all of the currently active cleanup sites would be on or near a potential housing opportunity and land use strategy site. **Figure 4.8-1, Cleanup Sites**, shows the active and closed hazardous materials release sites, as of April 29, 2022. On Figure 4.8-1, an “x” on the symbol means that investigation and cleanup at the listed site has been completed and the overseeing regulatory agency has concluded that the given site no longer poses a threat to people or the environment. Note that closed sites may have residual levels of contamination that are below regulatory action levels.



SOURCE: Esri, 2022; SWRCB, 2022; M-Group, 2022; ESA, 2022

Menlo Park Housing Element Update EIR

Figure 4.8-1
Cleanup Sites

As of April 29, 2022, there are 16 active hazardous materials sites that are undergoing investigation and cleanup within the City limits. Relative to the potential housing opportunity and land use strategy sites, six active hazardous materials release sites are located on or adjacent to potential housing opportunity and land use strategy sites along El Camino Real, and one active hazardous materials release site is located on a potential housing opportunity site along Sand Hill Road. Sites located further away from the proposed housing opportunity and land use strategy sites are unlikely to affect proposed housing opportunity and land use strategy sites, and are therefore not discussed further. The status of the relevant active hazardous materials release sites are listed below in **Table 4.8-1**.

TABLE 4.8-1
ACTIVE AND RELEVANT HAZARDOUS MATERIALS RELEASE SITES

Site ID Number	Site Name	Address	Type	Status
Located Along El Camino Real				
T10000013709	Launderland Dry Cleaners	995 El Camino Real	Cleanup Program Site	Open - Site Assessment
T10000013708	New Guild Cleaners (Former)	961 El Camino Real	Cleanup Program Site	Open - Site Assessment
SI0608144772	Norge/ Atherton Cleaners, Former	1438 El Camino Real	Cleanup Program Site	Open - Site Assessment
T10000013712	Peninsula Arts Guild	949 El Camino Real	Cleanup Program Site	Open - Long Term Management
T0608132242	Wo Sing Cleaners	570 Derry Lane	Cleanup Program Site	Open - Remediation
60001377	Former Menlo Park Pet Hospital	1450 El Camino Real	Evaluation	Inactive - Needs Evaluation
Located Along Sand Hill Road				
SL0608148913	Sharon Heights Cleaners	325 Sharon Park Drive	Cleanup Program Site	Open - Remediation

SOURCE: SWRCB and DTSC 2022

Proximity to Schools

The *ConnectMenlo* EIR noted that there are eight elementary, four middle, and one high school within the City limits of Menlo Park. This condition has not changed and some of the schools could be within 0.25-mile of a potential housing opportunity and land use strategy site.

4.8.3 Regulatory Setting

The following section focuses on any changes to the regulatory setting that have occurred since certification of the *ConnectMenlo* EIR. Draft EIR Section 4.7, *Hazards and Hazardous Materials*, evaluated effects relative to hazards and hazardous materials. There, Section 4.7.1.1, *Regulatory Framework*, described regulations applicable to this topic, and that description is still current for this SEIR, except as noted below.

State

California Building Code

The version of the California Building Code cited in the *ConnectMenlo* EIR is 2013. The current version is dated 2019 and is scheduled to be updated again in 2022. However, the updates are not anticipated to substantially affect the analysis of hazards and hazardous materials.

Assembly Bill 747

AB 747 was adopted in 2019, and requires safety elements to be reviewed and updated as necessary to identify evacuation routes and their capacity, safety, and viability under a range of emergency scenarios. The law authorizes a city or county that has adopted a local hazard mitigation plan, emergency operations plan, or other document that fulfills commensurate goals and objectives to use that information in the safety element to comply with this requirement by summarizing and incorporating by reference that other plan or document in the safety element.

Senate Bill 99

SB 99 was adopted in 2019, and requires a city or county, upon the next revision of the housing element on or after January 1, 2020, to review and update the safety element to include information identifying residential developments in hazard areas that do not have at least two emergency evacuation routes.

County

San Mateo County 2021 Multijurisdictional Local Hazard Mitigation Plan

San Mateo County has developed a local hazard mitigation plan that encompassed 20 cities and towns in the county, as well the county's fire districts and other special purpose districts. (San Mateo County, 2021). The plan defines measures to reduce risks from natural disasters in the San Mateo County planning area, which consists of the entire county, including unincorporated areas, incorporated cities, and special purpose districts. The plan complies with federal and State hazard mitigation planning requirements to establish eligibility for funding under Federal Emergency Management Agency (FEMA) grant programs for all planning partners. It updates the county's previous plan, the *2016 San Mateo County Hazard Mitigation Plan.*

Local

Menlo Park General Plan

The Menlo Park General Plan is a comprehensive long-range general plan for the physical development of the City of Menlo Park. The General Plan contains the current City of Menlo Park Land Use and Circulation Elements, which were adopted in 2016 (City of Menlo Park, 2016a) and the current City of Menlo Park Open Space/Conservation, Noise and Safety Elements, which were adopted in 2013 (City of Menlo Park, 2013). The Safety Element is currently undergoing revision as part of the HEU process. The various elements within the General Plan include goals and policies for the physical development of the City. Goals and policies relevant to hazards and hazardous materials are listed below.

Goal LU-1: Promote the orderly development of Menlo Park and its surrounding area.

Program LU-1.D: Infill Development Streamlined Review. Establish Zoning Ordinance provisions to streamline review of infill development through "uniformly applicable development policies or standards" (per CEQA Guidelines Section 15183.3) that reduce potential adverse environmental effects, such as: regulations governing grading, construction activities, storm water runoff treatment and containment, hazardous materials, and greenhouse gas emissions; and impact fees for public improvements, including safety and law enforcement services, parks and open space, and transit, bicycle, and pedestrian infrastructure.

Goal LU-4: Promote the development and retention of business uses that provide goods or services needed by the community that generate benefits to the City, and avoid or minimize potential environmental and traffic impacts.

Policy LU-4.5: ***Business Uses and Environmental Impacts***. Allow modifications to business operations and structures that promote revenue generating uses for which potential environmental impacts can be mitigated.

Goal LU-7: Promote the implementation and maintenance of sustainable development, facilities and services to meet the needs of Menlo Park's residents, businesses, workers, and visitors.

Policy LU-7.7: ***Hazards***. Avoid development in areas with seismic, flood, fire and other hazards to life or property when potential impacts cannot be mitigated.

Goal S-1: ***Assure a Safe Community***. Minimize risk to life and damage to the environment and property from natural and human-caused hazards, and assure community emergency preparedness and a high level of public safety services and facilities.

Policy S1.1: Location of Future Development. Permit development only in those areas where potential danger to the health, safety and welfare of the residents of the community can be adequately mitigated.

Policy S-1.3: ***Hazard Data and Standards***. Integrate hazard data (geotechnical, flood, fire, etc.) and risk evaluations into the development review process and maintain, develop and adopt up-to-date standards to reduce the level of risk from natural and human-caused hazards for all land use.

Policy S-1.5: ***New Habitable Structures***. Require that all new habitable structures to incorporate adequate hazard mitigation measures to reduce identified risks from natural and human-caused hazards.

Policy S1.8: Safety Element Updates. Review and comprehensively revise the Safety Element whenever substantial new scientific data or evidence related to prevention of natural and human hazards becomes available, and coordinate with other General Plan elements and City emergency plans.

Policy S1.10: Safety Review of Development Projects. Continue to require hazard mitigation, crime prevention, fire prevention and adequate access for emergency vehicles in new development.

Policy S-1.11: ***Visibility and Access to Address Safety Concerns***. Require that residential development be designed to permit maximum visibility and access to law enforcement and fire control vehicles consistent with privacy and other design considerations.

Policy S-1.16: ***Hazardous Materials Regulations***. Review and strengthen, if necessary, regulations for the structural design and/or uses involving hazardous materials to minimize risk to local populations. Enforce compliance with current State and local requirements for the manufacturing, use, storage, transportation and disposal of hazardous materials, and the designation of appropriate truck routes in Menlo Park.

Policy S-1.17: ***Potential Exposure of New Residential Development to Hazardous Materials***. Minimize risk associated with hazardous materials by assessing exposure to hazardous materials of new residential development and sensitive populations near existing industrial and manufacturing areas. Minimize risk associated with hazardous materials.

Policy S-1.18: ***Potential Hazardous Materials Conditions Investigation***. Require developers to conduct an investigation of soils, groundwater and buildings affected by hazardous-material potentially released from prior land uses in areas historically used for commercial or industrial uses, and identify and implement mitigation measures to avoid adversely affecting the environment or the health and safety of residents or new uses.

Policy S-1.19: ***Disposal of Existing Hazardous Materials on Sites Planned for Housing***. Require that sites planned for housing be cleared of hazardous materials (paint, solvents, chlorine, etc.) and the hazardous materials disposed in compliance with State and Federal laws.

Policy S-1.26: ***Erosion and Sediment Control***. Continue to require the use of best management practices for erosion and sediment control measures with proposed development in compliance with applicable regional regulations.

Policy S-1.27: ***Regional Water Quality Control Board (RWQCB) Requirements***. Enforce stormwater pollution prevention practices and appropriate watershed management plans in the RWQCB general National Pollutant Discharge Elimination System requirements, the San Mateo County Water Pollution. Prevention Program and the City's Stormwater Management Program. Revise, as necessary, City plans so they integrate water quality and watershed protection with water supply, flood control, habitat protection, groundwater recharge, and other sustainable development principles and policies.

Policy S-1.29: ***Fire Equipment and Personnel Access***. Require adequate access and clearance, to the maximum extent practical, for fire equipment, fire suppression personnel, and evacuation for high occupancy structures in coordination with the Menlo Park Fire Protection District.

Policy S-1.30: ***Coordination with the Menlo Park Fire District***. Encourage City-Fire District coordination in the planning process and require all development applications to be reviewed and approved by the Menlo Park Fire Protection District prior to project approval.

Policy S1.34: Disaster Preparedness Planning. Ensure disaster preparedness in cooperation with other public agencies and appropriate public-interest organizations. Expand abilities of residents to assist in local responses to disasters. Ensure adequate resources, facilities, and other support for emergency response equitably throughout the City.

Policy S1.36: Emergency Notification System. Continue to support and improve on the Emergency Notification System for disaster information release in emergencies.

Policy S1.37: Emergency Connectors and Evacuation Routes. Maintain a system of emergency connectors and evacuation routes as part of the City's disaster planning.

Policy S1.38: Emergency Vehicle Access. Require that all private roads be designed to allow access for emergency vehicles as a prerequisite to the granting of permits and approvals for construction.

Policy S1.39: Emergency Preparedness for Sensitive Populations. Review and improve disaster response capabilities, recovery operations and evacuation planning for sensitive populations in the event of earthquake or other disasters.

Program S1.J: ***Require Health and Safety Plan for Hazardous Materials***. Require the preparation of health and safety plans to be used to protect the general public and all workers in construction areas from potentially hazardous materials. The plan shall describe the practices and procedures to protect worker health in the event of an accidental release of hazardous materials or if previously undiscovered hazardous materials are encountered during construction. The plan shall include items such as spill prevention, cleanup and evacuation procedures. The plan will help protect the public and workers by providing procedures and contingencies that will help reduce the exposure to hazardous materials.

Goal CIRC-1: Provide and maintain a safe, efficient, attractive, user-friendly circulation system that promotes a healthy, safe, and active community and quality of life throughout Menlo Park.

Policy CIRC-1.3: ***Engineering***. Use data-driven findings to focus engineering efforts on the most critical safety projects.

Policy CIRC-1.6: ***Emergency Response Routes***. Identify and prioritize emergency response routes in the Citywide circulation system.

Program CIRC-1.E: ***Emergency Response Routes Map***. In collaboration with the Menlo Park Fire Protection District and Menlo Park Police Department, adopt a map of emergency response routes that considers alternative options, such as the Dumbarton Corridor, for emergency vehicle access. Modifications to emergency response routes should not prevent or impede emergency vehicle travel, ingress, and/or egress.

Program CIRC-1.F: ***Coordination with Emergency Services***. Coordinate and consult with the Menlo Park Fire Protection District in establishing circulation standards to assure the provision of high quality fire protection and emergency medical services within the City.

Goal CIRC-2: Increase accessibility for and use of streets by pedestrians, bicyclists, and transit riders.

Policy CIRC-2.14: ***Impacts of New Development***. Require new development to mitigate its impacts on the safety (e.g., collision rates) and efficiency (e.g., vehicle miles traveled (VMT) per capita) of the circulation system. New development should minimize cut-through and high-speed vehicle traffic on residential streets; minimize the number of vehicle trips; provide appropriate bicycle, pedestrian, and transit connections, amenities and improvements in proportion with the scale of proposed projects; and facilitate appropriate or adequate response times and access for emergency vehicles.

Goal CIRC-3: Increase mobility options to reduce traffic congestion, greenhouse gas emissions, and commute travel time.

Policy CIRC-3.3: ***Emerging Transportation Technology***. Support efforts to fund emerging technological transportation advancements, including connected and autonomous vehicles, emergency vehicle pre-emption, sharing technology, electric vehicle technology, electric bikes and scooters, and innovative transit options.

Program CIRC-3.B: ***Emergency Response Coordination***. Equip all new traffic signals with pre-emptive traffic signal devices for emergency services. Existing traffic signals without existing pre-emptive devices will be upgraded as major signal modifications are completed.

Menlo Park Emergency Operations Plan

As discussed above, the City adopted an Emergency Operations Plan in 2014. The plan aligns with the National Incident Management System (NIMS) and the California Standardized Emergency Management System (SEMS). The plan provides Emergency Operations Center (EOC) responders with procedures, documentation, and user friendly checklists to effectively manage emergencies, and it also provides detailed information of supplemental requirements such as Public Information, Damage Assessment, and Recovery Operations.

Menlo Park Municipal Code

Menlo Park Municipal Code Section 13.18.020 requires that any activity occurring within City rights-of-way first obtain an encroachment permit to do so from the Director of Public Works. The Code specifies that no encroachment of any kind which impedes, obstructs or denies pedestrian, vehicular, or other lawful travel within the limits of the public right-of-way or which impairs adequate sight-distance or safe pedestrian or vehicular traffic will be permitted.

Menlo Park Fire Protection District Resolution No. 1476-2011

As discussed above, in 2011, the MPFPD Board adopted a resolution that identified a system of primary response routes in the MPFPD service area (MPFPD, 2011). The routes generally correspond to the area's arterial roadways, and provide for management of rapid deployment and maintenance of acceptable response times in the community. The resolution provides that traffic mitigation devices not acceptable to the MPFPD are prohibited unless approved by the Fire Chief.

Menlo Park Fire Protection District Fire Prevention Code

Ordinance 45-2019 of the Menlo Park Fire Protection District adopted the District's Fire Code, which is based on the 2019 California Fire Code, California Code of Regulations, Title 24, Part 9, which prescribes regulations governing conditions to life and property from fire or explosion through building standards and non-building standards, modified by local amendments specific to the District. Project applications for development in Menlo Park are plan-checked by the District for compliance with the Code.

Menlo Park Fire Protection District Standards and Guidelines Manual

The District's Standards and Guidelines Manual serves as a supplemental instruction and interpretation manual for the District's Fire Prevention Code. The manual provides detail on the

District's requirements related to roadways and circulation, access, fire protection equipment, hydrants, fire sprinklers, water supply, vegetation management, and home hardening against wildfire in areas with heightened fire risk.

4.8.4 Environmental Impacts and Mitigation Measures

Scope of Analysis

The analysis in this SEIR describes impacts identified in the 2016 *ConnectMenlo* EIR, and describes how the impacts of the HEU would differ, as applicable. Note that impacts related to wildfire are discussed in Section 4.17 of this SEIR, *Wildfire*.

Significance Thresholds

The thresholds used to determine the significance of impacts related to hazards and hazardous materials are based on Appendix G of the *CEQA Guidelines*. Implementation of the HEU would have a significant impact on the environment if it would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 and, as a result, it would create a significant hazard to the public or the environment.
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, the project would result in a safety hazard or excessive noise for people residing or working in the project area.
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

Issues Not Discussed in Impacts

The HEU would have no impact to the following topics based on the HEU's characteristics, its geographical location, and underlying site conditions. Therefore, these topics are not addressed further in this document for the following reasons:

- ***Location within 2 miles of an airport.*** As discussed in Section 4.8.2, *Environmental Setting, Summary of ConnectMenlo EIR*, the only airport within two miles of the City limits is the Palo Alto Airport, but that the airport safety zone does not extend to within the City limits. This condition has not changed and none of the potential housing opportunity and land use

strategy sites would be located within two miles of the airport. Therefore, this significance criterion is not applicable to the Project and is not discussed further.

Methodology and Assumptions

This environmental analysis of the potential impacts related to hazards and hazardous materials is based on a review of literature and database research, and Menlo Park planning documents referenced above.

Development in the City, including development allowed by the HEU and any associated infrastructure, is regulated by the various laws, regulations, and policies summarized above in Section 4.8.3, *Regulatory Setting*. Compliance with applicable federal, State, and local laws and regulations is assumed in this analysis and local and State agencies would be expected to continue to enforce applicable requirements to the extent that they do so now. Note that compliance with many of the regulations is a condition of permit approval.

A significant impact would occur if, after considering the features described in the Project Description and the required compliance with regulatory requirements, future development allowed by the HEU and development of any associated infrastructure would create a significant hazard or meet other criteria listed above. For those impacts considered to be significant, mitigation measures are proposed to reduce the identified impacts.

Impacts and Mitigation Measures

Impact HAZ-1: Implementation of the HEU would not create a significant hazard to the public or the environment through the routine transport, use, disposal, or accidental release of hazardous materials. *(Less than Significant)*

The *ConnectMenlo* EIR determined that the required compliance with numerous existing laws, regulations, and General Plan policies that govern the testing, handling, removal, and disposal of hazardous materials would limit the potential for creation of hazardous conditions due to the routine use or accidental release of hazardous materials. Accordingly, the EIR determined that implementation of the project would result in *less-than-significant* impacts with respect to the routine transport, use, disposal, or accidental release of hazardous materials. These same findings apply to implementation of the HEU, as discussed below.

Demolition and Construction

Development or housing could involve the demolition and removal of existing structures, if any are present on the site(s) being developed. Existing structures may contain hazardous building materials such as asbestos-containing materials (ACM), lead-based paint (LBP), and other hazardous building materials. Demolition activities may encounter hazardous building materials with concentrations of hazardous materials above regulatory action levels, which could adversely affect construction workers, the public, and the environment. As discussed in the *ConnectMenlo* EIR, numerous existing regulations require that demolition and removal activities that may disturb or require the removal of hazardous building materials must be inspected and tested for the presence of hazardous materials. If present, the hazardous building materials must be managed and disposed of in accordance with applicable federal, State, and local laws and

regulations. The removal of ACM and LBP would require the oversight and approval of the Bay Area Air Quality Management District. The removal of PCB-containing materials would require compliance with DTSC regulations for disposal.

The required compliance with the numerous laws and regulations discussed above that govern the testing, handling, removal, and disposal of hazardous building materials would limit the potential for creation of hazardous conditions due to the use or accidental release of hazardous materials, and would render this impact **less than significant**.

During the construction of new housing, construction equipment and materials would include fuels, oils and lubricants, solvents and cleaners, cements and adhesives, paints and thinners, degreasers, cement and concrete, and asphalt mixtures, which are all commonly used in construction. The routine use or an accidental spill of hazardous materials could result in inadvertent releases, which could adversely affect construction workers, the public, and the environment.

Construction activities would be required to comply with numerous hazardous materials regulations designed to ensure that hazardous materials are transported, used, stored, and disposed of in a safe manner to protect worker safety, and to reduce the potential for a release of construction-related fuels or other hazardous materials into the environment, including stormwater and downstream receiving water bodies. Contractors would be required to prepare and implement Hazardous Materials Business Plans (HMBPs) that would require that hazardous materials for construction would be used properly and stored in appropriate containers with secondary containment to prevent a potential release. The California Fire Code would also require measures for the safe storage and handling of hazardous materials.

As discussed in Section 4.9, *Hydrology and Water Quality*, construction contractors would be required to prepare a Stormwater Pollution Prevention Plan (SWPPP) for construction activities according to the National Pollutant Discharge Elimination System (NPDES) General Construction Permit requirements. The SWPPP would list the hazardous materials (including petroleum products) proposed for use during construction; describe spill prevention measures, equipment inspections, equipment and fuel storage; protocols for responding immediately to spills; and describe best management practices (BMPs) for controlling site runoff.

In addition, the transportation of hazardous materials would be regulated by the USDOT, Caltrans, and the California Highway Patrol (CHP). Together, federal and State agencies determine driver-training requirements, load labeling procedures, and container specifications designed to minimize the risk of accidental release.

Finally, in the event of a spill that releases hazardous materials at a construction site, a coordinated response would occur at the federal, State, and local levels, including the county or City fire districts, which would be the local hazardous materials response team. In the event of a hazardous materials spill, the fire and law enforcement departments would be simultaneously notified and sent to the scene to respond and assess the situation.

The required compliance with the numerous laws and regulations discussed above that govern the transportation, use, handling, and disposal of hazardous materials would limit the potential for creation of hazardous conditions due to the use or accidental release of hazardous materials, and would render this impact **less than significant**.

Operations

Once constructed, residences would use and store small quantities of chemicals typical in residences, such as household cleaning solutions, paints and thinners, and motor fuel (e.g., for vehicles and lawn mowers). Few of the chemicals would be considered hazardous materials (e.g., bleach) and the anticipated volumes would be small (typically less than 5 gallons). Given that the quantities would be small, the routine use or an accidental spill of hazardous materials would render this impact **less than significant**.

Mitigation: None required.

Impact HAZ-2: Implementation of the HEU would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. *(Less than Significant)*

As discussed in Section 4.8.2, *Environmental Setting, Proximity to Schools,* there are thirteen schools located within Menlo Park. The *ConnectMenlo* EIR determined that the required compliance with numerous existing laws, regulations, and General Plan policies that govern the testing, handling, removal, and disposal of hazardous materials would limit the potential for creation of hazardous emissions or handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. Accordingly, the *ConnectMenlo* EIR determined that implementation of the project would result in *less-than-significant* impacts with respect to hazardous materials near schools. These same findings apply to implementation of the HEU, as discussed below.

Demolition and Construction

As discussed above in Impact HAZ-1, there are numerous regulations covering the transportation, use, storage, and disposal of hazardous materials during demolition and construction activities. The required compliance with these regulations would ensure that nearby schools would not be exposed to hazardous materials. In addition, any work that would encroach on public streets would require project applicants to apply to the Menlo Park Public Works Department for an encroachment permit. This permit would require the preparation and implementation of a Traffic Control Plan to manage the movement of vehicles, including those transporting hazardous materials on roads adjacent to or near schools. With compliance with existing regulations and the implementation of the required Traffic Control Plan, the impact relative to hazardous materials, substances, or waste in proximity to schools would be **less than significant.**

Operations

As discussed in Impact HAZ-1, once constructed, residences would use and store small quantities of chemicals typical in residences, such as household cleaning solutions, paints and thinners, and

motor fuel (e.g., cars and lawn mowers). Few of the chemicals would be considered hazardous materials (e.g., bleach) and the anticipated volumes would be small (typically less than 5 gallons). Given that few of the routinely used chemicals would be considered hazardous and that the quantities would be small, the routine use or an accidental spill of hazardous materials near a school would render this impact **less than significant**.

Mitigation: None required.

Impact HAZ-3: Implementation of the HEU could result in development projects being located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 and, as a result, would it create a significant hazard to the public or the environment. ***(Less than Significant with Mitigation)***

As discussed in Section 4.8.2, *Environmental Setting, Hazardous Materials Sites*, some existing active and some closed hazardous materials release sites that are listed on the Cortese List (i.e., Government Code Section 65962.5) due to the release of hazardous materials are located within or adjacent to some potential housing opportunity and land use strategy sites. Construction on active or closed hazardous materials sites could expose construction workers, the public or the environment to hazardous materials.

The *ConnectMenlo* EIR determined that the required compliance with numerous existing laws, regulations, and General Plan policies that govern the testing, handling, removal, and disposal of hazardous materials would limit the potential for creation of hazardous conditions due to developing housing on or adjacent to known hazardous materials releases sites (i.e., hazardous materials sites listed on the Cortese List). However, the disturbance and release of hazardous materials during earthwork activities, if present, could pose a hazard to construction workers, the public, and the environment, and impacts could be potentially significant. To reduce the impacts to less than significant, the *ConnectMenlo* EIR developed two mitigation measures. These same findings and mitigation measures apply to implementation of the HEU, as discussed below.

Demolition and Construction

As discussed in Section 4.8.2, *Environmental Setting, Hazardous Materials Sites*, and as shown on Figure 4.8-1, there are known hazardous materials release sites on or adjacent to potential housing opportunity and land use strategy sites. These hazardous materials release sites may contain contaminated soil and/or groundwater as a result of previous land uses. During construction, there is the potential to encounter previously unknown contaminated soil, and, if dewatering is needed, groundwater. Construction workers, the public, and the environment could be exposed to hazardous materials and the impact could be **potentially significant**.

As discussed in Impact HAZ-1, there are numerous regulations covering the transportation, use, storage, and disposal of hazardous materials during construction activities. The required compliance with these regulations would reduce the exposure to hazardous materials. As discussed in the *ConnectMenlo* EIR, to further ensure that contaminated materials are properly handled, project applicants for the sites identified in Figure 4.8-1, or any other sites on or adjacent

to known hazardous materials release sites, would be required to implement **Mitigation Measures HAZ-3a, Environmental Site Management Plan, and HAZ-3b, Vapor Intrusion Assessment,** as described below.

Mitigation Measure HAZ-3a: Environmental Site Management Plan

Project applicants shall ensure that construction at the sites with known contamination are conducted under a project-specific Environmental Site Management Plan (ESMP) that is prepared by qualified personnel in consultation with the RWQCB or the DTSC, as appropriate. The purpose of the ESMP is to protect construction workers, the general public, the environment, and future site occupants from subsurface hazardous materials previously identified at the site and to address the possibility of encountering unknown contamination or hazards in the subsurface. The ESMP shall summarize soil and groundwater analytical data collected on the project site during past investigations; identify management options for excavated soil and groundwater, if contaminated media are encountered during deep excavations; and identify monitoring, irrigation, or other wells requiring proper abandonment in compliance with local, State, and federal laws, policies, and regulations.

The ESMP shall include measures for identifying, testing, and managing soil and groundwater suspected of or known to contain hazardous materials. The ESMP shall:

1) provide procedures for evaluating, handling, storing, testing, and disposing of soil and groundwater during project excavation and dewatering activities, respectively;

2) describe required worker health and safety provisions for all workers potentially exposed to hazardous materials in accordance with State and federal worker safety regulations; and

3) designate personnel responsible for implementation of the ESMP.

Mitigation Measure HAZ-3b: Vapor Intrusion Assessment

Project applicants shall ensure that a vapor intrusion assessment is performed by a licensed environmental professional for sites with potential residual contamination in soil, soil gas, or groundwater that are planned for redevelopment with an overlying occupied building. If the results of the vapor intrusion assessment indicate the potential for significant vapor intrusion into an occupied building, project design shall include vapor controls or source removal, as appropriate, in accordance with regulatory agency requirements. Soil vapor controls could include vapor barriers, passive venting, and/or active venting. The vapor intrusion assessment and associated vapor controls or source removal can be incorporated into the ESMP (Mitigation Measure HAZ-4a)

Significance after Mitigation: Implementation of Mitigation Measures HAZ-3a and HAZ-3b, together with compliance with applicable laws and regulations regarding cleanup and reuse of a listed hazardous material site, would ensure that the adoption of the proposed project would result in **less than significant** impacts with respect to development on sites with known hazardous materials.

Operations

As discussed above, once constructed, hazardous materials would have been removed from former hazardous materials release sites and vapor barriers installed, as needed. Consequently,

the developed sites would no longer pose risks to people or the environment, which would render this impact **less than significant**.

Impact HAZ-4: Implementation of the HEU would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. ***(Less than Significant)***

The *ConnectMenlo* EIR found that the project would not impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. The EIR found that the project would not include potential land use changes that would impair or physically interfere with the ability to implement the City's Emergency Operations Plan. The EIR further found that the Land Use and Circulation Elements, which were adopted as part of the *ConnectMenlo* project, and the existing Open Space/Conservation, Noise, and Safety Elements contained general goals, policies, and programs that would require local planning and development decisions to consider impacts to the environment related to an adopted emergency response plan. These goals and policies were outlined above in Section 4.8.3, *Regulatory Setting*. These same findings apply to implementation of the HEU.

Demolition and Construction

The construction of residences as part of residential development projects that could result from implementation of the HEU would include the transportation and movement of equipment, materials, and construction workers. If located along designated evacuation and emergency response routes or in areas subjected to limited or constrained access, these construction activities could impair or interfere with adopted emergency response plans or emergency evacuation plans, and could be potentially significant.

However, as discussed in Section 4.8.3, *Regulatory Setting*, Section 13.18.020 of the City's Municipal Code outlines requirements for encroachment permits when development projects encroach into public rights-of-way during construction. Examples of encroachment could include temporary use of public rights-of-way for staging, construction, or traffic control purposes. Projects with high volumes of truck traffic are also required to take out an encroachment permit to ensure that trucks do not create undue damage to public roadways. For larger projects, preparation and implementation of a construction traffic control/traffic management plan is also required to manage construction traffic in a manner that would ensure adequate traffic flow and to keep key routes open.

Further, MPFPD has identified key routes within the City that must remain open for purposes of emergency response and evacuation. During the permit review process, impacts from residential development to those routes would be identified and addressed through compliance with restrictions on operational interference as specified in MPFPD's Resolution No. 1476-2011. In this manner, construction of residential projects that might arise as a result of the HEU's implementation would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan during construction.

Operations

Once constructed, the residential projects would not restrict or interfere with the flow of emergency vehicles or evacuation because they would not reconfigure or physically block routes used for emergency access or evacuation. While additional traffic volumes could be expected on these routes with the development of more housing, emergency responders would be able to access all areas of the City with the help of traffic signal prioritization and vehicular lights/sirens. Similarly, while there could be increased roadway volumes on streets near new development, the City's urban form, with many streets providing multiple ways to travel in each direction, suggests traffic would be sufficiently dispersed to avoid substantially impairing emergency evacuation by nearby residents.

Also, the City would be required to periodically update its emergency response and evacuation plan(s) as required under AB 747 and the City's General Plan. This periodic reevaluation would address these changed conditions, and would adjust the emergency response and evacuation plans accordingly.

For these reasons, the adoption of the HEU would result in **less than significant** impacts with respect to interference with an adopted emergency response plan or emergency evacuation plan. This conclusion is the same as that found in the *ConnectMenlo* EIR.

Mitigation: None required.

Cumulative Impacts

This section presents an analysis of the cumulative effects of the HEU in combination with other past, present, and reasonably foreseeable future development that could cause cumulatively significant impacts. Significant cumulative impacts related to hazards and hazardous materials could occur if the incremental impacts of the HEU combined with the incremental impacts of cumulative development would be significant, and if the HEU's contribution would be considerable. Cumulative development projections for 2040 are included in the project description and described in Section 4.0.3, *Cumulative Impacts*.

The geographic area affected by the potential housing opportunity and land use strategy sites and their potential to contribute to cumulative impacts varies based on the environmental resource under consideration. The geographic scope of analysis for cumulative hazardous materials impacts encompasses and is limited to the potential housing opportunity and land use strategy sites and their immediately adjacent area. This is because impacts relative to hazardous materials are generally site-specific and depend on the nature and extent of the hazardous materials release, and existing and future soil and groundwater conditions. For example, hazardous materials incidents tend to be limited to a smaller and more localized area surrounding the immediate spill location and extent of the release, and could only be cumulative if two or more hazardous materials releases spatially overlapped.

The timeframe during which the project could contribute to cumulative hazards and hazardous materials effects includes the construction and operations phases. For the potential housing opportunity and land use strategy sites, the operations phase is permanent. However, similar to the geographic limitations discussed above, it should be noted that impacts relative to hazardous materials are generally time-specific. Hazardous materials events could only be cumulative if two or more hazardous materials releases occurred at the same time, as well as overlapping at the same location.

Impact HAZ-5: Implementation of the HEU, when combined with other past, present, or reasonably foreseeable projects, would not contribute considerably to cumulative impacts relative to hazards and hazardous materials. *(Less than Significant)*

Cumulative Impacts During Demolition and Construction

Significant cumulative impacts related to hazards and hazardous materials could occur if the incremental impacts of the housing opportunity and land use strategy sites combined with the incremental impacts of cumulative development discussed above would substantially increase the risk that people or the environment would be exposed to hazardous materials.

The construction activities for all cumulative development would be subject to the same regulatory requirements discussed for the potential housing opportunity and land use strategy sites for compliance with existing hazardous materials regulations, including spill response. Construction projects that have spills of hazardous materials would be required to remediate their respective sites to the same established regulatory standards as the potential housing opportunity and land use strategy sites. This would be the case regardless of the number, frequency, or size of the release(s). The responsible party associated with each spill would be required to remediate site conditions to the same established regulatory standards. The residual less than significant effects of the potential housing opportunity and land use strategy sites that would remain after mitigation would not combine with the potential residual effects of cumulative projects to cause a potential significant cumulative impact because residual impacts would be highly site-specific and would be below regulatory standards. Accordingly, no significant cumulative impact with respect to the use of hazardous materials would result. For the above reasons, the Project would not cause or contribute to a cumulatively considerable impact with respect to the use of hazardous materials, and impacts would be **less than significant**.

Construction for two or more projects that occur at the same time and use the same roads could cause interference with emergency access. Similar to the potential housing opportunity and land use strategy sites, for construction work that will affect traffic on public streets, the City of Menlo Park requires project applicants to apply for an encroachment permit that would include the requirement to prepare and implement a Traffic Control Plan for all work that would encroach on any public street. The encroachment permit would include traffic control measures to manage the movement of vehicles, including ensuring that emergency vehicles (e.g., police, fire, ambulances, and other vehicles traveling under emergency conditions) are able to pass through or by construction sites. With the implementation of the encroachment permit and its traffic control

measures, the impact relative to emergency response or emergency evacuation would not cause or contribute to a cumulatively considerable impact, and impacts would be **less than significant**.

Mitigation: None required.

Cumulative Impacts During Operations

Significant cumulative impacts related to operational hazards could occur if the incremental impacts of the potential housing opportunity and land use strategy sites combined with other projects cause a substantial increase in risk that people or the environment would be exposed to hazardous materials used or encountered during the operations phase.

Once constructed, the residences would use and store small quantities of chemicals typical in residences, such as household cleaning solutions, paints and thinners, and motor fuel (e.g., cars and lawn mowers). Few of the chemicals would be considered hazardous materials (e.g., bleach) and the anticipated volumes would be small (typically less than 5 gallons). Given that the quantities would be small, the potential housing opportunity and land use strategy sites would not cause or contribute to a cumulatively significant impact with respect to the use of hazardous materials, and impacts would be **less than significant**.

For the cumulative projects that include the use of reportable quantities of hazardous materials, the cumulative project components involving the handling, storage, and disposal of hazardous materials would be required to prepare and implement an HMBP and comply with applicable regulations, including those governing containment, site layout, and emergency response and notification procedures in the event of a spill or release. Transportation and disposal of wastes, such as spent cleaning solutions, would also be subject to regulations for the safe handling, transportation, and disposal of chemicals and wastes. As noted previously, such regulations include standards to which parties responsible for hazardous materials releases must return spill sites, regardless of location, frequency, or size of release, or existing background contaminant concentrations to their original conditions. Therefore, compliance with existing regulations regarding hazardous materials transport would reduce the risk of environmental or human exposure to such materials. The combined effects of the proposed housing sites and cumulative projects would not be cumulatively considerable to result in a significant cumulative impact, and impacts would be **less than significant**.

Once constructed, cumulative projects would not restrict or interfere with the flow of emergency vehicles or evacuation because they would not reconfigure or physically block routes used for emergency access or evacuation. While additional traffic volumes could be expected on these routes with the development of more housing, emergency responders would be able to access all areas of the City with the help of traffic signal prioritization and vehicular lights/sirens. Similarly, while there could be increased roadway volumes on streets near new development, the City's urban form, with many streets providing multiple ways to travel in each direction, suggests traffic would be sufficiently dispersed to avoid substantially impairing emergency evacuation by nearby residents.

Also, the City would be required to periodically update its emergency response and evacuation plan(s) as required under AB 747 and the City's General Plan. This periodic reevaluation would address these changed conditions, and would adjust the emergency response and evacuation plans accordingly. Based on these considerations, the combined effects of the proposed housing opportunity and land use strategy sites and cumulative projects would not be cumulatively considerable or result in a significant cumulative impact, and impacts would be **less than significant.**

Mitigation: None required.

4.8.5 References

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4.9 Hydrology and Water Quality

4.9.1 Introduction

This section evaluates the effects of the Housing Element Update (HEU) on hydrology and water quality, focusing on changes to the *ConnectMenlo* EIR (certified in 2016) that may result in new or more severe impacts, and describes any mitigation measures needed to address any such impacts.

Analysis related to water *supply* is provided in Section 4.16 of this SEIR, *Utilities and Service Systems*.

Findings of the ConnectMenlo Final EIR

Hydrological and water quality related impacts of the *ConnectMenlo* project were analyzed in Section 4.8 of the Connect Menlo Draft EIR. The *ConnectMenlo* Final EIR determined that the project would have the following impacts (deemed less than significant with no mitigation required) with respect to hydrology and water quality:

- HYDRO-1: Implementation of the proposed project would not violate any water quality standards or discharge requirements. *(Less than Significant Impact*)
- HYDRO-2: Implementation of the proposed project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted). *(Less than Significant Impact*)
- HYDRO-3: Implementation of the proposed project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the amount of surface runoff in a manner which would result in substantial erosion or siltation on- or off-site. *(Less than Significant Impact*)
- HYDRO-4: Implementation of the proposed project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site. *(Less than Significant Impact*)
- HYDRO-5: Implementation of the proposed project would not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. *(Less than Significant Impact*)
- HYDRO-6: Implementation of the proposed project would not otherwise substantially degrade water quality. *(Less than Significant Impact*)
- HYDRO-7: Implementation of the proposed project would place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map. *(Less than Significant Impact*)

- HYDRO-8: Implementation of the proposed project would not place within a 100-year flood hazard area structures which would impede or redirect flood flows. *(Less than Significant Impact*)
- HYDRO-9: Implementation of the proposed project would not expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of a levee or dam break or flooding as a result of sea level rise. *(Less than Significant Impact*)
- HYDRO-10: Implementation of the proposed project would not expose people or structures to a significant risk of inundation by seiche, tsunami, or mudflow. *(Less than Significant Impact*)
- HYDRO-11: Implementation of the proposed project, in combination with past, present, and reasonably foreseeable projects, would result in less than significant cumulative impacts with respect to hydrology and water quality. *(Less than Significant Impact*)

Notice of Preparation Comments

The Notice of Preparation (NOP) for the SEIR was circulated on December 23, 2021 and a scoping meeting was held on January 24, 2022. The NOP and the comments received during the public comment period can be found in **Appendix A** of this EIR. No comments relevant to hydrology and water quality were received during the NOP scoping period.

Information Sources

The primary sources of information referenced in this section include those listed below. Please note that a full list of references for this topic can be found at the end of this section.

- City of Menlo Park General Plan (2016a)
- Connect Menlo Draft EIR (2016b)
- Water Quality Control Plan San Francisco Bay Region (2018)
- FEMA National Flood Hazard Layer (2019)
- Urban Water Management Plans for the Menlo Park Municipal Water and Bear Gulch Water District (2021)

4.9.2 Environmental Setting

Menlo Park is located within an area in the water quality jurisdiction of the San Francisco Bay Regional Water Quality Control Board. The City is approximately 17 square miles in area and spans a variety of land use designations. Its topography spans from the Bayfront tidelands and marshes on its northeast to the foothills of the Pacific Coast Range at the southwest. The majority of the southern boundary of the City is formed by San Francisquito Creek, a major tributary to South San Francisco Bay. Menlo Park is bounded by the Town of Atherton, Redwood City and unincorporated North Fair Oaks to the north. Atherton Channel runs along the boundary between Redwood City and Menlo Park converging with the Bayfront Canal west of Marsh Road. Palo Alto and East Palo Alto are to the south. San Francisco Bay and adjacent wetlands comprise 12 square miles or two-thirds of Menlo Park's total area (City of Menlo Park, 2016).

Existing Conditions

The discussion below describes the existing and baseline conditions for hydrology and water quality, and also describes changes to these conditions, if any, since the *ConnectMenlo* EIR was adopted in 2016.

Surface Waters

The City of Menlo Park is located within the 50-square mile San Francisquito Creek watershed, which includes portions of both Santa Clara County and San Mateo County. The uppermost elevations of the watershed are located west of Highway 35 (Skyline Boulevard), and its lowest points are in East Palo Alto where San Francisquito Creek empties into the San Francisco Bay. The southernmost edge of the watershed is in the Los Trancos Regional Preserve near Palo Alto, and its northern most edge is Sweeny Ridge in the Golden Gate National Recreation Area.

Water flows generally southwest to northeast toward southern San Francisco Bay through natural creeks, streams, and channelized waterways. In the undeveloped marshes along San Francisco Bay, water flows through Flood Slough and Ravenswood Slough. San Francisquito Creek, the main creek system in Menlo Park, flows northeasterly toward San Francisco Bay and forms the southern boundary of the City limits. This waterway is spanned by riparian vegetation roughly 25 to 75 meters wide.

Surface Water Quality

A review of the California 2018 Integrated Report Map reveals that San Francisquito Creek (extending from Searsville Lake to the South San Francisco Bay) is listed on the Clean Water Act (CWA) 303(d) list as impaired for pollutants such as trash, sedimentation/siltation, and diazinon (RWQCB, 2018a). South San Francisco Bay is also listed on the 303(d) list for various pollutants as shown on **Table 4.9-1** (RWQCB, 2018b). The term 303(d) list is short for the State's list of impaired and threatened waters (e.g., stream/river segments, lakes). The State identifies the pollutant causing the impairment, when known.

Groundwater

Menlo Park overlies the southern end of the Santa Clara Valley Groundwater Basin's, San Mateo Plain Groundwater Subbasin (groundwater basin number 2-009.03; DWR, 2004; or "subbasin") of the Santa Clara Valley Groundwater Basin. The subbasin is not adjudicated, nor has it been found by the Department of Water Resources (DWR) to be in a condition of overdraft (i.e., where groundwater extraction exceeds recharge). Neither Menlo Park Municipal Water (MPMW) or the Bear Gulch Water District rely on groundwater for their water supplies; however, MPMW has constructed one emergency water supply well and plans to construct one to two additional emergency wells in order to achieve another 1,500 gallons per minute (gpm) (for a total supply capacity of 3,000 gpm) as part of the planned Emergency Water Storage/Supply Project. See the discussion on *Water Supply*, below, for information on these wells.

TABLE 4.9-1
CWA 303(D) LISTED SURFACE WATERS

CWA 303(d) Listed Surface Water	Listed pollutant	Source	Status
San Francisquito Creek			
	Diazinon	Unknown	Being addressed by a USEPA-approved[b] TMDL[c]
	Sedimentation/siltation	Unknown	TMDL required
	Trash	Unknown	Being addressed by an action other than a TMDL
South San Francisco Bay			
	Mercury	Unknown	Being addressed by a USEPA-approved TMDL
	Dieldrin	Unknown	TMDL required
	Selenium	A source unknown	TMDL required
	DDT	A source unknown	TMDL required
	Chlordane	A source unknown	TMDL required
	PCBs	A source unknown	Being addressed by a USEPA-approved TMDL
	Dioxin compounds	A source unknown	TMDL required
	Furon compounds	A source unknown	TMDL required
	Invasive species	A source unknown	TMDL required

NOTES:

a The term 303(d) list is short for the State's list of impaired and threatened waters (e.g., stream/river segments, lakes). The State identifies the pollutant causing the impairment, when known.
b USEPA = U.S. Environmental Protection Agency
c TMDL refers to total maximum daily load which is the maximum quantity of a particular contaminant that a waterbody can assimilate without experiencing adverse effects on the beneficial use identified.

SOURCE: SF Bay Regional Water Quality Control Board, 2018.

As part of the implementation of the Sustainable Groundwater Management Act (SGMA), the subbasin was ranked as a "very low priority" basin under the 2014 California Statewide Groundwater Elevation Monitoring (CASGEM) basin prioritization process and maintained this ranking in DWR's latest basin prioritization effort in 2019. The subbasin is therefore not subject to the requirements of the SGMA (MPMW, 2021a).

Located within the 45-square mile San Francisquito Creek Watershed, the MPMW service area contains both mountainous bedrock terrain and comparatively flat alluvial deposits. Coarse- and fine-grained alluvial deposits from San Francisquito Creek can be found in the MPMW service area. There is a shallow aquifer and a deep aquifer that has an upper and a lower zone in the MPMW service area. Both aquifers lie beneath a laterally extensive confining layer. The shallow aquifer is unconfined while the deep aquifer is semi-confined. Pump tests and empirical transmissivity data have indicated that it is feasible to develop a municipal supply from the groundwater subbasin. It is estimated that the groundwater subbasin can be as thick as 1,000 feet in some locations.

Groundwater in the Santa Clara Valley Groundwater Basin naturally flows towards San Francisco Bay from the uplands in the southwest. Reverse groundwater gradients, from San Francisco Bay toward the uplands, have been seen when pumping has exceeded the rate of recharge. Natural recharge occurs by infiltration of water from streams that enter the valley from the upland areas within the drainage basin and by percolation of precipitation that falls directly on the valley floor. The estimated annual recharge rate of the San Francisquito Creek watershed ranges from 4,000 to 8,000 acre-feet per year, equivalent to 3.6 to 7.2 mgd.

According to the San Mateo Plain Groundwater Basin Assessment, inflows and outflows to the Basin average about 7,900 acre-feet per year (AFY) under current land and water use conditions. The largest sources of recharge are deep percolation of rain and applied irrigation water in irrigated areas, deep percolation of rain in non-irrigated areas, percolation from creeks, and water pipe leaks. (EKI, HydroFocus, Todd Groundwater, 2018). The largest outflows are groundwater seepage to creeks and tidal wetlands, groundwater pumping for water supply, groundwater infiltration into sewers, and dewatering pumping. During wet periods, rainfall recharge and stream percolation are above average, which replenishes the temporary decrease in groundwater storage and restores subsurface outflows. A sequence of wet years temporarily boosts all of those items.

Within the Basin, considerable outflow occurs to local streams, sewers, and into and beneath San Francisco Bay. Protection of groundwater recharge generally is beneficial and promotion of recharge may be an important management action for the future, and one that is actively being evaluated within the Basin. At this time, with regard only to the water balance of the Basin, additional recharge would likely result in additional groundwater discharge (EKI, HydroFocus, Todd Groundwater, 2018). It should be noted that variability of inflows and outflows does exist; therefore, at this time it reasonable to assume that groundwater quantities in the Basin are relatively stable and wet years would replenish groundwater extractions and outflows in dry years.

Water Supply

Water supply for those portions of the City of Menlo Park that would be affected by the HEU's housing opportunity and land use strategy sites is delivered through two primary providers: California Water Service Company's Bear Gulch District and MPMW. Detailed information on these water suppliers and their supply sources can be found in Section 4.16 of this SEIR, *Utilities and Service Systems*. The Bear Gulch District derives its water supply from a combination of local surface water and imported surface water purchased through the San Francisco Public Utilities Commission (SFPUC). The sole source of MPMW's potable water has been wholesale water also supplied by SFPUC Regional Water Service. Approximately 85 percent of this water supply originates in the Hetch Hetchy watershed, located in Yosemite National Park, and flows down the Tuolumne River into the Hetch Hetchy Reservoir. Water from the Hetch Hetchy watershed is managed through the Hetch Hetchy Water and Power Project. The remaining 15 percent of the water supply to the RWS originates in the Alameda and Peninsula watersheds and is stored in six different reservoirs in Alameda and San Mateo Counties.

Groundwater is currently not considered as a normal or dry year supply for Menlo Park; however, MPMW has constructed one emergency water supply well and plans to construct one to two

additional emergency wells in order to achieve another 1,500 gallons per minute (gpm) (for a total supply capacity of 3,000 gpm) as part of the planned Emergency Water Storage/Supply Project. The wells would serve as a supplemental (as needed) supply during significant water shortages due to an emergency or drought conditions (MPMW, 2021a). Recycled water used in Menlo Park is sourced from the West Bay Sanitary District.

Flood Zones

The Federal Emergency Management Agency (FEMA) prepares maps of flood hazard zones throughout the United States. Areas within the 100-year flood hazard area are subject to a 100-year flood, which means that in any given year the risk of flooding in the designated area is 1 percent. Maps are also available for 500-year floods, which means that in any given year, the flood risk in the designated area is 0.2 percent. In some locations, maps include base flood elevation information for the 100-year flood event, which refers to the minimum height of the flood waters during a 100-year flood event, reported in feet above sea level. **Figure 4.9-1** depicts the flood hazard zones in the vicinity of Menlo Park relative to the HEU's potential housing opportunity and land use strategy sites.

Dam Safety

Dam failure is the uncontrolled release of impounded water (such as a lake or reservoir) behind a dam. Possible causes for dam failure include poor maintenance, flooding, landslides, earthquake, vandalism or other issues. Dam failure is extremely rare. Although there is no historic record of a dam failure in San Mateo County or Menlo Park, there are several reservoirs that present a risk of downstream inundation in the event of a dam failure that could result from an earthquake or other catastrophic event.

The California Department of Water Resources Division of Safety of Dams (DSOD) is responsible for conducting annual inspections and disclosing risk associated with jurisdictional structures. DSOD hazard potential classifications are based on Federal guidelines published by FEMA. FEMA recommends a three-step rating system that defines low, significant, and high hazard potential classifications, determined from factors including potential loss of life, economic loss, and environmental damage resulting from a *hypothetical (i.e., sunny day)* dam failure scenario. As depicted on **Figure 4.9-2, Dam Failure Inundation Zones**, portions of Menlo Park or its sphere of influence could become inundated if the dams at Bear Gulch, Felt Lake, or Searsville Reservoir were to be structurally compromised.

Bear Gulch Reservoir, owned by California Water Service Company (CalWater) is a 725 acre-feet (AF) capacity earthen embankment reservoir constructed in 1896. The reservoir (CA00658) has an assessed condition of "fair", meaning that no existing deficiencies are recognised for normal operating conditions. Rare or extreme hydrologic or seismic events may result in a dam safety deficiency for structures classified as fair. The downstream hazard rating for this structure is categorized as extremely high (DSOD, 2021).

Felt Lake (CA00670) owned by Stanford University, is a 900 AF capacity reservoir with an earthen embankment constructed in 1930. The assessed condition for this structure is satisfactory, meaning that no existing or potential dam safety deficiencies are recognized, and acceptable

performance is expected under all loading conditions (static, hydrologic, seismic) in accordance with the minimum applicable state or federal regulatory criteria or tolerable risk guidelines. The downstream hazard rating for this structure is also categorized as extremely high.

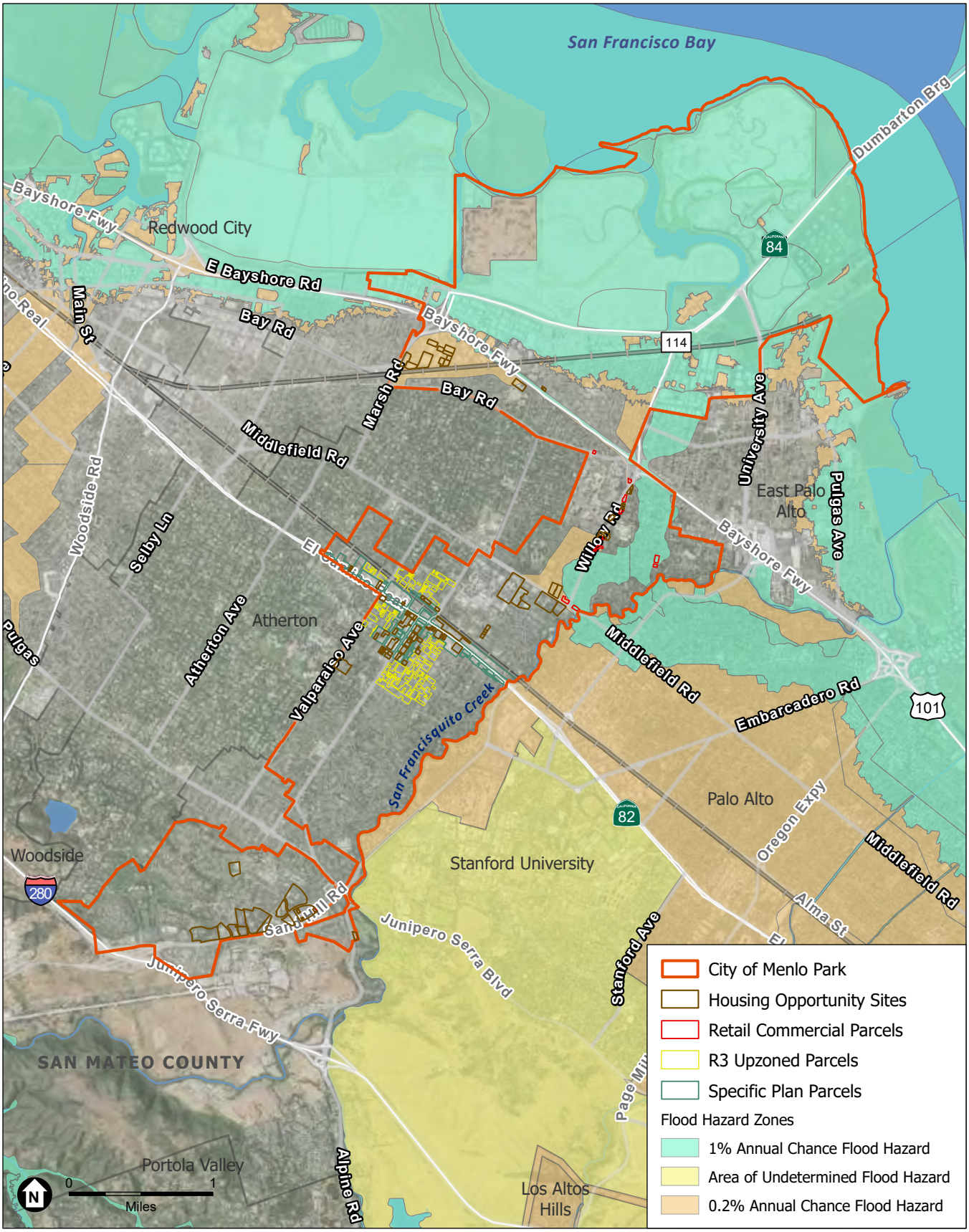
Searsville Dam and Reservoir, also owned by Stanford University, was constructed in 1892 as a 1,840 AF capacity reservoir. Sedimentation has greatly reduced the reservoir to less than 10 percent of its original capacity. Water stored at Searsville provides one of several sources of non-potable water used at Stanford for landscape irrigation, agriculture and fire protection. Due to the drought, limited use of the impounded water has occurred in recent years (Stanford University, 2015). The assessed condition of the dam is satisfactory and downstream hazard rating is categorized as extremely high (DSOD, 2021).

Stormwater and Flood Resilience

Cities and unincorporated communities in San Mateo County generate runoff that flows into the Bayfront Canal via the Atherton Channel and six other drainage basins. The Atherton Channel and the Bayfront Canal converge between Redwood City and Menlo Park, east of US-101 and north of Marsh Road near the entrance of Bedwell Bayfront Park. The combined flows discharge into San Francisco Bay. For the past several decades, high tides have kept stormwater from draining properly, and even minor rainfall events have resulted in nearby flooding of streets and businesses. Historically, flooding has occurred in the neighborhoods near the Bayfront Canal (Redwood City) and Atherton Channel (Menlo Park and Atherton), particularly during storms coinciding with high tides.

Menlo Park joined with Redwood City, Atherton, and San Mateo County to establish shared funding responsibilities and initiate a project to reduce the frequency and impacts of flooding. The San Mateo County Flood and Sea Level Rise Resiliency District was formed in 2020 and is leading the implementation of this effort. The project consists of installation of underground concrete culverts that divert excess flow from Bayfront Canal and Atherton Channel into managed ponds within the Ravenswood Complex of the South Bay Salt Ponds Restoration Project. There are numerous stormwater improvement projects currently being implemented in Menlo Park and throughout San Mateo County (San Mateo County Department of Public Works, 2021).

The San Francisquito Creek Joint Powers Authority (SFCJPA) serves the communities of Menlo Park, Palo Alto, and East Palo Alto by addressing flood risks from the San Francisquito Creek and San Francisco Bay through collaborative planning and multi-benefit projects including implementing and monitoring flood risk reduction, and sea-level rise resiliency projects. The current effort involves the Strategy to Advance Flood Protection Ecosystem and Recreation along San Francisco Bay (or SAFER project). This effort consists of engineered and natural flood protection along with habitat restoration and recreational improvements (SFCJPA, 2022).

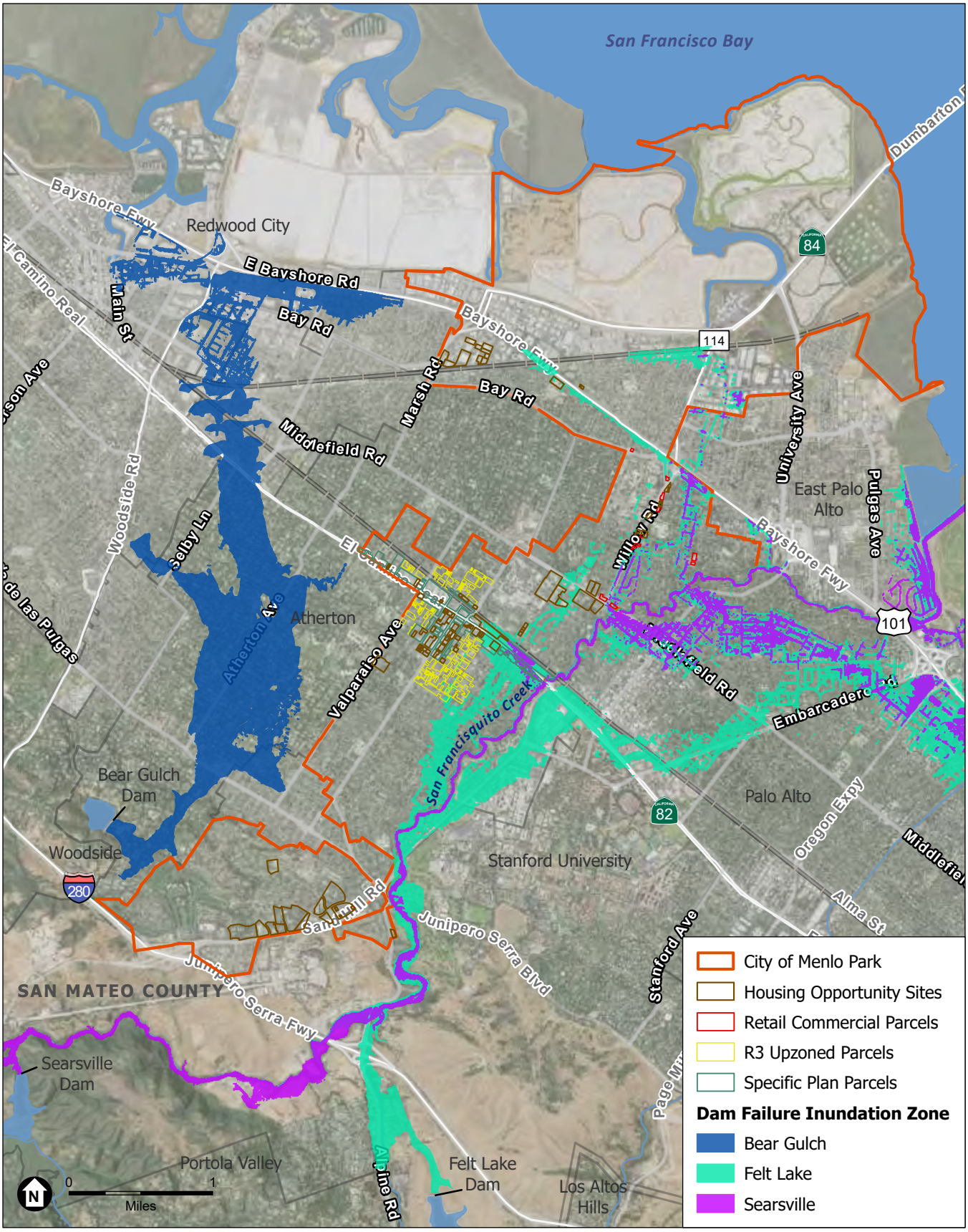


SOURCE: Esri, 2022; FEMA, 2022; M-Group, 2022; ESA, 2022

Menlo Park Housing Element Update EIR

Figure 4.9-1
Flood Zones

ESA



SOURCE: Esri, 2022; DWR, 2021; M-Group, 2022; ESA, 2022

Menlo Park Housing Element Update EIR

Figure 4.9-2
Dam Failure Inundation Zones

ESA

Tsunami and Seiches

Tsunamis are ocean waves generated by vertical movement of the sea floor, normally associated with earthquakes or volcanic eruptions. Portions of Menlo Park northeast of Bayfront Expressway are within a tsunami hazard area (CGS, 2021). None of the HEU's housing opportunity and land use strategy sites are within a tsunami inundation zone.

Seiches are oscillations of enclosed or semi-enclosed bodies of water that result from seismic events, wind stress, volcanic eruptions, underwater landslides, and local basin reflections of tsunamis. Seiches occur in enclosed or partially enclosed bodies of water, such as a lake or reservoir. San Francisco Bay is a large open body of water that presents no immediate risk of seiche.

4.9.3 Regulatory Setting

The following section focuses on any changes to the regulatory setting that have occurred since certification of the *ConnectMenlo* EIR. Section 4.8 of that Draft EIR, *Hydrology and Water Quality*, evaluated effects related to hydrology, water quality, flooding, sea level rise, dam inundation, stormwater effects, tsunami, seiche, and mudflow. There, Section 4.8.1.1, *Regulatory Framework*, described regulations applicable to this topic, and that description is still current for this SEIR, except as supplemented below.

Regional

San Francisco Bay Plan

As required by the McAteer-Petris Act, the San Francisco Bay Plan was submitted to the California State Legislature in 1969, and revisions to the Act designated the San Francisco Bay Conservation and Development Commission (BCDC) as the permanent agency responsible for carrying out the Bay Plan. The Bay Plan includes policies to guide future uses of the Bay and shoreline and maps that apply these policies. The Bay Plan contains policies reflecting goals for water quality, pollution prevention, wildlife, and shoreline protection, among others.

San Francisco Bay Water Quality Control Plan (Basin Plan)

The Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) is the master water quality control planning document used to designate beneficial uses and surface and ground water quality objectives. The Project site is located within the water quality control jurisdiction of Region 2, the San Francisco Bay Regional Water Quality Control Board (RWQCB). Region 2 is tasked with implementing the adopted Basin Plan for the San Francisco Bay Basin through planning, permitting, and enforcement of established water quality objectives. In accordance with State Policy for Water Quality Control, Region 2 employs a range of beneficial use designations for surface waters (including creeks, streams, lakes, and reservoirs), as well as groundwaters, marshes, and mudflats that serve as the basis for establishing water quality objectives, discharge conditions, and prohibitions. The Basin Plan, as updated with amendments adopted through May 4, 2017, has identified existing and potential beneficial uses supported by the key surface water drainages throughout its jurisdictional planning area (SF RWQCB, 2017). Designated beneficial uses for water bodies in the study area are provided in **Table 4.9-2**.

TABLE 4.9-2
DESIGNATED BENEFICIAL USES FOR WATER BODIES IN THE STUDY AREA

Water Body	Designated Beneficial Uses
San Francisquito Creek	COLD, MIGR, WARM, WILD, REC-1, REC-2
South San Francisco Bay	COMM, EST, IND, MIGR, NAV, RARE, SHELL, SPWN, WILD, REC-1*, REC-2
Santa Clara Valley San Mateo Subbasin	MUN, PROC, IND, AGR

NOTES:

Existing and Potential Beneficial Uses Key:

AGR (Agricultural Supply); COLD (Cold Freshwater Habitat); COMM (Commercial and Sport Fishing); EST (Estuarine habitat); IND (Industrial Service Supply; MIGR (Fish Migration); MUN (Municipal and Domestic Supply); REC-1 (Water Contact Recreation); REC-2 (Noncontact Water Recreation); PROC (Industrial Process Supply); SHELL (Shellfish Harvesting); SPWN (Fish Spawning); RARE (Preservation of Rare and Endangered Species); WARM (Warm Freshwater Habitat); WILD (Wildlife Habitat).

SOURCE: RWQCB, 2017

Phase I - Municipal Regional Stormwater Permit (MRP)

The federal Clean Water Act (CWA) was amended in 1987 to address urban stormwater runoff pollution of the nation's waters. In 1990, US EPA promulgated rules establishing Phase 1 of the National Pollutant Discharge Elimination System (NPDES) stormwater program. The Phase 1 program for Municipal Separate Storm Sewer System (MS4s) requires operators that serve populations of 100,000 or greater to implement a stormwater management program to control polluted discharges from these MS4s.

The Water Board issued county-wide municipal stormwater permits in the early 1990s to operators of MS4s serving populations over 100,000 (Phase 1). On November 19, 2015, the Water Board re-issued these county-wide municipal stormwater permits as one Municipal Regional Stormwater NPDES Permit No. Order No. R2-2015-0049 to regulate stormwater discharges from municipalities such as Menlo Park and local agencies in San Mateo County and numerous other counties in the San Francisco Bay Area (SFB RWCQB 2021).

Condition C.3 under the MRP stipulates standards for new development and redevelopment to include source control site design and stormwater treatment measures to address stormwater runoff pollutant discharges. For projects discharging directly to CWA Section 303(d) waterbodies (Table 4.9-1) conditions of approval must require that post development runoff not exceed pre-development levels for listed pollutants (SFB RWQCB 2015).

Local

Menlo Park General Plan

The Menlo Park General Plan is a comprehensive long-range general plan for the physical development of the City of Menlo Park (City of Menlo Park, 2016a). The General Plan contains the current City of Menlo Park Housing Element, which was adopted in 2014 (City of Menlo Park, 2014). The various elements within the General Plan include goals and policies for the physical development of the City. Goals and policies related to Hydrology and Water Quality are listed below.

The following goals from the Open Space/Conservation, Noise, and Safety Elements are applicable to the project:

Goal LU-6: Preserve open-space lands for recreation; protect natural resources and air and water quality; and protect and enhance scenic qualities.

Goal LU-7: Promote the implementation and maintenance of sustainable development, facilities and services to meet the needs of Menlo Park's residents, businesses, workers, and visitors.

Policy LU-7.4: Water Protection. Work with regional and local jurisdictions and agencies responsible for ground water extraction to develop a comprehensive underground water protection program in accordance with the San Francisquito Creek Watershed Policy, which includes preservation of existing sources and monitoring of all wells in the basin to evaluate the long term effects of water extraction.

Policy LU-7.7: Hazards. Avoid development in areas with seismic, flood, fire, and other hazards to life or property when potential impacts cannot be mitigated.

Goal OSC-5: Ensure Healthy Air Quality and Water Quality. Enhance and preserve air quality in accord with state and regional standards and encourage coordination regarding water quality management, including management of both the water supply and wastewater treatment.

Policy OSC-5.1 Air and Water Quality Standards. Continue to apply standards and policies established by the Bay Area Air Quality Management District (BAAQMD), San Mateo Countywide Water Pollution Prevention Program (SMCWPPP), and City of Menlo Park Climate Action Plan through the California Environmental Quality Act (CEQA) process and other means as applicable.

Policy OSC-5.3 Water Conservation. Encourage water-conserving practices in businesses, homes, and institutions.

Goal S-1: Assure a safe community.

Policy S-1.1: Location of Future Development. Permit development only in those areas where potential danger to the health, safety and welfare of the residents of the community can be adequately mitigated.

Policy S-1.5: New Habitable Structures. Require that all new habitable structures incorporate adequate hazard mitigation measures to reduce identified risks from natural and human-caused hazards.

Policy S-1.8: Safety Element Updates. Review and comprehensively revise the Safety Element whenever substantial new scientific data or evidence related to prevention of natural and human hazards becomes available, and coordinate with other General Plan elements and City emergency plans.

Policy S-1.9: Community Safety Services and Facilities. In coordination with other agencies, maintain adequate and cost-effective levels of safety services, facilities and programs to address safety concerns in Menlo Park.

Policy S-1.10: Safety Review of Development Projects. Continue to require hazard mitigation, crime prevention, fire prevention and adequate access for emergency vehicles in new development.

Policy S-1.21 Flood and Tsunami Hazard Planning and Mapping. Consider the threat of flooding and tsunamis in planning and management practices to minimize risk to life, environment and property and maintain up-to-date tsunami hazard zones maps and flood maps as new information is provided by FEMA and other regional agencies. Modify land use plans in areas where tsunamis and flooding are hazards and permit only uses that will sustain acceptable levels of damage and not endanger human lives in the event of inundation.

Policy S-1.22 Flood Damage Prevention. Continue to apply standards for any construction projects (new structures and existing structures proposed for substantial improvement) in areas of special flood hazard in accordance with FEMA and the Flood Damage Prevention Ordinance, including the use of flood-resistant construction materials and construction methods that minimize flood damage. Locate new essential public facilities outside of flood zones, such as City operations facilities, police and fire stations, and hospitals, to the extent feasible.

Policy S-1.23: Potential Dam Inundation. Consider potential risks from dam inundation in the development approval process.

Policy S-1.24: Dam Safety. Support programs by the California Division of Safety of Dams to retrofit or replace dams or to increase earthquake resistance of dams and mitigate impacts of dam failures. State efforts to inspect dams and evaluate dam safety requirements shall also be supported.

Policy S-1.25: Creeks and Drainage-ways. Seek to retain San Francisquito and Atherton creeks/channels in their natural state in order to prevent undue erosion of creek banks. Protect creek-side habitat and provide maintenance access along creeks where appropriate.

Policy S-1.26: Erosion and Sediment Control. Continue to require the use of best management practices for erosion and sediment control measures with proposed development in compliance with applicable regional regulations.

Policy S-1.27: Regional Water Quality Control Board (RWQCB) Requirements. Enforce stormwater pollution prevention practices and appropriate watershed management plans in the RWQCB general National Pollutant Discharge Elimination System requirements, the San Mateo County Water Pollution Prevention Program and the City's Stormwater Management Program. Revise, as necessary, City plans so they integrate water quality and watershed protection with water supply, flood control, habitat protection, groundwater recharge, and other sustainable development principles and policies.

Policy S-1.28: Sea Level Rise. Consider sea level rise in siting new facilities or residences within potentially affected areas.

Menlo Park Green Infrastructure Plan

In 2019, Menlo Park initiated a Green Infrastructure (GI) Plan to address concerns with respect to the increasing rate of urban runoff and pollution associated with impervious surfaces and the City's traditional storm drainage systems. The GI Plan intends to shift traditional storm drain networks toward green infrastructure systems which utilize plants and soils to mimic natural watershed processes and advance beneficial stormwater treatment, flood attenuation, and groundwater recharge. The GI Plan serves as technical guidance for advancing green infrastructure projects from inception to post construction by referencing standard details, specifications, maintenance procedures, and tracking tools aimed at intercepting contaminants and reducing pollution in local waterways tributary to San Francisco Bay (Menlo Park, 2019).

Menlo Park Municipal Water – Urban Water Management Plan

In May 2021, the Menlo Park City Council approved the 2020 Urban Water Management Plan for Menlo Park Municipal Water (MPMW). The Urban Water Management Plan (UWMP) is a foundational document containing source information about MPMW's historical and projected water demands, regionally available water supplies, an assessment of water supply reliability and vulnerabilities, water shortage contingency planning, and demand management measures (MPMW, 2021a).

Menlo Park Municipal Water – Water Shortage Contingency Plan

Concurrent with the UWMP, MPMW developed a water shortage contingency plan based on the following guiding principle:

> Eliminate water waste, prioritize the reduction of non-essential water uses, and preserve water uses that are essential to the health, safety, welfare, and economic vitality of MPMW's customers during periods of water shortage (MPMW, 2021b).

California Water Service Company Bear Gulch District – Urban Water Management Plan

The UWMP for the Bear Gulch District (a division of the California Water Service Company or Cal Water) is a long range planning document for water supply and system planning. The UWMP provides a source for data on populations, housing, water demands, water supplies and capital improvement projects used in regional water resource management plans, city and county general plans, and statewide regional water resource plans. The UWMP describes the water supply and delivery system reliability, water demand (or use) characterization, shortage contingency planning, and demand management measures (Cal Water, 2021).

4.9.4 Environmental Impacts and Mitigation Measures

Scope of Analysis

The analysis in this SEIR identifies impacts identified in the 2016 *ConnectMenlo* EIR, and describes how the impacts of the HEU would differ, as applicable.

Significance Thresholds

The thresholds used to determine the significance of impacts related to hydrology and water quality are based on the current version of the Appendix G of the *CEQA Guidelines*. Note that the criteria used to evaluate impacts to water resources differ from those used for the certified 2016 *ConnectMenlo* EIR, as Appendix G was substantially updated in 2019, partly in response to the *California Building and Industry Association v. Bay Area Air Quality Management District* decision. The Appendix G Checklist questions for hydrology and water quality were substantially revised as a result. Accordingly, for this SEIR, implementation of the HEU could have a significant impact on hydrology and water quality if it would:

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality;

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin;

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

   i. result in substantial erosion or siltation on- or off-site;

   ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;

   iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff, or;

   iv. impede or redirect flood flows.

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation;

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

Issues Not Discussed in Impacts

There would be no risk of inundation from a seiche event in the vicinity of the HEU housing opportunity and land use strategy sites. There are no potential housing opportunity and land use strategy sites identified for areas subject to tsunami hazards. These issues are not discussed further in this section.

Methodology and Assumptions

Impacts on hydrology and water quality are evaluated using the current CEQA Appendix G criteria listed above. Impacts are evaluated based on information included in the City of Menlo Park General Plan, the Water Quality Control Plan for the San Francisco Bay Basin, San Francisco Bay Municipal Regional Permit stormwater guidance, Federal Emergency Management Agency Flood Map Service Center, and City of Menlo Park Municipal Code pertaining to stormwater and development standards near creeks and in floodways.

Residential development projects and associated infrastructure improvements that could result from the HEU's implementation would be regulated by the various laws, regulations, and policies summarized in the *ConnectMenlo* EIR and above in Section 4.9.3. Compliance with applicable federal, State, and local laws and regulations is assumed in this analysis, and local and State agencies would be expected to continue to enforce applicable requirements to the extent that they do so now. Note that compliance with many of the regulations is a condition of permit approval.

Impacts and Mitigation Measures

Impacts

Impact HYDRO-1: Implementation of the HEU would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. (*Less than Significant Impact*)

The *ConnectMenlo* EIR determined that regulatory controls, combined with implementation of site design, source control, and treatment control measures required for new development or redevelopment projects would ensure the protection of water quality. Accordingly, the EIR determined that implementation of the project would result in less-than-significant impacts with respect to water quality. These same findings apply to implementation of the HEU, as discussed below.

Development projects proposed under the HEU would have a significant impact if development would violate water quality standards and waste discharge requirements (WDR), pursuant to NPDES *Permit CA CAS612008*; *Order No. R2-2015-0049* issued to permittees in the region and in effect in the City of Menlo Park. A violation could occur if development would substantially increase pollutant loading levels in the sanitary sewer system, either through the direct introduction of contaminants generated by industrial land uses, or indirectly through stormwater pollution.

Construction

Construction of the housing units that could derive from the HEU's implementation would involve ground disturbing activities such as trenching and excavation, vegetation removal and grading. As soil disturbing activities occur across a landscape, the potential for erosion and sedimentation increases. Disturbed soils are typically more susceptible to erosion from rain and wind, which in the absence of preventative measures, can lead to mobilization of sediments and silt through runoff. Erosion can escalate under storm events.

To accomplish such construction, heavy equipment such as bulldozers, graders, earth movers, heavy trucks, trenching equipment and other machinery is likely to be used. Such machinery could contribute pollutants to stormwater runoff in the form of sediment and other pollutants such as fuels, oil, lubricants, hydraulic fluid, or other contaminants. Additionally, runoff from construction sites could introduce pollutants to stormwater. Sediment, silt, and construction debris, if mobilized during construction could be transported to receiving waters such as San Francisquito Creek or South San Francisco Bay. Degradation of these water bodies could violate water quality standards impacting beneficial uses (identified in Table 4.9-2). As noted in Section 4.9.2, *Environmental Setting*, San Francisquito Creek is listed as impaired for sediment/siltation and various other pollutants that could be mobilized through runoff. TMDLs developed or

required for these waterways contain legal limits on allowable levels of contaminants with the goal of restoring water quality of these surface waters.

As described in Section 4.9.3, *Regulatory Setting*, construction projects that result in one or more acres of ground disturbance, or less than one acre but would be part of a larger plan of development or sale, would be required to obtain coverage under the NPDES Construction General Permit. Preparation of a SWPPP, along with its implementation during construction, is required to comply with the NPDES Construction General Permit. Moreover, development projects implemented under the HEU would be subject to controls and requirements described in the Menlo Park Municipal Code. Specifically, development projects are required to submit a grading and drainage plan and an erosion and sediment control plan and implement best management practices (BMPs) to control stormwater runoff during construction. If subsurface excavation requires dewatering of groundwater, coverage under the construction dewatering general permit or waste discharge requirements may also be required.

With adherence to these regulatory standards and NPDES Construction General Permit requirements along with associated measures and best management practices described in the SWPPP, construction activities would not generate water quality violations. The impact associated with construction would therefore be **less than significant.**

Operation and Maintenance

Once constructed, development proposed under the HEU would be subject to municipal regional stormwater requirements pursuant to *NPDES Permit CAS612008; Order No. R2-2015-0049* and the waste discharge requirements and conditions of the associated San Mateo Countywide Pollution Prevention Program.

Municipal stormwater requirements include City engineering review of a written hydrology report containing the nature of the project, the existing and off-site conditions, calculating the runoff coefficient, provide net impervious surface area, and identify the drainage basin along with other important information, assumptions, and findings. A site plan and hydraulic profiles are also required. Regulated projects for which building or grading permits are issued (after January 1, 2016) must include a stormwater management plan and include Low Impact Development (LID) design measures (such as pervious paving or bioretention areas) for stormwater capture and pretreatment. The stormwater management plan shall also specify operational and maintenance BMPs along with an inspection and maintenance schedule. The requirements stipulate that prior to occupancy, the site owner shall enter into a formal written stormwater BMP operation and maintenance agreement with the City, among other provisions. Implementation of the required BMPs and adherence to the maintenance schedule and terms of the agreement would effectively limit water quality violations.

With adherence to these water quality requirements, impacts associated with operation and maintenance of the HEU would be **less than significant** with no mitigation required.

Mitigation Measure: None required.

Impact HYDRO-2: Implementation of the HEU would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable management of the groundwater basin. (*Less than Significant Impact*)

The *ConnectMenlo* EIR concluded that implementation of the proposed project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that a net deficit in aquifer volume or a lowering of the local groundwater table level would occur. Although the EIR was drafted before SGMA went into effect, the requirements for groundwater sustainability planning are not applicable for the San Mateo Plain subbasin, a very low priority groundwater subbasin. These findings remain consistent for the HEU, as described below.

The consideration of groundwater resources under this criterion includes both the anticipated project demand for groundwater resources and its alteration of the recharge capability of the basin. If, for example, development of HEU projects were to require substantial quantities of groundwater during construction or operation, or if the development were to include placement of impervious surfaces to the extent that there would be an appreciable reduction in the overall recharge area for the groundwater basin, such activities could be considered potentially significant.

As discussed in the setting section, the San Mateo Plain groundwater basin is a very low priority basin, meaning the basin has not been identified as one subject to the SGMA requirement that a groundwater sustainability plan be prepared. Conditions in this basin are stable, due mainly to the fact that the City of Menlo Park is not reliant on groundwater for its water supply.

Construction

It is anticipated that construction of projects resulting from adoption of the HEU would use water to suppress fugitive dust or for other construction purposes. As the projects have not been formally proposed, the water demand associated with this construction is not currently known. However, it is likely that given the regional availability of recycled water, at least some portion of this demand could be met using recycled water. Further, the City of Menlo Park is not reliant upon groundwater for its water supply. For these reasons, construction activities would not substantially decrease groundwater supplies and the impact would be **less than significant**.

Operation

As discussed in the setting, and as detailed in the MPMW's UWMP, the City of Menlo Park is not currently reliant on groundwater for its water supply. This analysis therefore assumes that projects considered under the HEU would not rely on groundwater as its source of drinking water supply. However, as stated above in Section 4.9.2, while groundwater is not relied upon under normal or dry year conditions, MPMW has constructed one emergency water supply well and plans to construct an additional well to achieve another 1,500 gallons per minute (gpm) (for a total supply capacity of 3,000 gpm or 4.32 mgd) as part of the planned Emergency Water Storage/Supply Project. The wells would serve as short-term emergency supplemental (as needed) supply only during significant water shortages due to an emergency or during drought conditions. To provide operational flexibility, the City plans to permit its emergency wells as

"active" wells. The City's plan is to use the groundwater wells for emergency purposes only, but as active wells, MPMW will have the flexibility to provide well water during emergencies that last more than 14 days per year or more than five consecutive days.

It is generally expected that increases in the frequency and severity of drought conditions and supply reductions through SFPUC's RWS could increase in coming years. Together with the increased population from the HEU's implementation, this expected condition may result in more frequent water shortages, an increased need for conservation, and occasional reliance on supplemental groundwater from MPMW's groundwater wells. As described in the groundwater setting, groundwater in the Santa Clara Valley Groundwater Basin naturally flows towards San Francisco Bay from the uplands in the southwest towards San Francisco Bay. The estimated annual recharge rate of the San Francisquito Creek watershed ranges from 4,000 to 8,000 acre-feet per year, equivalent to 3.6 to 7.2 mgd.

As described above, the City plans to use groundwater during emergencies and shortages only, however, assuming these wells will be permitted as "active" wells, the City could use groundwater for more than 14 days per year or more than five consecutive days. For conservative water supply planning, calculated estimates of 14 days of continual groundwater pumping at 90 percent of capacity would be approximately 54 MG or 167 AF; if the City needed to continue using groundwater for up to 30 days, estimated extractions would be approximately 117 MG or 358 AF.

As described above, the San Mateo Groundwater subbasin was ranked as a "very low priority" basin and inflows and outflows to the Basin average about 7,900 acre-feet per year (AFY) under current land and water use conditions. As described above, groundwater quantities in the Basin are relatively stable, in other words, in equilibrium, as wet years would replenish groundwater extractions and outflows in dry years. If the City intends on pumping groundwater for up to 30 days and extracting approximately 358 AF as a supplemental supply source to blend with its imported water to serve existing plus projected demand associated with implementation of the HEU, long-term depletion of groundwater is not anticipated because the Basin is stable and groundwater recharge balances extractions. Therefore operational impacts under this criterion would be **less than significant**.

Mitigation Measure: None required.

Impact HYDRO-3: Implementation of the HEU would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: i) result in substantial erosion or siltation on- or offsite; ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite; iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or iv) impede or redirect flood flows. (*Less than Significant Impact*)

The *ConnectMenlo* EIR concluded that development consistent with the Menlo Park General Plan would not require extensive expansions of the existing stormwater drainage infrastructure,

because most of the sites would either be infill projects or located within existing storm drainage systems and because the development would be subject to City requirements for no net increase in stormwater flow rates. In addition, the EIR determined that such development would be required to implement landscaping features that provide on-site infiltration of stormwater runoff. For these reasons, the EIR concluded that with implementation of these regulatory controls, impacts associated with stormwater drainage capacity exceedances and runoff from future development would be less than significant. These findings remain consistent for the HEU, as described below.

Subsequent to the adoption of the *ConnectMenlo* EIR, the City has engaged in improvements to its stormwater system and is implementing the Green Infrastructure (GI) Plan. Recent improvements include upgrades to the San Mateo County Bayfront Canal and Atherton Channel, Chrysler Pump Station, Menlo Park municipal storm drain system, and the San Francisquito Creek Joint Powers Authority projects designed to improve stormwater drainage and minimize localized conditions of flooding.

Construction

As discussed under Impact HYDRO-1, construction of projects associated with the HEU would involve grading and other soil disturbance which could result in runoff containing silt, sedimentation, and other pollutants, which, if mobilized, could potentially affect receiving waters. Construction would entail alteration of the landscape and placement of impervious surfaces. In the absence of measures to capture runoff, impacts associated with erosion and siltation of local waterways could occur. Similarly, runoff could enter City storm drains and result in capacity exceedances. Construction of the residential developments that could derive from the HEU's implementation would entail the use of heavy equipment and would include greater than one-acre of ground disturbing activities for the projects. Therefore, coverage under the State Construction General Permit would be required, which would include the preparation and implementation of a SWPPP to control runoff.

Development allowed by the HEU would be required to conform to stormwater management and control standards and would have to demonstrate that such development would not result in capacity exceedances as part of the projects' stormwater management plans, and such plans would be subject to City review and approval. These regulatory controls along with implementation of measures described in the SWPPP would limit runoff and potential exceedances of silt and pollutants.

Operation

Placement of impervious surfaces within flood zones for the HEU has the potential to impede or redirect flood flows and this would be considered a significant impact. Residential construction proposed in flood zones would be required to conform to standards for elevation and flood proofing (as described in Section 4.9.3, *Regulatory Setting*), such that the base floor of the proposed development would be required to be elevated (to the specified elevation depending on the flood zone designation) to a grade sufficiently above the base flood elevation. Compliance with City standards and applicable creek setback limitations would minimize potential flood impacts. Elevation of the structures located in the flood zone would allow for flood waters to pass

beneath the structures and into the municipal storm drain network. Therefore, adherence to regulatory requirements would limit the potential to impede or redirect flood flows.

Development allowed by the HEU would be subject to Menlo Park Municipal Code requirements intended to be consistent with *NPDES Permit CAS612008 Order No. R2-2015-0049* and the waste discharge requirements and conditions of the associated San Mateo Countywide Pollution Prevention Program.

The City of Menlo Park and San Mateo County are permittees of the MRP. As part of the review process for municipal development which creates or replaces 10,000 square feet of impervious surface area, a stormwater management plan would be required. Compliance with provision C.3 of the MRP must be demonstrated at the time of application for a development project including rezoning, tentative map, conditional use permit, variance, site development review, design review, development agreement or building permit (Menlo Park, 2022). Source control of pollution, site design, and stormwater treatment measures are required for new and redevelopment. In addition to providing treatment and source control, projects recreating or replacing an acre or more of impervious area (unless exempted) must also provide flow controls (or hydromodification management measures) so that post project runoff does not exceed estimated pre-project rates and durations. Regulated projects for which building or grading permits are issued (after January 1, 2016) must include Low Impact Development (LID) design measures (such as pervious paving or bioretention areas) for stormwater capture and pretreatment.

Menlo Park Municipal Code Chapter 7.42 (Stormwater Ordinance 859) contains additional regulatory requirements for stormwater management and discharge control. Project development proposed under the HEU would be required to demonstrate that stormwater capacity exceedances would not occur by completing and implementing a stormwater management and control plan for the projects complete with hydromodification area calculations and LID measures, as applicable. The stormwater management plans submitted for projects allowed by the HEU would be subject to City engineering review and approval.

Based upon each of the considerations outlined above, the impact of the HEU's implementation on stormwater runoff, erosion, and storm drainage and flooding would be **less than significant**.

Mitigation Measure: None required.

Impact HYDRO-4: Implementation of the HEU in a flood zone, tsunami hazard area, or dam inundation zone would not risk release of pollutants due to project inundation. ***(Less than Significant Impact)***

Inundation across portions of Menlo Park could occur in the event of localized flooding (Figure 4.9-1) or regionally in the event of a dam failure (see Figure 4.9-2). Potential housing opportunity and land use strategy sites associated with the HEU would be subject to local controls applicable to development within flood zones, which would reduce potential impacts associated with release

of contaminants. As discussed under Impact HAZ-1 in Section 4.8 of this SEIR, *Hazards and Hazardous Materials*, prior to construction, contractors would be required to prepare a Stormwater Pollution Prevention Plan (SWPPP) for construction activities according to the National Pollutant Discharge Elimination System (NPDES) General Construction Permit requirements. The SWPPP would list the hazardous materials (including petroleum products) proposed for use during construction; describe spill prevention measures, equipment inspections, equipment and fuel storage; protocols for responding immediately to spills; and describe BMPs for controlling site runoff. Once constructed, residences developed as a result of the HEU would use and store small quantities of chemicals typical in residences, such as household cleaning solutions, paints and thinners, and motor fuel (e.g., for vehicles and lawn mowers). Few of the chemicals would be considered hazardous materials (e.g., bleach) and the anticipated volumes would be small (typically less than 5 gallons). Given that the quantities would be small, the routine use or an accidental spill of hazardous materials and potential contamination in the event of flooding would be negligible. Therefore, impacts associated with these hazards would be less than significant.

As described in Section 4.8, *Hazards and Hazardous Materials*, construction and land uses (i.e., residences) allowed by the HEU are anticipated to introduce urban contaminants (such as heavy metals, oils, grease, pesticide residues, etc.) to the area. Therefore, given the location of potential housing opportunity and land use strategy sites within a dam failure inundation zone, the projects allowed by the HEU could present potentially significant risks for the release of contaminants into surface or groundwater if the earthen berms containing Bear Gulch or Felt Lake were to disintegrate or be undermined. DSOD regulatory compliance measures, including, but not limited to, maintenance of berms surrounding the reservoirs and annual inspections, would decrease the likelihood of catastrophic failure of these reservoirs.

As depicted in Figure 4.9-2, the inundation zone for a hypothetical sunny day failure of the dam at Bear Gulch would have a very minor impact on Menlo Park as only a small portion of the City's Sphere of Influence could experience 1 to 2 feet of flooding. Groundwater could be impacted by such an event; however, there are no potential housing opportunity and land use strategy sites identified in the HEU that would be affected or contribute contaminants in the event of dam failure at Bear Gulch.

As also shown in Figure 4.9-2, the inundation zones for a hypothetical sunny day failure of the dam at Felt Lake shows more extensive flood potential across the City of Menlo Park. A review of the inundation maps prepared for DSOD show that parts of downtown Menlo Park south of Alma Street near Alto Lane could reach depths of up to 5 to 10 feet, though deeper flood depths have been projected within the confined channel of San Francisquito Creek. As noted in Section 4.9.2, *Environmental Setting*, the assessed condition of Felt Lake dam is satisfactory meaning that no existing or potential dam safety deficiencies are currently recognized, and acceptable performance is expected under all loading conditions (static, hydrologic, seismic) in accordance with the minimum applicable state or federal regulatory criteria or tolerable risk guidelines.

In consideration of the noted condition assessments for the two dams whose inundation zones are mapped to cross Menlo Park, it is highly unlikely that the structures present risks to potential sites

identified in the HEU. Furthermore, extensive flooding associated with a hypothetical sunny day failure of Searsville Dam is also highly unlikely to occur given that the water capacity of the reservoir has been reduced to 10 percent of its original capacity due to drought and sedimentation. Therefore, due to the low level of risk for dam failure inundation, impacts associated with release of contaminants would be **less than significant**.

Mitigation Measure: None required.

Impact HYDRO-5: Implementation of the HEU would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. ***(Less than Significant Impact)***

The *ConnectMenlo* EIR concluded that future development, as part of the City's approval process would be required to comply with existing federal, State, and local regulations with respect to water quality, and implement stormwater BMPs to prevent the introduction of pollutants to stormwater. Pursuant to Menlo Park Municipal Code requirements, a storm water management plan and hydrology report must be prepared for projects that replace or introduce more than 10,000 square feet of impervious surfaces. Source control and treatment measures would be required to be detailed in the storm water management plan and hydrology report for such projects. For these reasons, the EIR determined that adoption of the project would result in less than significant water quality impacts. These requirements are still in effect and would continue to control water quality impacts within Menlo Park.

The *ConnectMenlo* EIR did not specifically evaluate conflicts with the Basin Plan. An impact under this criterion would occur if proposed activities during construction or operation would result in water quality violations to receiving waters of San Francisquito Creek or South San Francisco Bay.

As discussed under Impact HYDRO-1, the HEU has the potential to increase contamination of local water ways and the San Francisco Bay and surface waters that are identified as impaired due to existing contamination. However, as previously noted in this section there are numerous regulatory controls in effect in Menlo Park to limit unauthorized discharges. The City requires that multi-family and subdivision grading and drainage adhere to specific standards for source control and pretreatment to reduce runoff and remove contaminants from the City's storm drain system. With implementation and enforcement of such regulatory controls, the HEU would not conflict or obstruct implementation of basin plan water quality requirements.

As discussed in the setting section, the San Mateo Plain Groundwater Basin is not an adjudicated basin nor is it identified by DWR as a medium or high priority groundwater basin. Therefore, there is no requirement under SGMA to complete a groundwater sustainability plan for the basin. As the site is not located in a groundwater basin subject to SGMA planning requirements, this section, therefore, considers in a more general sense if the project's use of this water would conflict with sustainable groundwater management. As discussed above under Impact HYDRO-2, the City of Menlo Park is not reliant on groundwater for its water supply.

As described in the setting section, the City of Menlo Park (through MPMW) and Cal Water (through its Bear Gulch District) have adopted water shortage contingency plans, which contain mandates for water conservation and specific use limits that the project would be subject to in dry years (or years of prolonged drought). Demand management actions include provisions to enact a moratorium on new service connections during times of prolonged drought, for example. These regulatory controls are intended to ensure that Menlo Park manages its supplies consistent with its sustainable water management planning principals. Development considered under the HEU would be subject to these regulatory controls. Therefore, the HEU would not conflict with sustainable groundwater management and the impact would be **less than significant**.

Mitigation Measure: None required.

Cumulative Impacts

This section presents an analysis of the cumulative effects of the HEU in combination with other past, present, and reasonably foreseeable future development that could cause cumulatively significant impacts. Significant cumulative impacts related to hydrology and water quality could occur if the incremental impacts of the HEU combined with the incremental impacts of cumulative development are significant, and if the HEU's contribution to the impact is considerable. Development projections for 2040 are included in the project description and described in Section 4.0.3, *Cumulative Impacts*.

The geographic area affected by the potential housing opportunity and land use strategy housing sites and their potential to contribute to cumulative impacts varies based on the environmental resource under consideration. The geographic scope of analysis for cumulative hydrology and water quality impacts is limited to the Menlo Park City limits and the potential housing opportunity and land use strategy sites. The timeframe during which the project could contribute to cumulative hydrology and water quality impacts includes the construction and operations phases. For the potential housing opportunity and land use strategy sites, the operations phase is permanent.

Impact HYDRO-6: Implementation of the HEU, in combination with past, present, and reasonably foreseeable future development, would result in a less than significant cumulative impact with respect to hydrology and water quality. *(Less than Significant Impact)*

Menlo Park is not located in a medium- or high-priority groundwater basin and not one in condition of overdraft. As discussed under impact HYDRO-2, Menlo Park does not rely on groundwater for its water supply. Although the HEU and other recently constructed and reasonably foreseeable future projects would place demands on potable water, these demands would be evaluated on a case-by case basis, along with regional water budgeting in the UWMP and subject to changes invoked under the water shortage contingency plan during conditions of drought. Even when considered in the cumulative context, the HEU would not result in cumulatively considerable groundwater supply impacts.

As described in Section 4.0 (**Table 4.0-1**), there are numerous other residential "pipeline" developments recently constructed, proposed to be constructed, or under design review approval consideration with the City, as well as additional residential and nonresidential growth anticipated through the year 2040. Similar to future potential housing sites identified under the HEU, such development or redevelopment is subject to regional and local stormwater management guidelines and requirements. Projects involving the creation or replacement of 10,000 square feet of impervious surface area would be subject to hydromodification management controls and LID design standards and would be required to demonstrate in their stormwater control management plans that run off from disturbed sites is adequately controlled. Therefore, when considered in the cumulative context, hydrology and water quality impacts would be controlled through existing regulatory requirements and would not be cumulatively significant. Cumulative impacts would be **less than significant**.

Mitigation Measure: None required.

4.9.5 References

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4.10 Land Use and Planning

4.10.1 Introduction

This section evaluates the effects of the Housing Element Update (HEU) on land use and planning, focusing on changes to the *ConnectMenlo* EIR (certified in 2016) that may result in new or more severe impacts, and describes any mitigation measures needed to address any such impacts.

Findings of the *ConnectMenlo* Final EIR

Land use and planning impacts of the *ConnectMenlo* project were analyzed in Section 4.9 of the *ConnectMenlo* Draft EIR. The *ConnectMenlo* Final EIR determined that the project would have the following impacts with respect to land use and planning:

- LU-1: Implementation of the proposed project would not physically divide an established community. (*Less than Significant Impact*)

- LU-2: Implementation of the proposed project would not conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect. (*Less than Significant Impact, with Mitigation)*

- LU-3: Implementation of the proposed project would not conflict with any applicable habitat conservation plan or natural community conservation plan. (*Less than Significant Impact*)

- LU-4 Implementation of the proposed project, in combination with past, present, and reasonably foreseeable projects, would not result in significant cumulative impacts with respect to land use and planning. (*Less than Significant Impact, with Mitigation)*

Since certification of the *ConnectMenlo* Final EIR, Appendix G of the CEQA Guidelines has been amended to remove the third impact criterion listed above regarding conflict with any applicable habitat conservation plan or natural community conservation plan from the *Land Use and Planning* section of the Appendix G Environmental Checklist Form. This impact criterion is included in the *Biological Resources* section of the current Appendix G Environmental Checklist Form. Accordingly, Readers are directed to Section 4.3, *Biological Resources,* of this SEIR for a discussion of the aforementioned significance criterion.

Notice of Preparation Comments

The Notice of Preparation (NOP) for the SEIR was circulated on December 23, 2021 and a scoping meeting was held on January 24, 2022. The NOP and the comments received during the public comment period can be found in **Appendix A** of this SEIR. Comments relating to land use and planning received during the NOP comment period included concerns regarding whether the HEU would actually result in development of new housing; concerns regarding the feasibility of housing sites identified in the NOP; requests for additional feasible housing sites to be identified; requests for more aggressive strategies and policies to ensure a lack of barriers for housing to be

built on selected sites; desire for the HEU to address potential modifications to non-residential zoning, particularly in District 1 to reduce amount of office space permitted generally in the area; desire for the HEU to propose measures to create a more equal balance between residential and non-residential zoning; a request for the project scope to evaluate the appropriate levels of mixed-use zoning to create a better jobs to housing balance; concern regarding impacts from changes in zones that affect established land uses and neighborhoods; concern that the draft list of housing sites in the NOP is unlikely to lead the City to meet its Regional Housing Needs Allocation (RHNA) goals, and that it will likely be rejected by the California Department of Housing and Community Development (HCD); and a desire for the HEU to support affordable housing development to the fullest extent, and support more below market rate (BMR) development.

Information Sources

The primary sources of information referenced in this section included those listed below. Please note that a full list of references for this topic can be found at the end of this section.

- City of Menlo Park General Plan (2016a).
- *ConnectMenlo* Draft EIR (2016b).

4.10.2 Environmental Setting

The *ConnectMenlo* EIR (City of Menlo Park, 2016b) described land use and planning conditions as they existed at the time of the EIR's preparation. The description is limited to the Bayfront Area, which comprises the northernmost portion of Menlo Park and was the focus of the *ConnectMenlo* project. The discussion below describes existing conditions related to land use and planning for the HEU, which includes the entire City.

Existing Conditions

City of Menlo Park

The City of Menlo Park is located in the San Francisco Bay Area, approximately 30 miles south of downtown San Francisco and about 20 miles northwest of San Jose. The City boundaries and its regional location are shown in **Figure 3-1** in Chapter 3 of this SEIR, *Project Description*. The City is generally bounded by San Francisco Bay to the north and east; the cities of East Palo Alto and Palo Alto and Stanford University to the southeast; and Atherton, unincorporated North Fair Oaks, and Redwood City to the northwest. The City is accessed by Interstate 280 (I-280), U.S. Highway 101 (US-101), Caltrain, State Route 84 (SR-84, or Bayfront Expressway) via the Dumbarton Bridge, and a variety of arterial roadways, as well as regional and local pedestrian and bicycles routes. El Camino Real, the Caltrain rail station, and downtown, along with the nearby Civic Center, constitute the historic core of Menlo Park. The El Camino Real/Downtown Specific Plan area encompasses El Camino Real, the rail station area, and downtown. Menlo Park has a range of urban and suburban land uses, including residential neighborhoods of varied densities, its downtown, parks, and commercial centers.

The City of Menlo Park currently includes approximately 14,000 residential dwelling units. Single-family neighborhoods comprise more than two-thirds of residential land in Menlo Park.

The residential areas of the City are divided into several principal neighborhoods, including downtown, Allied Arts/Stanford Park, Bayfront, Belle Haven, Flood Triangle, Central Menlo, Felton Gables, Linfield Oaks, Sharon Heights, Suburban Park, Lorelei Manor, and the Willows. Residential uses include single-family detached and attached homes, duplexes, secondary dwelling units, multi-family apartments, and condominiums.

The City's commercial centers include retail, service, and various other business uses. Neighborhood-serving retail areas include the intersection of Menlo and Gilbert Avenues, as well as a number of small retail clusters along Willow Road. El Camino Real hosts a number of commercial uses and also serves as a major thoroughfare connecting Menlo Park to Atherton, Redwood City, Palo Alto, and other Peninsula and South Bay cities. Together, Santa Cruz Avenue and El Camino Real feature a variety of uses, including restaurants, shops, offices, hotels, residences, places of worship, and mixed-use sites.

Employment centers are generally concentrated in several clusters: the Bayfront area adjacent to San Francisco Bay, the Veterans Administration Medical Center at 795 Willow Road, central/downtown Menlo Park, and along portions of Sand Hill Road.

The Bayfront Area comprises the northern most portion of Menlo Park and is generally bounded by San Francisco Bay to the north; Redwood City to the west; East Palo Alto to the southeast; and the Menlo Park neighborhoods of Belle Haven, Flood Triangle, Suburban Park, and Lorelei Manor to the south. As described in the *ConnectMenlo* EIR, uses in the Bayfront Area include a mix of generally low intensity offices, research and development, warehousing, and light manufacturing. The Bayfront Area was the focus of the *ConnectMenlo* project, which resulted in rezoning the general industrial area (the former M-2 Area) in 2016, providing for additional non-residential and residential development opportunities.

The City includes numerous active and passive recreation areas, including Bedwell Bayfront Park, located at the east end of Menlo Park on San Francisco Bay at US-101 and Marsh Road. The Baylands provide habitat for a wide variety of plants and animals in the Don Edwards National Wildlife Refuge.

Existing Land Use Designations

Figure 3-2 in Chapter 3 of this SEIR, *Project Description*, shows the City's existing General Plan land use designations, which are described below.

Residential

Very Low Density Residential. This designation provides for single-family detached homes, secondary dwelling units, public and quasi-public uses, and similar and compatible uses. Density is a maximum of 2.9 units per acre, and floor area ratio (FAR)[1] is limited to those identified in the

[1] Floor area ratio (FAR) is the measurement of a building's floor area in relation to the size of the lot or parcel on which it is located. FAR is typically expressed as either a decimal number or percentage and is derived by dividing the total area of the building by the total area of the parcel.

applicable zoning district, which is typically 2,800 square feet plus 25 percent of the lot area over 7,000 square feet for lots 5,000 square feet or greater in area.

Low Density Residential. This designation provides for single-family detached homes, secondary dwelling units, public and quasi-public uses, and similar and compatible uses. Density is a maximum of 8.9 units per acre, and FAR is limited to those identified in the applicable zoning district.

Medium Density Residential. This designation provides for single-family detached and attached homes, duplexes, multi-family apartments, condominiums, public and quasi-public uses, and similar and compatible uses. The maximum density is 18.5 units per acre as identified in the applicable zoning district, and up to 30 units per acre in designated areas around the El Camino Real/Downtown Specific Plan boundary. Allowable FAR is in the range of 40 to 75 percent, as identified in the applicable zoning district.

High Density Residential. This designation provides for multi-family apartments, condominiums, senior rental housing, public and quasi-public uses, and similar and compatible uses. Density is a maximum of 40 units per acre as identified in the applicable zoning district, and may be up to 97 units per net acre for senior rental housing. The maximum FAR is 150 percent.

Commercial

Retail/Commercial. This designation provides for retail services, personal services, professional offices, banks, savings and loans, restaurants, cafes, theaters, residences, public and quasi-public uses, and similar and compatible uses. Maximum residential density is 30 units per acre, as identified in the applicable zoning district. The maximum FAR for non-residential uses is 50 percent, 90 percent for residential uses, and 100 percent for mixed uses, as identified in the applicable zoning district.

Professional and Administrative Office. This designation provides for professional, executive, general, and administrative offices, banks, savings and loans, research and development facilities, convalescent homes, residential uses, public and quasi-public uses, and similar and compatible uses. Maximum residential density is 18.5 units per acre. The maximum FAR for non-residential uses is 40 percent, as identified in the applicable zoning district.

Other City Designations

Parks and Recreation. This designation provides for open space and conservation areas, public and private golf courses, and passive and active recreation uses. The maximum FAR is 2.5 percent.

Public/Quasi-Public. This category accommodates facilities such as schools, libraries, government offices, and community facilities as follows:

- **Public Facilities.** This designation provides for public and quasi-public uses such as government offices, fire stations, schools, churches, hospitals, public utility facilities, sewage treatment facilities, reservoirs, and similar and compatible uses. The maximum FAR shall not exceed 30 percent. The City recognizes that it does not have the authority to regulate

development by federal, State, or other certain governmental agencies, but the City will work cooperatively with these agencies in an effort to ensure their development is consistent with City goals and plans.

- **Allied Arts Guild.** This designation applies to the Guild for artisans and craftsmen comprised of retail shops, workshops, restaurant, gardens and public grounds at 75 Arbor Road. The Guild was constructed in 1929 and has historic significance for both its relationship to the American Arts and Crafts Movement and the architecturally important buildings and gardens. Allowed uses shall be as established in the Allied Arts Guild Preservation Permit. The maximum FAR for the property shall be 15 percent.

Baylands. This designation provides for the preservation and protection of wildlife habitat and ecological values associated with the marshlands and former salt ponds bordering San Francisco Bay and similar and compatible uses. The maximum amount of development allowed under this designation shall be 5,000 square feet of building floor area per parcel.

Bayfront Area

The purpose of the Bayfront Area designation is to create live/work/play environments. This designation encourages office, research and development, residential, commercial uses, and hotels, all in close proximity or integrated with one another. These designations are intended to foster innovation and emerging technologies; promote the creation of an employment district with travel patterns that are oriented toward pedestrian, transit, and bicycle use; and provide amenities to surrounding neighborhoods and fiscal support to the City leveraged through development intensity bonuses. The Office and Life Sciences designations allow increased development intensities with the provision of community amenities. Master planned projects on parcels that are in the same designation that are in close proximity or large contiguous parcels with different zoning designations and that are owned by the same entity may calculate residential density, FAR and open space based on aggregate lot area provided that the underlying development regulations are satisfied and the vision for the Bayfront Area identified in the General Plan is maintained and the maximum overall residential density and/or FAR of the combined parcels is not exceeded.

Office. This designation provides for office and research and development uses, business-oriented community education and training facilities, supportive sales and personal services, corporate housing, and hotel uses. The designation also accommodates existing and new light-industrial uses that are not in conflict with existing or planned commercial or residential uses in the vicinity. Hotels are allowed as options in several locations. The maximum corporate housing density is 30 units per acre. The maximum base FAR is 45 percent and the maximum bonus FAR with community amenities is 100 percent. The maximum FAR for corporate housing is 60 percent, 25 percent for retail and service uses, and 175 percent for hotels.

Life Sciences. This designation provides for new life sciences and research and development uses, along with high-tech office and supportive sales and personal services. The designation also accommodates existing light-industrial uses and new light-industrial uses that are not in conflict with existing or planned commercial or residential uses in the vicinity. The maximum base FAR is 55 percent and the maximum bonus FAR with community amenities is 125 percent. The maximum FAR for retail and service uses is 10 percent.

Mixed Use Residential. This designation provides for higher density housing to meet the needs of all income levels. It also allows mixed-use developments with integrated or stand-alone supportive sales and service uses, and uses that are consistent with the Office Designation. Sales uses can range from small-scale businesses that serve nearby employment to a large-format grocery to serve adjacent neighborhoods. This designation is intended to promote live/work/play environments oriented toward pedestrians, transit, and bicycle use, especially for commuting to nearby jobs. The maximum base residential density is 30 units per acre, and the maximum bonus residential density is 100 units per acre. The maximum base FAR for residential is 90 percent, and a maximum of 225 percent for bonus FAR. Non-residential uses have a maximum base FAR of 15 percent and bonus FAR of 25 percent.

Light Industrial. This designation provides for light manufacturing and assembly, distribution of manufactured products, research and development facilities, industrial supply, incidental warehousing, offices, supportive sales and personal services, public and quasi-public uses, and similar and compatible uses. The maximum FAR is 55 percent.

Commercial Business Park. This designation provides for light manufacturing and assembly, distribution of manufactured products, research and development facilities, industrial supply, incidental warehousing, offices, supportive sales and personal services, hotels, public and quasi-public uses, and similar and compatible uses. The maximum FAR is 45 percent, except through a negotiated development agreement, which could allow a maximum FAR of 137.5 percent, with office uses limited to 100 percent.

El Camino Real/Downtown Specific Plan

The El Camino Real/Downtown Specific Plan applies to downtown Menlo Park and areas along El Camino Real. This designation provides for a variety of retail, office, residential, personal services, and public and semipublic uses, as specified Chapter 16.58, *SP-ECR/D El Camino Real/Downtown Specific Plan*, of the Menlo Park Zoning Ordinance. The plan created a number of land use designations that are specific to the plan area. These land use designations allow for a variety of uses, either in separate buildings or in mixed-use buildings. The plan specifies which uses are permitted, permitted with limits, conditionally permitted and prohibited within each area.

The plan also established a combination of standards and guidelines to manage the design and construction of new buildings. The standards and guidelines are intended to encourage infill development on underutilized parcels of land while respecting the smaller scale, fine grain character of the downtown and the surrounding residential area. Standards and guidelines created included those relating to: 1) development intensity; 2) building height; 3) setbacks and projections with setbacks; 4) massing and modulation; 5) ground floor treatment, entry and commercial frontage; 6) open space; 7) parking, service, and utilities; and 8) sustainable practices. The plan also established a series of ten zoning districts to govern density, building size, placement, and design. Development projects are required to adhere to both the general and specific standards applicable to the zoning district in which a project site is located.

El Camino Real Mixed Use. The El Camino Real Mixed Use designation allows for a variety of retail, office, residential and public and semipublic uses. Building character in this land use

designation relates to adjacent neighborhoods, with maximum building heights of two to three stories, except for buildings of up to three to four stories (with provision of public benefit) on part of northeast El Camino Real, and buildings of up to four to five stories permitted on the southeast end of El Camino Real. The allowed development intensities vary with the lowest intensity on the far northern end of El Camino Real, moderate intensities on the southwest end and highest intensities on the southeast end of El Camino Real, where parcels are separated from adjacent uses by El Camino Real (to the west) and the railroad right-of-way (to the east).

El Camino Real Mixed Use/Residential. The El Camino Real Mixed Use/Residential designation emphasizes residential use in close proximity (approximately 1/2 mile) to the station area and downtown, in order to support area businesses, transit use and overall downtown vibrancy. This designation also allows for a variety of retail, office and public and semipublic uses. The maximum building heights vary from two to three stories in most locations up to three to four stories (with provision of public benefit) on part of northeast El Camino Real and four to five stories, and the highest intensities, on the east side of El Camino Real south of Ravenswood Avenue.

Downtown/Station Area Retail/Mixed Use. The Downtown/Station Area Retail/Mixed Use designation focuses on uses that enhance downtown vibrancy by building upon existing community-serving retail and personal services in the downtown area. While emphasizing retail for ground-floor uses, the designation allows for a mix of uses, including office and residential uses, enhancing downtown vibrancy through an increased customer base for restaurants and retail businesses. It also allows for theaters (commercial recreation), hotels and some public and semipublic uses. This designation covers the current public parking plazas, which could accommodate limited non-parking uses. To complement the size of existing downtown business establishments and building character, the size of some types of businesses are limited, and allowable building heights are two to three stories for all but the area in closest proximity to the train station, where heights of either three to four or four to five stories are allowed. Allowed intensities in the downtown core are generally consistent with historic levels while higher intensities are allowed in the train station area.

Downtown/Station Area "Main Street" Overlay. The Downtown/Station Area "Main Street" Overlay enhances the retail emphasis of the Downtown/Station Area Retail/Mixed Use designation by specifically limiting non-retail ground floor uses on Santa Cruz Avenue. Development standards and guidelines otherwise match the underlying Downtown/Station Area Retail/Mixed Use designation.

Downtown Adjacent (Office/Residential). Allowing for office, limited personal services and residential uses, the Downtown Adjacent Office/Residential designation complements but does not compete with retail uses in the downtown area. The category permits offices and personal services (with certain size limitations), residential uses and public and semipublic uses. It excludes retail and hotel uses. The allowable building height is two to three stories, which complements buildings in downtown and adjacent neighborhoods.

4.10.3 Regulatory Setting

Section 4.9 of the *ConnectMenlo* EIR evaluated effects to land use and planning. There, Section 4.9.1.1, *Regulatory Framework*, described regulations applicable to this topic. However, because the land use and planning evaluation in the *ConnectMenlo* EIR was largely limited to the Bayfront Area, and the HEU includes the entire City, this section includes an updated and expanded description of regulations applicable the land use and planning evaluation for the HEU.

Federal

No federal plans, policies, regulations, or laws related to land use and planning are applicable to the proposed implementation of the HEU.

State

California Housing Element Law

California law (Government Code Section 65580, et seq.) requires cities and counties to include a Housing Element as a part of their General Plans to address housing conditions and needs in the community. Housing Elements are prepared approximately every eight years, following timetables set forth in the law. The Housing Element must identify and analyze existing and projected housing needs and "make adequate provision for the existing and projected needs of all economic segments of the community," among other requirements. The City adopted its current Housing Element in 2014, and must adopt an updated housing element by January 31, 2023.

State law mandates that all cities and counties zone land appropriately to accommodate the increasing needs of regional population growth. Regional housing needs are determined by the California Department of Housing and Community Development (HCD).

There have been substantial changes to State laws regarding housing in the recent years, including changes to housing element requirements (e.g., requiring that housing elements affirmatively further fair housing), changes to facilitate production of Accessory Dwelling Units (ADUs) and other forms of housing, and changes that limit local agencies' ability to condition or deny applications for affordable housing.

Regional

Association of Bay Area Governments Area Governments and RHNA

The Association of Bay Area Governments (ABAG) is the comprehensive regional planning agency and council of governments for the nine-county San Francisco Bay Area Region. Its members include the counties of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano and Sonoma counties and 101 cities and towns of the San Francisco Bay Region.

ABAG determines the distribution of affordable housing in the region through its RHNA process. As discussed in Chapter 3 of this SEIR, *Project Description,* for the period from 2023 to 2031, HCD has identified a regional housing need of 441,176 housing units in the Bay Area, which ABAG was responsible for distributing to local jurisdictions via adoption of its final RHNA Plan

in December 2021. Each jurisdiction's RHNA includes requirements for very low income, low income, moderate income, and above moderate households (ABAG, 2021).

Menlo Park's RHNA is 2,946 units. The City's HEU must plan for housing that meets this RHNA, plus an appropriate buffer.

Plan Bay Area

SB 375 requires all metropolitan regions in California to complete a sustainable communities strategy (SCS) as part of a regional transportation plan. In the Bay Area, the Metropolitan Transportation Commission (MTC) and ABAG are jointly responsible for developing and adopting a SCS that integrates transportation, land use, and housing to meet GHG reduction targets set by the California Air Resources Board (CARB).

Plan Bay Area 2050, adopted in October 2021, serves as the SCS for the Bay Area, in accordance with SB 375. *Plan Bay Area 2050* is comprised of 35 strategies across the elements of housing, the economy, transportation, and the environment. A core household and employment growth strategy of Plan Bay Area is "focused growth" in existing communities along the existing transportation network. Key to implementing this focused growth strategy are Priority Development Areas (PDAs) and Transit-Rich Areas (TRAs), as recommended and approved by local governments. As defined by the plan, PDAs are areas where new development will support the needs of residents and workers in a pedestrian-friendly environment served by transit. Plan Bay Area also recommends increasing non-auto travel mode share and reducing vehicle miles traveled per capita and per employee by promoting transit-oriented development, transit improvements, and active transportation modes such as walking and bicycling.

Prior to *Plan Bay Area 2050*, Plan Bay Area 2040, adopted in 2017, was the most recent regional transportation plan and sustainable communities strategy for the Bay Area region. *Plan Bay Area 2050* updates Plan Bay Area 2040 and is consistent with the current Regional Housing Needs Allocation cycle. However, since Plan Bay Area 2050 was adopted in late 2021, Plan Bay Area 2040 continues to serve as the basis for regional and county-wide transportation models until the models are updated. Updates to the models are anticipated within the next several years.

For a discussion of the HEU's consistency with the regional housing projections in Plan Bay Area, see Chapter 4.12, *Population and Housing*, of this SEIR. For a discussion of the proposed HEU's consistency with Plan Bay Area as it relates to greenhouse gas emissions, see Chapter 4.7, *GHG Emissions*, of this SEIR.

San Francisco Bay Conservation and Development Commission

In 1969, the McAteer Petris Act designated the San Francisco Bay Conservation and Development Commission (BCDC) as the agency responsible for the protection of the San Francisco Bay and its natural resources. BCDC fulfills this mission through the implementation of the San Francisco Bay Plan (Bay Plan), an enforceable plan that guides the future protection and use of San Francisco Bay and its shoreline (BCDC, 2019). The Bay Plan includes a range of policies on public access, water quality, fill, and project design. The Bay Plan also designates shoreline areas that should be reserved for water related purposes like sports, industry, and public

recreation, airports, and wildlife areas. Impacts related to biological resources and water quality are discussed in Section 4.3, *Biological Resources*, and Section 4.9, *Hydrology and Water Quality*, of this SEIR, respectively.

Airport Land Use Comprehensive Plans

The City of Menlo Park does not host any public or private airports or airstrips. Menlo Park is located approximately 6 miles to the northwest of Moffett Federal Airfield, 14 miles to the northwest of the San Jose International Airport, 15 miles to the southeast of San Francisco International Airport, and 18 miles to the south of Oakland International Airport. The study area is also located in close proximity to two smaller airports; with portions of Menlo Park as near as 2 miles from the Palo Alto Airport and other areas of the City as near as approximately 4 miles from the San Carlos Airport. Additional small airports in the vicinity include the Hayward Executive Airport, at 11 miles away, and the Half Moon Bay airport, at 16 miles away.

The Comprehensive Land Use Plan (CLUP) for the Palo Alto Airport was adopted by the Santa Clara County Airport Land Use Commission in 2008 and was most recently amended in November 2020 (Santa Clara County, 2008). The CLUP is intended to safeguard the general welfare of the inhabitants within the vicinity of Palo Alto Airport and ensure that new surrounding uses do not affect continued safe airport operation. Specifically, the CLUP seeks to protect the public from the adverse effects of aircraft noise, to ensure that people and facilities are not concentrated in areas susceptible to aircraft accidents, and to ensure that no structures or activities adversely affect navigable airspace. Menlo Park does not fall within the Airport Influence Area of this facility, and none of the noise or safety zones for the Palo Alto airport fall within the boundaries of Menlo Park. Some eastern portions of Menlo Park fall within the 254–354-foot Part 77 height restriction area for the Palo Alto Airport. However, the maximum height for any structure in the City of Menlo Park is 45 feet.

Local

Menlo Park General Plan

The Menlo Park General Plan is a comprehensive long-range plan for the physical development of the City of Menlo Park (City of Menlo Park, 2016a). The General Plan contains the current City of Menlo Park Housing Element, which was adopted in 2014 (City of Menlo Park, 2014). The various elements within the General Plan include goals and policies for the physical development of the City. Goals and policies related to land use and planning are listed below.

Goal LU-1: Promote orderly development of Menlo Park and its surrounding area.

> ***Policy LU-1.1: Land Use Patterns.*** Cooperate with the appropriate agencies to help assure a coordinated land use pattern in Menlo Park and the surrounding area.
>
> ***Policy LU-1.2: Transportation Network Expansion.*** Integrate regional land use planning efforts with development of an expanded transportation network focusing on mass transit rather than freeways, and support multi-modal transit development that coordinates with Menlo Park land uses.

Policy LU-1.3: Land Annexation. Work with interested neighborhood groups to establish steps and conditions under which unincorporated lands within the City's sphere of influence may be annexed.

Policy LU-1.4: Unincorporated Land Development. Request that San Mateo County consider Menlo Park's General Plan policies and land use regulations in reviewing and approving new developments in unincorporated areas in Menlo Park's sphere of influence.

Policy LU-1.5: Adjacent Jurisdictions. Work with adjacent jurisdictions to ensure that decisions regarding potential land use activities near Menlo Park include consideration of City and Menlo Park community objectives.

Goal LU-2: Maintain and enhance the character, variety and stability of Menlo Park's residential neighborhoods.

Policy LU-2.1: Neighborhood Compatibility. Require new residential development to possess high quality design that is compatible with the scale, look, and feel of the surrounding neighborhood and that respects the City's residential character.

Policy LU-2.3: Mixed use Design. Allow mixed-use projects with residential units if project design addresses potential compatibility issues such as traffic, parking, light spillover, dust, odors, and transport and use of potentially hazardous materials.

Policy LU-2.4: Second Units. Encourage development of second residential units on single-family lots consistent with adopted City standards.

Policy LU-2.7: Conversion of Residential Units. Limit the loss in the number of residential units or conversion of existing residential units to nonresidential uses, unless there is a clear public benefit or equivalent housing can be provided to ensure the protection and conservation of the City's housing stock to the extent permitted by law.

Goal LU-3: Retain and enhance existing and encourage new neighborhood-serving commercial uses, particularly retail services, to create vibrant commercial corridors.

Policy LU-3.1: Underutilized Properties. Encourage underutilized properties in and near existing shopping districts to redevelop with attractively designed commercial, residential, or mixed-use development that complements existing uses and supports pedestrian and bicycle access.

Policy LU-3.3: Neighborhood Retail. Preserve existing neighborhood-serving retail, especially small businesses, and encourage the formation of new neighborhood retail clusters in appropriate areas while enhancing and preserving the character of the neighborhood.

Goal LU-4: Promote the development and retention of business uses that provide goods or services needed by the community that generate benefits to the City, and avoid or minimize potential environmental and traffic impacts.

Policy LU-4.1: Priority Commercial Development. Encourage emerging technology and entrepreneurship, and prioritize commercial development that provides fiscal benefit to the City, local job opportunities, and/or goods or services needed by the community.

Policy LU-4.2: Hotel Locations. Allow hotel uses at suitable locations in mixed-use and nonresidential zoning districts.

Policy LU-4.3: Mixed Use and Nonresidential Development. Limit parking, traffic, and other impacts of mixed-use and nonresidential development on adjacent uses, and promote high-quality architectural design and effective transportation options.

Policy LU-4.4: Community Amenities. Require mixed-use and nonresidential development of a certain minimum scale to support and contribute to programs that benefit the community and the City, including education, transit, transportation infrastructure, sustainability, neighborhood serving amenities, child care, housing, job training, and meaningful employment for Menlo Park youth and adults.

Policy LU-4.5: Business Uses and Environmental Impacts. Allow modifications to business operations and structures that promote revenue generating uses for which potential environmental impacts can be mitigated.

Policy LU-4.6: Employment Center Walkability. Promote local-serving retail and personal service uses in employment centers and transit areas that support walkability and reduce auto trips, including along a pedestrian-friendly, retail-oriented street in Belle Haven.

Policy LU-4.7: Fiscal Impacts. Evaluate proposed mixed-use and nonresidential development of a certain minimum scale for its potential fiscal impacts on the City and community.

Goal LU-5: Strengthen Downtown and the El Camino Real Corridor as a vital, competitive shopping area and center for community gathering, while encouraging preservation and enhancement of Downtown's atmosphere and character as well as creativity in development along El Camino Real.

Policy LU-5.1: El Camino Real/Downtown Specific Plan. Implement the El Camino Real/Downtown Specific Plan to ensure a complementary mix of uses with appropriate siting, design, parking, and circulation access for all travel modes.

Policy LU-5.2: El Camino Real/Downtown Housing. Encourage development of a range of housing types in the El Camino Real/Downtown Specific Plan area, consistent with the Specific Plan's standards and guidelines, and the areas near/around the Specific Plan area.

Goal LU-6: Preserve open-space lands for recreation; protect natural resources and air and water quality; and protect and enhance scenic qualities.

Policy LU-6.2: Open Space in New Development. Require new nonresidential, mixed use, and multiple dwelling development of a certain minimum scale to provide ample open space in the form of plazas, greens, dens, and parks whose frequent use is encouraged through thoughtful placement and design.

Policy LU-6.3: Public Open Space Design. Promote public open space design that encourages active and passive uses, and use during daytime and appropriate nighttime hours to improve quality of life.

Policy LU-6.4: Park and Recreational Land Dedication. Require new residential development to dedicate land, or pay fees in lieu thereof, for park and recreation purposes.

Policy LU-6.5: Open Space Retention. Maximize the retention of open space on larger tracts (e.g., portions of the St. Patrick's Seminary site) through means such as rezoning consistent with existing uses, clustered development, acquisition of a permanent open space easement, and/or transfer of development rights.

Policy LU-6.6: Public Bay Access. Protect and support public access to the Bay for the scenic enjoyment of open water, sloughs, and marshes, including restoration efforts, and completion of the Bay Trail.

Policy LU-6.7: Habitat Preservation. Collaborate with neighboring jurisdictions to preserve and enhance the Bay, shoreline, San Francisquito Creek, and other wildlife habitat and ecologically fragile areas to the maximum extent possible.

Policy LU-6.9: Pedestrian and Bicycle Facilities. Provide well designed pedestrian and bicycle facilities for safe and convenient multi-modal activity through the use of access easements along linear parks or paseos.

Policy LU-6.10: Stanford Open Space Maintenance. Encourage the maintenance of open space on Stanford lands within Menlo Park's unincorporated sphere of influence.

Policy LU-6.11: Baylands Preservation. Allow development near the Bay only in already developed areas.

Goal LU-7: Promote the implementation and maintenance of sustainable development, facilities and services to meet the needs of Menlo Park's residents, businesses, workers, and visitors.

Policy LU-7.1: Sustainability. Promote sustainable site planning, development, landscaping, and operational practices that conserve resources and minimize waste.

Policy LU-7.2: Water Supply. Support the efforts of the Bay Area Water Supply and Conservation Agency or other appropriate agencies to secure adequate water supplies for the Peninsula, to the extent that these efforts are in conformance with other City policies.

Policy LU-7.3: Supplemental Water Supply. Explore and evaluate development of supplemental water sources and storage systems, such as wells and cisterns, for use during both normal and dry years, in collaboration with water providers and users.

Policy LU-7.4 Water Protection. Work with regional and local jurisdictions and agencies responsible for ground water extraction to develop a comprehensive underground water protection program in accordance with the San Francisquito Creek Watershed Policy, which includes preservation of existing sources and the basin to evaluate the long term effects of water extraction.

Policy LU-7.5: Reclaimed Water Use. Implement use of adequately treated "reclaimed" water (recycled/non-potable water sources such as, graywater, blackwater, rainwater, stormwater, foundation drainage, etc.) through dual plumbing systems for outdoor and indoor uses, as feasible.

Policy LU-7.6: Sewage Treatment Facilities. Support expansion and improvement of sewage treatment facilities to meet Menlo Park's needs, as well as regional water quality standards, to the extent that such expansion and improvement are in conformance with other City policies.

Policy LU-7.7: Hazards. Avoid development in areas with seismic, flood, fire and other hazards to life or property when potential impacts cannot be mitigated.

Policy LU-7.8: Cultural Resource Preservation. Promote preservation of buildings, objects, and sites with historic and/or cultural significance.

Policy LU-7.9: Green Building. Support sustainability and green building best practices through the orientation, design, and placement of buildings and facilities to optimize their energy efficiency in preparation of State zero-net energy requirements for residential construction in 2020 and commercial construction in 2030.

Goal CIRC-1: Provide and maintain a safe, efficient, attractive, user-friendly circulation system that promotes a healthy, safe, and active community and quality of life throughout Menlo Park.

Policy CIRC-1.2: Capital Project Prioritization. Maintain and upgrade existing rights-of-way before incurring the cost of constructing new infrastructure, and ensure that the needs of non-motorized travelers are considered in planning, programming, design, reconstruction, retrofit, maintenance, construction, operations, and project development activities and products.

Policy CIRC-1.3: Engineering. Use data-driven findings to focus engineering efforts on the most critical safety projects.

Policy CIRC-1.6: Emergency Response Routes. Identify and prioritize emergency response routes in the Citywide circulation system.

Policy CIRC-1.7: Bicycle Safety. Support and improve bicyclist safety through roadway maintenance and design efforts.

Policy CIRC-1.8: Pedestrian Safety. Maintain and create a connected network of safe sidewalks and walkways within the public right of way to ensure that appropriate facilities, traffic control, and street lighting are provided for pedestrian safety and convenience, including for sensitive populations.

Policy CIRC-1.9: Safe Routes to Schools. Support Safe Routes to School programs to enhance the safety of school children who walk and bike to school.

Goal CIRC-2: Increase accessibility for and use of streets by pedestrians, bicyclists, and transit riders.

Policy CIRC-2.11: Design of New Development. Require new development to incorporate design that prioritizes safe pedestrian and bicycle travel and accommodates senior citizens, people with mobility challenges, and children.

Policy CIRC-2.14: Impacts of New Development. Require new development to mitigate its impacts on the safety (e.g., collision rates) and efficiency (e.g., vehicle miles traveled (VMT) per capita) of the circulation system. New development should minimize cut-through and high-speed vehicle traffic on residential streets; minimize the number of

vehicles trips; provide appropriate bicycle, pedestrian, and transit connections, amenities and improvements in proportion with the scale of proposed projects; and facilitate appropriate or adequate response times and access for emergency vehicles.

Goal CIRC-3: Increase mobility options to reduce traffic congestion, greenhouse gas emissions, and commute travel time.

Policy CIRC-3.1: Vehicle Miles Traveled. Support development and transportation improvements that help reduce per capita vehicle miles traveled.

Policy CIRC-3.2: Greenhouse Gas Emissions. Support development, transportation improvements, and emerging vehicle technology that help reduce per capita greenhouse gas emissions.

Policy CIRC-3.3: Emerging Transportation Technology. Support efforts to fund emerging technological transportation advancements, including connected and autonomous vehicles, emergency vehicle pre-emption, sharing technology, electric vehicle technology, electric bikes and scooters, and innovative transit options.

Goal CIRC-4: Improve Menlo Park's overall health, wellness, and quality of life through transportation enhancements.

Policy CIRC-4.1: Global Greenhouse Gas Emissions. Encourage the safer and more widespread use of nearly zero-emission modes, such as walking and biking, and lower emission modes like transit, to reduce greenhouse gas emissions.

Policy CIRC-4.2: Local Air Pollution. Promote non-motorized transportation to reduce exposure to local air pollution, thereby reducing risks of respiratory diseases, other chronic illnesses, and premature death.

Policy CIRC-4.3: Active Transportation. Promote active lifestyles and active transportation, focusing on the role of walking and bicycling, to improve public health and lower obesity.

Policy CIRC-4.4: Safety. Improve traffic safety by reducing speeds and making drivers more aware of other roadway users.

Goal CIRC-5: Support local and regional transit that is efficient, frequent, convenient, and safe.

Policy CIRC-5.1: Transit Service and Ridership. Promote improved public transit service and increased transit ridership, especially to employment centers, commercial destinations, schools, and public facilities.

Policy CIRC-5.2 Transit Proximity to Activity Centers. Promote the clustering of as many activities as possible within easy walking distance of transit stops, and locate any new transit stops as close as possible to housing, jobs, shopping areas, open space, and parks.

Policy CIRC-5.3 Rail Service. Promote increasing the capacity and frequency of commuter rail service, including Caltrain; protect rail rights-of-way for future transit service; and support efforts to reactivate the Dumbarton Corridor for transit, pedestrian, bicycle, and emergency vehicle use.

Policy CIRC-5.4: Caltrain Enhancements. Support Caltrain safety and efficiency improvements, such as positive train control, grade separation (with priority at Ravenswood Avenue), electrification, and extension to Downtown San Francisco (Transbay Terminal), provided that Caltrain service to Menlo Park increases and use of the rail right-of-way is consistent with the City's Rail Policy.

Policy CIRC-5.5: Dumbarton Corridor. Work with Caltrain and appropriate agencies to reactivate the rail spur on the Dumbarton Corridor with appropriate transit service from Downtown Redwood City to Willow Road with future extension across the San Francisco Bay.

Policy CIRC-5.6 Bicycle Amenities and Transit. Encourage transit providers to improve bicycle amenities to enhance convenience, including access to transit including bike share program, secure storage at transit stations and on-board storage where feasible.

Policy CIRC-5.7 New Development. Ensure that new nonresidential, mixed-use, and multiple-dwelling residential development provides associated needed transit service, improvements and amenities in proportion with demand attributable to the type and scale of the proposed development.

Goal H-2: Existing Housing and Neighborhoods. Maintain, protect and enhance existing housing and neighborhoods.

Policy H-2.2: Preservation of Residential Units. Limit the conversion of residential units to other uses and regulate the conversion of rental developments to non-residential uses unless there is a clear public benefit or equivalent housing can be provided to ensure the protection and conservation of the City's housing stock to the extent permitted by law.

Policy H-2.3: Condominium Conversions. Assure that any conversions of rental housing to owner housing accommodate the tenants of the units being converted, consistent with requirements to maintain public health, safety and welfare. The City will also encourage limited equity cooperatives and other innovative housing proposals that are affordable to lower income households.

Policy H-2.4: Protection of Existing Affordable Housing. Strive to ensure that affordable housing provided through government incentives, subsidy or funding, and deed restrictions remains affordable over time, and the City will intervene when possible to help preserve such housing.

Policy H-2.5: Maintenance and Management of Quality Housing and Neighborhoods. Encourage good management practices, rehabilitation of viable older housing and long-term maintenance and improvement of neighborhoods.

Goal H-4: New Housing. Use land efficiently to meet housing needs for a variety of income levels, implement sustainable development practices and blend well-designed new housing into the community.

Policy H-4.1: Housing Opportunity Areas. Identify opportunity areas and sites where a special effort will be made to provide affordable housing consistent with other General Plan policies. Given the diminishing availability of developable land, Housing Opportunity Areas should have the following characteristics:

a. The site has the potential to deliver sales or rental units at low or below market rate prices or rents.

b. The site has the potential to meet special housing needs for local workers, single parents, seniors, small families or large families.

c. The City has opportunities, through ownership or special development review, to facilitate provision of housing units to meet its housing objectives.

d. The site scores well for Low Income Housing Tax Credits (LIHTC) subsidy or has unique opportunities due to financing and/or financial feasibility.

e. For sites with significant health and safety concerns, development may be tied to nearby physical improvements, and minimum density requirements may be reduced.

f. Site development should consider school capacity and the relationship to the types of residential units proposed (i.e., housing seniors, small units, smaller workforce housing, etc. in school capacity impact areas).

g. Consider incorporating existing viable commercial uses into the development of housing sites.

Policy H-4.4: Variety of Housing Choices. Strive to achieve a mix of housing types, densities, affordability levels and designs in response to the broad range of housing needs in Menlo Park. Specific items include:

a. The City will work with developers of non-traditional and innovative housing approaches in financing, design, construction and types of housing that meet local housing needs.

b. Housing opportunities for families with children should strive to provide necessary facilities nearby or on site.

c. The City will encourage a mix of housing types, including owner and rental housing, single and multiple-family housing, housing close to jobs and transit, mixed use housing, work force housing, special needs housing, single-room occupancy (SRO) housing, shared living and cohousing, mobile-homes, manufactured housing, self-help or "sweat equity" housing, cooperatives and assisted living.

d. The City will support development of affordable, alternative living arrangements such as cohousing and "shared housing" (e.g., the Human Investment Project's — HIP Housing —shared housing program).

Policy H-4.6: Mixed Use Housing. Encourage well-designed mixed use developments (residential mixed with other uses) where residential use is appropriate to the setting and to encourage mixed-use development in proximity to transit and services, such as at shopping centers and near to the downtown to support Downtown businesses (consistent with the El Camino Real/Downtown Specific Plan).

Policy H-4.8: Retention and Expansion of Multi-Family Sites and Medium and Higher Density. Strive to protect and expand the supply and availability of multi-family and mixed-use infill housing sites for housing. When possible, the City will avoid re-designing or rezoning multi-family residential land for other uses or to lower densities without re-designating equivalent land for multi-family development and will ensure that adequate sites remain at all times to meet the City's share of the region's housing needs.

Policy H-4.12: Fair Share Distribution of Housing throughout Menlo Park. Promote the distribution of new, higher density residential developments throughout the City, taking into consideration compatibility with surrounding existing residential uses, particularly near public transit and major transportation corridors in the City.

Goal OSC-4: Promote Sustainability and Climate Action Planning.

Policy OSC-4.1: Sustainable Approach to Land Use Planning to Reduce Resource Consumption. Encourage, to the extent feasible, (1) a balance and match between jobs and housing, (2) higher density residential and mixed-use development to be located adjacent to commercial centers and transit corridors, and (3) retail and office areas to be located within walking and biking distance of transit or existing and proposed residential developments.

El Camino Real/Downtown Specific Plan

The El Camino Real/Downtown Specific Plan was adopted in 2012 and established a framework for private and public improvements on El Camino Real, in the Caltrain station area, and in downtown Menlo Park. The plan's focus is on the character and extent of enhanced public spaces, the character and intensity of private infill development, and circulation and connectivity improvements. It includes a strategy for implementation of public space improvements, such as wider sidewalks and plazas, and other infrastructure improvements. The Specific Plan has a number of specific goals:

- Encourage infill development of vacant and under-utilized lots along El Camino Real through increased intensities, coupled with strict building modulation and ground-floor setback and building profile requirements that both attenuate the mass and scale of larger buildings and create wider public sidewalks;

- Retain the existing "village" character downtown by keeping buildings low and requiring varied building massing, including through building profile and façade modulation requirements;

- Increase downtown activity, foot traffic and transit use through enhanced public spaces, mixed-use infill projects (including residential uses) and higher intensities of development near the commuter rail station;

- Enhance community life through an integrated network of widened sidewalks, promenades, pocket parks and public gathering spaces; and

- Enhance east-west connectivity across El Camino Real through crosswalk and sidewalk improvements, while accommodating north-south vehicular through-traffic, and across the railroad tracks through grade-separated pedestrian and bicycle connections.

Menlo Park Municipal Code

Besides the General Plan, the City of Menlo Park Municipal Code is the primary tool that regulates physical development in Menlo Park. The Municipal Code contains all ordinances for the City, and identifies land use categories, site development regulations, and other general provisions that ensure consistency between the General Plan and proposed development projects. The Menlo Park Zoning Ordinance (Title 16 of the Menlo Park Municipal Code) implements the

land use designations in the General Plan by establishing comprehensive zoning rules for the City. The Zoning Ordinance defines the City's zoning districts and identifies the land uses permitted and conditionally permitted in each. The Zoning Ordinance also establishes development regulations regarding building heights, setbacks, parking ratios, building land cover, and floor area.

Chapter 16.58, *SP-ECR/D El Camino Real/Downtown Specific Plan*, of the Zoning Ordinance states the purpose and intent of the ECR/D Specific Plan district is to preserve and enhance community life, character and vitality though public space improvements, mixed use infill projects sensitive to the small town character of Menlo Park and improved connectivity. The El Camino Real/Downtown Specific Plan was adopted in 2012 and applies to Downtown Menlo Park and areas along El Camino Real. The El Camino Real/Downtown Specific Plan encourages improvements to the Downtown's streetscape and parking facilities and allows new mixed use development along El Camino Real. The El Camino Real/Downtown Specific Plan contains a number of tailored land use designations, which allow a mix of commercial, including retail, office, hotel, as well as residential, depending on the location within the Specific Plan area.

Menlo Park Climate Action Plan

The City's 2030 Climate Action Plan (CAP) includes actions to reduce Menlo Park's greenhouse gas (GHG) emissions. The City's CAP was adopted with the purpose of reducing GHGs community-wide and meeting the reduction target (i.e., carbon neutral by 2030). The City has identified GHG reduction measures related to the transportation, energy, and land use sectors that can be coupled with state and existing local actions to reduce GHG emissions. The CAP identifies the following strategies to reach carbon neutrality by 2030:

- Explore policy/program options to convert 95 percent of existing buildings to all-electric by 2030;
- Set Citywide goals for increasing electric vehicles to 100 percent of new vehicles by 2025 and decreasing gasoline sales 10 percent a year from a 2018 baseline;
- Expand access to electric vehicle (EV) charging for multifamily and commercial properties;
- Reduce vehicle miles traveled (VMT) by 25 percent or an amount recommended by the Complete Streets Commission;
- Eliminate the use of fossil fuels from municipal operations; and
- Develop a climate adaption plan to protect the community from sea level rise and flooding.

The most recent update to the City's CAP, the 2030 CAP, was adopted in April 2021. For a discussion of the HEU's consistency with CAP, see Chapter 4.7, *GHG Emissions*, of this SEIR.

4.10.4 Environmental Impacts and Mitigation Measures

Scope of Analysis

The analysis in this SEIR describes impacts identified in the 2016 *ConnectMenlo* EIR, and describes how the impacts of the HEU would differ, as applicable.

Significance Thresholds

The thresholds used to determine the significance of impacts related to land use and planning are based on Appendix G of the *CEQA Guidelines*. Implementation of the HEU would have a significant impact on the environment if it would:

- Physically divide an established community.
- Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

Methodology and Assumptions

The analysis of potential impacts related to land use and planning evaluates the potential for the HEU to result in substantial adverse effects related to land use and planning, including physical division of an established community and the potential for implementation of the HEU to conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

As detailed in Chapter 3 of this SEIR, *Project Description*, the project analyzed in this SEIR would include adoption of General Plan amendments that would add or modify goals, objectives, policies, and implementation programs related to housing, safety, and environmental justice. General Plan amendments would also include conforming amendments to other elements of the General Plan, as needed, to ensure internal consistency. Amendments to the Housing Element would address among other things, the maintenance, preservation, improvement, and development of housing in the City. In addition, the HEU would include an inventory of housing opportunity sites and land use strategy sites with sufficient existing and new housing sites at appropriate densities to meet the City's RHNA requirement plus an ample buffer, and the City would modify provisions of its zoning ordinance, zoning map, and El Camino Real/Downtown Specific Plan as necessary to reflect the housing opportunity sites inventory and land use strategies to meet the City's RHNA.

Because these zoning and policy changes are part of the HEU, by definition the HEU would not conflict with them. Also, consistent with CEQA, the analysis does not consider inconsistency with land use plans and policies to be a physical effect on the environment unless the plan or policy was adopted for the purpose of avoiding or mitigating a significant environmental effect. Adverse physical effects on the environment that could result from implementation of the HEU, including the changes to land use addressed in this section, are evaluated and disclosed in the appropriate technical sections of this SEIR.

Impacts and Mitigation Measures

Impacts

Impact LU-1: Implementation of the HEU would not physically divide an established community. *(Less than Significant)*

The *ConnectMenlo* EIR found that the project would not physically divide an established community. The EIR listed a number of General Plan policies (listed again in this SEIR above in Section 4.10.3, *Regulatory Setting*) related to future development under the project, and determined that existing and proposed goals, policies, programs, and zoning regulations would provide the long-term planning framework for orderly development under the project. The EIR identified that future development under the project would generally retain the existing roadway patterns and could include circulation improvements such as new streets, paseos, access points, sidewalks and bike paths that are intended to improve circulation. The analysis noted that these improvements do not propose any new major roadways or other physical features through parcels designated for residential use or other communities that would create new barriers in the study area. Therefore, while several parcels designated for residential uses were proposed within the project area, the EIR found that the project would not divide existing established community. These same findings apply to implementation of the HEU, as discussed below.

Implementation of the HEU would provide for the development of additional housing units in the City. As described in Chapter 3 of this SEIR, *Project Description*, the HEU would plan for development of up to 4,000 new housing units in the City via a variety of strategies in addition to pending projects (2,719 units), and accessory dwelling unit production (85 units). This would meet the City's RHNA allocation of 2,946 units and also provide a suitable buffer. In doing so, the Housing Element would be updated to identify specific sites for multifamily housing, including the housing opportunity and land use strategy sites shown in **Figure 3-3** in Chapter 3 of this SEIR, *Project Description*. In addition, the Land Use Element of the General Plan would be amended to update applicable land use designations if/as needed to reflect the housing sites. In addition, the City would modify provisions of its zoning ordinance, zoning map, and El Camino Real/Downtown Specific Plan as necessary to reflect the housing opportunity sites and land use strategy sites to meet the City's RHNA.

It is important to note that the identification of housing sites in the City's Housing Element does not mean someone necessarily will develop housing on those sites at the planned unit count or level of affordability. Although the City must plan for housing development, it does not directly build, or require to be built, any housing. Instead, the identification of housing sites is intended to plan for and encourage housing, and its development by property owners and developers is largely dependent on market forces and (in the case of affordable housing) available subsidies.

Regardless, development of new housing units under the HEU would promote coordinated land use patterns within the City, and would conform to the City's revised zoning allowances, in response to the City's RHNA allocation and State law, which requires the City to identify sufficient housing sites to accommodate the City's RHNA allocation.

As with the development assessed in the *ConnectMenlo* EIR, development under the HEU would not alter the physical layout of the City such that movement within or across the housing sites or the City would be obstructed. The HEU also does not propose any roadways, such as freeways, that would divide the City or isolate individual neighborhoods within it. In addition, future development would perpetuate development per regulations established under Chapter 16.02 of Menlo Park's Municipal Code, and as part of the City's project approval process, would be required to comply with existing regulations and General Plan policies. Based upon each of these considerations, implementation of the HEU would not physically divide an established community, and the impact would therefore be **less than significant**.

Mitigation Measure: None required.

Impact LU-2: Implementation of the HEU would not cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. (*Less than Significant Impact, with Mitigation*)

The *ConnectMenlo* EIR found that the project would not cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. The EIR noted that the analysis addressed future development consistency with the General Plan and how the project is consistent with other applicable land use plans, policies, and regulations that concentrate on land use and planning. The EIR identified that consistency with applicable land use plans, policies, and regulations that concentrate on specific environmental topics were discussed in the relevant topical sections of the Draft EIR.

Menlo Park General Plan and Zoning Ordinance

The *ConnectMenlo* EIR found that the General Plan and Zoning Ordinance are the primary planning documents for the City of Menlo Park. The EIR stated that the proposed updates associated with the *ConnectMenlo* project are intended to ensure consistency between the General Plan and Zoning Ordinance. Because the General Plan is the overriding planning document for the City, and because the project involved amending the General Plan and Zoning Ordinance to increase consistency, the EIR determined that consistency impacts in this regard would be less than significant, and no mitigation measures were required.

The *ConnectMenlo* EIR found that the goals, policies and programs of the General Plan are established to guide daily decision making for the development and conservation of land in Menlo Park. The General Plan's policies set out the guidelines that will be used by City staff and the Planning Commission in their review of land development projects and in decision making about City actions. A policy indicates a commitment of the local legislative body to a particular course of action. The EIR identified that the policies of the Menlo Park General Plan have been carefully prepared to reduce and/or avoid impacts to the environment as a result of future development in the City to the extent feasible. Zoning is one of the primary means of implementing the General Plan. For properties in Menlo Park, a parcel's zoning designation

stems directly from its General Plan land use designation, with the zoning designation acting as a means to implement the General Plan by refining the specific uses and development standards for that parcel. Nonetheless, the *ConnectMenlo* EIR determined that future development proposals in Menlo Park could be inconsistent with the applicable goals, policies, and programs in the General Plan that have been prepared to reduce and/or avoid impacts to the environment and the supporting zoning standards. To address this potential significant impact, the *ConnectMenlo* EIR included Mitigation Measure LU-2:

> Prior to project approval, as part of the project application process, future development in Menlo Park is required to demonstrate consistency with the applicable goals, policies, and programs in the General Plan and the supporting Zoning standards to the satisfaction of the City of Menlo Park's Community Development Department. A future project is consistent with the General Plan and Zoning standards if, considering all its aspects, it will further the goals, policies, and programs of the General Plan and supporting Zoning standards and not obstruct their attainment.

The EIR determined that implementation of Mitigation Measure LU-2 would reduce the impact to less than significant. These same findings apply to implementation of the HEU, as discussed below.

As detailed in Chapter 3 of this SEIR, *Project Description*, the HEU would include adoption of General Plan amendments that would add or modify goals, objectives, policies, and implementation programs related to housing, safety, and environmental justice. General Plan amendments would also include conforming amendments to other elements of the General Plan, as needed, to ensure internal consistency. Amendments to the Housing Element would address among other things, the maintenance, preservation, improvement, and development of housing in the City. In addition, the HEU would include an inventory of housing opportunity sites and land use strategy sites with sufficient existing and new housing sites at appropriate densities to meet the City's RHNA requirement plus an ample buffer, and the City would modify provisions of its zoning ordinance, zoning map, and El Camino Real/Downtown Specific Plan as necessary to reflect the housing opportunity and land use strategy to meet the City's RHNA.

As with the General Plan and zoning updates discussed in the *ConnectMenlo* EIR, the proposed updates associated with the HEU are intended to ensure consistency between the General Plan and Zoning Ordinance. Because the General Plan is the overriding planning document for the City, and because the HEU includes amending the General Plan and Zoning Ordinance to increase consistency, consistency impacts in this regard would be less than significant and no mitigation measures are required.

As with the development assessed in the *ConnectMenlo* EIR, proposals for future development that would occur with implementation of the HEU could be determined to be inconsistent with the applicable goals, policies, and programs in the General Plan that have been prepared to reduce and/or avoid impacts to the environment and the supporting zoning standards, resulting it a **potentially significant impact**.

Accordingly, mitigation prescribed in the *ConnectMenlo* EIR is also prescribed for the HEU. That measure is as follows:

> **Mitigation Measure LU-2: Demonstrate consistency with the applicable goals, policies, and programs in the General Plan and the supporting Zoning standards.**
>
> Prior to individual project approval, as part of the project application process, future development in Menlo Park shall be required to demonstrate consistency with the applicable goals, policies, and programs in the General Plan and the supporting Zoning standards to the satisfaction of the City of Menlo Park's Community Development Department. A future project is consistent with the General Plan and Zoning standards if, considering all its aspects, it will further the goals, policies, and programs of the General Plan and supporting Zoning standards and not obstruct their attainment.
>
> **Significance After Mitigation:** Implementation of Mitigation Measure LU-2 would ensure that future development that would occur with implementation of the HEU not cause a significant environmental impact due to a conflict with the General Plan and the supporting Zoning standards. Therefore, implementation of this mitigation measure would reduce potential impacts to **less than significant, with mitigation**.

El Camino Real/Downtown

As described in Section 3.4.2 of this SEIR, the HEU includes a number of land use strategies that would increase the permitted densities within the El Camino Real/Downtown Specific Plan area, remove the existing residential unit cap, and modify the associated development standards. The HEU would allow at least 30 dwelling units per acre (du/ac) as the base level density, and potentially increase the maximum bonus level density to 80 dwelling units per acre depending on the location within the Specific Plan area. Bonus level development requires a developer to provide a public benefit in exchange for higher density development potential. The intent of this strategy would be to remove the existing residential cap of 680 units permitted in the Specific Plan area and to modify development standards such as height and/or parking ratios to allow greater development potential on parcels. These actions would require amendments to the Specific Plan, Land Use Element, and Zoning Ordinance.

The Specific Plan area and sites in the housing sites inventory would be rezoned to include the Affordable Housing Overlay (AHO) provided in Menlo Park Municipal Code Chapter 16.98. The HEU would call on the City to amend the Code to allow for densities up to 100 du/ac for 100 percent affordable housing developments (meaning 100 percent of units would be available to low and very low-income residents). This strategy could also include amendments to provide increased residential densities for mixed-income developments (market-rate units and affordable units combined) where the percentage of affordable housing exceeds the City's Below Market Rate requirement as provided in Menlo Park Municipal Code Chapter 16.96.

The HEU's housing sites inventory would include some sites in C-1, C-1-A, C-1-C, C-2, C-2-A, C-2-B, C-2-S, C-4, and P zoning districts and would require the City to modify Code provisions regarding retail/commercial zoning districts to allow for residential uses that would allow 30 du/ac and include other potential modifications to the development standards to encourage the production of mixed-use developments (residential and non-residential uses combined).

The HEU's housing sites inventory would also include some R-3 zoned sites around downtown and would require the City to modify applicable Code provisions to remove the 10,000 square-foot minimum lot size, which would allow all sites in the R-3 area downtown a residential density of up to 30 du/ac.

Based upon each of these proposed actions, implementation of the HEU would result in changes to the existing zoning in several areas of the Specific Plan area, and those changes would result in the allowance of higher density residential development than that which is currently allowed. To be implemented, each of the above land use strategies would require amendments to the Specific Plan, Land Use Element, and Zoning Ordinance. As part of the HEU's adoption, existing land use designations and zoning that do not conform to the densities identified in the HEU would be amended to reflect the new condition. Also, the HEU would explain the City's RHNA requirements and include policies necessary to advance the City's housing program notwithstanding potentially competing policies in the Land Use Element. With adoption of the HEU and conforming changes to land use designations and zoning, the project would therefore be consistent with the General Plan and the Specific Plan, as amended, and the impact would be **less than significant**.

Other Land Use Plans and Policies

Plan Bay Area

As described above in Section 4.10.3, *Regulatory Setting*, Plan Bay Area is a joint regional planning document prepared jointly by ABAG and the MTC that utilizes a multipronged strategy to address housing affordability, transportation requirements, the region's widening income disparities and economic hardships faced by low- and middle-income workers, and the Bay Area's vulnerabilities to natural disasters such as earthquakes and floods.

Priority Development Areas (PDAs) form the implementing framework for Plan Bay Area. PDAs are areas along transportation corridors which are served by public transit that allow opportunities for development of transit oriented, infill development within existing communities that are expected to host the majority of future development. The El Camino Real and Downtown PDA in Menlo Park is located along both sides of El Camino Real Corridor from the City's border with Atherton to the San Mateo/Santa Clara County line.

The *ConnectMenlo* EIR listed a number of General Plan policies (listed again in this SEIR above in Section 4.10.3, *Regulatory Setting*) that would encourage the reduction of vehicle usage and encourage a mix of land uses and densities to promote non-vehicular travel and decrease GHG emissions, thereby ensuring consistency with Plan Bay Area. The *ConnectMenlo* EIR noted that the project would continue the same land use designations as established in the El Camino Real/Downtown Specific Plan. Furthermore, because the project included goals and policies that would promote non-vehicular travel, decrease GHG emissions, and encourage development of housing options in proximity to transit, jobs, shopping, and services within the El Camino Real and Downtown PDA and Citywide, the EIR determined implementation of the project would not conflict with the Plan Bay Area, and the impact would be less than significant with no mitigation required. These same findings apply to implementation of the HEU, as discussed below.

As detailed in Chapter 3 of this SEIR, *Project Description*, the project analyzed in this SEIR would include adoption of General Plan amendments that would add or modify goals, objectives, policies, and implementation programs related to housing, safety, and environmental justice. General Plan amendments would also include conforming amendments to other elements of the General Plan, as needed, to ensure internal consistency. Amendments to the Housing Element would address, among other things, the maintenance, preservation, improvement, and development of housing in the City. In addition, the HEU would include an inventory of housing opportunity and land use strategy sites with sufficient existing and new housing sites at appropriate densities to meet the City's RHNA requirement plus an ample buffer, and the City would modify provisions of its zoning ordinance, zoning map, and El Camino Real/Downtown Specific Plan as necessary to reflect the housing opportunity sites inventory and land use strategy sites to meet the City's RHNA. While the HEU would increase the permitted densities within the El Camino Real/Downtown Specific Plan area and modify associated development standards, the intent of this modification is to allow for increased housing development in the El Camino Real and Downtown PDA, which is consistent with the overarching goals of Plan Bay Area to encourage development of transit oriented, infill development within existing communities. These same principles are embodied in the HEU as it pertains to development of new housing in the City as a whole. As in the *ConnectMenlo* EIR, the proposed updates associated with the HEU are intended to ensure consistency with applicable General Plan policies that encourage the reduction of vehicle usage and encourage a mix of land uses and densities to promote non-vehicular travel and decrease GHG emissions. For these reasons implementation of HEU would not conflict with policies of Plan Bay Area adopted for the purpose of avoiding or mitigating an environmental effect, and the impact would be **less than significant** with no mitigation required.

For a discussion of the HEU's consistency with the regional housing projections in Plan Bay Area, see Chapter 4.12, *Population and Housing*, of this SEIR. For a discussion of the proposed HEU's consistency with Plan Bay Area as it relates to greenhouse gas emissions, see Chapter 4.7, *GHG Emissions*, of this SEIR.

San Francisco Bay Conservation and Development Commission

The San Francisco Bay Plan (Bay Plan) guides the future protection and use of San Francisco Bay and its shoreline. The Bay Plan includes a range of policies on public access, water quality, fill, and project design. The Bay Plan also designates shoreline areas that should be reserved for water related purposes like sports, industry, and public recreation, airports, and wildlife areas.

The *ConnectMenlo* EIR found that, while no future development under the project was anticipated on the shoreline or in the Bay, General Plan policies (listed again in this SEIR above in Section 4.10.3, *Regulatory Setting*) would continue to protect natural resources and water quality, thereby ensuring consistency with the Bay Plan, and the impact would be less than significant with no mitigation required. These same findings apply to implementation of the HEU, as discussed below.

As in the *ConnectMenlo* EIR, the proposed updates associated with the HEU are intended to ensure consistency with applicable General Plan policies, including policies to protect natural resources and water quality and resources of San Francisco Bay and its shoreline. As with the

development assessed in the *ConnectMenlo* EIR, proposals for future development that would occur with implementation of the HEU, would be required (with implementation of Mitigation Measure LU-2) to demonstrate consistency with the applicable goals, policies, and programs in the General Plan. For these reasons implementation of HEU would not conflict with the Bay Plan and the impact would be **less than significant** with no mitigation required.

Airport Land Use Comprehensive Plans

As discussed above in Section 4.10.3, *Regulatory Setting*, the Comprehensive Land Use Plan (CLUP) for the Palo Alto Airport was adopted by the Santa Clara County Airport Land Use Commission in 2008 and was most recently amended in November 2020 (Santa Clara County, 2008). The CLUP is intended to safeguard the general welfare of the inhabitants within the vicinity of Palo Alto Airport and ensure that new surrounding uses do not affect continued safe airport operation. Specifically, the CLUP seeks to protect the public from the adverse effects of aircraft noise, to ensure that people and facilities are not concentrated in areas susceptible to aircraft accidents, and to ensure that no structures or activities adversely affect navigable airspace. Menlo Park does not fall within the Airport Influence Area of this facility, and none of the noise or safety zones for the Palo Alto airport fall within the boundaries of Menlo Park. However, some eastern portions of Menlo Park fall within the 254-foot and 354-foot Part 77 height restriction areas for the Palo Alto Airport. Some areas within the Bayfront area currently allow building heights of up to 120 feet, but this height is well below the height restrictions prescribed for the Part 77 areas. Thus, as was the finding in the *ConnectMenlo* EIR, impacts related to potential conflicts with the CLUP would be **less than significant** with no mitigation required.

Menlo Park Climate Action Plan

For a discussion of the HEU's consistency with the City's CAP, see Chapter 4.7, *GHG Emissions*, of this SEIR.

Cumulative Impacts

This section presents an analysis of the cumulative effects of the HEU in combination with other past, present, and reasonably foreseeable future development that could cause cumulatively significant impacts. Significant cumulative impacts related to land use and planning could occur if the incremental impacts of the HEU combined with the incremental impacts of cumulative development would be significant, and if the HEU's contribution would be considerable. Cumulative development projections for 2040 are included in the project description and described in Section 4.0.3, *Cumulative Impacts*.

Impact LU-3: Implementation of the HEU would not combine with other past, present, and reasonably foreseeable projects to result in significant cumulative impacts with respect to land use and planning. (*Less than Significant Impact*)

The *ConnectMenlo* EIR evaluated cumulative effects related to land use to take into account growth projected by the project within the City boundary and Sphere of Influence (SOI), in combination with impacts from projected growth in the rest of Santa Mateo County and the

surrounding region, as forecast by ABAG. Impacts from cumulative growth were considered in the context of their consistency with regional planning efforts. Within this context, the EIR found that the project would not divide an established community or conflict with established plans, policies and regulations, or with habitat and conservation plans or policies. The EIR found that implementation of Mitigation Measure LU-2 would ensure future projects in Menlo Park are consistent with the City's General Plan policies. The EIR found that the project would also not create or exacerbate land use conflicts in or outside the City of Menlo Park, as the project would be consistent with existing and proposed changes in other local and regional plans. The analysis found that growth in the rest of Santa Mateo County and the surrounding region is occurring in already urbanized areas and would not require significant land use changes that would create land use conflicts, nor would they divide communities. Therefore, the EIR determined that cumulative impacts related to land use and planning would be less than significant with mitigation.

Cumulative development projected to occur in Menlo Park in 2040 would not alter the physical layout of the City such that movement within or across the housing sites or the City would be obstructed. There are also no plans for major roadways, such as freeways, that would divide the City or isolate individual neighborhoods within it. In addition, future development would be required to ensure orderly development per regulations established under Chapter 16.02 of Menlo Park's Municipal Code. Furthermore, future development under the HEU, as part of the City's project approval process, would be required to comply with existing regulations and address General Plan policies intended to minimize impacts related to the physical division within an established community. Based upon each of these considerations, cumulative development would not physically divide an established community, and the impact would therefore be less than significant.

As discussed above under Impact LU-1, General Plan and zoning updates associated with the HEU would ensure consistency between the General Plan and Zoning Ordinance. Cumulative development projected to occur in Menlo Park in 2040 would be required to conform with the General Plan and Zoning ordinance as amended. For these reasons, there would be no conflict with any local land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. In addition, the cumulative development and the HEU would be required to conform with land use policies in applicable State, regional, and local plans.

Conclusion

Based upon each of the above considerations, there would be no significant cumulative impact associated with land use and planning, and the impact would therefore be **less than significant.**

4.10.5 References

Association of Bay Area Governments (ABAG), 2021. *Final Regional Housing Needs Allocation (RHNA) Plan: San Francisco Bay Area, 2023-2031*. Adopted December 16, 2021. Available at: https://abag.ca.gov/sites/default/files/documents/2021-12/proposed%20Final_RHNA_Allocation_Report_2023-2031.pdf. Accessed April 12, 2022.

Association of Bay Area Governments & Metropolitan Transportation Commission (ABAG & MTC), 2021. *Plan Bay Area 2050*. Adopted October 21, 2021. Available at: https://www.planbayarea.org/sites/default/files/documents/Plan_Bay_Area_2050_October_2021.pdf. Accessed May 8, 2022.

Association of Bay Area Governments & Metropolitan Transportation Commission (ABAG & MTC), 2017. *Plan Bay Area 2040*. Adopted July 26, 2017. http://2040.planbayarea.org/files/2020-02/Final_Plan_Bay_Area_2040.pdf

City of Menlo Park, 2016a. *City of Menlo Park General Plan*. Available online: https://www.menlopark.org/146/General-Plan. Accessed May 6, 2022.

City of Menlo Park, 2016b. *Draft EIR for ConnectMenlo: General Plan Land Use & Circulation Elements and M-2 Area Zoning Update*. Available online: https://www.menlopark.org/1013/Environmental-Impact-Report. Accessed May 6, 2022.

San Francisco Bay Conservation and Development Commission (BCDC), *San Francisco Bay Plan*, 1965 (as amended through 2019).

Santa Clara County, 2008. *Comprehensive Land Use Plan for the Palo Alto Airport*, Amended November 2020. Available online: https://stgenpln.blob.core.windows.net/document/ALUC_PAO_CLUP.pdf. Accessed May 8, 2022.

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4.11 Noise and Vibration

4.11.1 Introduction

This section evaluates the effects of the Housing Element Update (HEU) on noise and vibration focusing on changes to the *ConnectMenlo* EIR (certified in 2016) that may result in new or more severe impacts, and describes any mitigation measures needed to address any such impacts.

Findings of the *ConnectMenlo* Final EIR

Noise and vibration impacts of the *ConnectMenlo* project were analyzed in Section 4.10 of the *ConnectMenlo* Draft EIR. The *ConnectMenlo* Final EIR determined that the project would have the following impacts with respect to noise or vibration:

- NOISE-1: Future projects in Menlo Park could result in development that exceed noise limits required under Title 24 and the City's regulations. *(Significant Impact)*
- NOISE-2: Future projects in Menlo Park could cause exposure of people to, or generation of, excessive groundborne vibration or groundborne noise levels. *(Significant Impact)*
- NOISE-3: Implementation of the proposed project would not cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the proposed project. *(Less than Significant Impact)*
- NOISE-4: Future projects in Menlo Park could result in construction-related noise that exceeds noise limits required under the City's regulations. *(Significant Impact)*
- NOISE-5: Implementation of the proposed project would not cause exposure of people residing or working in the vicinity of the study area to excessive aircraft noise levels, for a project located within an airport land use plan, or where such a plan has not been adopted, within 2 miles of a public airport or public use airport. *(Less than Significant Impact)*
- NOISE-6: Implementation of the proposed project would not cause exposure of people residing or working in the project site to excessive noise levels, for a project within the vicinity of a private airstrip. *(Less than Significant Impact)*
- NOISE-7: Implementation of the proposed project, in combination with past, present, and reasonably foreseeable projects, would result in significant cumulative impacts with respect to noise. *(Significant Impact)*

Notice of Preparation Comments

The Notice of Preparation (NOP) for the SEIR was circulated on December 23, 2021 and a scoping meeting was held on January 24, 2022. The NOP and the comments received during the public comment period can be found in **Appendix A** of this SEIR. No comments were received that were relevant to noise and vibration.

Information Sources

The primary sources of information referenced in this section included those listed below. Please note that a full list of references for this topic can be found at the end of this section.

- City of Menlo Park General Plan (2016a).
- *ConnectMenlo* Draft EIR (2016b).
- California General Plan Guidelines (Governor's Office of Planning and Research, 2017).

Technical Background and Noise Terminology

Noise can be generally defined as unwanted sound. Sound, traveling in the form of waves from a source, exerts a sound pressure level (referred to as sound level) that is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing and 120 to 140 dB corresponding to the threshold of pain.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude (sound power). The sound pressure level, therefore, constitutes the additive force exerted by a sound corresponding to the frequency/sound power level spectrum.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. Therefore, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to low and extremely high frequencies instead of the frequency mid-range. This method of frequency weighting is referred to as A weighting and is expressed in units of A-weighted decibels (dBA). Frequency A-weighting follows an international standard methodology of frequency de-emphasis and is typically applied to community noise measurements.

Noise exposure is a measure of noise over a period of time. Noise level is a measure of noise at a given instant in time. Community noise varies continuously over a period of time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic and atmospheric conditions. What makes community noise constantly variable throughout a day, besides the slowly changing background noise, is the addition of short duration single event noise sources (e.g., aircraft flyovers, motor vehicles, sirens), which are readily identifiable to the individual receptor. These successive additions of sound to the community noise environment vary the community noise level from instant to instant, requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts.

This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

- **L_{eq}:** the energy-equivalent sound level is used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The L_{eq} is the constant sound level, which would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).
- **L_{max}:** the instantaneous maximum noise level for a specified period of time.
- **L_{dn}:** is a 24-hour day and night A-weighted noise exposure level, which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night ("penalizing" nighttime noises). Noise between 10:00 p.m. and 7:00 a.m. is weighted (penalized) by adding 10 dB to take into account the greater annoyance of nighttime noises.
- **CNEL:** similar to L_{dn}, the Community Noise Equivalent Level (CNEL) adds a 5-dB "penalty" for the evening hours between 7:00 p.m. and 10:00 p.m. in addition to a 10-dB penalty between the hours of 10:00 p.m. and 7:00 a.m.

As a general rule, in areas where the noise environment is dominated by traffic, the L_{eq} during the peak-hour is generally within one to two decibels of the L_{dn} at that location.

Effects of Noise on People

When a new noise is introduced to an environment, human reaction can be predicted by comparing the new noise to the ambient noise level, which is the existing noise level comprised of all sources of noise in a given location. In general, the more a new noise exceeds the ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived;
- Outside of the laboratory, a 3-dB change is considered a just-perceivable difference;
- A change in level of at least 5-dB is required before any noticeable change in human response would be expected; and
- A 10-dB change is subjectively heard as approximately a doubling in loudness and can cause an adverse response.

The perceived increases in noise levels shown above are applicable to both mobile and stationary noise sources. These relationships occur in part because of the logarithmic nature of sound and the decibel system. The human ear perceives sound in a non-linear fashion; hence, the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

Noise Attenuation

Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate between 6 dB for hard sites and 7.5 dB for soft sites for each doubling

of distance from the reference measurement. Hard sites are those with a reflective surface between the source and the receiver such as parking lots or smooth bodies of water. No excess ground attenuation is assumed for hard sites and the changes in noise levels with distance (drop-off rate) is simply the geometric spreading of the noise from the source. Soft sites have an absorptive ground surface such as soft dirt, grass, or scattered bushes and trees. In addition to geometric spreading, an excess ground attenuation value of 1.5 dB (per doubling distance) is normally assumed for soft sites. Line sources (such as traffic noise from vehicles) attenuate at a rate between 3 dB for hard sites and 4.5 dB for soft sites for each doubling of distance from the reference measurement.

Noise levels may also be reduced by intervening structures, such as a row of buildings, a solid wall, or a berm located between the receptor and the noise source.

Fundamentals of Vibration

As described in the Federal Transit Administration's (FTA) Transit Noise and Vibration Impact Assessment Manual (FTA, 2018), ground borne vibration can be a serious concern for nearby neighbors, causing buildings to shake and rumbling sounds to be heard. In contrast to airborne noise, ground borne vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of ground borne vibration are trains, buses and heavy trucks on rough roads, and construction activities such as blasting, sheet pile-driving, and operation of heavy earth-moving equipment.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal, which is measured in inches per second (in/sec). The PPV is most frequently used to describe vibration impacts to buildings. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (V_{db}) is commonly used to express RMS. The decibel notation acts to compress the range of numbers required to describe vibration. Typically, ground borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors for vibration assessment include structures (especially older masonry structures), people who spend a lot of time indoors (especially residents, students, the elderly and sick), and vibration sensitive equipment such as hospital analytical equipment and equipment used in computer chip manufacturing.

The effects of ground borne vibration include movement of the building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. In extreme cases, the vibration can cause damage to buildings. Building damage is not a factor for most projects, with the occasional exception of blasting and pile-driving during construction. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by only a small margin.

4.11.2 Environmental Setting

Existing Noise-Sensitive Land Uses

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication, and can cause physiological and psychological stress and hearing loss. Given these effects, some land uses are considered more sensitive to noise levels than others due to the duration and nature of time people spend at these uses. In general, residences are considered most sensitive to noise as people spend extended periods of time in them, including the nighttime hours. Therefore, noise impacts to rest and relaxation, sleep, and communication are highest at residential uses. Schools, hotels, hospitals, nursing homes, and recreational uses are also considered to be more sensitive to noise as activities at these land uses involve rest and recovery, relaxation and concentration, and increased noise levels tend to disrupt such activities. Places such as churches, libraries, and cemeteries, where people tend to pray, study, and/or contemplate, are also sensitive to noise but due to the limited time people spend at these uses, impacts are usually tolerable. Commercial and industrial uses are considered the least noise-sensitive.

Existing Noise Environment

The noise environment in and around the City is influenced by vehicular traffic, such as along US 101 and local roadways such as Willow Road, El Camino Real, Santa Cruz Avenue, Middle Avenue, Valparaiso Avenue, Middlefield Avenue, and Oak Grove Avenue. Other noise sources in the vicinity include the Caltrain rail system. The map of traffic noise contours contained in the City's General Plan indicates that traffic noise within the vast majority of Menlo Park is between 63 and 83.2 dBA CNEL.

Table 4.11-1 presents measured noise levels recorded at select locations around the City as compiled from existing available analyses conducted within the City. The measured values in Table 4.11-2 include all noise sources unlike the traffic noise modeling presented in Table 4.11-1.

4.11.3 Regulatory Setting

The following section focuses on any changes to the regulatory setting that have occurred since certification of the *ConnectMenlo* EIR. Draft EIR Section 4.10, *Noise,* evaluated effects to noise and vibration. There, Section 4.10.1.2, *Regulatory Framework,* described regulations applicable to this topic, and that description is still current for this SEIR, except as noted below.

Federal

Noise Control Act

In 1972, the Noise Control Act was established to address the concerns of noise as a growing danger to the health and welfare of the nation's population, particularly in urban areas. In 1974, in response to the Noise Control Act, the U.S. Environmental Protection Agency (EPA) published Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare

with an Adequate Margin of Safety.[1] **Table 4.11-2** summarizes U.S. EPA findings for residential land uses.

TABLE 4.11-1
EXISTING MONITORED NOISE LEVELS ALONG STREETS IN THE VICINITY OF HOUSING ELEMENT UPDATE OPPORTUNITY SITES

Location	Noise Level (Ldn)
LT-1: 1360 Willow Road	77.1[a]
LT-2: 1439 Kavanaugh Drive	67.4[a]
LT-3: 1125 Alberni Avenue	61.1[a]
LT-4: 1396 Carlton Avenue	59.6[a]
LT-5: Soccer field at Beechwood School	70.5[b]
LT-6: Eastern terminus of Sandlewood Street	63.8[b]
LT-7: 1601 Stone Pine Lane	70[c]
LT-8: 1128 Merrill Street	72[c]
LT-9: 638 Alma Street	68[c]
LT-10: 248 Alma Street	66[c]
LT-11: 162 Jefferson Drive, facing US 101	75.2[d]

NOTES:

a. ICF. 2022. *Willow Village Master Plan Project*. Available online: https://beta.menlopark.org/files/sharedassets/public/community-development/documents/projects/under-review/willow-village/draft-eir/willow-village-master-plan-draft-environmental-impact-report.pdf. Accessed April 28, 2022
b. ICF. 2016. *Facebook Campus Expansion Project Draft Environmental Impact Report.* Available online: https://www.menlopark.org/DocumentCenter/View/10287/Ch03-06_Noise_Draft-EIR?bidId=. Accessed April 28, 2022
c. California High-Speed Rail Authority. 2020. *San Francisco to San Jose Project Section Draft EIR/EIS*. Available online: https://hsr.ca.gov/wp-content/uploads/docs/programs/san_francisco_san_jose/Draft_EIRS_FJ_V1-12_CH_3.4_Noise_Vibration.pdf. Accessed April 28, 2022.
d. This value is in the CNEL metric, not Ldn which is typically with approximately 1 dB of the Ldn value. ICF. 2014. *Commonwealth Corporate Center Project*. Available online: https://www.menlopark.org/DocumentCenter/View/1657/Noise?bidId=. Accessed April 28, 2022.

TABLE 4.11-2
SOUND LEVELS THAT PROTECT PUBLIC HEALTH (DBA)

Category	Measure of Exposure	Indoor			Outdoor		
		Activity Interference	Hearing Loss	To Protect Against Both Effects	Activity Interference	Hearing Loss	To Protect Against Both Effects
Residential with Outside Space	L_{dn}	45	70	45	55	70	55
Residential with No Outside Space	L_{dn}	45	70	45	-	-	-

NOTES:

Sound levels are yearly average equivalent in decibels; the exposure period which results in hearing loss at the identified level is a period of forty years.

SOURCE: U.S. Environmental Protection Agency, Information of Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an adequate Margin of Safety, 1974.

[1] U.S. Environmental Protection Agency (U.S. EPA), 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an adequate margin of Safety. March 1974.

Occupational Safety and Health Administration

The Occupational Safety and Health Administration (OSHA) aims to ensure worker safety and health in the United States by working with employers and employees to create better working environments. With regard to noise exposure and workers, OSHA regulations set forth accepted criteria to protect the hearing of workers exposed to occupational noise. Noise exposure regulations are listed in 29 Code of Federal Regulations (CFR) Section 1910.95. Section 1910.95(c)(1) states that an employer shall administer a hearing conservation program whenever noise exposure levels equal or exceed an 8-hour time-weighted average sound level of 85 dBA.

Federal Aviation Administration

The Federal Aviation Administration (FAA) has published guidelines for land use compatibility in 14 CFR Part 150. For aviation noise analyses, the FAA has determined that the 24-hour cumulative exposure of individuals to noise resulting from aviation activities must be established in terms of L_{dn} as FAA's primary metric. However, the FAA recognizes CNEL as an alternative metric for assessing aircraft (e.g., helicopters) noise exposure in California.

Based on FAA standards, a significant noise impact would occur if analysis shows that the project would cause noise sensitive areas to experience an increase in the aircraft noise level of 1.5 dB CNEL or more when aircraft levels are 65 dBA CNEL or higher. In addition, a significant noise impact would occur if noise sensitive land uses would be newly exposed to levels of 65 dBA CNEL or higher as a result of a project. For example, a 1.5 dB increase at an aircraft noise level of 63.5 dBA CNEL that brings the aircraft noise level to 65 dBA CNEL would be considered a significant impact.

According to Chapter 65 of Title 42 of the United States Code, and Articles 3 and 3.5 of Chapter 4 of Division 9 of the Public Utilities Code of the State of California, local enforcement of noise regulations and land use regulations related to noise control of airports (e.g., helistops) are preempted by the FAA.

State

Title 24

Title 24 of the California Code of Regulations codifies Sound Transmission Control requirements, which establishes uniform minimum noise insulation performance standards for new hotels, motels, dormitories, apartment houses, and dwellings other than detached single-family dwellings. Specifically, Title 24 states that interior noise levels attributable to exterior sources shall not exceed 45 dBA CNEL in any habitable room of new dwellings.

Department of Industrial Relations

The Division of Occupational Safety and Health (DOSH) protects workers and the public from safety hazards through its California Divisions of Occupational Safety and Health (Cal/OSHA) program. The Cal/OSHA Program is responsible for enforcing California laws and regulations pertaining to workplace safety and health and for providing assistance to employers and workers about workplace safety and health issues. DOSH enforces noise standards in the workplace in conjunction with OSHA through the CAL/OSHA program.

Local

Menlo Park General Plan

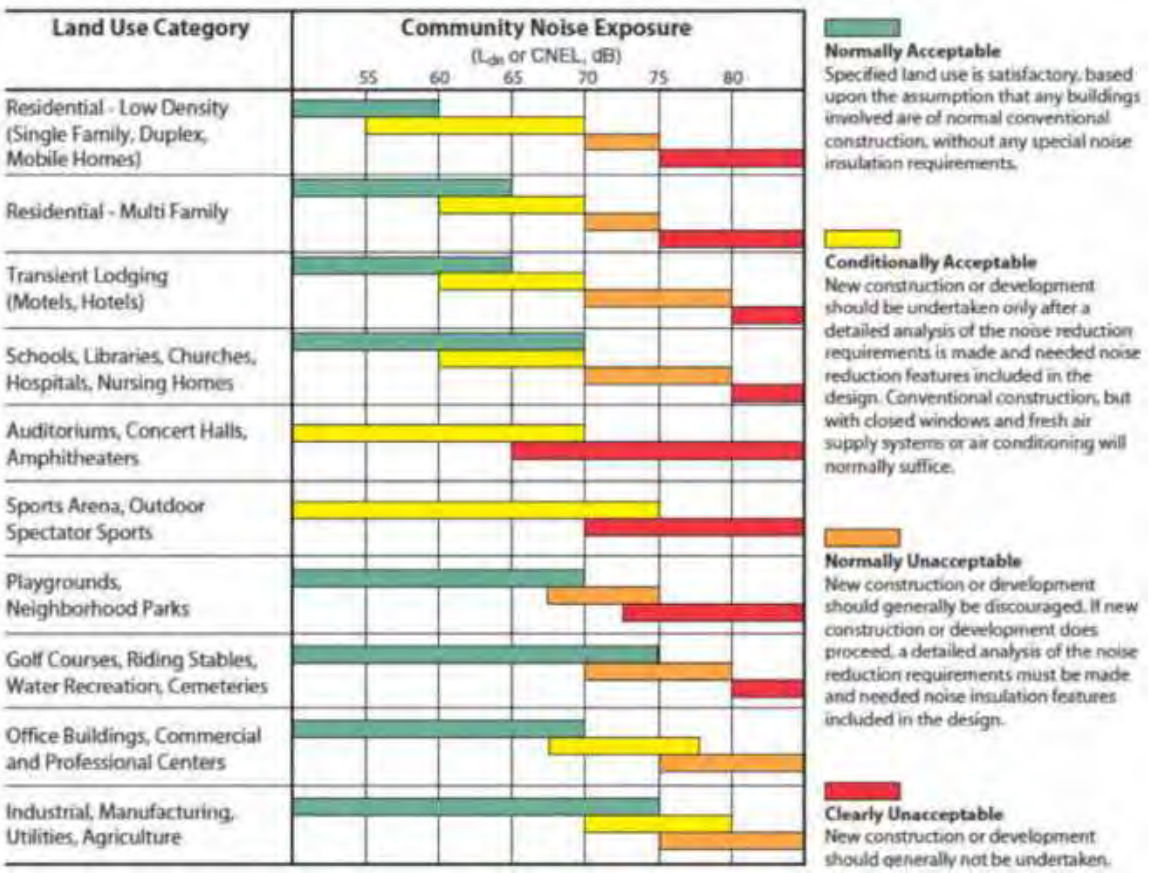
The Menlo Park General Plan is a comprehensive long-range general plan for the physical development of the City of Menlo Park (City of Menlo Park, 2016a). The General Plan contains the current City of Menlo Park Housing Element, which was adopted in 2014 (City of Menlo Park, 2014). The various elements within the General Plan include goals and policies for the physical development of the City. Goals and policies related to noise and vibration that are salient to residential development are listed below.

Goal N-1s: Achieve Acceptable Noise Levels.

***Policy N1.1*: Compliance with Noise Standards.** Consider the compatibility of proposed land uses with the noise environment when preparing or revising community and/or specific plans. Require new projects to comply with the noise standards of local, regional, and building code regulations, including but not limited to the City's Municipal Code, Title 24 of the California Code of Regulations, and subdivision and zoning codes.

***Policy N1.2*: Land Use Compatibility Noise Standards.** Protect people in new development from excessive noise by applying the City's Land Use Compatibility Noise Standards for New Development [see chart on the next page] to the siting and required mitigation for new uses in existing noise environments.

Land Use Compatibility Noise Standards for New Development



***Policy N1.3*: Exterior and Interior Noise Standards for Residential Use Areas.** Strive to achieve acceptable interior noise levels and exterior noise levels for backyards and/or common usable outdoor areas in new residential development, and reduce outdoor noise levels in existing residential areas where economically and aesthetically feasible.

***Policy N1.4*: Noise Sensitive Uses.** Protect existing residential neighborhoods and noise sensitive uses from unacceptable noise levels and vibration impacts. Noise sensitive uses include, but are not limited to, hospitals, schools, religious facilities, convalescent homes and businesses with highly sensitive equipment. Discourage the siting of noise-sensitive uses in areas in excess of 65 dBA CNEL without appropriate mitigation and locate noise sensitive uses away from noise sources unless mitigation measures are included in development plans.

***Policy N1.5*: Planning and Design of New Development to Reduce Noise Impacts.** Design residential developments to minimize the transportation-related noise impacts to adjacent residential areas and encourage new development to be site planned and architecturally designed to minimize noise impacts on noise sensitive spaces. Proper site planning can be effective in reducing noise impacts.

***Policy N1.6*: Noise Reduction Measures.** Encourage the use of construction methods, state-of-the-art noise abating materials and technology and creative site design including, but not limited to, open space, earthen berms, parking, accessory buildings, and landscaping to buffer new and existing development from noise and to reduce potential conflicts between ambient noise levels and noise-sensitive land uses. Use sound walls only when other methods are not practical or when recommended by an acoustical expert.

***Policy N1.8*: Potential Annoying or Harmful Noise.** Preclude the generation of annoying or harmful noise on stationary noise sources, such as construction and property maintenance activity and mechanical equipment.

***Policy N1.9*: Transportation Related Noise Attenuation.** Strive to minimize traffic noise through land use policies, traffic-calming methods to reduce traffic speed, law enforcement and street improvements, and encourage other agencies to reduce noise levels generated by roadways, railways, rapid transit, and other facilities.

***Policy N1.10*: Nuisance Noise.** Minimize impacts from noise levels that exceed community sound levels through enforcement of the City's Noise Ordinance. Control unnecessary, excessive and annoying noises within the City where not preempted by Federal and State control through implementation and updating of the Noise Ordinance.

Implementing Programs

***N1.A*: Require Acoustical Studies.** Require acoustical studies for all new multi-family residential projects within the projected Ldn 60 dB noise contours so that noise mitigation measures can be incorporated into project design and site planning.

***N1.D*: Minimize Construction Activity Noise.** Minimize the exposure of nearby properties to excessive noise levels from construction-related activity through CEQA review, conditions of approval and enforcement of the City's Noise Ordinance.

***N1.J*: Evaluate Noise Related Impacts of City Actions as Appropriate.** Analyze in detail the potential noise impacts of any actions that the City may take or act upon which could significantly alter noise level in the community.

Menlo Park Municipal Code

Basic Exterior Residential Noise Limitations

Chapter 8.06, Noise, contains the primary set of statutes through which Menlo Park regulates noise. For all noise measurements pursuant to the noise ordinance, the municipal code specifies standard procedures for conducting noise measurements, with specifications for sound-meter settings and placement. Section 8.06.030 sets maximum noise levels at any residential receiving property to a maximum of 60 dBA during the daytime hours between 7:00 a.m. to 10:00 p.m., and to 50 dBA during the nighttime hours between 10:00 p.m. and 7:00 a.m. The ordinance applies an additional 5 dBA penalty to sounds of a particularly annoying nature, such as tones, screeches, whines, and pulses, among others. The ordinance also includes a qualitative standard which prohibits noises which can be reasonably determined to be disturbing to an entire neighborhood or any considerable number of residents.

Exceptions – Noise Limitation Exceptions and Exemptions

The Menlo Park noise ordinance also contains a number of qualified exceptions to the limitations stipulated in the ordinance; these include construction, powered equipment, and leaf blowers, deliveries, social gatherings, pavement sweeping, garbage collection, and animals. Additionally, the ordinance contains general exemptions for emergencies and emergency warning devices, sporting and City-permitted events, City and State projects, and the normal operation of typical motor vehicles. Of these, the most notable exceptions and exemptions for the purposes of this analysis include those for construction, motor vehicles, and deliveries.

Construction activities have a qualified exemption from the noise ordinance between the hours of 8:00 a.m. and 6:00 p.m. Monday through Friday; construction activities are only allowed on Saturday and Sunday between the hours of 9:00 a.m. and 5:00 p.m. and only if they are being personally undertaken by property owners performing maintenance or improvements. The ordinance still prohibits the use of any piece of equipment that causes noise levels exceeding 85 dBA at a distance of 50 feet. Construction that is sufficiently quiet so as to be fully compliant with the basic exterior noise limitations set out by the ordinance is generally allowed at any time.

Notwithstanding specialized vehicle equipment or sound amplification systems, noise from the normal operation of motor vehicles (including cars, trucks, busses, trains, and airplanes) is exempted from the provisions of the noise ordinance. Noise from deliveries to food retailers and restaurants are generally excepted from the ordinance, while noise from other commercial and industrial deliveries are generally excepted between 7:00 a.m. and 6:00 p.m. Monday through Friday and 9:00 a.m. to 5:00 p.m. Saturday and Sunday. Temporally and geographically specific exceptions for street sweeping and garbage collection are also described in detail by the noise ordinance.

Other Chapters with Noise Regulations

In addition to Chapter 8.06, *Noise*, there are several other chapters in the Menlo Park municipal code that mention noise. In Chapter 8.07, Leaf Blowers, the municipal code mentions that leaf blowers are a source of loud noise and stipulates that operators of these devices must wear ear protection. In Chapter 8.12, Business Operations after Midnight, Section 8.12.040 indicates that a permit for late-night business operations may be revoked if noise from the establishment exceeds

that foreseen by the permit. Chapter 8.28, Parks and Recreation, prohibits the creation of obtrusive noise in parks. Section 9.26.080 of Chapter 9.26, Poultry and Rabbits, prohibits the keeping of animals or fowl which cause unreasonable and disturbing noise for residents. In the goals of Chapter 11.64, Transportation Systems Management, it is stated that noise reduction through decreased traffic is a goal of the chapter. Finally, in Chapter 13.18, Use of Public Rights-of-Way, Section 13.18.110, Regulations, stipulates that all regulations, including those related to noise, apply to the construction, operation, maintenance, and repair of facilities in the public rights-of-way.

Chapter 16.08.095 establishes noise limits applicable to roof-mounted equipment. Specifically, mechanical equipment, such as air conditioning equipment, ventilation fans, vents, ducting, or similar equipment, may be placed on the roof of a building; provided, that such equipment shall be screened from view as observed at an eye level horizontal to the top of the roof-mounted equipment, except for the SP-ECR/D district which has unique screening requirements, and all sounds emitted by such equipment shall not exceed fifty (50) decibels at a distance of fifty (50) feet from such equipment.

Vibration Standards

Neither the City of Menlo Park nor the County of San Mateo have regulatory standards for construction or operational vibration sources. For the purpose of this analysis, to evaluate the impacts of the proposed project under CEQA, federal standards are used to address vibration impacts from the operation of equipment to adjacent uses.

The U.S. Department of Transportation (Federal Transit Administration [FTA]) provides criteria for acceptable levels of groundborne vibration for various types of special buildings that are sensitive to vibration. The human reaction to various levels of vibration is highly subjective and varies from person to person. The upper end of the range shown for the threshold of perception, or roughly 65 VdB, may be considered annoying by some people. Vibration below 65 VdB may also cause secondary audible effects such as a slight rattling of doors, suspended ceilings/fixtures, windows, and dishes, any of which may result in additional annoyance.

The FTA provides criteria to evaluate potential human annoyance due to groundborne vibration caused by frequent and intermittent events. These FTA criteria, shown in Table 4.10-6, are used in this analysis to evaluate impacts from transportation sources to sensitive land uses throughout the City. The FTA also provides criteria to evaluate potential structural damage associated with vibration, and these FTA criteria are used in this analysis. Structures amplify groundborne vibration and wood-frame buildings, such as typical residential structures, are more affected by ground vibration than heavier buildings. The level at which groundborne vibration is strong enough to cause architectural damage has not been determined conclusively. The most conservative estimates are reflected in the FTA standards.

4.11.4 Environmental Impacts and Mitigation Measures

Scope of Analysis

The analysis in this SEIR describes impacts identified in the 2016 *ConnectMenlo* EIR, and describes how the impacts of the HEU would differ, as applicable.

Significance Thresholds

The thresholds used to determine the significance of impacts related to noise and vibration are based on Appendix G of the *CEQA Guidelines*. Implementation of the HEU would have a significant impact on the environment if it would:

- Result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Generate excessive groundborne vibration or groundborne noise levels; or
- For a project located within the vicinity of a private air strip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the region surrounding the Project Site to excessive noise levels.

Issues Not Discussed in Impacts

- ***Expose people or structures to or generate excessive groundborne noise levels.*** The second criterion above relates to groundborne vibration and groundborne noise levels, but only the issue of groundborne vibration is relevant to the HEU. Groundborne noise occurs when vibrations transmitted through the ground result in secondary radiation of noise. Groundborne noise is generally associated with underground railway operations and with construction activities such as blasting, neither of which are likely to result from implementation of the proposed HEU. Future planned development within the City would not involve equipment that would produce groundborne vibration; therefore, no impacts related to the exposure of people or structures to, or the generation of, excessive groundborne noise levels would occur in connection with project operations. The potential for construction activities to result in groundborne vibration is addressed below in Impact 4.11-3.

Methodology and Assumptions

Information for this assessment of impacts relative to noise and vibration resulting from implementation of the HEU is based on a review of City and County plans, including the City of Menlo Park General Plan, and existing and future traffic volumes provided by Hexagon Transportation Consultants.

Roadside noise levels were calculated for the same roadways analyzed for the Level of Service analysis provided to the City of Menlo Park. The street segments selected for analysis are those expected to be most directly impacted by the proposed HEU. These streets are forecast to experience the greatest percentage increase in traffic generated by development under the HEU.

CEQA generally requires the consideration of both the Existing Plus Project condition and Cumulative Plus Project condition when evaluating whether a project would expose existing sensitive receptors to traffic noise that would result in a substantial increase over existing conditions. The analysis in Impact NOI-5 presents the traffic noise increases along roadways within the City under the HEU in comparison to both the Existing and Cumulative (2040) and Cumulative without the HEU conditions.

The California Supreme Court's *California Building and Industry Association v. Bay Area Air Quality Management District (CBIA v. BAAQMD*) decision[2] has indicated that the impact of existing environmental conditions on a project's future users or residents are generally not required to be considered in a CEQA evaluation, except when the project may exacerbate existing hazards or existing conditions. CEQA analysis is therefore concerned with a project's impact on the environment, rather than with the environment's impact on a project and its users or residents. Thus, with respect to existing traffic noise and existing rail noise and vibration on proposed sensitive land uses, the City is not required under CEQA to consider the effects of locating new receptors into an area where such noise and vibration levels already exist. Therefore, traffic and railroad noise exposure and rail vibration on future sensitive receptors within the City are not assessed in this Draft SEIR. It should be noted, however, that *CBIA v. BAAQMD* decision does not preclude jurisdictions like the City from considering these types of impacts during its own planning and development review processes.

Additionally, this analysis also assesses the potential noise impact with respect to the increase in construction noise over existing noise levels. In *King and Gardiner Farms LLC. v. County of Kern* (2020) 45 Cal.App.5th 814, 893, the California Supreme Court determined that the use of an absolute noise level as the threshold of significance violated CEQA. In the *King and Gardiner* case, the County determined the significance of the noise impacts being assessed in the applicable EIR based solely on whether the estimated ambient noise level with the project would exceed the 65 decibels threshold set forth in the Kern County General Plan. Based on prior case law, the court in the *King and Gardiner* decision concluded that the magnitude of the noise increase must be addressed to determine the significance of the change in noise levels and that the EIR did not include an analysis, supported by substantial evidence, explaining why the magnitude of an increase in ambient noise need not be addressed to determine the significance of the project's noise impact.

As a result of the court's decision in *King and Gardiner Farms LLC. v. County of Kern*, in addition to the assessment of construction noise relative to the restrictions of the Menlo Park Municipal Code (where applicable), this analysis applies an increase of 10 dBA or more over existing noise levels at sensitive receptor locations to warrant the implementation of construction noise control measures. Such an increase is a perceived doubling of loudness (Caltrans, 2013).

[2] *California Building Industry Association v. Bay Area Air Quality Management District*, S213478. (A135335, A136212; 218 Cal.App.4th 1171; Alameda County Superior Court; RG10548693. Filed December 17, 2015.)

Impacts and Mitigation Measures

Impacts

Impact NOI-1: Construction activities associated with implementation of the HEU would not result in generation of a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. (*Less than Significant Impact, with Mitigation*)

The *ConnectMenlo* EIR found that the project would have a substantial adverse effect with respect to future projects in Menlo Park resulting in construction-related noise that could exceed noise limits required under the City's regulations, which considered commercial and industrial development and the possibility of impact pile driving. To address this potential impact, the EIR identified Mitigation Measure NOISE-1c to require project applicants to minimize the exposure of nearby properties to excessive noise levels from construction-related activity through CEQA review, conditions of approval and/or enforcement of the City's Noise Ordinance. Specifically, the mitigation measure requires a mechanism by which the owner/developer are responsible for requiring contractors to implement a menu of measures to limit construction-related noise.

Under the HEU, the primary source of temporary noise within the City would be from demolition and construction. Construction activities within the City would involve both off-road construction equipment (e.g., excavators, dozers, cranes, etc.) and transport of workers and equipment to and from construction sites. **Table 4.11-3** shows typical noise levels produced by the types of off-road equipment that would likely be used during future construction areas within the City. Development of residential uses under the HEU would be unlikely to require impact pile driving or similar equipment that may be expected to generate high noise levels, as such activities would typically be associated with high-rise development that is not envisioned. However, it is still possible that pile driving could still be required in certain areas, since use of the technique is dictated not only by building height, but also by specific soil conditions at a given site. A need for pile driving would typically be identified through site-specific geotechnical studies as projects move through the development and design processes.

Construction noise is a major source of temporary noise within the City and would continue to be so regardless of whether or not the HEU is adopted. Noise levels near individual construction sites under the proposed HEU would not be substantially different from what they would be under the existing Housing Element. Since specific future projects within the City are unknown at this time, it is conservatively assumed that the construction areas associated with these future projects could be located within 50 feet of sensitive land uses. To quantify construction-related noise exposure at the nearest sensitive land uses, it is assumed that the two loudest pieces of construction equipment would operate within 50 feet of a sensitive receptor.

TABLE 4.11-3
REFERENCE CONSTRUCTION EQUIPMENT NOISE LEVELS (50 FEET FROM SOURCE)

Type of Equipment	L_{max}, dBA	Hourly L_{eq}, dBA/Percent Use[a]
Backhoe	80	76/40
Jackhammer	85	78/20
Roller	85	78/20
Impact pile driver	95	88/20
Vibratory pile driver	95	88/20
Compactor	80	73/20
Paver	85	82/50
Crane	85	77/16
Grader	85	81/40
Concrete mixer truck	85	81/40
Loader	80	76/40
Air compressor	80	76/40
Excavator	85	81/40

NOTES:

a Percent used during the given time period (usually an hour – hourly L_{eq}) were obtained from the FHWA Roadway Construction Noise Model User's Guide.

SOURCE: FHWA, 2006.

Under the HEU, sensitive receptors located within 50 feet of an excavator or other construction equipment producing similar levels of noise could be exposed to a noise level of 82 dBA L_{eq}. However, Menlo Park Municipal Code Section 8.06.040 Exceptions (a) Construction Activities specifically exempts construction noise between the hours of eight a.m. and six p.m. on weekdays and (b) Powered equipment exempts equipment used on a temporary, occasional or infrequent basis operated between the hours of eight a.m. and six p.m. on weekdays. No piece of equipment is allowed to generate noise in excess of eighty-five dBA at fifty feet. Therefore, under the HEU, likely construction equipment operations would operate within the constraints of Municipal Code Section 8.06.040(b). However, future projects would be required to demonstrate compliance with the City's required standards and in this respect, impacts are therefore considered **potentially significant**, and **Mitigation Measure NOI-1** is prescribed below to address this potential impact. Additionally, although not an adopted standard of the Municipal Code or a policy of the General Plan Noise Element, construction impacts under CEQA may be considered significant if they were to result in a substantial increase over existing ambient conditions at a noise sensitive receptor for a prolonged period of time. Future infill development projects constructed pursuant to the HEU have the potential to be conducted 50 feet or closer to the property line of existing residences or other noise-sensitive uses, which increases the potential for prolonged, yet temporary, increases in localized noise levels which would also represent a potentially significant impact warranting mitigation measures.

While development under the HEU could also trigger the need for infrastructure upgrades that could occur in proximity to sensitive uses, such projects tend to progress linearly and, therefore,

would not be expected to result in localized increases in noise affecting a given receptor for a prolonged period of time.

Mitigation Measure NOI-1: Construction Noise Control.

Project applicants shall minimize the exposure of nearby properties to excessive noise levels from construction-related activity through CEQA review, conditions of approval, and/or enforcement of the City's Noise Ordinance. Prior to issuance of demolition, grading, and/or building permits for development projects, a note shall be provided on development plans indicating that during on-going grading, demolition, and construction, the property owner/developer shall be responsible for requiring contractors to implement the following measures to limit construction- related noise:

- Demonstrate that any construction activities taking place outside daytime construction hours of 8:00 a.m. to 6:00 p.m. Monday through Friday shall comply with the 60 dBA Leq limit during the hours of 7:00 a.m. to 8:00 a.m. and the 50 dBA Leq limit during the hours of 6:00 a.m. to 7:00 a.m. In addition, the property owner/developer shall demonstrate that individual pieces of equipment proposed for use will not exceed the limit (85 dBA Leq at 50 feet) for powered equipment noise and that combined construction noise will not result in a 10 dBA increase over the ambient noise level at nearby sensitive receptors. Activities that would produce noise above applicable daytime or nighttime limits shall be scheduled only during normal construction hours. If it is concluded that a particular piece of equipment will not meet the requirements of this mitigation measure, that equipment shall not be used outside the daytime construction hours.
- Verify construction activities are conducted at adequate distances or otherwise shielded with sound barriers, as determined through analysis, from noise-sensitive receptors when working outside the daytime construction hours of 8:00 a.m. to 6:00 p.m. Monday through Friday, and verify compliance with the Menlo Park Municipal Code though measurement.
- All internal combustion engines on construction equipment and trucks are fitted with properly maintained mufflers, air intake silencers, and/or engine shrouds that are no less effective than as originally equipped by the manufacturer.
- Stationary equipment such as generators and air compressors shall be located as far as feasible from nearby noise-sensitive uses.
- Stockpiling is located as far as feasible from nearby noise-sensitive receptors.
- Limit unnecessary engine idling to the extent feasible.
- Limit the use of public address systems.
- Construction traffic shall be limited to the haul routes established by the City of Menlo Park.
- Additional controls, as warranted, may include but are not limited to:
  - Upgraded construction equipment mufflers (e.g., improved mufflers, intake silencers, ducts, engine enclosures, acoustically attenuating shields, shrouds) on equipment and trucks used for Project construction.

- Equipment staging plans (e.g., locating stationary equipment at adequate distances).
- Limitations on equipment and truck idling.
- Shielding sensitive receptors with sound barriers to comply with the Menlo Park Municipal Code.

Significance After Mitigation: With implementation of Mitigation Measure NOI-1, construction noise impacts of subsequent projects would be reduced to **less than significant with mitigation** by incorporating best construction noise management practices as outlined above.

Impact NOI-2: Stationary noise sources from development within the HEU area would not result in a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. (*Less than Significant Impact*)

The *ConnectMenlo* EIR found that the project would have a potential adverse effect with respect to future projects in Menlo Park resulting in noise that could exceed noise limits required under the City's regulations which considered commercial and industrial development. To address this potential impact, the EIR identified Mitigation Measure NOISE-1b to require stationary noise sources, and landscaping and maintenance activities to comply with Chapter 8.06, Noise, of the Menlo Park Municipal Code.

Unlike industrial uses and some commercial land uses, residential uses are not typically associated with excessive noise generation. Characteristics of residential uses that are noise-producing include stationary source noises such as air conditioning equipment and pool equipment which generally do not generate substantial noise levels. At the present time, the type, size, and the location of any air handling equipment that may be associated with housing developed under the HEU is unknown. However, Section 16.08.095 of the Menlo Park Municipal Code establishes maximum noise levels for roof-mounted equipment. Specifically, such mechanical equipment (air conditioning equipment, ventilation fans, vents, ducting, or similar equipment) is prohibited from generating a noise level in excess of 50 dBA at a distance of 50 feet from such equipment. In addition, that such equipment is required to be screened from view as observed at an eye level horizontal to the top of the roof-mounted equipment, except for the SP-ECR/D district which has unique screening requirements. Based on these requirements, which are enforced, the impact would be **less than significant**.

Mitigation Measure: None required.

Impact NOI-3: Implementation of the HEU would not result in generation of excessive groundborne vibration or groundborne noise levels. (*Less than Significant Impact*)

The *ConnectMenlo* EIR found that future projects in Menlo Park could cause exposure of people to, or generation of, excessive groundborne vibration or groundborne noise levels. Specifically, the EIR identified the potential for architectural damage Citywide as a result of construction-generated vibration. To address this potential vibration impact, the EIR identified Mitigation Measure NOISE-2a to require the project applicant/developer to prepare a noise and vibration analysis to assess and mitigate potential noise and vibration impacts for any development project requiring pile driving or blasting.

The *ConnectMenlo* EIR also found that future projects in Menlo Park could cause long-term vibration impacts of future development Citywide on existing or potential future sensitive uses and identified Mitigation Measure Noise-2b to locate sensitive receptors away from vibration sources. However, this impact is largely the impact of the environment on the project which, as of 2015 is no longer an impact under CEQA, as discussed above under methodology.

Future construction activities could occur under the proposed HEU which could have the potential to expose sensitive land uses within the City to groundborne vibration. Construction activities would occur in a variety of locations throughout the City under the HEU, which may require activities or use of off-road equipment known to generate some degree of vibration. Activities that would potentially generate excessive vibration, such as blasting or impact pile driving would not be expected to occur from housing development under the HE, as such activities would typically be associated with high-rise development that is not envisioned. However, it is still possible that pile driving could still be required in certain areas, since use of the technique is dictated not only by building height, but also by specific soil conditions at a given site. A need for pile driving would typically be identified through site-specific geotechnical studies as projects move through the development and design processes. Receptors sensitive to vibration include structures (especially older masonry structures), people (especially residents, the elderly, and the sick), and equipment (e.g., magnetic resonance imaging equipment, high resolution lithographic, optical and electron microscopes). Regarding the potential effects of groundborne vibration to people, except for long-term occupational exposure, vibration levels rarely affect human health.

Since specific future projects within the City are unknown at this time, it is conservatively assumed that the construction areas associated with these future projects could be located within 50 feet of sensitive land uses.

The primary vibration-generating activities associated with the proposed project would occur during grading, placement of underground utilities, and construction of foundations. **Table 4.11-4** shows the typical vibration levels produced by construction equipment at various distances. The most substantial source of groundborne vibrations associated with housing development construction would be the use of drill rigs for foundation peers, if required.

TABLE 4.11-4
VIBRATION LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	PPV (in/sec)[a]	
	At 25 Feet (Reference)	At 50 feet
Large Bulldozer	0.089	0.35
Auger Drill Rig	0.089	0.35
Loaded Trucks	0.076	0.30
Jackhammer	0.035	0.14

NOTES:

a Vibration amplitudes for construction equipment assume normal propagation conditions and were calculated using the following formula: PPV (equip) = PPV (ref) x (25/D)1.1 where:

PPV (equip) = the peak particle velocity in in/sec of the equipment adjusted for the distance
PPV (ref) = the reference vibration level in in/sec from pp. 31–33 and Table 18 of the Caltrans Vibration Guidance Manual, as well as Table 12-2 of the FTA's Noise and Vibration Guidance Manual
D = the distance from the equipment to the receiver

SOURCES: Caltrans, *Transportation and Construction Vibration Guidance Manual*, April 2020, pp. 29–34, http://www.dot.ca.gov/hq/env/noise/publications.htm, accessed on December 21, 2021; FTA, *Transit Noise and Vibration Impact Assessment Manual*, September 2018, https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf, accessed December 21, 2021.

According to the Caltrans' *Transportation and Construction Vibration Guidance Manual*, the building damage threshold for historic and some older buildings is 0.25 PPV (in/sec).[3] As indicated in Table 4.11-4, construction activities at distances of 25 feet or further from the nearest existing buildings would be well below the threshold of 0.25 PPV to avoid structural damage to historic and older buildings. For these reasons, project-related construction and operational groundborne vibration impacts would be **less than significant**.

Mitigation Measure: None required.

Impact NOI-4: Transportation increases along roadways under the HEU would not result in a substantial permanent increase in ambient noise levels in the project vicinity above baseline levels without the project. (*Less than Significant Impact*)

The *ConnectMenlo* EIR found that with development of future projects in Menlo Park, there would be no roadway segments that would experience a substantial permanent increase in ambient noise levels and that, therefore, operational traffic noise impacts would be less than significant.

Vehicular traffic noise increases associated with the proposed HEU were estimated using algorithms found in the FHWA's *Traffic Noise Model Technical Manual* and the estimated traffic volumes provided by the Transportation consultant for this Draft SEIR's traffic analysis for the HEU. The results of the vehicular traffic noise modeling effort for the HEU, **Table 4.11-5**, are compared to year 2021 baseline conditions without the HEU. The traffic model is conservative in

3 California Department of Transportation (Caltrans), 2020. *Transportation and Construction Vibration Guidance manual.* April 2020.

that it does not currently account for the proportion of the vehicle fleet that is electrically-powered, which generates reduced noise levels compared with vehicles powered by combustion engines.

TABLE 4.11-5
BASELINE AND PROJECTED PEAK HOUR TRAFFIC NOISE LEVELS ALONG STREETS
HOUSING ELEMENT UPDATE

Roadway Segment	Baseline Condition (2021)[a]	Baseline plus HEU Condition[a]	Project Increase over Baseline Condition[a]	Significant Increase (Yes or No)?
Marsh Road from Scott Drive to Bohannon Drive	70.0	70.2	0.2	No
Marsh Road from Bohannon Drive to Bay Road	69.3	69.5	0.2	No
Willow Road from Hamilton Ave to Newbridge Street	70.7	70.9	0.2	No
Willow Road from Newbridge Street to U.S. 101	72.2	72.3	0.1	No
Willow Road from U.S. 101 to Durham Street	65.9	66.3	0.4	No
Willow Road from Durham Street to Coleman Avenue	65.4	65.9	0.5	No
Willow Road from Gilbert Avenue to Middlefield Road	64.9	65.5	0.6	No
Middlefield Road from Willow Road to Ringwood Avenue	62.9	63.2	0.3	No
Middlefield Road from Ringwood Avenue to Oak Grove Avenue	68.1	68.9	0.8	No
Ravenswood Avenue from Middlefield Road to Laurel Street	68.9	69.2	0.3	No
Ravenswood Avenue from Laurel Street to Alma Street	63.9	64.3	0.4	No
El Camino Real from Alejandra Avenue to Encinal Avenue	65.0	65.4	0.4	No
El Camino Real from Encinal Avenue to Valparaiso Avenue	71.6	71.9	0.3	No
El Camino Real from Valparaiso Avenue Oak Grove Avenue	71.2	71.6	0.4	No
El Camino Real from Oak Grove Avenue to Santa Cruz Avenue	70.9	71.2	0.3	No
El Camino Real from Santa Cruz Avenue to Ravenswood Avenue	70.9	71.2	0.3	No
El Camino Real from Ravenswood Avenue to Middle Avenue	70.4	70.8	0.4	No
Encinal Avenue from El Camino Real to Laurel Street	71.9	72.2	0.3	No
Valparaiso Avenue from ECR to University Drive	61.0	61.0	0.0	No
Glenwood Avenue from ECR to Middlefield Road	65.0	65.3	0.3	No
Oak Grove Avenue from ECR to University Drive	60.7	61.3	0.6	No
Oak Grove Avenue from ECR to Middlefield Road	62.3	63.1	0.8	No
Ravenswood Avenue from El Camino Real to Laurel Street	61.9	62.6	0.7	No
Menlo Avenue from ECR to Crane Street	65.2	65.7	0.5	No
Middle Avenue from ECR to University Drive	62.2	63.1	0.9	No
Sand Hill Road from Oak Avenue to Santa Cruz Avenue	62.8	63.0	0.2	No
Sand Hill Road from Santa Cruz Avenue to Sharon Park Drive	69.8	69.9	0.1	No
Sand Hill Road from Sharon Park Drive to I-280	70.0	70.3	0.3	No
Santa Cruz Avenue from Sand Hill Road to Alameda de las Pulgas	71.1	71.4	0.3	No
Alpine Road from Junipero Serra Boulevard to Stowe Lane	66.8	67.0	0.2	No

NOTES:

a Noise levels were determine using methodology described in FHWA's Traffic Noise Model Technical Manual.

SOURCE: ESA, 2022 (Appendix C)

The City has not adopted a specific, quantitative threshold for what constitutes a significant permanent increase in ambient noise levels. The smallest increase in loudness perceptible by the human ear is 3 dBA and increases of 5 dBA or greater are clearly perceptible. (Caltrans, 2013) Therefore, in the absence of quantitative ambient noise level increase thresholds adopted by the City with respect to transportation sources, a substantial increase in ambient noise levels would be defined as either: a 5 dB increase, if after the increase the ambient noise level remains in the range of what would be "normally acceptable" at the sensitive land use where the noise is being received; or a 3 dB increase, if after the increase the ambient noise level exceeds the range of what would be "normally acceptable" at a noise-sensitive land use where the noise is being received. Regardless, as can be seen from the increases in roadside noise presented in Table 4.11-5, the increase in roadside noise levels along all roadways analyzed was less than 1 dBA. Therefore, adoption of the HEU would have a less than significant impact with respect to operational roadway noise.

Mitigation Measure: None required.

Impact NOI-5: Implementation of the HEU would not expose people residing or working in the project area to excessive noise levels due to being located within the vicinity of a private airstrip or an airport land use plan or within two miles of a public airport or public use airport. *(Less than Significant Impact)*

The *ConnectMenlo* EIR found that development of future projects in Menlo Park would not result in exposure to excessive aircraft noise levels and the impact would be less than significant. This determination was based on the fact that no areas of Menlo Park fall within an airport land use plan for any of the airports located in close proximity to the City. Although a small portion of Menlo Park falls within two miles of the Palo Alto Airport, this area is not covered by the airport's influence area, nor is it within the airport's 55 dB noise contour. All other airports are located 4 or more miles away from the study area. These conditions have not changed, and the *ConnectMenlo* EIR's findings are still applicable to the HEU for the following reasons.

The Palo Alto Airport is located 1.5 miles from the City limits. The Palo Alto Airport Comprehensive Land Use Plan (CLUP) indicates that the existing 60 dBA CNEL noise contour of Palo Alto Airport extends about 500 feet west of and out along the extended runway center line to about 2,300 feet northwest of Bay Road in East Palo Alto in San Mateo County. Therefore, aircraft operations of the Palo Alto Airport would not impact the potential occupants of any of the prospective housing opportunity sites and land use strategy sites of the HEU.

Mitigation Measure: None required.

Cumulative Impacts

This section presents an analysis of the cumulative effects of the HEU in combination with other past, present, and reasonably foreseeable future projects that could cause cumulatively considerable impacts. Significant cumulative impacts related to noise and vibration could occur if

the incremental impacts of the HEU were combined with the incremental impacts of one or more of the cumulative projects or cumulative development projections for 2040 included in the project description and described in Section 4.0.3, *Cumulative Impacts*.

The *ConnectMenlo* EIR found that its analysis of noise and vibration impacts addressed cumulative impacts with regard to noise, as well as groundborne noise and vibration. Notwithstanding the possibility of multiple simultaneous nearby noise sources in combination could result in higher overall noise levels, this effect is captured and accounted for by the ambient noise level metrics which form the basis of the Thresholds of Significance for noise analysis. Therefore, the EIR considered its project-level analysis to also represent a cumulative analysis with the same findings of significance.

Impact NOI-6: Construction activities associated with implementation of the HEU, when combined with other past, present, or reasonably foreseeable projects, would not result in generation of a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. (*Less than Significant Impact*)

Development that could occur with implementation of the HEU and the cumulative projects listed in Table 4.0-1 and shown in Figure 4.0-1 (see Section 4.0 of this SEIR), if constructed contemporaneously, could result in construction noise levels higher than those of development of the HEU alone at some receptor locations. Some of the cumulative projects in Table 4.0-1 would be located more than 1,200 feet from identified housing opportunity sites and land use strategy sites under the HEU, and therefore construction of such projects would be unlikely to combine with construction activities associated with development under the HEU due to attenuation over distance and the presence of intervening structures. However, the Willow Village project would be close to a few land use strategy sites with potential zoning modifications and therefore construction has the potential to combine and result in greater noise levels at sensitive uses than the those generated by development under the HEU alone.

As discussed in Impact 4.11-1, above, sensitive receptors located within 50 feet of an excavator or other construction equipment producing similar levels of noise could be exposed to a noise level of 82 dBA L_{eq}. The City of Menlo Park noise ordinance exempts construction activities between the hours of 8:00 a.m. and 6:00 p.m. Monday through Friday. Construction activities are only allowed on Saturday and Sunday between the hours of 9:00 a.m. and 5:00 p.m. and only if they are being personally undertaken by property owners performing maintenance or improvements. Despite these allowances for weekend residential maintenance, the ordinance prohibits the use of any equipment that results in noise levels exceeding 85 dBA at a distance of 50 feet. However, as discussed above in Impact NOI-1, future projects would be required to demonstrate compliance with the City's required standards. Therefore, because the potential exists for construction projects under the HEU and other foreseeable development to occur simultaneously and in proximity to one another, potentially resulting in prolonged localized increases over existing ambient noise level at noise sensitive uses, future construction activities under the HEU and cumulative development could create construction noise impacts that are **potentially significant.**

Mitigation Measure: Implement Mitigation Measure NOI-1.

Significance with Mitigation: With implementation of Mitigation Measure NOI-1, construction noise impacts of subsequent HEU projects and cumulative projects would be reduced to **less than significant with mitigation** by incorporating best construction noise management practices as outlined above.

Impact NOI-7: Stationary noise sources from development within the HEU area, when combined with other past, present, or reasonably foreseeable projects, would not result in a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. (*Less than Significant Impact*)

Development that could occur with implementation of the HEU and the cumulative development described in Section 4.0 of this SEIR, could result in stationary source noise levels higher than those of development of the HEU alone at some receptor locations.

At the present time, the type, size, and the location of any air handling equipment that may be associated with housing developed under the HEU is unknown. As discussed in Impact NOI-2, Section 16.08.095, Roof-mounted equipment, of the Menlo Park Municipal Code establishes maximum noise levels. In addition, such equipment shall be screened from view as observed at an eye level horizontal to the top of the roof-mounted equipment, except for the SP-ECR/D district which has unique screening requirements. Because these requirements would apply to all past, present, or reasonably foreseeable projects as well as from development with the proposed HEU, the cumulative impact with respect to stationary noise sources potentially resulting in a substantial permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance would be **less than significant**.

Impact NOI-8: Construction activities associated with implementation of the HEU, when combined with other past, present, or reasonably foreseeable projects, would not result in exposure of persons to or generation of excessive ground borne vibration levels. (*Less than Significant Impact*)

Development that could occur with implementation of the HEU and the cumulative development described in Section 4.0 of this SEIR could be constructed contemporaneously.

With regard to the potential for a cumulative vibration-related damage impact to occur, because vibration impacts are based on instantaneous PPV levels, worst-case groundborne vibration levels from construction are generally determined by whichever individual piece of equipment generates the highest vibration levels. Unlike the analysis for average noise levels, in which noise levels of multiple pieces of equipment can be combined to generate a maximum combined noise level, instantaneous peak vibration levels do not combine in this way. Vibration from multiple construction sites, even if they are located close to one another, would not combine to raise the maximum PPV. For this reason, the cumulative impact of construction vibration from multiple

construction projects located near one another would generally not combine to further increase vibration levels. In essence, vibration effects are highly localized.

Vibration impacts resulting from construction of subsequent projects under the HEU would not combine with vibration effects from cumulative projects in the vicinity. Therefore, cumulative groundborne vibration impacts related to potential damage effects and interference with vibration-sensitive equipment would be **less than significant**.

Impact NOI-9: Transportation activities under the HEU, when combined with other past, present, or reasonably foreseeable projects, would not result in a substantial permanent increase in ambient noise levels in the project vicinity above baseline levels without the project and cumulative development. (*Less than Significant Impact*)

Development that could occur with implementation of the HEU and the cumulative development described in Section 4.0 of this SEIR, could result in increased roadside noise levels generated by an increase in roadway traffic.

Vehicular traffic noise increases associated with the proposed HEU inclusive of projected development in the cumulative year 2040 scenario were estimated using algorithms found in the FHWA's *Traffic Noise Model Technical Manual* and the estimated 2040 traffic volumes provided in this Draft SEIR's traffic analysis for the HEU. The results of the vehicular traffic noise modeling effort for the HEU are included in **Table 4.11-6**.

As can be seen from the increases in roadside noise presented in Table 4.11-6, the cumulative increase in roadside noise levels compared to baseline 2021 conditions along all roadways analyzed was less than 2 dBA. Therefore, the cumulative increase in roadside noise levels would be **less than significant**.

Mitigation Measure: None required.

TABLE 4.11-6
BASELINE AND PROJECTED PEAK HOUR TRAFFIC NOISE LEVELS ALONG STREETS
HOUSING ELEMENT UPDATE

Roadway Segment	Baseline Condition (2021)[a]	2040 plus HEU Condition[a]	Project Increase over Baseline Condition[a]	Significant Increase (Yes or No)?
Marsh Road from Scott Drive to Bohannon Drive	70.0	70.6	0.6	No
Marsh Road from Bohannon Drive to Bay Road	69.3	70.1	0.8	No
Willow Road from Hamilton Ave to Newbridge Street	70.7	71.2	0.5	No
Willow Road from Newbridge Street to U.S. 101	72.2	73.1	0.9	No
Willow Road from U.S. 101 to Durham Street	65.9	66.4	0.5	No
Willow Road from Durham Street to Coleman Avenue	65.4	66.1	0.7	No
Willow Road from Gilbert Avenue to Middlefield Road	64.9	65.7	0.8	No
Middlefield Road from Willow Road to Ringwood Avenue	62.9	63.7	0.8	No
Middlefield Road from Ringwood Avenue to Oak Grove Avenue	68.1	69.4	1.3	No
Ravenswood Avenue from Middlefield Road to Laurel Street	68.9	69.8	0.9	No
Ravenswood Avenue from Laurel Street to Alma Street	63.9	64.2	0.3	No
El Camino Real from Alejandra Avenue to Encinal Avenue	65.0	65.3	0.3	No
El Camino Real from Encinal Avenue to Valparaiso Avenue	71.6	72.4	0.8	No
El Camino Real from Valparaiso Avenue Oak Grove Avenue	71.2	71.8	0.6	No
El Camino Real from Oak Grove Avenue to Santa Cruz Avenue	70.9	71.4	0.5	No
El Camino Real from Santa Cruz Avenue to Ravenswood Avenue	70.9	71.5	0.6	No
El Camino Real from Ravenswood Avenue to Middle Avenue	70.4	71.2	0.8	No
Encinal Avenue from El Camino Real to Laurel Street	71.9	72.5	0.6	No
Valparaiso Avenue from ECR to University Drive	61.0	62.0	1.0	No
Glenwood Avenue from ECR to Middlefield Road	65.0	65.5	0.5	No
Oak Grove Avenue from ECR to University Drive	60.7	61.5	0.8	No
Oak Grove Avenue from ECR to Middlefield Road	62.3	62.9	0.6	No
Ravenswood Avenue from El Camino Real to Laurel Street	61.9	62.2	0.3	No
Menlo Avenue from ECR to Crane Street	65.2	65.7	0.5	No
Middle Avenue from ECR to University Drive	62.2	63.3	1.1	No
Sand Hill Road from Oak Avenue to Santa Cruz Avenue	62.8	63.2	0.4	No
Sand Hill Road from Santa Cruz Avenue to Sharon Park Drive	69.8	70.2	0.4	No
Sand Hill Road from Sharon Park Drive to I-280	70.0	70.5	0.5	No
Santa Cruz Avenue from Sand Hill Road to Alameda de las Pulgas	71.1	71.6	0.5	No
Alpine Road from Junipero Serra Boulevard to Stowe Lane	66.8	67.5	0.7	No

NOTES:
a Noise levels were determine using methodology described in FHWA's Traffic Noise Model Technical Manual.

SOURCE: ESA, 2022 (Appendix C)

4.11.5 References

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4.12 Population and Housing

4.12.1 Introduction

This section evaluates the effects of the Housing Element Update (HEU) on population and housing, focusing on changes to the *ConnectMenlo* EIR (certified in 2016) that may result in new or more severe impacts, and describes any mitigation measures needed to address any such impacts.

Findings of the *ConnectMenlo* Final EIR

Population and housing impacts of the *ConnectMenlo* project were analyzed in Section 4.11 of the *ConnectMenlo* Draft EIR. The *ConnectMenlo* Final EIR determined that the project would have the following impacts with respect to population and housing:

- POP-1: Implementation of the proposed project would not induce substantial population growth, or growth, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure). (*Less than Significant Impact*)
- POP-2: Implementation of the proposed project would not displace substantial numbers of existing housing units, necessitating the construction of replacement housing elsewhere. (*Less than Significant Impact*)
- POP-3: Implementation of the proposed project would not displace substantial numbers of people, necessitating the construction of replacement housing elsewhere. (*Less than Significant Impact*)
- POP-4: Implementation of the proposed project, in combination with past, present, and reasonably foreseeable projects, would result in a significant cumulative impact with respect to population and housing. (*Significant and Unavoidable Impact*)

Since certification of the *ConnectMenlo* Final EIR, Appendix G of the CEQA Guidelines has been amended to focus on whether projects would induce substantial *unplanned* growth rather than substantial growth.

Notice of Preparation Comments

The Notice of Preparation (NOP) for the SEIR was circulated on December 23, 2021 and a scoping meeting was held on January 24, 2022. The NOP and the comments received during the public comment period can be found in **Appendix A** of this SEIR. Comments relating to population and housing received during the NOP comment period included concerns regarding whether the HEU would actually result in development of new housing; concerns regarding the feasibility of housing sites identified in the NOP; requests for additional feasible housing sites to be identified; requests for more aggressive strategies and policies to ensure a lack of barriers for housing to be built on selected sites; desire for the HEU to address potential modifications to non-residential zoning, particularly in District 1 to reduce the amount of office space permitted generally in the area; desire for the HEU to propose measures to create a more equal balance between residential and non-residential zoning; a request for the project scope to evaluate the appropriate levels of mixed-use zoning to create a better jobs to housing balance; concern regarding impacts from changes in zones that affect established land uses and neighborhoods;

concern that the draft list of housing sites in the NOP is unlikely to lead the City to meet its Regional Housing Needs Allocation (RHNA) goals, and that it will likely be rejected by the California Department of Housing and Community Development (HCD); and a desire for the HEU to support affordable housing development to the fullest extent, and support more below market rate (BMR) development.

Information Sources

The primary sources of information referenced in this section included those listed below. Please note that a full list of references for this topic can be found at the end of this section.

- Association of Bay Area Governments (ABAG) Final Regional Housing Needs Allocation (RHNA) Plan: San Francisco Bay Area, 2023-2031 (2021).
- Association of Bay Area Governments & Metropolitan Transportation Commission (ABAG & MTC). *Plan Bay Area 2040* (2017).
- City of Menlo Park General Plan (2016a).
- *ConnectMenlo* Draft EIR (2016b).
- Keyser Marston Associates. Willow Village Master Plan Project Housing Needs Assessment (2016).
- U.S. Census Data.

4.12.2 Environmental Setting

The *ConnectMenlo* EIR (City of Menlo Park, 2016b) described population and housing conditions as they existed at the time of the EIR's preparation, when the City was estimated to have a population of 32,896 residents. As described in the EIR, between 2000 and 2014, Menlo Park saw a population increase of seven percent, compared to a nine percent increase in the larger Bay Area. The EIR noted that unlike growth in the larger region, Menlo Park's growth was marked by an increase in household size rather than an increase in the total number of households. Between 2000 and 2014, the average household size increased from 2.4 to 2.6 persons per household or nearly eight percent. Household growth in the Bay Area only grew by two percent during the same time period.

The EIR reported that in 2010, the City contained 13,085 housing units, with a 5.6 percent vacancy rate. Of the occupied housing units, approximately 56 percent were owner-occupied and 44 percent were renter-occupied. The vacancy rate and occupancy-by-tenure proportions were similar at the County level, with the estimated 2010 County vacancy rate at approximately five percent, and occupied units being approximately 59 percent owner-occupied and 41 percent renter-occupied. In 2010, approximately 55 percent of Menlo Park's homes were detached single-family homes, eight percent were attached single-family homes, 37 percent were multi-family homes, and less than one percent were mobile homes. These housing characteristics were similar to that reported for the County, which had 57 percent detached single-family homes, nine percent attached single-family homes, 32 percent multifamily homes, and one percent mobile homes.

With respect to future housing needs, the EIR noted that the Association of Bay Area Governments (ABAG) 2013 projections estimated that by 2040 the population of the City would grow to 43,200 and the number of households would grow to 16,360. This represented a projected population growth of 15 percent and a household growth of approximately 13 percent, which would be lower than the ABAG projected population growth of 21 percent and household growth of 18 percent for San Mateo County as a whole.

The EIR reported that there were roughly 31,920 jobs in the City in 2015, comprising roughly nine percent of all jobs in San Mateo County. The EIR noted that according to ABAG, jobs in the City were expected to increase by 13 percent between 2015 and 2040 from 31,920 to 36,150. Jobs in San Mateo County were expected to increase by 19 percent between 2015 and 2040, from 374,940 to 445,070.

Existing Conditions

The discussion below described the existing and baseline conditions for population and housing, and also describes how these conditions have changed since the *ConnectMenlo* EIR was adopted in 2016.

Population

The City of Menlo Park was incorporated in 1927 and encompasses approximately 17.3 square miles, approximately 7.4 square miles of which is comprised of open water areas in San Francisco Bay. According to the 2020 U.S. Census, the City had an estimated population of approximately 33,780 residents[1] in 2020. The 2010 U.S. Census found there were 32,026 residents of Menlo Park, and in 2000 there were 30,785.

Based on this Census data, data from the California Department of Finance, and local knowledge about development trends, City staff estimates the Citywide population in the SEIR baseline year of 2021 as 36,715 people, a number that would increase by 3,723 with occupancy of approved projects that are under construction or expected to be constructed, for a total 2021 baseline population of 40,438. (See Table 3-5 in Chapter 3, *Project Description*.)

The U.S. Census estimated that the population of San Mateo County as a whole was 764,442 in 2020, 718,442 in 2010, and 707,161 in 2000.[2] The California Department of Finance (DOF) estimates that population in the County will be 801,879 by 2031 and 813,098 by 2040.[3]

1 U.S. Census, 2020. Quick Facts. Menlo Park, California. Available online at: https://www.census.gov/quickfacts/menloparkcitycalifornia.dashboard/lafayettecitycalifornia,contracostacentrecdpcalifornia,US/HSG010219#HSG010219. Accessed April 12, 2022.

2 U.S. Census. San Mateo County, California Geography Profile. Available online at: https://data.census.gov/cedsci/profile?g=0500000US06081. Accessed April 12, 2022.

4 U.S. Census, 2020. Menlo Park, California Geography Profile. Available online: https://data.census.gov/cedsci/profile?g=1600000US0646870. Accessed April 12, 2021.

Housing

The U.S. Census Bureau estimates that there were 13,857 housing units in Menlo Park in 2020[4], with an eight percent vacancy rate. Approximately 58.2 percent of the housing units in the City were owner-occupied. There were approximately 13,085 housing units in the City in 2010. This represented an increase of approximately 772 housing units between 2010 and 2020.

TABLE 4.12-1
CITY OF MENLO PARK POPULATION AND HOUSING UNITS PER THE US CENSUS

	2010	2020	2010—2020 Growth (%)
Menlo Park			
Total Population	32,026	33,780	+ 5.5
Total Housing Units[a]	13,085	13,857	+ 5.9

NOTES:

a Housing units" are all housing (occupied and unoccupied housing units).

SOURCES: US Census (see footnotes below).

Based on this Census data, data from the California Department of Finance, and local knowledge about development trends, City staff estimates the number of residential units in the City in SEIR baseline year of 2021 as 14,016, a number that would increase by 1,448 with approved projects that are under construction or expected to be constructed, for a total 2021 baseline of 15,464 dwelling units. (See Table 3-5 in Chapter 3, *Project Description*.)

The U.S. Census estimated that there were 283,693 housing units in San Mateo County as a whole in 2020, and 271,031 in 2010.[5] In 2020, the homeownership rate in the County was approximately 59.9 percent.

TABLE 4.12-2
SAN MATEO COUNTY POPULATION AND HOUSING UNITS PER THE US CENSUS

	2010	2020	2010-2020 Growth (%)
San Mateo County			
Population	718,442	764,442	+ 6.4
Total Housing Units[a]	271,031	283,693	+ 4.7

NOTES:

a Housing units" are all housing (occupied and unoccupied housing units).

SOURCE: US Census (see footnotes below).

4 U.S. Census, 2020. Menlo Park, California Geography Profile. Available online: https://data.census.gov/cedsci/profile?g=1600000US0646870. Accessed April 12, 2021.

5 U.S. Census. San Mateo County, California Geography Profile. Available online at: https://data.census.gov/cedsci/profile?g=0500000US06081. Accessed April 12, 2022.

Employment

Employment growth is an important driver of housing demand, both regionally and locally. Employment growth over the past several years in the Bay Area and the City has most likely contributed to significant upward pressure on the housing market, as evidenced in rent and housing price increases. Approximately 95 percent of workers living in San Mateo County commute to jobs in San Mateo, Santa Clara, and San Francisco Counties, based on U.S. Census data.[6] San Mateo County is a productive economic area, led by technology, bioscience, and service industries. Approximately 66 percent of Menlo Park residents aged 16 and older were in the work force in 2020, slightly lower than the county rate (69 percent) but higher than the state rate (63 percent). Most City residents who are in the workforce are in management or business, science, or art-related occupations (69 percent), which is significantly higher than the county rate (47 percent) and the state rate (38 percent).

The next most common employment categories for the City are sales and office occupations (14 percent), followed by service occupations (11 percent).[7] San Mateo County was affected by the housing mortgage/financial crisis of late 2008 with a decrease in available jobs and employed residents. However, between 2010 and 2019, approximately 591,000 jobs were added in San Mateo, Santa Clara, and San Francisco Counties. More than half of the total job growth occurred in high-wage sectors, which are generally defined as professions where average annual employee compensation is above $100,000 (as of 2016). Over the past decade, high-wage industries posted an annual job growth rate of 4.6 percent, versus 3.4 percent for all industries. The 2020 economic recession, caused by the coronavirus pandemic, eliminated a portion of the jobs added over the past decade. Although some jobs were recovered in the third quarter of 2020, total employment remained 6 percent less than the first quarter in all sectors and 1 percent less in high-wage sectors. More recent data (as of January 2022) from the U.S. Bureau of Labor Statistics show that total unemployment in San Mateo County declined by 2.2 percent between November 2020 and November 2021; the national unemployment rate declined by 2.5 percent during the same period.[8] Plan Bay Area Projections 2040 predicts steady employment growth between 2020 and 2040 for the City, county, and Bay Area as a whole.

ABAG estimated that there were approximately 36,410 jobs in Menlo Park in 2020, and has projected a growth in employment of 16.6 percent by 2040. This growth rate in Menlo Park is greater than that projected for the Bay Area Region (13.6 percent) during the same period. Based on Census data, data from the California Department of Finance, and local knowledge about development and employment trends, City staff estimates the number of jobs in the City in the SEIR baseline year of 2021 as 43,691, a number that would increase by 1,257 with approved projects that are under construction or expected to be constructed, for a total 2021 baseline of 44,948 (see Table 3-5 in Chapter 3, *Project Description*).

6 Keyser Marston Associates. 2021. Willow Village Master Plan Project Housing Needs Assessment. Available: appendix_3.13_housing-needs-assessment.pdf (menlopark.org). Accessed May 2, 2022.

7 Ibid.

8 U.S. Department of Labor, Bureau of Labor Statistics. 2022. San Francisco Area Economic Summary. Available: https://www.bls.gov/regions/west/summary/blssummary_sanfrancisco.pdf. Accessed: May 2, 2022.

According to ABAG projections, the number of employed residents in the City is currently 62.4 percent of the number of jobs in the City. In the next 20 years, the number of employed residents is expected to remain relatively constant, decreasing only slightly to 61.7 percent.[9]

The average median income (AMI) in San Mateo County for a family of four was approximately $149,600 as of 2021. Because the City's housing prices are high, many people who work in the City cannot afford to live in the City. Consequently, people who work in the community often must commute long distances. All levels of income, including above-moderate income households, face challenges regarding affordable housing in Menlo Park as well as in the broader Bay Area. In fact, because of the high cost of housing, housing affordability challenges extend to households that earn more than 150 percent of the AMI.[10]

The difference between what the workforce and the community can pay for housing, based on household income and the prices for homes in the community, is referred to as an affordability gap.[11] Housing production has not kept pace with job growth in San Mateo County and adjacent counties. The ratio of jobs to housing units has steadily increased in San Mateo, Santa Clara, and San Francisco Counties since 2010 when the ratio was approximately 1.35. In 2019, the jobs/housing ratio for the three counties averaged approximately 1.75. This ratio of more jobs in the area than houses leads to longer commutes for employees living outside of the three counties and an increase in housing prices and rents for houses within the three counties. However, in 2020, the jobs-housing ratio declined as a result of job losses associated with the pandemic.[12] According to the U.S. Census Bureau's 2015–2019 American Community Survey (ACS), 5.9 percent of those who currently work in Menlo Park also live in Menlo Park. That number has declined since the 2000 census, which showed that 7.2 percent of those who worked in Menlo Park lived in Menlo Park. This percentage is low compared with most other cities in the Bay Area and attributable to a range of factors, such as affordability constraints, which already limit a worker's ability to find housing within the City, and the large number of jobs in Menlo Park relative to the housing stock. Another contributing factor is the location and boundary configuration of the City and in the county generally, which means that many jurisdictions lie within a short commute.[13]

4.12.3 Regulatory Setting

The following section focuses on any changes to the regulatory setting that have occurred since certification of the *ConnectMenlo* EIR. Draft EIR Section 4.11, *Population and Housing*, evaluated effects to population and housing. There, Section 4.11.1.1, *Regulatory Framework*, described regulations applicable to this topic, and that description is still current for this SEIR, with the additions noted below.

9 Association of Bay Area Governments and Metropolitan Transportation Commission. 2018. Plan Bay Area Projections 2040.

10 Keyser Marston Associates. 2021. Willow Village Master Plan Project Housing Needs Assessment.

11 City of Menlo Park. 2014. City of Menlo Park General Plan, Housing Element.

12 Keyser Marston Associates. 2021. Willow Village Master Plan Project Housing Needs Assessment.

13 Ibid.

Federal

The federal Fair Housing Act (42 U.S.C. 3601 et seq.), enacted in 1968, prohibits discrimination by direct providers of housing, such as landlords and real estate companies as well as other entities, such as municipalities, banks or other lending institutions and homeowners insurance companies whose discriminatory practices make housing unavailable to persons because of race or color, religion, sex, national origin, familial status, or disability.

State

California Housing Element Law

California law (Government Code Section 65580, et seq.) requires cities and counties to include a Housing Element as a part of their General Plans to address housing conditions and needs in the community. Housing elements are prepared approximately every eight years, following timetables set forth in the law. The housing element must identify and analyze existing and projected housing needs and "make adequate provision for the existing and projected needs of all economic segments of the community," among other requirements. The City adopted its current Housing Element in 2014, and must adopt an updated housing element by January 31, 2023.

State law mandates that all cities and counties zone land appropriately to accommodate the increasing needs of regional population growth. Regional housing needs are determined by the California Department of Housing and Community Development (HCD).

There have been substantial changes to State laws regarding housing in the recent years, including changes to housing element requirements (for example requiring that housing elements affirmatively further fair housing), changes to facilitate production of Accessory Dwelling Units (ADUs) and other forms of housing, and changes that limit local agencies' ability to condition or deny applications for affordable housing.

Regional

Association of Bay Area Governments and RHNA

The Association of Bay Area Governments (ABAG) is the comprehensive regional planning agency and council of governments for the nine-county San Francisco Bay Area Region. Its members include the counties of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano and Sonoma counties and 101 cities and towns of the San Francisco Bay region.

ABAG determines the distribution of the regional housing need through its Regional Housing Needs Allocation (RHNA) process. For the period from 2023 to 2031, HCD has identified a need of more than 441,000 housing units in the Bay Area — more than double the amount from the last eight-year cycle (187,000 units between 2015 and 2023). ABAG distributes this regional

housing need to local jurisdictions, including allocations for very low income, low income, moderate income, and above moderate households.[14]

As discussed in Chapter 3, *Project Description*, jurisdictions in the Bay Area are currently updating their housing elements for the 6th Cycle, representing the eight year planning period from 2023 to 2031. ABAG adopted the Final Regional Housing Needs (RHNA) Plan for the region in December 2021 (ABAG, 2021) and Menlo Park's RHNA is 2,946 units, distributed among four income categories. The housing allocation for Menlo Park by income category is enumerated in Table 4.12-3. The City's HEU must plan for housing that meets this RHNA, plus an appropriate buffer.

TABLE 4.12-3
6TH CYCLE (2023-2031) ABAG HOUSING ALLOCATIONS FOR THE CITY OF MENLO PARK

Income Category	Citywide Total Housing Units	Portion of Total Allocation
Very Low	740	25.1 %
Low	426	14.5 %
Moderate	496	16.8 %
Above Moderate	1,284	43.6 %
Total	2,946	100 %

SOURCE: ABAG. 2021. Final Regional Housing Needs Allocation (RHNA) Plan: San Francisco Bay Area, 2023-2031. Available at: https://abag.ca.gov/sites/default/files/documents/2021-12/proposed%20Final_RHNA_Allocation_Report_2023-2031.pdf. Accessed April 112, 2022.

Plan Bay Area 2040 and Plan Bay Area 2050

Plan Bay Area 2040 is a regional planning document prepared jointly by ABAG and the Metropolitan Transportation Commission (MTC) that utilizes a multipronged strategy to address housing affordability, transportation requirements, the region's widening income disparities and economic hardships faced by low- and middle-income workers, and the Bay Area's vulnerabilities to natural disasters such as earthquakes and floods. Three principal issues form the core of the Action Plan:

- **Housing**: Lower the share of income spent on housing and transportation costs, lessen displacement risk, and increase the availability of housing affordable to low- and moderate-income households.
- **Economic Development**: Improve transportation access to jobs, increase middle wage job creation, and maintain the region's infrastructure.
- **Resilience**: Enhance climate protection and adaptation efforts, strengthen open space protections, create healthy and safe communities, and protect communities against natural hazards.

[14] Bay Area Council of Governments. 2021. ABAG_2023-2031_Draft_RHNA_Plan.pdf (ca.gov) *Regional Needs Housing Plan 2023-2031*.

As discussed previously, based on the RHNA allocations for housing units from ABAG, each jurisdiction must update their housing element to show the proposed allocations of housing. While the RHNA focuses on the eight-year cycle, Plan Bay Area 2040 focuses also on the longer-term vision for growth through 2040.

In October, 2021, ABAG and MTC adopted an updated plan; Plan Bay Area 2050 (ABAG & MTC, 2021).[15] While the plan has been adopted, it will take up to three years for the plan's growth forecast to be integrated into MTC's transportation model, after which updates to each county's transportation model will take place. For these reasons, and for purposes of this SEIR, Plan Bay Area 2040 is referenced as the regional plan containing regional population, housing and employment projections.

Local

Menlo Park General Plan

The Menlo Park General Plan is a comprehensive long-range plan for the physical development of the City of Menlo Park (City of Menlo Park, 2016a). The General Plan contains the current City of Menlo Park Housing Element, which was adopted in 2014 (City of Menlo Park, 2014). The various elements within the General Plan include goals and policies for the physical development of the City. Goals and policies related to population and housing are listed below.

Goal LU-1: Promote orderly development of Menlo Park and its surrounding area.

Policy LU-1.1: Land Use Patterns. Cooperate with the appropriate agencies to help assure a coordinated land use pattern in Menlo Park and the surrounding area.

Policy LU-1.2: Transportation Network Expansion. Integrate regional land use planning efforts with development of an expanded transportation network focusing on mass transit rather than freeways, and support multi-modal transit development that coordinates with Menlo Park land uses.

Policy LU-1.3: Land Annexation. Work with interested neighborhood groups to establish steps and conditions under which unincorporated lands within the City's sphere of influence may be annexed.

Policy LU-1.4: Unincorporated Land Development. Request that San Mateo County consider Menlo Park's General Plan policies and land use regulations in reviewing and approving new developments in unincorporated areas in Menlo Park's sphere of influence.

Policy LU-1.5: Adjacent Jurisdictions. Work with adjacent jurisdictions to ensure that decisions regarding potential land use activities near Menlo Park include consideration of City and Menlo Park community objectives.

Goal LU-2: Maintain and enhance the character, variety and stability of Menlo Park's residential neighborhoods.

[15] Association of Bay Area Governments & Metropolitan Transportation Commission (ABAG & MTC). 2021. Plan Bay Area 2050. Adopted October 21, 2021. Available at: https://www.planbayarea.org/sites/default/files/documents/Plan_Bay_Area_2050_October_2021.pdf. Accessed April 12, 2022.

Policy LU-2.1: Neighborhood Compatibility. Require new residential development to possess high quality design that is compatible with the scale, look, and feel of the surrounding neighborhood and that respects the City's residential character.

Policy LU-2.3: Mixed use Design. Allow mixed-use projects with residential units if project design addresses potential compatibility issues such as traffic, parking, light spillover, dust, odors, and transport and use of potentially hazardous materials.

Policy LU-2.4: Second Units. Encourage development of second residential units on single family lots consistent with adopted City standards.

Policy LU-2.7: Conversion of Residential Units. Limit the loss in the number of residential units or conversion of existing residential units to nonresidential uses, unless there is a clear public benefit or equivalent housing can be provided to ensure the protection and conservation of the City's housing stock to the extent permitted by law.

Goal LU-3: Retain and enhance existing and encourage new neighborhood-serving commercial uses, particularly retail services, to create vibrant commercial corridors.

Policy LU-3.1: Underutilized Properties. Encourage underutilized properties in and near existing shopping districts to redevelop with attractively designed commercial, residential, or mixed-use development that complements existing uses and supports pedestrian and bicycle access.

Policy LU-3.3: Neighborhood Retail. Preserve existing neighborhood-serving retail, especially small businesses, and encourage the formation of new neighborhood retail clusters in appropriate areas while enhancing and preserving the character of the neighborhood.

Goal LU-4: Promote the development and retention of business uses that provide goods or services needed by the community that generate benefits to the City, and avoid or minimize potential environmental and traffic impacts.

Policy LU-4.1: Priority Commercial Development. Encourage emerging technology and entrepreneurship, and prioritize commercial development that provides fiscal benefit to the City, local job opportunities, and/or goods or services needed by the community.

Policy LU-4.2: Hotel Locations. Allow hotel uses at suitable locations in mixed-use and nonresidential zoning districts.

Policy LU-4.3: Mixed Use and Nonresidential Development. Limit parking, traffic, and other impacts of mixed-use and nonresidential development on adjacent uses, and promote high-quality architectural design and effective transportation options.

Policy LU-4.4: Community Amenities. Require mixed-use and nonresidential development of a certain minimum scale to support and contribute to programs that benefit the community and the City, including education, transit, transportation infrastructure, sustainability, neighborhood serving amenities, child care, housing, job training, and meaningful employment for Menlo Park youth and adults.

Policy LU-4.5: Business Uses and Environmental Impacts. Allow modifications to business operations and structures that promote revenue generating uses for which potential environmental impacts can be mitigated.

Policy LU-4.6: Employment Center Walkability. Promote local-serving retail and personal service uses in employment centers and transit areas that support walkability and reduce auto trips, including along a pedestrian-friendly, retail-oriented street in Belle Haven.

Policy LU-4.7: Fiscal Impacts. Evaluate proposed mixed-use and nonresidential development of a certain minimum scale for its potential fiscal impacts on the City and community.

Goal LU-5: Strengthen Downtown and the El Camino Real Corridor as a vital, competitive shopping area and center for community gathering, while encouraging preservation and enhancement of Downtown's atmosphere and character as well as creativity in development along El Camino Real.

Policy LU-5.1: El Camino Real/Downtown Specific Plan. Implement the El Camino Real/Downtown Specific Plan to ensure a complementary mix of uses with appropriate siting, design, parking, and circulation access for all travel modes.

Policy LU-5.2: El Camino Real/Downtown Housing. Encourage development of a range of housing types in the El Camino Real/Downtown Specific Plan area, consistent with the Specific Plan's standards and guidelines, and the areas near/around the Specific Plan area.

Goal LU-6: Preserve open-space lands for recreation; protect natural resources and air and water quality; and protect and enhance scenic qualities.

Policy LU-6.2: Open Space in New Development. Require new nonresidential, mixed use, and multiple dwelling development of a certain minimum scale to provide ample open space in the form of plazas, greens, dens, and parks whose frequent use is encouraged through thoughtful placement and design.

Policy LU-6.3: Public Open Space Design. Promote public open space design that encourages active and passive uses, and use during daytime and appropriate nighttime hours to improve quality of life.

Policy LU-6.4: Park and Recreational Land Dedication. Require new residential development to dedicate land, or pay fees in lieu thereof, for park and recreation purposes.

Policy LU-6.5: Open Space Retention. Maximize the retention of open space on larger tracts (e.g., portions of the St. Patrick's Seminary site) through means such as rezoning consistent with existing uses, clustered development, acquisition of a permanent open space easement, and/or transfer of development rights.

Policy LU-6.6: Public Bay Access. Protect and support public access to the Bay for the scenic enjoyment of open water, sloughs, and marshes, including restoration efforts, and completion of the Bay Trail.

Policy LU-6.7: Habitat Preservation. Collaborate with neighboring jurisdictions to preserve and enhance the Bay, shoreline, San Francisquito Creek, and other wildlife habitat and ecologically fragile areas to the maximum extent possible.

Policy LU-6.9: Pedestrian and Bicycle Facilities. Provide well designed pedestrian and bicycle facilities for safe and convenient multi-modal activity through the use of access easements along linear parks or paseos.

Policy LU-6.10: Stanford Open Space Maintenance. Encourage the maintenance of open space on Stanford lands within Menlo Park's unincorporated sphere of influence.

Policy LU-6.11: Baylands Preservation. Allow development near the Bay only in already developed areas.

Goal LU-7: Promote the implementation and maintenance of sustainable development, facilities and services to meet the needs of Menlo Park's residents, businesses, workers, and visitors.

Policy LU-7.1: Sustainability. Promote sustainable site planning, development, landscaping, and operational practices that conserve resources and minimize waste.

Policy LU-7.2: Water Supply. Support the efforts of the Bay Area Water Supply and Conservation Agency or other appropriate agencies to secure adequate water supplies for the Peninsula, to the extent that these efforts are in conformance with other City policies.

Policy LU-7.3: Supplemental Water Supply. Explore and evaluate development of supplemental water sources and storage systems, such as wells and cisterns, for use during both normal and dry years, in collaboration with water providers and users.

Policy LU-7.4 Water Protection. Work with regional and local jurisdictions and agencies responsible for ground water extraction to develop a comprehensive underground water protection program in accordance with the San Francisquito Creek Watershed Policy, which includes preservation of existing sources and the basin to evaluate the long term effects of water extraction.

Policy LU-7.5: Reclaimed Water Use. Implement use of adequately treated "reclaimed" water (recycled/non-potable water sources such as, graywater, blackwater, rainwater, stormwater, foundation drainage, etc.) through dual plumbing systems for outdoor and indoor uses, as feasible.

Policy LU-7.6: Sewage Treatment Facilities. Support expansion and improvement of sewage treatment facilities to meet Menlo Park's needs, as well as regional water quality standards, to the extent that such expansion and improvement are in conformance with other City policies.

Policy LU-7.7: Hazards. Avoid development in areas with seismic, flood, fire and other hazards to life or property when potential impacts cannot be mitigated.

Policy LU-7.8: Cultural Resource Preservation. Promote preservation of buildings, objects, and sites with historic and/or cultural significance.

Policy LU-7.9: Green Building. Support sustainability and green building best practices through the orientation, design, and placement of buildings and facilities to optimize their energy efficiency in preparation of State zero-net energy requirements for residential construction in 2020 and commercial construction in 2030.

Goal CIRC-1: Provide and maintain a safe, efficient, attractive, user-friendly circulation system that promotes a healthy, safe, and active community and quality of life throughout Menlo Park.

Policy CIRC-1.2: Capital Project Prioritization. Maintain and upgrade existing rights-of-way before incurring the cost of constructing new infrastructure, and ensure that the needs of non-motorized travelers are considered in planning, programming, design, reconstruction, retrofit, maintenance, construction, operations, and project development activities and products.

Policy CIRC-1.3: Engineering. Use data-driven findings to focus engineering efforts on the most critical safety projects.

Policy CIRC-1.6: Emergency Response Routes. Identify and prioritize emergency response routes in the Citywide circulation system.

Policy CIRC-1.7: Bicycle Safety. Support and improve bicyclist safety through roadway maintenance and design efforts.

Policy CIRC-1.8: Pedestrian Safety. Maintain and create a connected network of safe sidewalks and walkways within the public right of way to ensure that appropriate facilities, traffic control, and street lighting are provided for pedestrian safety and convenience, including for sensitive populations.

Policy CIRC-1.9: Safe Routes to Schools. Support Safe Routes to School programs to enhance the safety of school children who walk and bike to school.

Goal CIRC-2: Increase accessibility for and use of streets by pedestrians, bicyclists, and transit riders.

Policy CIRC-2.11: Design of New Development. Require new development to incorporate design that prioritizes safe pedestrian and bicycle travel and accommodates senior citizens, people with mobility challenges, and children.

Policy CIRC-2.14: Impacts of New Development. Require new development to mitigate its impacts on the safety (e.g., collision rates) and efficiency (e.g., vehicle miles traveled (VMT) per capita) of the circulation system. New development should minimize cut-through and high-speed vehicle traffic on residential streets; minimize the number of vehicles trips; provide appropriate bicycle, pedestrian, and transit connections, amenities and improvements in proportion with the scale of proposed projects; and facilitate appropriate or adequate response times and access for emergency vehicles.

Goal CIRC-3: Increase mobility options to reduce traffic congestion, greenhouse gas emissions, and commute travel time.

Policy CIRC-3.1: Vehicle Miles Traveled. Support development and transportation improvements that help reduce per capita vehicle miles traveled.

Policy CIRC-3.2: Greenhouse Gas Emissions. Support development, transportation improvements, and emerging vehicle technology that help reduce per capita greenhouse gas emissions.

Policy CIRC-3.3: Emerging Transportation Technology. Support efforts to fund emerging technological transportation advancements, including connected and

autonomous vehicles, emergency vehicle pre-emption, sharing technology, electric vehicle technology, electric bikes and scooters, and innovative transit options.

Goal CIRC-4: Improve Menlo Park's overall health, wellness, and quality of life through transportation enhancements.

Policy CIRC-4.1: Global Greenhouse Gas Emissions. Encourage the safer and more widespread use of nearly zero-emission modes, such as walking and biking, and lower emission modes like transit, to reduce greenhouse gas emissions.

Policy CIRC-4.2: Local Air Pollution. Promote non-motorized transportation to reduce exposure to local air pollution, thereby reducing risks of respiratory diseases, other chronic illnesses, and premature death.

Policy CIRC-4.3: Active Transportation. Promote active lifestyles and active transportation, focusing on the role of walking and bicycling, to improve public health and lower obesity.

Policy CIRC-4.4: Safety. Improve traffic safety by reducing speeds and making drivers more aware of other roadway users.

Goal CIRC-5: Support local and regional transit that is efficient, frequent, convenient, and safe.

Policy CIRC-5.1: Transit Service and Ridership. Promote improved public transit service and increased transit ridership, especially to employment centers, commercial destinations, schools, and public facilities.

Policy CIRC-5.2 Transit Proximity to Activity Centers. Promote the clustering of as many activities as possible within easy walking distance of transit stops, and locate any new transit stops as close as possible to housing, jobs, shopping areas, open space, and parks.

Policy CIRC-5.3 Rail Service. Promote increasing the capacity and frequency of commuter rail service, including Caltrain; protect rail rights-of-way for future transit service; and support efforts to reactivate the Dumbarton Corridor for transit, pedestrian, bicycle, and emergency vehicle use.

Policy CIRC-5.4: Caltrain Enhancements. Support Caltrain safety and efficiency improvements, such as positive train control, grade separation (with priority at Ravenswood Avenue), electrification, and extension to Downtown San Francisco (Transbay Terminal), provided that Caltrain service to Menlo Park increases and use of the rail right-of-way is consistent with the City's Rail Policy.

Policy CIRC-5.5: Dumbarton Corridor. Work with Caltrain and appropriate agencies to reactivate the rail spur on the Dumbarton Corridor with appropriate transit service from Downtown Redwood City to Willow Road with future extension across the San Francisco Bay.

Policy CIRC-5.6 Bicycle Amenities and Transit. Encourage transit providers to improve bicycle amenities to enhance convenience, including access to transit including bike share program, secure storage at transit stations and on-board storage where feasible.

Policy CIRC-5.7 New Development. Ensure that new nonresidential, mixed-use, and multiple-dwelling residential development provides associated needed transit service, improvements and amenities in proportion with demand attributable to the type and scale of the proposed development.

Goal H2: Existing Housing and Neighborhoods. Maintain, protect and enhance existing housing and neighborhoods.

Policy H2.2: Preservation of Residential Units. Limit the conversion of residential units to other uses and regulate the conversion of rental developments to non-residential uses unless there is a clear public benefit or equivalent housing can be provided to ensure the protection and conservation of the City's housing stock to the extent permitted by law.

Policy H2.3: Condominium Conversions. Assure that any conversions of rental housing to owner housing accommodate the tenants of the units being converted, consistent with requirements to maintain public health, safety and welfare. The City will also encourage limited equity cooperatives and other innovative housing proposals that are affordable to lower income households.

Policy H2.4: Protection of Existing Affordable Housing. Strive to ensure that affordable housing provided through government incentives, subsidy or funding, and deed restrictions remains affordable over time, and the City will intervene when possible to help preserve such housing.

Policy H2.5: Maintenance and Management of Quality Housing and Neighborhoods. Encourage good management practices, rehabilitation of viable older housing and long-term maintenance and improvement of neighborhoods.

Goal H4: New Housing. Use land efficiently to meet housing needs for a variety of income levels, implement sustainable development practices and blend well-designed new housing into the community.

Policy H4.1: Housing Opportunity Areas. Identify opportunity areas and sites where a special effort will be made to provide affordable housing consistent with other General Plan policies. Given the diminishing availability of developable land, Housing Opportunity Areas should have the following characteristics:

a. The site has the potential to deliver sales or rental units at low or below market rate prices or rents.

b. The site has the potential to meet special housing needs for local workers, single parents, seniors, small families or large families.

c. The City has opportunities, through ownership or special development review, to facilitate provision of housing units to meet its housing objectives.

d. The site scores well for Low Income Housing Tax Credits (LIHTC) subsidy or has unique opportunities due to financing and/or financial feasibility.

e. For sites with significant health and safety concerns, development may be tied to nearby physical improvements, and minimum density requirements may be reduced.

f. Site development should consider school capacity and the relationship to the types of residential units proposed (i.e., housing seniors, small units, smaller workforce housing, etc. in school capacity impact areas).

g. Consider incorporating existing viable commercial uses into the development of housing sites.

Policy H4.4: Variety of Housing Choices. Strive to achieve a mix of housing types, densities, affordability levels and designs in response to the broad range of housing needs in Menlo Park. Specific items include:

a. The City will work with developers of non-traditional and innovative housing approaches in financing, design, construction and types of housing that meet local housing needs.

b. Housing opportunities for families with children should strive to provide necessary facilities nearby or on site.

c. The City will encourage a mix of housing types, including: owner and rental housing, single and multiple-family housing, housing close to jobs and transit, mixed use housing, work force housing, special needs housing, single-room occupancy (SRO) housing, shared living and cohousing, mobile-homes, manufactured housing, self-help or "sweat equity" housing, cooperatives and assisted living.

d. The City will support development of affordable, alternative living arrangements such as cohousing and "shared housing" (e.g., the Human Investment Project's — HIP Housing —shared housing program).

Policy H4.6: Mixed Use Housing. Encourage well-designed mixed use developments (residential mixed with other uses) where residential use is appropriate to the setting and to encourage mixed-use development in proximity to transit and services, such as at shopping centers and near to the downtown to support Downtown businesses (consistent with the El Camino Real/Downtown Specific Plan).

Policy H4.8: Retention and Expansion of Multi-Family Sites and Medium and Higher Density. Strive to protect and expand the supply and availability of multi-family and mixed-use infill housing sites for housing. When possible, the City will avoid re-designing or rezoning multi-family residential land for other uses or to lower densities without re-designating equivalent land for multi-family development and will ensure that adequate sites remain at all times to meet the City's share of the region's housing needs.

Policy H4.12: Fair Share Distribution of Housing throughout Menlo Park. Promote the distribution of new, higher density residential developments throughout the City, taking into consideration compatibility with surrounding existing residential uses, particularly near public transit and major transportation corridors in the City.

Goal OSC-4: Promote Sustainability and Climate Action Planning.

Policy OSC-4.1: Sustainable Approach to Land Use Planning to Reduce Resource Consumption. Encourage, to the extent feasible, (1) a balance and match between jobs and housing, (2) higher density residential and mixed-use development to be located adjacent to commercial centers and transit corridors, and (3) retail and office areas to be

located within walking and biking distance of transit or existing and proposed residential developments.

4.12.4 Environmental Impacts and Mitigation Measures

Scope of Analysis

The scope of this impact analysis is limited to the identification of new or more severe impacts that would result from implementation of the HEU, in relation to the certified 2016 *ConnectMenlo* EIR.

Significance Thresholds

The thresholds used to determine the significance of impacts related to population and housing are based on Appendix G of the *CEQA Guidelines*. Implementation of the HEU would have a significant impact on the environment if it would:

- Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure).
- Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.

Methodology and Assumptions

The proposed Project would update the City's housing element and plan for development of additional housing. Importantly, the first significance threshold above requires an evaluation of whether a project would induce "unplanned growth," which it would not, since the housing element itself is a plan. Similarly, the Final Regional Housing Needs (RHNA) Plan and the housing requirements contained therein is also a plan. It thus follows that the HEU's conformance with those plans would avoid a significant environmental impact. Nonetheless, the analysis informs consideration of whether implementation of the HEU would induce substantial unplanned population growth, and is supplemented with a consideration of whether the planned development of new housing would displace existing people or housing, necessitating construction of replacement housing.

Impacts and Mitigation Measures

Impacts

Impact PH-1: Implementation of the HEU would not induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure). (*Less than Significant Impact*)

The *ConnectMenlo* EIR found that the project would not induce substantial population growth. The EIR listed a number of General Plan policies (listed again in this SEIR above in Section 4.12.3) related to population growth and housing development, and determined that existing and proposed goals, policies, programs, and zoning regulations would provide the long-term planning

framework for orderly development under the proposed project through the 2040 horizon year. With respect to extension of roads and other infrastructure, the EIR noted that the City is largely built out and is already well served by utility and transportation infrastructure. Future development would be infill development and would be concentrated on sites previously identified for development. Any necessary improvements to the existing infrastructure would be made to accommodate the proposed new development and would not accommodate additional growth beyond that need that would lead to additional growth outside of the already urbanized areas of the City. These same findings apply to implementation of the HEU, as discussed below.

Implementation of the HEU would provide for the development of additional housing units in the City and a resulting increase in the City's population. As described in Chapter 3 of this SEIR, *Project Description*, the HEU would plan for development of up to 4,000 new housing units in the City via a variety of strategies in addition to pending projects (2,733 units), and accessory dwelling unit production (85 units). This would meet the City's RHNA allocation of 2,946 units and also provide a suitable buffer. In doing so, the Housing Element would be updated to identify specific sites for multifamily housing, including the HEU housing opportunity sites and land use strategy sites shown in Figure 3-3 in Chapter 3 of this SEIR, *Project Description*. In addition, the Land Use Element of the General Plan would be amended to update applicable land use designations if/as needed to reflect the housing sites, and the sites would be rezoned if necessary to allow greater residential densities than are currently allowed. If all sites were developed at the planned densities to accommodate the 4,000 new units, pending projects, and ADUs, the population of the City would increase by approximately 17,522 persons, based on a ratio of 2.57 persons per household.[16]

It is important to note that the identification of housing sites in the City's Housing Element does not mean someone necessarily will develop housing on those sites at the planned unit count or level of affordability. Although the City must plan for housing development, it does not directly build, or require to be built, any housing. Instead, the identification of housing sites is intended to plan for and encourage housing, and its development by property owners and developers is largely dependent on market forces and (in the case of affordable housing) available subsidies.

Regardless, development of new housing units under the HEU would promote coordinated land use patterns within the City, and would conform to the City's revised zoning allowances, in response to the ABAG's RHNA allocation and State law, which requires the City to identify sufficient housing sites to accommodate the City's RHNA allocation. By definition, such development would be "planned" rather than unplanned, and would conform to the City's zoning code and General Plan as amended, as well as the ABAG RHNA Plan.

As with the development assessed in the *ConnectMenlo* EIR, development under the HEU would be infill in nature and would not require extension of services to previously undeveloped areas. Any upsizing or improvement to existing infrastructure would be designed to serve only the

[16] 4,000 housing units + 2,733 pending units + 85 ADUs = 6,818 units x 2.57 persons per household = 17,552 persons. The ratio of 2.57 persons per household derives from the *ConnectMenlo* EIR, and is consistent with assumptions inherent in the City's transportation model.

planned housing, and would not enable growth or facilitate unplanned growth beyond that housing.

Based upon each of these considerations, implementation of the HEU would not directly or indirectly induce unplanned population growth to the area, and the impact would therefore be **less than significant**.

Mitigation Measure: None required.

Impact PH-2: Implementation of the HEU would not displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere. (*Less than Significant Impact*)

The *ConnectMenlo* EIR found that the project would not displace substantial numbers of people that could require the construction of replacement housing elsewhere. This was based on the fact that no new nonresidential land use designations proposed under the project were located on sites where residential land uses currently exist, and housing was proposed as part of the project to address local and regional housing needs. Thus, no displacement of existing housing units would occur. The EIR also noted that the proposed Land Use Element, which would be adopted as part of the proposed project, and the existing Housing Element both contained general goals, policies, and programs that would require local planning and development decisions to consider impacts to the environment related to population issues. Those goals and policies are listed again in this SEIR above in Section 4.12.3. These same findings apply to implementation of the HEU, as discussed below.

Much of the developable area of the City is already developed, and nearly all of the parcels identified for upzoning as part of the HEU are already developed with some sort of use, typically office or commercial. The City's General Plan contains a number of policies to limit the conversion of existing residential areas to non-residential uses. Policy LU-2.7, for example, limits the loss in the number of residential units or conversion of existing residential units to nonresidential uses. As noted above in Section 4.12.3, Policy H4.1 requires City planning efforts to identify opportunity sites and areas where a special effort will be made to provide affordable housing consistent with other General Plan policies.. The policy identified specific characteristics that housing opportunity sites must possess, and these characteristics have been incorporated into the sites identified as part of the HEU.

Policy H4.8 directs the City to retain and expand multi-family and higher density sites, and to avoid rezoning multi-family residential land for other uses or to lower densities without re-designating equivalent land for multi-family development. Policy H-4.12 directs the City to distribute higher density residential developments throughout the City, particularly near public transit and major transportation corridors in the City.

The HEU would support each of these policies, in that the HEU would not redesignate or rezone an existing residential area to a nonresidential use. In general, just the opposite would occur, since the HEU would generally upzone existing sites to accommodate more housing. Therefore, there

would be no conversion of housing uses to non-housing uses and residential displacements would not occur. Ultimately, the number of housing units in the City would increase and would address the region's housing needs. As such, the effect would generally be beneficial in nature, and the impact would be **less than significant**.

Mitigation Measure: None required.

Cumulative Impacts

This section presents an analysis of the cumulative effects of the HEU in combination with other past, present, and reasonably foreseeable future projects that could cause cumulatively significant impacts. Significant cumulative population and housing impacts could occur if the incremental impacts of the HEU combined with the incremental impacts of the cumulative development projections for 2040 included in Chapter 3 of this SEIR, *Project Description* would result in substantial unplanned growth or displacement, and if the HEU's contribution would be considered "considerable."

Impact PH-3: Implementation of the HEU would not combine with other past, present, and reasonably foreseeable projects to create a significant impact to population and housing. (*Less than Significant Impact*)

The *ConnectMenlo* EIR evaluated cumulative effects to take into account growth projected by the proposed project within the City boundary and Sphere of Influence (SOI), in combination with impacts from projected growth in the rest of Santa Mateo County and the surrounding region, as forecast by ABAG. Impacts from cumulative growth were considered in the context of their consistency with regional planning efforts. Within this context, the EIR found that the project's impact would be significant and unavoidable. This finding was based on the misalignment between the proposed project and the regional growth projections that were then in effect. The EIR recognized that ABAG updates its forecasts for employment and growth every two to four years, and that regional growth projections and planning forecasts would eventually be updated to reflect growth from the project. However, the EIR conservatively determined that until the regional projections were updated, the project's impacts related to exceeding regional growth without adequate regional planning would be significant, and that there were no available mitigation measures to reduce the impact. This same finding is *not* applicable to the HEU, since the HEU itself is being prepared in response to ABAG's RHNA plan. In fact, the HEU is needed to conform the City's housing site availability with ABAG's distribution of the regional housing need and State law.

Unplanned Growth

As discussed under the analysis for Impacts PH-1 and PH-2, implementation of the HEU would have a less than significant impact with respect to unplanned population growth or residential displacement. When growth planned for in the HEU is combined with other growth projected to occur in the City, there would be a total of 24,829 dwelling units, and 63,810 residents in Menlo

Park by the year 2040 (the year used for analysis in the *ConnectMenlo* EIR).[17] This would represent an increase of 9,365 dwelling units and 23,372 people from the 2021 baseline and would exceed the projection of households and population for the City of Menlo Park in *Plan Bay Area 2040*.[18]

Nonetheless, as discussed above, complete build-out of the HEU in the timeframe of the housing element and this analysis represents a conservative assumption, and would represent a rate of housing growth the City has not seen in recent years. Also, the potential population and housing growth provided for in the HEU would conform to the ABAG RHNA Plan and would conform to the City's zoning code and General Plan, as amended, and would thus constitute "planned growth."

Residential Displacement

As discussed above under Impact PH-2, the HEU would support existing City and regional policies concerning the provision of more housing. The HEU would not redesignate or rezone an existing residential area to a nonresidential use. Other jurisdictions throughout the region are undergoing a similar transition, as each responds to the substantial increase in each jurisdiction's RHNA allocation and regional efforts to provide more housing, particularly at affordable price points. Ultimately, the number of housing units in the City and the region would increase and would address the region's housing needs, particularly as the number of jobs in the region also increases.

Conclusion

Based upon each of the above considerations, implementation of the HEU would not be cumulatively considerable, and the impact would therefore be **less than significant**.

Mitigation Measure: None required.

4.12.5 References

Association of Bay Area Governments (ABAG). 2021. *Final Regional Housing Needs Allocation (RHNA) Plan: San Francisco Bay Area, 2023-2031*. Adopted December 16, 2021. Available at: https://abag.ca.gov/sites/default/files/documents/2021-12/proposed%20Final_RHNA_Allocation_Report_2023-2031.pdf. Accessed April 12, 2022.

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[17] See 2040 growth projections in Table 3-5 in Chapter 3, *Project Description.*

[18] Plan Bay Area 2040 projected 17,680 households in Menlo Park by 2040 and a total population of 54,920.

Association of Bay Area Governments & Metropolitan Transportation Commission (ABAG & MTC). 2017. *Plan Bay Area 2040*. Adopted July 26, 2017. http://2040.planbayarea.org/files/2020-02/Final_Plan_Bay_Area_2040.pdf

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City of Menlo Park. 2014. *City of Menlo Park Housing Element, 2015-2023*. Available online: https://beta.menlopark.org/files/sharedassets/public/community-development/documents/adopted-housing-element-2015-2023_20141202185715361 9.pdf. Accessed February 23, 2022.

Keyser Marston Associates. 2021. Willow Village Master Plan Project Housing Needs Assessment. Available: appendix_3.13_housing-needs-assessment.pdf (menlopark.org). Accessed May 2, 2022.

4.13 Public Services and Recreation

4.13.1 Introduction

This section evaluates the effects of the Housing Element Update (HEU) on public service facilities and recreation facilities, focusing on changes to the *ConnectMenlo* EIR (certified in 2016) that may result in new or more severe impacts, and describes any mitigation measures needed to address any such impacts.

Findings of the *ConnectMenlo* Final EIR

Public services and recreation impacts of the *ConnectMenlo* project were analyzed in Section 4.12 of the *ConnectMenlo* Draft EIR. The *ConnectMenlo* Final EIR determined that the project would have the following impacts with respect to public services and recreation:

- PS-1: Implementation of the proposed project would not result in the need for new or physically altered fire protection facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives. (*Less than Significant Impact*)
- PS-2: Implementation of the proposed project, in combination with past, present and reasonably foreseeable projects, would result in less-than-significant cumulative impacts with respect to fire protection services. (*Less than Significant Impact*)
- PS-3: Implementation of the proposed project would not result in the need for new or physically altered police protection facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives. (*Less than Significant Impact*)
- PS-4: Implementation of the proposed project, in combination with past, present and reasonably foreseeable projects, would not result in significant cumulative impacts with respect to police services. (*Less than Significant Impact*)
- PS-5: Implementation of the proposed project would not result in the need for new or physically altered park facilities or other recreational facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, or other performance objectives. (*Less than Significant Impact*)
- PS-6: Implementation of the proposed project would not increase the use of existing neighborhood and regional parks or other recreational facilities, such that substantial physical deterioration of the facility would occur, or be accelerated. (*Less than Significant Impact*)
- PS-7: Implementation of the proposed project, in combination with past, present and reasonably foreseeable projects, would result in less-than-significant cumulative impacts with respect to parks. (*Less than Significant Impact*)
- PS-8: Implementation of the proposed project would not result in the need for new or physically altered school facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, or other performance objectives. (*Less than Significant Impact*)

- PS-9: Implementation of the proposed project, in combination with past, present and reasonably foreseeable projects, would not result in less-than-significant cumulative impacts with respect to school services. (*Less than Significant Impact*)
- PS-10: Implementation of the proposed project would not result in the need for new or physically altered library facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, or other performance objectives. (*Less than Significant Impact*)
- PS-11: Implementation of the proposed project, in combination with past, present and reasonably foreseeable projects, would result in less-than-significant cumulative impacts with respect to libraries. (*Less than Significant Impact*)

Notice of Preparation Comments

The Notice of Preparation (NOP) for the SEIR was circulated on December 23, 2021 and a scoping meeting was held on January 24, 2022. The NOP and the comments received during the public comment period can be found in **Appendix A** of this EIR. In response to the NOP, the Menlo Park Fire Protection District requested that the Safety Element recognize the District's Primary Response Routes, the adopted response time standards, and the impacts of roads and congestion to those response times. The District also noted that larger housing projects require higher water fire flow demands to water infrastructure, and that District-approved traffic calming devices should be installed on Non-Primary Response Routes only. The District also noted that higher density projects and resultant increased to population could impact future District staffing needs.

Information Sources

The primary sources of information referenced in this section included those listed below. Please note that a full list of references for this topic can be found at the end of this section.

- City of Menlo Park General Plan (2016a).
- *ConnectMenlo* Draft EIR (2016b).
- Willow Village Master Plan Project Draft EIR (2022).

4.13.2 Environmental Setting

The *ConnectMenlo* EIR (City of Menlo Park, 2016b) described public service and recreational facilities as they existed at the time of the EIR's preparation. The EIR described existing fire, police, school, and recreation facilities, and described staffing levels and planned facility improvements. The information below provides updates to the existing conditions information provided in the *ConnectMenlo* EIR.

Fire Protection Services

The entirety of the City is designated as a Local Responsibility Area (LRA) by CalFire. The same is true for the surrounding incorporated communities of Atherton, East Palo Alto, and Palo Alto. Fire protection in the City is provided by the Menlo Park Fire Protection District (MPFPD). In addition to Menlo Park, MPFPD covers the communities of Atherton, Menlo Park, East Palo

Alto, and some of the unincorporated areas of San Mateo County, for a residential service population of approximately 90,000 people. As of 2021, MPFPD had 148 full time employees, with 109 employees providing direct fire and emergency services and 39 others providing administrative support (Constant Associates, 2021). MPFPD responds to approximately 8,500 emergencies a year with about 60 percent of them being emergency medical incidents. MPFPD maintains seven fire stations and one administration center within its service area (ESCI, 2020):

- Station #1 at 300 Middlefield Road in Menlo Park. The station serves the City of Menlo Park and parts of the Town of Atherton. In addition to its response area in the MPFPD service area, the station also responds to the City of Palo Alto as part of mutual aid. The station currently houses one Type 1 engine, one Type 1 reserve engine, one Type 1 training engine, and one specialized firefighting truck.[1]
- Station #2 at 2290 East University Avenue in East Palo Alto. This station provides fire protection and emergency medical services (EMS) to the City of East Palo Alto, which is in the southernmost part of the MPFPD service area. The station currently houses one Type 1 engine and one specialized firefighting truck.
- Station #3 at 32 Almendral Avenue in Atherton. This station serves the Town of Atherton. In addition to Atherton, Station 3 also covers areas that are in the unincorporated parts of Redwood City. The station currently houses one Type 1 engine.
- Station #4 at 3322 Alameda de Las Pulgas in West Menlo Park. This station serves the unincorporated area of West Menlo Park and surrounding incorporated areas of Menlo Park and Atherton. The station currently houses two Type 1 engines and one Type 6 engine.
- Station #5 at 4101 Fair Oaks Avenue in Menlo Park. This station serves the North Fair Oaks area of the MPFPD service area and unincorporated areas of Redwood City. Since its response area borders Redwood City, the station also provides automatic aid to the Redwood City Fire Department. The station currently houses one Type 1 engine.
- Station #6 at 700 Oak Grove Avenue in Menlo Park. This station serves areas of the MPFPD service area that include portions of the Town of Atherton and City of Menlo Park, including

[1] As defined in the MPFPD Community Risk Assessment (ESCI, 2020), the City's firefighting apparatus are as follows: 1) Engine – primary response unit from each station for most types of service requests equipped with a pump and ability to carry water; 2) Truck – a specialized apparatus used for structure fires, rescues, and other service requests equipped with long ladders, salvage, overhaul equipment, and rescue tools; 3) Tender – a vehicle used for fires in areas without fire hydrants that is designed to carry large quantities of water to a fire incident; 4) Wildland Engine – a smaller vehicle with a pump and water tank designed to be used for brush and grass fires in wildland areas; 5) HazMat – a vehicle that carries specialized equipment for use in hazardous materials emergencies.

A Type 1 fire engine is designed for structural firefighting. It will typically include a pump that operates at 1,000 gallons per minute (gpm), a 400 gal/tank, 1,200 ft. of 2 1/2″ hose, 400 ft. of 1 1/2" hose, 200 ft. of 1″ hose, 20 + feet of ladder, a 500 gpm Master Stream, and minimum staffing of four firefighters. A Type 3 fire engine is typically four-wheel-drive, and is designed for rapid deployment, pick up, and relocation during wildfires. Technically, a Type 3 fire engine includes a pump operating at 120 gpm, a large 500 gal/tank, 1,000 ft. of 1 1/2″ hose, 800 ft. of 1″ hose, and a minimum of four firefighters. A Type 5 engine is normally an initial attack engine on a medium duty chassis. A Type 6 fire engine is a smaller wildland engine, usually mounted on a pickup chassis. A quint engine is a fire-fighting apparatus that serves the dual purpose of an engine and a ladder truck. These standards can vary slightly depending on the needs of the community where they are deployed. (California Fire Prevention Organization, 2021).

the downtown area where the station is located. The station currently houses one Type 1 engine.

- Station #77 at 1467 Chilco Street in Menlo Park. This station is located in the northern portion of the City in the Bayfront area. The station currently houses two Type 1 engines, one Type 5 engine, one Type 6 engine, and one quint engine.

- MPFPD Administration Building at 170 Middlefield Road in Menlo Park. This 6,000 square-foot facility houses MPFPD's administrative functions.

MPFPD conducted an assessment of its operations and facilities in 2020 (ESCI, 2020). The evaluation considered each facility's location, its future use and viability in terms of serving the community, and the capability of accommodating increases in staffing levels and emergency response apparatuses in the future. Of the eight facilities inspected, one of which was the Administration Headquarters, two stations were ranked as "excellent or excellent/new," four were ranked "good," and two were ranked as "fair to poor" condition. Several stations were noted to present constraints associated with future expansion potential, with those constraints generally associated with the buildings themselves possessing limited expansion potential, or the size and location of existing lots creating constraints to expansion. Similar conditions were noted in a previous assessment conducted in 2012 and reported in the *ConnectMenlo* EIR, which noted that Stations 3, 4, 5, and 77 would likely need to be relocated or expanded to accommodate future need.[2]

Police Protection

The Menlo Park Police Department (MPPD) provides law enforcement services to the City. The Department is comprised of several principal divisions or units: command staff, patrol, investigations, code enforcement, and communications. In 2022, the Department employed 47 sworn officers and 20.5 professional staff members, to include three community service officers (CSO) and one emergency preparation coordinator. A slight reduction in staff was implemented during the COVID-19 emergency as a fiscal response, and was not representative of a permanent demobilization. For instance, three additional sworn officers and four additional professional staff have been brought on since 2021 (MPPD, 2022).

In 2021, the Department responded to over 20,000 calls for service, conducted over 3,550 traffic stops, over 870 pedestrian and bicycle stops, and arrested 560 individuals (MPPD, 2022). The *ConnectMenlo* EIR defined the City's service population as the existing resident population plus one-third of the employees in Menlo Park. Using that formula, MPPD's current service population is estimated as 55,270.[3] The current MPPD service ratio is therefore approximately 0.9 sworn officers per 1,000 residents.[4] In the preparation of the General Plan and M-2 Area Zoning Update effort in 2016 (*ConnectMenlo*), MPPD indicated that it would need to hire an

2 See *ConnectMenlo* Draft EIR, page 4.12-4.

3 See Table 3-5 in Chapter 3 of this SEIR, *Project Description*. The baseline (2021) population of the City is 40,438 persons, and the number of jobs is 44,948. The above service population is calculated as follows: 40,438 + (44,948 x 0.33) = 55,270.

4 47 / (55,270 / 1,000) = 0.850, rounded to 0.9.

additional 17 sworn officers and purchase equipment commensurate to the level of growth anticipated in Menlo Park.

MPPD's main police station is located at City Hall at 701 Laurel Street. The Department also operates a police substation and neighborhood service center north of US 101 in the Belle Haven neighborhood. The Belle Haven Neighborhood Service Center and Substation houses the MPPD's Code Enforcement Office and School Resource Officer. MPPD officers use the substation to make calls as well as interview and/or process suspects, victims, or witnesses. In addition, the substation serves as a place for the community to meet with police officers or gather for other meetings or events.

The MPPD has a mutual aid agreement with every police agency in San Mateo County. This includes the Atherton Police Department, East Palo Alto Police Department, Redwood City Police Department, and the San Mateo County Sherriff's Office, which is responsible for law enforcement in unincorporated areas of Menlo Park and Redwood City. The MPPD also has an informal mutual aid agreement with the Palo Alto Police Department, which borders Menlo Park but is in Santa Clara County (MPPD, 2020). While these agreements are in place (both formal and informal), it is important to note that mutual aid by surrounding cities cannot be relied upon as a substitute for local policing efforts. Each agency in the region is responsible for peace and order in their own jurisdiction. Because the jurisdictions in the region tend to be small in size, MPPD officers often assist neighboring jurisdictions during times of local need, and vice versa.

Public Schools

Four elementary/middle school districts and one high school district serve students within the boundaries of Menlo Park: Menlo Park City School District (CSD), Ravenswood CSD, Las Lomitas Elementary School District, Redwood CSD, and Sequoia Union High School District.

Menlo Park City School District

The Menlo Park CSD serves parts of Menlo Park, Atherton, and unincorporated areas of San Mateo County. The Menlo Park CSD operates an early-learning center, three elementary schools (Encinal School, Laurel School, and Oak Knoll School) and one middle school (Hillview Middle School). In 2018–2019 (the most recent data available), total student enrollment at the four K–8 schools was 2,922. With 188 teachers, the Menlo Park CSD has a student/teacher ratio of approximately 15.5 students per teacher.[5,6] The Menlo Park CSD is required to accommodate students within its boundaries. When a school reaches capacity, students can attend an alternate school within the District. If all classes are at capacity, then the Menlo Park CSD may increase the class size or open new classrooms. **Table 4.13-1**, below, provides a breakdown of the schools within the District, their capacities for 2015 to 2025, and current enrollment. Although Table 4.13-1 indicates that there is additional capacity available in all Menlo Park CSD schools, Menlo Park CSD has indicated that each of its schools is at capacity, either because of classroom size or

5 California Department of Education. 2021a. DataQuest: 2019–2020 Enrollment by Ethnicity and Grade, Menlo Park City School District.

6 California Department of Education. 2021b. DataQuest: 2018–2019 Certificated Staff by Ethnicity for 2018-19, Menlo Park City School District.

the current state of the facilities.[7] The Menlo Park CSD's most recent student generation rates for elementary schools are 0.44 student per single-family unit and 0.18 student per single-family attached or multi-family unit.[8]

TABLE 4.13-1
MENLO PARK CITY SCHOOL DISTRICT – CAPACITY AND ENROLLMENT

School	Grades	Capacity [a]	Enrollment (2019-2020) [b]	Additional Capacity[c]
Laurel School	K-5	720[b]	705	15
Encinal School	K-5	720	636	84
Oak Knoll School	K-5	720	621	99
Hillview Middle School	6-8	1,100	960	140
TOTAL		**3,260**	**2,922**	**338**

NOTES:

a The capacity data provided in this table reflects information provided in *ConnectMenlo*.
b Laurel School was expanded to include the Upper Campus following publication of the *ConnectMenlo*. The expansion added capacity for 360 students, in addition to the 360-student capacity reported in *ConnectMenlo*, for a total of 720 students.
c Although the data presented indicates there is additional capacity, Menlo Park CSD has indicated that each of its schools is at capacity, either because of classroom size or the current state of the facilities.

SOURCES: City of Menlo Park. 2016b. *Draft EIR for ConnectMenlo: General Plan Land Use & Circulation Elements And M-2 Area Zoning Update*.

California Department of Education. 2021b. *Dataquest: 2019–2020 Enrollment by Grade*.

Benson Lee Consulting and Arch Beach Consulting. 2014. *Initial Study for the Laurel School Upper Campus (O'Conner School Site) New School Construction Project.*

City of Menlo Park. 2022. *Willow Village Master Plan Project Draft EIR*. April, 2022. Available online: Willow Village City of Menlo Park. Accessed April 20, 2022.

ESA, May 2022.

Ravenswood City School District

The Ravenswood CSD serves northern Menlo Park and East Palo Alto. The District operates three elementary schools and one middle school. Belle Haven Elementary School and Ravenswood Middle School serve students in the Ravenswood CSD attendance area who live in Menlo Park. Reported student enrollment for the 2019–2020 school year (the most recent data available) was 1,752.[9] Ravenswood employed 162 teachers in 2018–2019, resulting in a student/teacher ratio of approximately 10.8 students per teacher.[10] The district anticipates that enrollment will drop slightly in the near term and then level out because of the COVID-19 pandemic and relatively low enrollment in the lower grades.[11] The Ravenswood CSD's student

7 City of Menlo Park. 2022. *Willow Village Master Plan Project Draft EIR*. April, 2022. Available online: Willow Village City of Menlo Park. Accessed April 20, 2022.

8 Enrollment Projection Consultants. 2015. *Concluding Documentation to Latest Forecast Update*. November 2, 2015.

9 City of Menlo Park. 2022. *Willow Village Master Plan Project Draft EIR*. Available online: Willow Village City of Menlo Park. Accessed April 20, 2022.

10 California Department of Education. 2021c. DataQuest: Certificated Staff by Ethnicity for 2018–2019, Ravenswood Elementary School District.

11 City of Menlo Park. 2022. *Willow Village Master Plan Project Draft EIR*. Available online: Willow Village City of Menlo Park. Accessed April 20, 2022.

generation rate is 0.249 student per housing unit for grades K–5 and 0.123 student per housing unit for grades 6–8.[12] **Table 4.13-2**, below, provides a breakdown of schools within the District, capacities, and current enrollment.

TABLE 4.13-2
RAVENSWOOD CITY SCHOOL DISTRICT – CAPACITY AND ENROLLMENT

School	Grades	Capacity [a]	Enrollment (2019-2020)	Additional Capacity
Belle Haven Elementary School	K-5	760	491	269
Costano School of the Arts	K-5	620	473	147
Los Robles Ronald McNair Academy	K-5	300	214	86
Cesar Chavez Ravenswood Middle School	6-8	820	574	246
TOTAL		**2,500**	**1,752**	**748**

NOTES:
a Capacity values reflect estimates that were based on 20 students per classroom.

SOURCES: City of Menlo Park. 2022. *Willow Village Master Plan Project Draft EIR*. Available Online: Willow Village City of Menlo Park. Accessed April 20, 2022.

ESA, May 2022

Las Lomitas Elementary School District

The Las Lomitas Elementary School District (LLEDS) comprises two schools in Menlo Park and Atherton; Las Lomitas Elementary School (grades K through 3) and La Entrada Middle School (grades 4 through 8). For the 2019-2020 school year, Las Lomitas Elementary School reported an average class size of between 19 and 22 students,[13] and La Entrada Middle school reported an average class size of between 22 and 24 students.[14] The District had a spike in enrollment in 2016-2017, with a combined enrollment of nearly 2,000 students. Enrollment has since stabilized around 1,100 to 1,200. During the height of enrollment, the District undertook a building program at both campuses, including construction a two-story classroom building at La Entrada Middle School and a combination classroom wing at Las Lomitas Elementary School, both of which accommodated students in three grades. District staff has indicated that it currently faces no capacity constraints.[15] The District has not undertaken a recent evaluation of student generation rates. A detailed study conducted in 2014 found a rate of 0.33 students per single-family unit, and 0.11 per multi-family units in 2013.[16]

12 School Facility Consultants. 2020. *School Facility Fee Justification Report for Residential, Commercial, and Industrial Development Projects for the Ravenswood City School District*.

13 Las Lomitas Elementary School District. 2021a. *Las Lomitas Elementary School 2021 School Accountability Report Card*. Available online: https://llesd-ca.schoolloop.com/file/1500178971344/1468166545726/6901349625335440044.pdf. Accessed April 21, 2022.

14 Las Lomitas Elementary School District. 2021a. *La Entrada Middle School 2021 School Accountability Report Card*. Available online: https://llesd-ca.schoolloop.com/file/1500178971344/1468166545726/4854745198271985653.pdf. Accessed April 21, 2022.

15 BAE Urban Economics. 2022. Verbal communication with District Superintendent Beth Polito and Stephanie Hagar of BAE, April 20, 2022.

16 Enrollment Projection Consultants. 2014. March 7, 2014.

Table 4.13-3, below, provides a breakdown of the schools within the District, their capacities, and current enrollment.

TABLE 4.13-3
LAS LOMITAS ELEMENTARY SCHOOL DISTRICT – CAPACITY AND ENROLLMENT

School	Grades	Capacity	Enrollment (2019-2020)	Additional Capacity
Las Lomitas Elementary School	K-3	*	485	*
La Entrada Middle School	4-8	*	715	*
TOTAL		*	**1,200**	*

NOTES:

* As discussed in this section's text, the District embarked on a building program several years ago to address a spike in enrollment. As enrollment has since declined and stabilized, the additional capacity has since been repurposed for other uses, and the District has indicated that it currently has excess capacity at both of its schools.

SOURCES: California Department of Education. 2022. *Dataquest: 2019–2020 Enrollment by Grade*.

BAE Urban Economics. 2022. Verbal communication with District Superintendent Beth Polito and Stephanie Hagar of BAE, April 20, 2022.

ESA, May 2022

Redwood City School District

The Redwood CSD serves elementary and middle school students in Redwood City and portions of San Carlos, Menlo Park, Atherton, and Woodside. Redwood CSD has 16 schools, including 11 elementary schools, one middle school, three charter schools, and one Spanish immersion school. Not including enrollment at the charter schools and Spanish immersion school, which are considered "schools of choice," student enrollment in the Redwood CSD is approximately 6,700.[17] The district employs approximately 400 teachers, resulting in a student/teacher ratio of approximately 16.8 students per teacher.[18] The Redwood CSD's student generation rates for elementary schools are 0.36 student for single-family detached units, 0.18 student for single-family attached units, and 0.10 student for multi-family units. The Redwood CSD's student generation rates for middle schools are 0.10 student for single-family detached units, 0.06 student for single-family attached units, and 0.04 student for multi-family units.[19]

Taft Community School and John F. Kennedy Middle School serve portions of Menlo Park. Because Redwood CSD is a "district of choice" that allows students to apply to its four "schools of choice" regardless of attendance boundary, not all students living within a specific attendance boundary necessarily attend those schools. **Table 4.13-4**, below, provides a breakdown of the schools within the district, their capacities, and current enrollment.

17 City Of Menlo Park. 2022. *Willow Village Master Plan Project Draft EIR*. Available Online: Willow Village City Of Menlo Park. Accessed April 20, 2022.

18 Ibid. This calculation is for the Redwood City School District's non-charter schools.

19 Decision Insite. 2015. Residential Research Summary. Prepared for the Redwood City School District.

TABLE 4.13-4
REDWOOD CITY SCHOOL DISTRICT – CAPACITY AND ENROLLMENT

School	Grades	Capacity	Enrollment (2019-2020)	Additional Capacity
Taft Community School	K-5	800	405	395
John F. Kennedy Middle School	6-8	1,150	737	413
TOTAL		**1,950**	**1,142**	**808**

SOURCES: City Of Menlo Park. 2022. *Willow Village Master Plan Project Draft EIR*. Available Online: Willow Village City Of Menlo Park. Accessed April 20, 2022.

California Department of Education. 2021d. *DataQuest: 2019–2020 Enrollment by Grade, Redwood City School District*.

ESA, May 2022

Sequoia Union High School District

The SUHSD operates four comprehensive high schools, one alternative high school, one technology- and design-focused high school, as well as additional programs. The SUHSD serves Atherton, East Palo Alto, San Carlos, Woodside, Belmont, Portola Valley, portions of unincorporated San Mateo County, and Menlo Park, and enrollment is steadily increasing. Total student enrollment in the SUHSD was 9,305 as of the 2020–2021 school year.[20] TIDE Academy, a new high school at 150 Jefferson Drive with capacity for 400 students,[21] opened in August 2019 to accommodate enrollment growth within the District. As of the 2020–2021 school year, an estimated 136 students were enrolled at TIDE Academy.[22] Among the other SUHSD schools, Menlo-Atherton High School serves students residing in Menlo Park. Total student enrollment at Menlo-Atherton High School in 2020–2021 was approximately 2,305.[23] This school's capacity is estimated to be 2,250; therefore, the school is somewhat overcapacity. With approximately 150 teachers,[24] Menlo-Atherton High School has a student/teacher ratio of approximately 16 students per teacher. The SUHSD uses the state's standard student generation rate of 0.2 student per housing unit.[25]

Libraries, Parks and Recreation Facilities

The Menlo Park Library and Community Services Department is responsible for providing recreational, education, and cultural programs for residents of Menlo Park. Its facilities include two public libraries, 13 parks, two community centers (i.e., Arrillaga Family Recreation Center and the Menlo Park Community Campus, which is currently under construction), two public pools, three child care centers, two gymnasiums, a senior center, and one gymnastics center. Included in the park and recreational areas are tennis courts, softball diamonds, picnic areas, dog parks, playgrounds, a skate park, a shared-use performing arts center, soccer fields, and open

20 City Of Menlo Park. 2022. *Willow Village Master Plan Project Draft EIR*. Available Online: Willow Village City Of Menlo Park. Accessed April 20, 2022.
21 Ibid.
22 Ibid.
23 Ibid.
24 Ibid.
25 Ibid.

space.[26] The Library and Community Services Department had approximately 63 full-time equivalent (FTE) staff members in fiscal year 2021-2022.

The City's General Plan Policy OSC-2.4 calls for maintaining a ratio of 5 acres of developed parkland per 1,000 residents. Currently, Menlo Park has an estimated population of 36,715 people, and 244 acres of parkland and open space for its residents.[27] Using these values, Menlo Park has a ratio of 6.65 acres of parkland per 1,000 residents

Menlo Park has two libraries: the Main Library at 800 Alma Street and the Belle Haven Branch Library at 413 Ivy Drive. In total, the libraries have approximately 37,800 square feet of space.[28] Operated by the City, the public libraries have approximately 24,100 registered borrowers and circulate 111,447 books and other print materials, 10,076 physical audio books, and 14,921 physical video materials. The Menlo Park Library also has various forms of multi-media resources, including e-books, downloadable audio materials, and downloadable video materials.[29] In 2017, the City authorized the Library System Improvement Project. This project includes three main components—a new Belle Haven branch, a new Main Library, and various short-term system improvements to support increased usage.

Short-term physical improvements are ongoing in the City's libraries. Construction of the new Menlo Park Community Campus, which will also include library facilities for the Belle Haven neighborhood, will be completed in 2023. The Belle Haven Branch Library location on Ivy Drive will relocate to the Menlo Park Community Campus when construction is complete. The library within this facility is estimated to have an area of 4,446 square feet.[30] With the new library on the Menlo Park Community Campus, total library square footage would increase to 38,800 square feet.

4.13.3 Regulatory Setting

The following section focuses on any changes to the regulatory setting that have occurred since certification of the *ConnectMenlo* EIR. Draft EIR Section 4.12, *Public Services and Recreation,* evaluated effects to public services and recreation. There, the various regulatory framework subsection in Section 4.12.1.1 described regulations applicable to this topic, and that description is still current for this SEIR, except as noted below.

Federal

National Fire Protection Association 1710

National Fire Protection Association (NFPA) 1710 is the standard for the organization and deployment of fire suppression operations, emergency medical operations, and special operations to the public by career fire departments. NFPA developed NFPA 1710 as an industry standard for

[26] City of Menlo Park Community Services Department. 2021. Community Services Department. Available: https://www.smc-connect.org/locations/menlo-park-community-services-department. Accessed: April 22, 2022.

[27] City of Menlo Park. 2022. *Willow Village Master Plan Project Draft EIR*. Available Online: Willow Village City Of Menlo Park. Accessed April 20, 2022.

[28] Ibid.

[29] California State Library. 2022. *California Public Library Statistics, 2019–2020*. Available: https://www.library.ca.gov/ services/to-libraries/statistics/. Accessed: April 20, 2022.

[30] Hart Howerton. 2020. *Menlo Park Community Campus Planning Application*. December 14.

the deployment of fire suppression operations to ensure safe and effective fire service operations. The Standard stipulates that the first fire engine should arrive to 90 percent of emergency calls within a range of 6:15 and 6:45 minutes. It is recognized that the NFPA 1710 Standard is the optimal national standard and is not regularly achieved in rural areas or areas otherwise far removed from firefighting service providers.

State

California Fire Code

The California Fire Code (Title 24, Part 9 of the California Code of Regulations) establishes regulations to safeguard against hazards of fire, explosion, or dangerous conditions in new and existing buildings, structures, and premises. The provisions of the Fire Code apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal, and demolition of every building or structure throughout the State of California. The Fire Code includes regulations regarding fire-resistance-rated construction, fire protection systems such as alarm and sprinkler systems, fire services features such as fire apparatus access roads, means of egress, and fire safety during construction and demolition.

Senate Bill 50

The Leroy F. Greene School Facilities Act of 1998, or Senate Bill 50 (SB 50), authorizes school districts to levy developer fees to finance the construction or reconstruction of school facilities, and restricts the ability of local agencies to deny project approvals on the basis that public school facilities (classrooms, auditoriums, etc.) are inadequate. School impact fees are collected at the time when building permits are issued. Payment of school fees is required by SB 50 for all new residential development projects and is considered full and complete mitigation of any school impacts. School impact fees are payments to offset capital cost impacts associated with new developments, which result primarily from costs of additional school facilities, related furnishings and equipment, and projected capital maintenance requirements. As such, agencies cannot require additional mitigation for any impacts on school facilities or due to the inadequacy of school facilities. Indirect impacts related to school attendance or construction of new facilities must still be considered under CEQA (e.g., indirect impacts on traffic, air quality, noise).

California Government Code, Section 65995(b), and Education Code Section 17620

SB 50 amended California Government Code Section 65995, which contains limitations on Education Code Section 17620, the statute that authorizes school districts to assess development fees within school district boundaries. Government Code Section 65995(b)(3) requires the maximum square footage assessment for development to be increased every two years, according to inflation adjustments. According to California Government Code Section 65995(3)(h), the payment of statutory fees is "deemed to be full and complete mitigation of the impacts of any legislative or adjudicative act, or both, involving, but not limited to, the planning, use, or development of real property, or any change in governmental organization or reorganization...on the provision of adequate school facilities." School districts are responsible for implementing the specific methods for mitigating school impacts under the Government Code.

Quimby Act

The Quimby Act of 1975 authorizes cities and counties to pass ordinances requiring developers to set aside land, donate conservation easements or pay fees for park improvements. The Quimby Act sets a standard park space to population ratio of up to 3 acres of park space per 1,000 persons. Cities with a ratio of higher than three acres per 1,000 persons can set a standard of up to 5 acres per 1,000 persons for new development. Per the Quimby Act, the calculation of a City's park space to population ratio is based on a comparison of the population count of the last federal census to the amount of City-owned parkland. A 1982 amendment to the law (AB 1600) requires agencies to clearly show a reasonable relationship between the public need for a recreation facility or park land, and the type of development project upon which the fee is imposed.

Mitigation Fee Act (California Government Code 66000-66008)

Enacted as AB 1600, the Mitigation Fee Act requires a local agency establishing, increasing, or imposing an impact fee as a condition of development to identify the purpose of the fee and the use to which the fee is to be put. The agency must also demonstrate a reasonable relationship between the fee and the purpose for which it is charged, and between the fee and the type of development project on which it is to be levied. This Act became enforceable on January 1, 1989.

Local

Menlo Park Municipal Code

Chapter 15.16 of the City's Municipal Code outlines the requirements for the dedication of land or payment of fees for park and recreational services and land for public right of access. Under Section 15.16.020, the City can require the dedication of land or the payment of fees, or a combination of both, for park and recreational purposes as a condition to the approval of a tentative subdivision or parcel map for residential development on one or more parcels of the subdivision. The amount of land dedicated or fees paid is calculated based upon residential density per the formula listed under Section 15.16.020(3), which is 5 acres per 1,000 persons.

Menlo Park General Plan

The Menlo Park General Plan is a comprehensive long-range general plan for the physical development of the City of Menlo Park (City of Menlo Park, 2016a). The General Plan contains the current City of Menlo Park Housing Element, which was adopted in 2014 (City of Menlo Park, 2014). The various elements within the General Plan include goals and policies for the physical development of the City. Goals and policies related to public services and recreation are listed below.

Goal LU-1: Promote the orderly development of Menlo Park and its surrounding area.

Policy LU-1.1: Land Use Patterns. Cooperate with the appropriate agencies to help assure a coordinated land use pattern in Menlo Park and the surrounding area.

Policy LU-1.5 Adjacent Jurisdictions. Work with adjacent jurisdictions to ensure that decisions regarding potential land use activities near Menlo Park include consideration of City and Menlo Park community objectives.

Policy LU-1.7 School Facilities. Encourage excellence in public education Citywide, as well as use of school facilities for recreation by youth to promote healthy living.

Goal LU-6: Preserve open-space lands for recreation; protect natural resources and air and water quality; and protect and enhance scenic qualities.

Policy LU-6.1: Parks and Recreation System. Develop and maintain a parks and recreation system that provides areas, play fields, and facilities conveniently located and properly designed to serve the recreation needs of all Menlo Park residents.

Policy LU-6.2: Open Space in New Development. Require new nonresidential, mixed use, and multiple dwelling development of a certain minimum scale to provide ample open space in the form of plazas, greens, community gardens, and parks whose frequent use is encouraged through thoughtful placement and design.

Policy LU-6.4 Park and Recreational Land Dedication. Require new residential development to dedicate land, or pay fees in lieu thereof, for park and recreation purposes.[31]

Goal LU-7: Promote the implementation and maintenance of sustainable development, facilities and services to meet the needs of Menlo Park's residents, businesses, workers, and visitors.

Goal S-1: Assure a Safe Community. Minimize risk to life and damage to the environment and property from natural and human-caused hazards, and assure community emergency preparedness and a high level of public safety services and facilities.

Policy S-1.30: Coordination with the Menlo Park Fire District. Encourage City-Fire District coordination in the planning process and require all development applications to be reviewed and approved by the Menlo Park Fire Protection District prior to project approval.

Goal H-4: New Housing. Use land efficiently to meet community housing needs at a variety of income levels, implement sustainable development practices and blend well-designed new housing into the community.

Policy H-4.1: Housing Opportunity Areas. Identify housing opportunity areas and sites where a special effort will be made to provide affordable housing consistent with other General Plan policies. Given the diminishing availability of developable land, Housing Opportunity Areas should have the following characteristics:

f. Site development should consider school capacity and the relationship to the types of residential units proposed (i.e., housing seniors, small units, smaller workforce housing, etc. in school capacity impact areas).

Goal OSC-2: Provide Parks and Recreation Facilities. Develop and maintain a parks and recreation system to provide areas and facilities conveniently located, sustainable, properly designed and well maintained to serve the recreation needs and promote healthy living of all residents, workers and visitors to Menlo Park.

[31] Per Menlo Park Municipal Cade 15.16.020, land dedication or in-lieu fees are only required for residential subdivisions, not for rental residential units.

Policy OSC-2.1: Open Space for Recreation Use. Provide open space lands for a variety of recreation opportunities, make improvements, construct facilities and maintain programs that incorporate sustainable practices that promote healthy living and quality of life.

Policy OSC-2.2: Planning for Residential Recreational Needs. Work with residential developers to ensure that parks and recreational facilities planned to serve new development will be available concurrently with need.

Policy OSC-2.3: Recreation Requirements for New Development. Require dedication of improved land, or payment of fee in lieu of, for park and recreation land for all residential uses.[32]

Policy OSC-2.4: Parkland Standards. Strive to maintain the standard of 5 acres of parkland per 1,000 residents.

Policy OSC-2.5: Schools for Recreational Use. Coordinate with the local school districts to continue to operate school sites for local recreation purposes.

Policy OSC-2.6: Pedestrian and Bicycle Paths. Develop pedestrian and bicycle paths consistent with the recommendations of local and regional trail and bicycle route projects, including the Bay Trail.

4.13.4 Environmental Impacts and Mitigation Measures

Scope of Analysis

The analysis in this SEIR identifies impacts identified in the 2016 *ConnectMenlo* EIR, and describes how the impacts of the HEU would differ, as applicable.

Significance Thresholds

The thresholds used to determine the significance of impacts related to public services and recreation are based on Appendix G of the *CEQA Guidelines*. Implementation of the HEU would have a significant impact on the environment if it would:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

  Fire protection;

  Police protection;

  Schools;

  Parks;

  Other public facilities.

[32] See above footnote.

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.
- Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

Methodology and Assumptions

Potential direct impacts to public services are analyzed by considering potential substantial adverse physical impacts that would be associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, as directed by the Significance Thresholds defined in Appendix G of the *CEQA Guidelines*. Consistent with CEQA Guidelines Section 15145, the analysis does not speculate regarding impacts where the location and/or design of potential new facilities are unknown. Potential direct impacts to recreation are discussed related to the accelerated substantial physical deterioration of recreational facilities and the construction/expansion of recreational facilities. The cumulative analysis considers potential public services and recreation impacts of the HEU's implementation combined with cumulative development in the City.

For purposes of the impact analysis, it is assumed that any projects developed as a result of the HEU's implementation would be required to comply with all applicable requirements as described above in Section 4.13.3, *Regulatory Setting*. For instance, it is assumed that any projects developed as a result of the HEU's implementation would be required to comply with adopted impact fee requirements, as well as coordination requirements with applicable service providers.

Impacts and Mitigation Measures

Impacts

Impact PS-1: Implementation of the HEU would not result in an increase in demand for fire protection and emergency medical response services that would require new or physically altered fire protection facilities in order to maintain acceptable service ratios, response times, or other performance objectives, construction of which could have significant physical environmental impacts. (*Less than Significant Impact*)

The *ConnectMenlo* EIR found that the project would not result in the need for new or physically altered fire protection facilities, the construction of which could cause significant environmental impacts. While the *ConnectMenlo* EIR did acknowledge that the project would introduce new residents and employees over the life of the project, and that those increases would likely result in heightened demand for fire protection and emergency medical services, the EIR concluded that compliance with existing regulations, payment of impact fees and taxes, and compliance with environmental requirements would ensure that the overall impact would be less than significant. These same findings apply to implementation of the HEU, as discussed below.

The HEU would generate an increased residential population and a daytime employment population that would require additional fire services in Menlo Park. As noted in Section 4.12 of this SEIR, *Population and Housing*, the HEU would provide for development of up to 4,000 new

residential units in the City, in addition to pending projects (2,733 units) and accessory dwelling unit production (85 units), for a potential population increase of 17,522 new residents in the City. Further, daytime employment in the City would also increase, and those persons would also require fire protection and emergency medical services while working in the City. Therefore, the HEU is expected to increase fire and medical calls from new Menlo Park residents and the onsite employees. In addition, residential developments constructed at higher densities using taller buildings could require more ladder trucks to provide sufficient fire suppression. Based upon these considerations, additional or expanded fire facilities could be required to house additional equipment and personnel. Increased water flow to provide firefighting water to taller buildings could also require upgrades to various water lines in the City.

As described above, the MPFPD currently employs a fire-protection staff of 109 professionals to serve an approximate residential service population of 90,000 persons. Thus, the current service ratio is 1.20 fire protection staff members per 1,000 residents in the service population, which is above the MPFPD's goal of one fire-protection staff member per 1,000 residents in the service population. If all residential development allowed for in the HEU were to occur, MPFPD would need to add additional fire protection personnel to maintain the minimum service ratio of one fire-protection staff member per 1,000 residents in the service population. Those additional staff members would need additional firefighting equipment (fire engines, etc.) that would need to be housed and maintained at MPFPD facilities. In addition, MPFPD could require additional equipment (i.e., ladder trucks) to serve taller buildings, but precise equipment requirements can't currently be known since specific projects have not been proposed.

The City is fully urbanized, and MPFPD already has a number of fire stations within its service area to serve the existing population. As such, all development that could occur as part of the HEU would occur in areas that are already developed and served by existing MPFPD facilities. As stated previously in Section 4.13.1, *Environmental Setting*, several stations were noted to present constraints associated with future expansion potential, with those constraints generally associated with the buildings themselves possessing limited expansion potential, or the size and location of existing lots creating constraints to expansion. However, these facilities are currently sufficient to accommodate a level of staffing that exceeds the District's adopted service ratio by approximately 20 percent.

The extent to which any additional fire facility expansion and upgrades to existing water lines could be required, and where, is currently unknown and would be dependent upon the actual location of additional development that could result from the HEU's implementation. The District's existing stations are located on infill lots in Menlo Park and neighboring jurisdictions, which are highly developed. Development under the HEU is anticipated to occur incrementally over many years, but even if it were to occur more rapidly than expected, existing City and MPFPD policies and procedures would still apply and would address and respond to increased facilities needs as appropriate. Since no concrete plans are currently available for any of the fire facility and water line upgrades that could be required if the HEU were implemented, it is not possible to speculate on the level of environmental impacts that could occur. Regardless, any actual construction that could be proposed in the future would be required to undergo a separate environmental review process, and would only result in localized impacts. As such,

implementation of the HEU would not result in substantial adverse physical environmental impacts associated with the provision of new or physically altered fire and emergency service facilities in order to maintain acceptable service ratios, response times, or other performance objectives. This finding is consistent with that found in the *ConnectMenlo* EIR. Impacts related to fire services would therefore be **less than significant**.

Mitigation Measure: None required.

Impact PS-2: Implementation of the HEU would not result in an increase in demand for police protection services that would require new or physically altered police facilities in order to maintain acceptable service ratios, response times, or other performance objectives, construction of which could have significant physical environmental impacts. (*Less than Significant Impact*)

At the time of the *ConnectMenlo* EIR's preparation, the MPPD indicated that they would need to hire an additional seventeen sworn officers and purchase commensurate equipment for those officers, in order to accommodate the level of growth and expansion of the proposed project. At full buildout, the additional seventeen officers would increase the Department's 2015 staffing ratio of 1.14 officers per 1,000 service population to 1.29 officers per 1,000 service population. The Department at that time indicated that any additional officers that might be required to meet the needs of additional residents in the City could be accommodated within the Department's existing facilities, and that no expansion or addition of facilities would be required.[33] The *ConnectMenlo* EIR thus found that any impacts associated with provision of additional police facilities would be less than significant. These same findings apply to implementation of the HEU, as discussed below.

Based on the service population formula used for the *ConnectMenlo* EIR, the MPPD's current service population is approximately 55,270, which represents the existing resident population plus one-third of the employees in Menlo Park.[34] The Department currently employs 47 sworn officers, so the current MPPD service ratio is therefore approximately 0.9 sworn officers per 1,000 residents.[35] The HEU could add additional residents and employees to City and MPPD's service area. Full buildout of the HEU would increase the service population from approximately 55,270 to 72,793.[36] Without additional hiring, this would substantially reduce the Department's service ratio, and to adjust the number of sworn police officers to meet the current 0.9 to 1,000 service population ratio, the MPPD would need to employ about 66 sworn officers, an increase of 19 FTE police officers above the current 47 to serve the fully built-out HEU.

33 See *ConnectMenlo* EIR, page 4.12-16.

34 See Table 3-5 in Chapter 3 of this SEIR, *Project Description*. The baseline (2021) population of the City is 40,438 persons, and the number of jobs is 44,948. The current service population is therefore 40,438 + (44,948 x 0.33) = 55,270.

35 47 / (55,270 / 1,000) = 0.850, rounded to 0.9.

36 See Table 3-5 in Chapter 3 of this SEIR, *Project Description*. With full buildout, the HEU would add 17,522 to the City's 2021 population, for a total of 57,960 persons, and the number of jobs would be 44,948. The total service population with full buildout of the HEU would thus be 57,960 + (44,948 x 0.33) = 72,793.

There are no current plans for immediate or near-term expansion of MPPD facilities or additional personnel or equipment.[37] For buildout of the *ConnectMenlo* project, the MPPD indicated that it would need to hire an additional 17 sworn officers and purchase commensurate equipment for those officers to accommodate the level of growth projected from *ConnectMenlo* and to maintain the Department's 2015 staffing ratio.[38] As stated previously, the Department at that time indicated that any additional officers that might be required to meet the needs of additional residents in the City could be accommodated within the Department's existing facilities, and that no expansion or addition of facilities would be required. It thus follows that the total sworn officer requirements of the HEU (66 projected total sworn officers to meet the current 0.9 officers to 1,000-person service population) could be accommodated using existing facilities, although this would likely push the capacity limits of the current facility footprint. Regardless, since no concrete plans are currently available for any of the police facility upgrades that might be required at some future time if the HEU is implemented, it is not possible to speculate on the environmental effects that could occur. Regardless, any actual construction that could be proposed in the future would be required to undergo a separate environmental review process, and would only result in localized impacts. Even if development were to occur more rapidly than anticipated, these same requirements would still apply and would address and respond to increased facilities needs as appropriate. This finding is consistent with that found in the *ConnectMenlo* EIR. Impacts related to police services would therefore be **less than significant**.

Mitigation Measure: None required.

Impact PS-3: Implementation of the HEU would not result in an increase in new students for public schools at a level that would require new or physically altered school facilities in order to maintain acceptable service ratios or other performance objectives, construction of which would have significant physical environmental impacts. (*Less than Significant Impact*)

The *ConnectMenlo* EIR determined that the project's impacts to school facilities would be less than significant. The EIR did note that additional or improved facilities would likely be required in the Menlo Park CSD, the Las Lomitas ESD, and Menlo-Atherton High School to accommodate the number of students generated should *ConnectMenlo* be fully built out. However, the EIR noted ongoing construction and renovation efforts in the Menlo Park CSD and the Las Lomitas ESD, since completed, and plans to construct a small high school in Menlo Park, also since completed. Ultimately, the EIR determined that since future development under the *ConnectMenlo* project would occur incrementally over the 24-year buildout horizon and, in compliance with SB 50, all developments would be subject to development impact fees and future school facilities construction would require its own environmental review. Accordingly, the EIR found that the impact would be less than significant. This same finding applies to implementation of the HEU, as discussed below, even if development were to occur at a faster pace than that assumed for *ConnectMenlo*.

[37] City Of Menlo Park. 2022. *Willow Village Master Plan Project Draft EIR*. Available Online: Willow Village City Of Menlo Park. Accessed April 20, 2022.

[38] See *ConnectMenlo* EIR, page 4.12-16.

Population growth under the HEU at full build-out would occur in many areas of the City, and potential HEU housing sites are scattered throughout each of the school districts that serve the City's residents. **Table 4.13-5** shows the number of new potential housing units identified within each district and the number of students generated by those units. The student generation rates for each district are those discussed previously in each school district's description above in Section 4.13.2. Since the HEU assumes that each site would be developed with higher density housing, each district's single-family attached or multi-family student generation rates were used to make the calculations, where applicable.

TABLE 4.13-5
HEU STUDENT GENERATION

School District	Residential Units	Student Generation Rate	Students Generated
Menlo Park City School District	2,860	0.18	515
Ravenswood City School District	194	0.249 (K-5) 0.123 (6-8)	48 24
Las Lomitas Elementary School District	494	0.11	54
Redwood City School District	427	0.04	17
Sequoia Union High School District	3,975	0.2	795
TOTAL			**1,453**

SOURCES: City of Menlo Park. 2022. *Willow Village Master Plan Project Draft EIR*. Available Online: Willow Village City of Menlo Park. Accessed April 20, 2022.

ESA, May, 2022.

Implementation of the HEU would result in a direct increase in demand for school facilities through its provision of residential units throughout the City. The number of students shown above in Table 4.13-5 assumes that all housing sites would be developed at the planned densities to accommodate the new HEU units. Elementary and middle school students generated by the HEU's implementation could attend the Menlo Park CSD, Ravenswood CSD, Las Lomitas ESD, or Redwood CSD, depending on their home addresses. High school students would attend Menlo-Atherton High School, though some could also attend TIDE Academy. The sections below provide a summary of the capacities of the various school districts and their ability to absorb students generated by the HEU.

Elementary and Middle Schools

Menlo Park City School District

Based on Menlo Park CSD's student generation rates, approximately 515 elementary and middle school students would be generated by the HEU's residential uses if full buildout were to occur. The students expected to be generated by the HEU within Menlo Park CSD's attendance area would represent approximately 15.8 percent of existing capacity at the District's schools. Based on the most recent enrollment data and school capacity estimates, as shown in Table 4.13-1, the Menlo Park CSD has capacity to accommodate approximately 338 students beyond those currently attending. However, the District has indicated that it considers the district's schools to

be at capacity, based on the age and condition of existing facilities.[39] This suggests the need for rehabilitation/replacement of existing facilities and/or construction of new facilities, the design and location of which have not been identified.

Ravenswood City School District

Based on the Ravenswood CSD's student generation rates, the HEU would generate approximately 72 students in grades K through 8 if full buildout were to occur. Based on currently available capacity and enrollment estimates, as shown in Table 4.13-2, the Ravenswood CSD has additional capacity for approximately 748 students. The elementary school and middle school students generated by the HEU would represent approximately 2.9 percent of existing capacity in the Ravenswood CSD. Based upon this information, it is anticipated that the Ravenswood CSD would be able to accommodate the increase in students potentially generated by the HEU within its existing facilities.

Las Lomitas Elementary School District

Based on the Las Lomitas ESD's student generation rates, the HEU would generate approximately 54 students in grades K through 8 if full buildout were to occur. As stated previously, the District had a spike in enrollment in 2016-2017, with a combined enrollment of nearly 2,000 students. Enrollment has since stabilized around 1,100 to 1,200. During the height of enrollment, the District undertook a building program at both campuses, including construction of a two-story classroom building at La Entrada Middle School and a combination classroom wing at Las Lomitas Elementary School, both of which accommodated students in three grades. District staff has indicated that it currently faces no capacity constraints.[40] Based upon this information, it is anticipated that the Las Lomitas ESD would be able to accommodate the increase in students potentially generated by the HEU within its existing facilities.

Redwood City School District

Based on the Redwood City CSD's student generation rates, the HEU would generate approximately 17 students in grades K through 8 if full buildout were to occur. As shown in Table 4.13-4, the District currently has capacity to accommodate approximately 808 additional students. In addition, the District anticipates decreased enrollment in the near term, indicating that the district is likely to maintain its enrollment capacity.[41] The students generated by the HEU would represent approximately 0.9 percent of total capacity in the District. Based upon this information, it is anticipated that the Redwood City CSD would be able to accommodate the increase in students potentially generated by the HEU within its existing facilities.

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39 City of Menlo Park. 2022. *Willow Village Master Plan Project Draft EIR*. Available Online: Willow Village City Of Menlo Park. Accessed April 20, 2022.

40 BAE Urban Economics. 2022. Verbal communication with District Superintendent Beth Polito and Stephanie Hagar of BAE, April 20, 2022.

41 City of Menlo Park. 2022. *Willow Village Master Plan Project Draft EIR*. Available Online: Willow Village City of Menlo Park. Accessed April 20, 2022.

High Schools

Sequoia Union High School District

Based on SUHSD's student generation rate, the HEU would generate approximately 795 additional high school students. This represents a 34.5 percent increase above Menlo-Atherton High School's 2020-2021 enrollment of 2,305 students. As shown in Table 4.13-1, Menlo-Atherton High School's capacity was estimated at 2,250, so the school is already operating slightly above capacity. In August 2019, the SUHSD opened a new high school, the TIDE Academy, to accommodate enrollment growth. As of the 2020–2021 school year, TIDE Academy has additional enrollment capacity for approximately 250 students.[42] Based upon this information, it is not anticipated that the students generated by the HEU could be accommodated by existing facilities. As described in the *ConnectMenlo* EIR, it is anticipated that new high school facilities would be required to accommodate the expected growth in Menlo Park. The design and location of any new facilities that may be required have not been identified.

Conclusion

As discussed above, the HEU would generate additional students within Menlo Park that would result in exceedances of school capacities within the Menlo Park CSD and Menlo-Atherton High School. However, projects constructed under the HEU would likely unfold over many years and would be subject to SB 50 school impact fee requirements, providing a mechanism to support this demand. Section 65996 of the State Government Code states that the payment of school impact fees constitutes full and complete mitigation for school impacts from development. These fees are based on the square footage and land use types proposed by a development project. Further, since no concrete plans are currently available for any of the school facility upgrades that might be required if the HEU is implemented, it is not possible to speculate on the environmental effects that could occur. Regardless, any actual construction that could be proposed in the future would be required to undergo a separate environmental review process, and would only result in localized impacts. Even if development were to occur more rapidly than anticipated, these same requirements would still apply and would address and respond to increased facilities needs as appropriate. As a result, the impacts related to schools would be **less than significant**.

Mitigation Measure: None required.

Impact PS-4: Implementation of the HEU would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. (*Less than Significant Impact*)

The *ConnectMenlo EIR* determined that the 245 acres of parkland currently available in the City provided a ratio of about 7 acres of parkland per 1,000 residents, and was therefore in exceedance of the City's adopted 5 acres per 1,000 residents standard. The EIR then found that given the existing "surplus" of parkland in the City, there would still be sufficient parkland available to meet the standard even after full implementation of the *ConnectMenlo* project. Accordingly, the

[42] Ibid.

EIR determined that additional parkland would not be required to serve the additional residents that would be generated by the project, and that the impact would therefore be less than significant.

If fully built-out at the densities identified, the HEU would increase the City's population by approximately 17,522 persons, for a total population of 57,960 persons. To meet the City's standard of 5 acres of parkland for each 1,000 residents, the amount of parkland required would be approximately 290 acres, or approximately 45 acres beyond that currently available. Full buildout of the HEU, however, would likely occur incrementally over many years, and some of the development projects undertaken as part of the HEU's implementation would likely include parks and recreational facilities as part of their own development. Further, new developments would be required to pay fees towards recreational facilities, as prescribed in the Quimby Act, which would provide a source of funding for the development of new facilities, should they be required. Further, since no concrete plans are currently available for any of the recreational facilities that might be required if the HEU is implemented, it is not possible to speculate as to the environmental effects that could occur. Regardless, any actual construction that could be proposed in the future would be required to undergo a separate environmental review process, and would only result in localized impacts. Even if development were to occur more rapidly than anticipated, these same requirements would still apply and would address and respond to increased facilities needs as appropriate.

It is not anticipated that the increase in the residential population would adversely affect park and recreational facilities through overuse, since the increased use of these facilities would be spread across existing facilities Citywide. For this reason, the HEU would not cause or accelerate the physical deterioration of existing neighborhood and regional parks or other recreational facilities.

Based upon each of these considerations, impacts to park and recreational facilities would be **less than significant**.

Impact PS-5: Implementation of the HEU would not result in substantial adverse impacts associated with the provision of or the need for new or physically altered library facilities. (*Less than Significant Impact*)

The *ConnectMenlo EIR* determined that future development under the project would be required to comply with existing regulation, including General Plan policies prepared to minimize impacts related to library services. The City, throughout the 24-year *ConnectMenlo* buildout horizon, would implement the General Plan programs that require the adoption of development impact fees to address infrastructure and service needs in the community, which could include library services. Accordingly, the EIR determined that impacts to library services would be less than significant. These same findings apply to implementation of the HEU, as discussed below.

Like *ConnectMenlo*, the HEU would introduce an increased residential population that would use the City's library resources. If fully built-out at the densities identified, the HEU would increase

the City's population by approximately 17,552 persons, for a total population of 57,960 persons. The Menlo Park Library assesses service needs through user surveys and by monitoring collection use, collecting direct user feedback on programs and services, and comparing services provided to those of other local libraries as well as library best practices.[43]

In 2017, the City authorized the Library System Improvement Project. This project includes three main components—a new Belle Haven branch, a new Main Library, and various short-term system improvements to support increased usage. Short-term physical improvements are ongoing in the City's libraries. Construction of the new Menlo Park Community Campus, which will also include library facilities for the Belle Haven neighborhood, will be completed in 2023. It is estimated that the library within this facility will have an area of 4,446 square feet. The current Belle Haven Branch Library on Ivy Drive will relocate to the Menlo Park Community Campus when construction is complete. With the new library on the Menlo Park Community Campus, total library square footage would increase to 38,800 square feet.

These ongoing library projects would expand Menlo Park's library capacity substantially. Further, projects constructed under the HEU would likely unfold incrementally over many years. While it is possible that the population increases associated with the HEU during that time could require expansion or construction of new library facilities, no concrete plans are currently available, and it is not possible to speculate as to the environmental effects that could occur. Regardless, any actual construction that could be proposed in the future would be required to undergo a separate environmental review process, and would only result in localized impacts. Even if development were to occur more rapidly than anticipated, these same requirements would still apply and would address and respond to increased facilities needs as appropriate. Based upon these considerations, the HEU's impacts to library services would be **less than significant**.

Mitigation Measure: None required.

Cumulative Impacts

This section presents an analysis of the cumulative effects of the HEU in combination with other past, present, and reasonably foreseeable future development that could cause cumulatively significant impacts. Significant cumulative impacts related to public services and recreation could occur if the incremental impacts of the HEU combined with the incremental impacts of cumulative development would be significant, and if the HEU's contribution would be considerable. Cumulative development projections for 2040 are included in the project description and described in Section 4.0.3, *Cumulative Impacts*.

[43] City of Menlo Park. 2022. *Willow Village Master Plan Project Draft EIR*. Available Online: Willow Village City Of Menlo Park. Accessed April 20, 2022.

Impact PS-6: The HEU, combined with cumulative development in the vicinity and Citywide, would not result in an adverse cumulative increase in demand for public services that would require new or physically altered governmental or park facilities, construction of which could have significant physical environmental impacts. (*Less than Significant Impact*)

Fire Protection Services

Cumulative impacts to fire protection services in the *ConnectMenlo* EIR were considered within the context of growth from development within the City combined with the estimated growth in the service area of the MPFPD, which includes the Cities of Atherton, East Palo Alto, and Menlo Park and some unincorporated areas of San Mateo County. The *ConnectMenlo* EIR determined that ongoing compliance with state and local laws, including the payment of developer fees to support the ability of the MPFPD to provide adequate services to its service area, would minimize impacts related to fire protection services. Furthermore, any future expansion of fire facilities would require permitting and review in accordance with CEQA, which would ensure that any environmental impacts would be disclosed and mitigated to the extent feasible. Thus, cumulative impacts to fire protection facilities were determined to be less than significant.

For the HEU, cumulative impacts to fire protection services were considered within the context of growth from development under the HEU, together with that of *ConnectMenlo*, and an additional 299 units within Menlo Park that may result from development on small sites affected by zoning and Specific Plan changes as part of the HEU after the end of the planning period in 2031. The cumulative planning horizon is 2040 and also considers estimated growth in the service area of the MPFPD, which includes the cities/towns of Atherton, East Palo Alto, and Menlo Park and some of the unincorporated areas of San Mateo County. As noted in Chapter 3, *Project Description*, of this EIR (see Table 3-5), in addition to buildout considered in the *ConnectMenlo* EIR, the cumulative scenario for this EIR also includes the additional unrestricted units at 123 Independence Drive, which would be served by the MPFPD, and are considered in the cumulative analysis for fire services.

The HEU, in combination with other projected growth in the MPFPD service area would increase demand on fire protection services. In addition, residential developments constructed at higher densities using taller buildings could require more ladder trucks to provide sufficient fire suppression. Increased water flow to provide firefighting water to taller buildings could also require upgrades to various water lines in the City. Based on the analysis presented under Impact PS-1, existing fire protection facilities are sufficient to absorb some level of increased population and housing growth while still maintaining acceptable staffing ratios. However, if development under the HEU were to be fully realized, some upgrades or expansions to these facilities would likely be required. The potential need for upgraded or expanded facilities would be greater with the addition of cumulative development throughout the service area.

The extent to which any additional expansion could be required, and where, is currently unknown and would be dependent upon the actual location of additional development that could result from the HEU's implementation and cumulative growth within the service area. The District's existing stations are located on infill lots in Menlo Park and neighboring jurisdictions, which are highly developed. Since no concrete plans are currently available for any of the fire facility upgrades that

might be required, it is not possible to speculate on the level of environmental impacts that could occur. Regardless, any actual construction that could be proposed in the future would be required to undergo a separate environmental review process, which would ensure that any environmental impacts would be disclosed and mitigated to the extent feasible. Further, impacts associated with construction of new or expanded facilities would tend to be localized. As such, implementation of the HEU, together with other cumulative growth that could occur concurrently, would not result in substantial adverse physical environmental impacts associated with the provision of new or physically altered fire and emergency service facilities. This finding is consistent with that found in the *ConnectMenlo* EIR. Cumulative impacts related to fire services would therefore be **less than significant**.

Police Services

Cumulative impacts to police services in the *ConnectMenlo* EIR were considered in the context of Menlo Park's City limits, which represent the MPPD's service area, although the EIR noted that the MPPD also maintains mutual aid agreements with the Atherton Police Department, East Palo Alto Police Department, Redwood City Police Department, and the San Mateo County Sherriff's Office. Pursuant to the *ConnectMenlo* EIR, the MPPD confirmed that no new or expanded facilities would be required to accommodate additional sworn officers or equipment. Growth under the *ConnectMenlo* project also was not expected to increase the degree or incidence of need for mutual aid from neighboring agencies significantly and result in a need for expanded facilities. Therefore, the EIR found that implementation of the *ConnectMenlo* project when considered with other past, present, and foreseeable future projects would have a less-than-significant cumulative effect with respect to the need for remodeled or expanded police facilities.

As discussed previously under Impact PS-2, the MPPD's current service population is approximately 55,270, which represents the existing resident population plus one-third of the employees in Menlo Park. The Department currently employs 47 sworn officers, so the current MPPD service ratio is therefore approximately 0.9 sworn officers per 1,000 residents. The HEU, together with other cumulative development, would add additional residents and employees to the City and MPPD's service area. Full buildout of the HEU in combination with cumulative growth projections would increase the service population from approximately 55,270 to 81,383.[44] Without additional hiring, this would substantially reduce the Department's service ratio, and to adjust the number of sworn police officers to meet the current 0.9 to 1,000 service population ratio, the MPPD would need to employ about 73 sworn officers, an increase of 26 FTE police officers above the current 47 to serve the fully built-out HEU and other cumulative development.

There are no current plans for immediate or near-term expansion of MPPD facilities or additional personnel or equipment.[45] For buildout of the *ConnectMenlo* project, the MPPD indicated that it would need to hire an additional 17 sworn officers and purchase commensurate equipment for

[44] See Table 3-5 in Chapter 3 of this SEIR, *Project Description*. The 2040 Cumulative (Maximum Buildout) Projections with HEU population of the City would be 63,810 persons, and the number of jobs would be 53,250. The above cumulative service population would thus be: 63,810 + (53,250 x 0.33) = 81,383.

[45] City Of Menlo Park. 2022. *Willow Village Master Plan Project Draft EIR*. Available Online: Willow Village City Of Menlo Park. Accessed April 20, 2022.

those officers to accommodate the level of growth projected from *ConnectMenlo* and to maintain the Department's 2015 staffing ratio.[46] At the time, the MPPD had 48 officers; one more than it has currently, so the total number of sworn officers was projected to be 65 officers. As stated previously, the Department at that time indicated that any additional officers that might be required to meet the needs of additional residents in the City could be accommodated within the Department's existing facilities, and that no expansion or addition of facilities would be required, although this would likely push the capacity limits of the current facility footprint. Regardless, since no concrete plans are currently available for any of the police facility upgrades that might be required at some future time if the HEU is implemented, it is not possible to speculate on the environmental effects that could occur. Regardless, any actual construction that could be proposed in the future would be required to undergo a separate environmental review process, which would ensure that any environmental impacts would be disclosed and mitigated to the extent feasible. Even if development were to occur more rapidly than anticipated, these same requirements would still apply and would address and respond to increased facilities needs as appropriate. Further, impacts associated with construction of new or expanded facilities would tend to be localized. As such, implementation of the HEU, together with other cumulative growth that could occur concurrently, would not result in substantial adverse physical environmental impacts associated with the provision of new or physically altered police facilities. This finding is consistent with that found in the *ConnectMenlo* EIR. Cumulative impacts related to fire services would therefore be **less than significant**.

School Facilities

Cumulative impacts to school services in the *ConnectMenlo* EIR were considered within the context of potential cumulative impacts from reasonably foreseeable growth in the areas served by the Menlo Park CSD, Las Lomitas ESD, Redwood CSD, Ravenswood CSD, and SUHSD. While the *ConnectMenlo* project and cumulative projects would add new students to these districts, the EIR determined that the cumulative projects would be subject to compliance with the City's General Plan and mandatory school impact fees under SB 50. Therefore, cumulative impacts related to school facilities were found to be less than significant.

As discussed under the analysis for Impact PS-3, population growth under the HEU at full build-out would occur in many areas of the City, and potential HEU housing sites are scattered throughout each of the school districts that serve the City's residents. The same is true for development that could occur based on cumulative growth projections for 2040. As with the HEU, cumulative growth would result in a direct increase in demand for school facilities through its provision of residential units throughout the City. However, new development, whether constructed under the HEU or pursuant to growth projections to the year 2040, would be subject to SB 50 school impact fee requirements, providing a mechanism to support this demand. Section 65996 of the State Government Code states that the payment of school impact fees constitutes full and complete mitigation for school impacts from development. These fees are based on the square footage and land use types proposed by a development project. Further, since no concrete plans are currently available for any of the school facility upgrades that might be required if the HEU and cumulative development is implemented, it is not possible to speculate on the

[46] See *ConnectMenlo* EIR, page 4.12-16.

environmental effects that could occur. Regardless, any actual construction that could be proposed in the future would be required to undergo a separate environmental review process, which would ensure that any environmental impacts would be disclosed and mitigated to the extent feasible. Further, impacts associated with construction of new or expanded facilities would tend to be localized. As a result, the impacts related to schools would be **less than significant**.

Parks and Recreational Facilities

Cumulative impacts to parks and recreational facilities in the *ConnectMenlo* EIR were considered in the context of park and recreational facilities within the City boundaries as well as San Mateo County and the Midpeninsula Regional Open Space District. The EIR found that even though the potential population increase under the project would increase the demand for park and recreational facilities, the EIR determined that the City would ensure that adequate parklands and recreational facilities would be provided through compliance with existing regulations. Thus, cumulative impacts associated with park and recreational facilities were determined to be less than significant.

As discussed above under Impact PS-4, there are currently about 245 acres of parkland in the City. If fully built-out at the densities identified and as projected in Table 3-5 of this SEIR (see Chapter 3, *Project Description*), the HEU in combination with 2040 cumulative projects would increase the City's population by approximately 23,372 persons, for a total population of 63,810 persons. To meet the City's standard of 5 acres of parkland for each 1,000 residents, the amount of parkland required would be approximately 319 acres, or approximately 74 acres beyond that currently available. Full buildout of the HEU and other cumulative development, however, would be likely to occur incrementally, and some of the development projects undertaken as part of the HEU's and cumulative project's implementation would likely include parks and recreational facilities as part of their own development. Further, new developments would be required to pay fees towards recreational facilities, as prescribed in the Quimby Act, which would provide a source of funding for the development of new facilities, should they be required.

The increase in the residential population associated with the HEU and cumulative development would not adversely affect park and recreational facilities through overuse, since the increased use of these facilities would be spread across existing facilities Citywide and would therefore be unlikely to cause substantial deterioration of any one facility.

It is possible, given the built-out nature of the City, that finding sufficient space to accommodate 74 acres of new parkland may not be possible. Should that be the case, it is possible that the City could fall below its 5 acres per 1,000 persons standard if full buildout of the HEU and all cumulative development were to occur. However, the City would still be likely to provide sufficient parkland to meet the State standard of 3 acres per 1,000 persons, which would be 194 acres, or about 53 acres less than that available currently. Regardless, since no concrete plans are currently available for any of the recreational facilities that might be required if the HEU and cumulative development is implemented, it is not possible to speculate as to the environmental effects that could occur. Any actual construction that could be proposed in the future would be required to undergo a separate environmental review process, which would ensure that any

environmental impacts would be disclosed and mitigated to the extent feasible. Further, impacts associated with construction of new or expanded facilities would tend to be localized.

Based upon each of these considerations, cumulative impacts to park and recreational facilities would be **less than significant**.

Library Facilities

Cumulative impacts to library services in the *ConnectMenlo* EIR were analyzed within the context of the Menlo Park Library service area. The EIR determined that the payment of property taxes would support the ability of the Menlo Park Library to provide adequate services in its service area and that the Menlo Park Library included long-range strategies to ensure the provision of adequate library facilities to meet the demands of existing and future residents of Menlo Park. Furthermore, the EIR found that the expansion of existing libraries or the construction of new libraries would occur in an urbanized area, which would reduce the potential for new environmental impacts, and require permitting and review in accordance with CEQA, which would ensure that any environmental impacts would be disclosed and mitigated to the extent feasible. Therefore, the EIR concluded that the effects of the project, when considered with cumulative projects, would result in less-than-significant cumulative impacts with respect to the need for remodeled or expanded library facilities.

Like *ConnectMenlo*, the HEU and 2040 cumulative development would introduce an increased residential population that would use the City's library resources. If fully built-out at the densities identified, the HEU and 2040 cumulative development would increase the City's population by approximately 23,372 persons, for a total population of 63,810 persons. As stated previously, the Menlo Park Library assesses service needs through user surveys and by monitoring collection use, collecting direct user feedback on programs and services, and comparing services provided to those of other local libraries as well as library best practices.

As noted previously under Impact PS-5, the City authorized a substation library improvement program in 2017. This project includes three main components—a new Belle Haven branch, a new Main Library, and various short-term system improvements to support increased usage. Short-term physical improvements are ongoing in the City's libraries. Construction of the new Menlo Park Community Campus, which will also include library facilities for the Belle Haven neighborhood, will be completed in 2023. It is estimated that the library within this facility will have an area of 4,446 square feet. The current Belle Haven Branch Library on Ivy Drive will relocate to the Menlo Park Community Campus when construction is complete. With the new library on the Menlo Park Community Campus, total library square footage would increase to 38,800 square feet.

These ongoing library projects would expand Menlo Park's library capacity substantially. Further, projects constructed under the HEU and cumulative development would be likely to unfold incrementally over many years. While it is possible that the population increases associated with cumulative development during that time could require expansion or construction of new library facilities, no concrete plans are currently available, and it is not possible to speculate as to the environmental effects that could occur. Regardless, any actual construction

that could be proposed in the future would be required to undergo a separate environmental review process, which would ensure that any environmental impacts would be disclosed and mitigated to the extent feasible. Further, impacts associated with construction of new or expanded facilities would tend to be localized. Based upon these considerations, the HEU's impacts to library services would be **less than significant**.

Conclusion

Based upon the analysis above, cumulative impacts to public service and recreation facilities caused by increased residential development and employment in the City would be offset by payment of standard fees, compliance with existing policies and regulations, and required environmental review for facility improvement projects if and when the need for such improvements are identified. The cumulative effect would therefore be **less than significant**.

Mitigation Measure: None required.

4.13.5 References

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4.14 Transportation

4.14.1 Introduction

This section evaluates the effects of the Housing Element Update (HEU) on transportation, focusing on changes to the *ConnectMenlo* EIR (certified in 2016) that may result in new or more severe impacts, and describes any mitigation measures needed to address any such impacts. Specifically, this section describes existing and future transportation and circulation within Menlo Park, describes the analysis methodology and regulatory framework, identifies potential transportation-related impacts of the HEU, and identifies the recommended mitigation measures for identified significant impacts.

For purposes of disclosing potential transportation impacts, projects in Menlo Park use the City of Menlo Park's current Transportation Impact Analysis (TIA) Guidelines to ensure compliance with both State and local requirements[1]. Up until July 1, 2020, the City's TIA Guidelines used roadway congestion or level of service (LOS) as the primary study metric for planning and environmental review purposes. However, the passage of Senate Bill (SB) 743 required the Governor's Office of Planning and Research (OPR) to establish a new metric for identifying and mitigating transportation impacts under CEQA in an effort to meet the State's goals to reduce GHG emissions, encourage infill development, and improve public health through more active transportation (non-driving transportation modes such as walking and biking). CEQA Section 21099(b)(2) states that upon certification of the revised guidelines for determining transportation impacts pursuant to CEQA Section 21099(b)(1), automobile delay, as described solely by LOS or similar measures of vehicular capacity or traffic congestion, shall not be considered a significant impact on the environment under CEQA. OPR identified vehicle miles traveled (VMT) as the required CEQA transportation metric for determining potentially significant environmental impacts[2]. In December 2018, the California Natural Resources Agency certified and adopted the CEQA Guidelines update package, including the section implementing SB 743 (CEQA Guidelines Section 15064.3). OPR developed a Technical Advisory on Evaluating Transportation Impacts in CEQA, which contains OPR's technical recommendations regarding assessment of VMT, thresholds of significance, and mitigation measures[3].

The transportation analysis in this SEIR complies with the City's TIA Guidelines, which require use of the City's VMT threshold for CEQA transportation impact analysis. Adoption of a local VMT threshold requires local agency approval and on June 23, 2020, the City Council approved local VMT thresholds for incorporation into the updated TIA Guidelines. The City Council, however, retained the requirement that the TIA also analyze LOS for local planning purposes. On January 11, 2022 the City Council approved changes to the local VMT thresholds, and this SEIR uses these updated thresholds. In accordance with SB 743 for purposes of determining potentially

1 Menlo Park, City of. 20222. Transportation Impact Analysis Guidelines Update, Staff Report (Pg227-255). Website: https://beta.menlopark.org/files/sharedassets/public/agendas-and-minutes/city-council/2022-meetings/agendas/20220111-city-council-agenda-packet.pdf (accessed March 18, 2022)

2 California Office of Planning and Research (OPR). 2016. Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA, Implementing Senate Bill 743 (Steinberg, 2013). January 20.

3 OPR. 2018. Technical Advisory on Evaluating Transportation Impacts in CEQA. Website: opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf. December 18.

significant environmental impacts, this SEIR will focus only on VMT as the threshold of significance. Per the TIA guidelines, a LOS analysis is documented in a memorandum separate from the SEIR document for planning purposes.

The information in this chapter is based on travel demand modeling, analyses, and identification of mitigations, if any, developed by Hexagon Transportation Consultants, Inc. The analyses were conducted in accordance with the current standards and methodologies required by law and set forth by the City of Menlo Park (in the TIA Guidelines) and the City/County Association of Governments of San Mateo County (C/CAG).

Findings of the *ConnectMenlo* Final EIR

Transportation and circulation impacts of the *ConnectMenlo* project were analyzed in Section 4.13 of the *ConnectMenlo* Draft EIR. The *ConnectMenlo* Final EIR determined that the project would have the following impacts with respect to transportation circulation:

- TRANS-1a: Implementation of the proposed project would exceed the City's current impact thresholds under the 2040 Plus Project conditions at some roadway segments in the study area. *(Significant and Unavoidable Impact, with Mitigation)*

- TRANS-1b: Implementation of the proposed project would result in increased delay to peak hour motor vehicle traffic exceeding the significance threshold at some of the study intersections. *(Significant and Unavoidable Impact, with Mitigation)*

- TRANS-2: Implementation of the proposed project would result in impacts to Routes of Regional Significance. *(Significant and Unavoidable Impact, with Mitigation)*

- TRANS-3: Implementation of the proposed project would not result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks. *(No Impact)*

- TRANS-4: Implementation of the proposed project would not substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). *(Less than Significant Impact)*

- TRANS-5: Implementation of the proposed project would not result in inadequate emergency access. *(Less than Significant Impact)*

- TRANS-6a: Implementation of the proposed project would not provide adequate pedestrian or bicycle facilities to connect to the area-wide circulation system. *(Significant and Unavoidable Impact, with Mitigation)*

- TRANS-6b: The project would generate a substantial increase in transit riders that cannot be adequately serviced by existing public transit services, and the project would generate demand for transit services at sites more than one-quarter mile from existing public transit routes. *(Significant and Unavoidable Impact, with Mitigation)*

- TRANS-6c: The project would result in increased peak hour traffic delay at intersections on Bayfront Expressway, University Avenue and Willow Road, as identified in TRANS-1, that

could decrease the performance of transit service and increase the cost of transit operations. *(Significant and Unavoidable Impact, with Mitigation)*

Notice of Preparation Comments

The Notice of Preparation (NOP) for the SEIR was circulated on December 23, 2021 and a scoping meeting was held on January 24, 2022. The NOP and the comments received during the public comment period can be found in **Appendix A** of this SEIR. Comments relevant to transportation included comments related to VMT analysis, a Transportation Demand Management (TDM) program, existing and proposed improvements for the pedestrian, bicycle, and transit networks, and fair share contribution as part of mitigation measures.

Information Sources

The primary sources of information referenced in this section included those listed below. Please note that a full list of references for this topic can be found at the end of this section.

- City of Menlo Park General Plan (2016a).
- *ConnectMenlo* Draft EIR (2016b).
- Transportation Impact Analysis Guidelines (2022).
- Transportation Master Plan (2020).

4.14.2 Environmental Setting

This section describes the existing conditions for transportation facilities in the City, including roadway network, transit service, and pedestrian and bicycle facilities in the vicinity of the areas where housing is proposed in the HEU.

Existing Roadway Network

Regional access to the City is provided via US-101, Interstate 280 (I-280), and State Route (SR) 84. Arterials in the City include Willow Road, University Avenue, Marsh Road, El Camino Real, Sand Hill Road, Middlefield Road, Ravenswood Avenue, Valparaiso Drive, and Santa Cruz Avenue. Many streets in the study area run at a diagonal compared to the ordinal directions. For the purposes of this study, US-101, El Camino Real and all parallel streets are considered to run north to south. Conversely, Willow Road, Ravenswood Avenue and all streets parallel are defined as running east to west.

Principal roadways that weren't described in the *ConnectMenlo* EIR or have since changed substantially are described below. Descriptions are provided using roadway classifications defined in the Menlo Park General Plan Circulation Element.

Ravenswood Avenue is an east-west, two to four-lane minor arterial in Menlo Park, extending from El Camino Real in the west to Middlefield Road in the east. West of El Camino Real, the road transitions to Menlo Avenue. The posted speed limit is 25 mph. Sidewalks are present on both sides of Ravenswood Avenue except for a short segment along the north side of the street between Merrill Street and El Camino Real. Crosswalks are provided at major intersections.

Bicycle facilities are provided along the street with most of the street striped as a Class II bike lane and a couple of short segments signed as Class III bike routes. On-street parking is not permitted on the street.

Valparaiso Drive is an east-west, two lane minor arterial in Menlo Park, extending from Hallmark Circle in the west to El Camino Real in the east after which it transitions to Glenwood Avenue. The posted speed limit is 30 mph. Sidewalks are present on the south side of the street, crosswalks are provided at major intersections, on-street parking is permitted on the south side of the street, and Class II bike lanes are striped on both sides of the street.

Santa Cruz Avenue is an east-west, two lane minor arterial in Menlo Park, extending from San Hill Road in the west to the Menlo Park Caltrain Station on the east. The posted speed limit is 25 mph. Sidewalks are present on both sides of the street, crosswalks are provided at major intersections, on-street parking is permitted on both sides of the street, and Class II bike lanes are striped on both sides of the street.

Existing Bicycle and Pedestrian Facilities

The City's existing bicycle facilities are classified according to the State's system of classification as identified in the Menlo Park General Plan Circulation Element:

- Class I (bike path) – A Class I bicycle facility is completely separated from vehicles on a paved right-of-way and is commonly known as a bike path.
- Multi-use Pathway – A Multi-use Pathway is a Class I bicycle facility that allows both bicyclists and pedestrians to use the facility.
- Class II (bike lane) – A Class II bicycle facility is a striped and stenciled lane on an existing right-of-way shared with vehicles and is commonly known as a bike lane.
- Class III (bike route) – A Class III bicycle facility is identified through signage and/or pavement markings called "sharrows" indicating that bicyclists and drivers share the same travel lane and is commonly referred to as a bike route.
- Class IV (protected bike lane) – A Class IV bicycle facility is a striped lane with a vertical and physical separation, such as parking or bollards, from the vehicle travel lane and is commonly referred to as a protected bike lane.

The HEU proposes housing units throughout the City. These units have been generally grouped into the following geographic areas within the City for discussion of existing bicycle and pedestrian facilities (see **Figure 4.14-1**). In addition, the City of Menlo Park adopted a Transportation Master Plan in 2020 that identifies appropriate projects to enhance the transportation network and prioritizes projects based on need for implementation. It includes an update to the City's Bicycle and Sidewalk Plans and identifies pedestrian projects such as installation of sidewalks, crosswalks, curb extensions, pedestrian signal phases, pedestrian refuge islands, flashing beacons, and bicycle projects such as installation of striped bike lanes and signed bike routes in the vicinity of the Housing Element subareas.

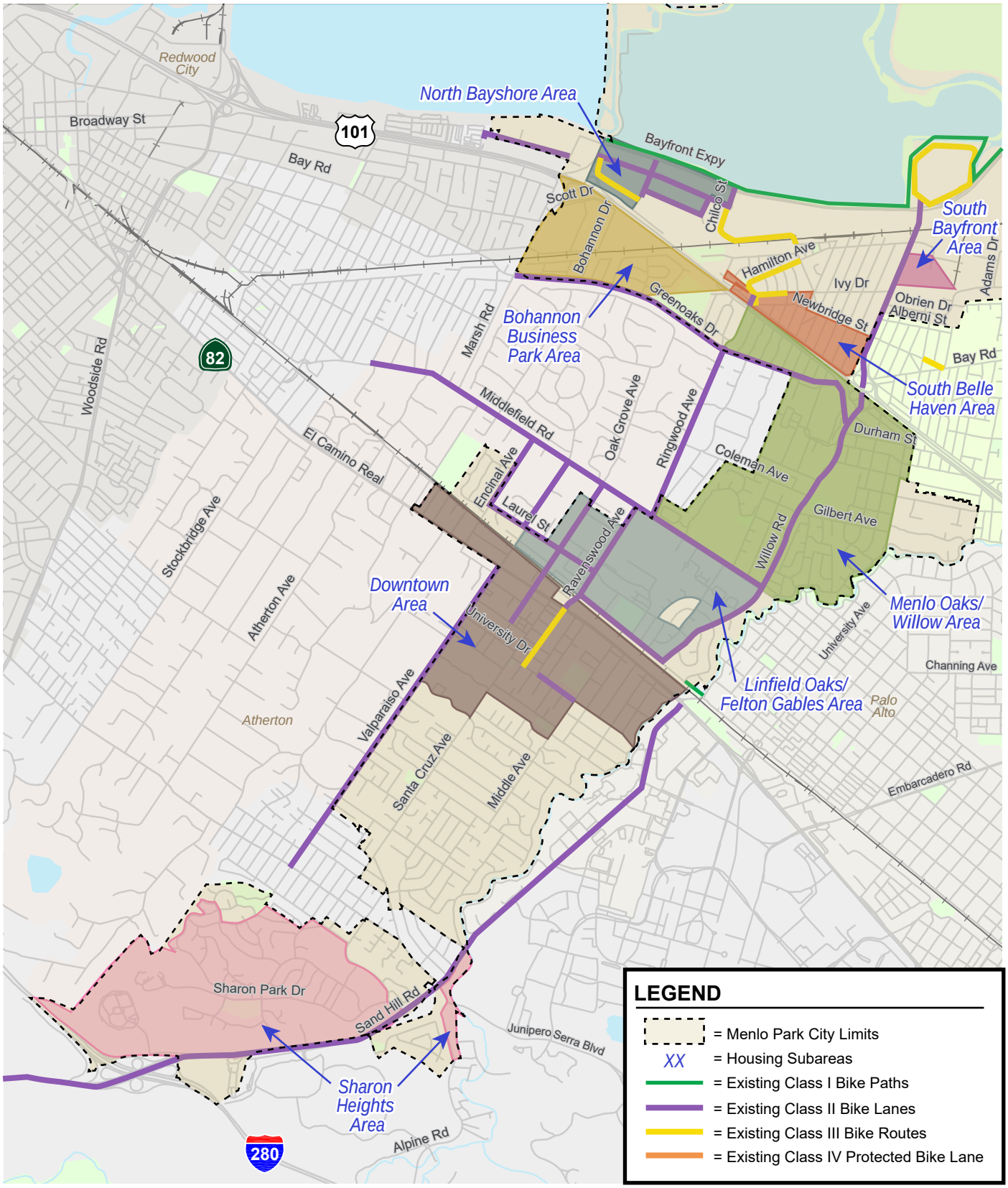

Figure 4.14-1
Existing Bicycle Facilities

Sharon Heights Area

Class II bicycle facilities are provided on Sand Hill Road. The facility extends to El Camino Real in the east and beyond I-280 in the west.

Pedestrian facilities consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections. The proposed housing sites are located in a residential area with predominantly single-family homes, and pedestrian facilities are very limited. Sidewalks are generally present on both sides of Sand Hill Road east of I-280, however, there are limited sidewalks along the surrounding local streets.

Downtown Area

Class II bicycle facilities are provided along the following streets: Valparaiso Avenue between Alameda de las Pulgas and El Camino Real, Oak Grove Avenue between Crane Street and Middlefield Road, University Drive between Live Oak Avenue and Middle Avenue, Santa Cruz Avenue between University Drive and Avy Way, and Sand Hill Road, west of El Camino Real. Class III bicycle facilities are provided along Menlo Avenue between El Camino Real and University Drive.

Pedestrian facilities consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections. In the downtown area of Menlo Park, there is a mix of retail and office uses. Streets are generally walkable with short block lengths, crosswalks, and sidewalks.

Linfield Oaks/Felton Gables Area

Class II bicycle facilities are provided along the following streets: Encinal Avenue between Laurel Street and Middlefield Road, Glenwood Avenue between El Camino Real and Laurel Street, Laurel Street between Encinal Avenue and Ravenswood Avenue, Middlefield Road between Willow Road and Encinal Avenue, Ravenswood Avenue between El Camino Real and Middlefield Road, Alma Street between Ravenswood Avenue and Willow Road, and Willow Road, east of Alma Street. There is also a north-south multi-use path connecting Alma Street in Menlo Park with Alma Street in Palo Alto.

Pedestrian facilities consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections. The proposed housing sites are located in an area that consists of a mix of multifamily and single-family housing, retail, office, and civic uses. The major streets and most local streets in this area have sidewalks on at least one side of the street. Speed humps are present along Laurel Street near the Civic Center, and along Willow Road between Middlefield Road and Laurel Street.

Menlo Oaks/Willows Area

Class II bicycle facilities are provided along the following streets: Bay Road between Marsh Road and Willow Road, Ringwood Avenue between Middlefield Road and Bay Road, Middlefield Road between Willow Road and Encinal Avenue, and Willow Road, east of Alma Street to O'Keefe Street. Willow Road, between the US-101 ramps, has Class IV bicycle facilities. There is also an east-west bicycle overpass over US-101 at Ringwood Avenue.

Pedestrian facilities consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections. The proposed housing sites are located in an area that consists of predominantly single-family housing and the Menlo Park VA Medical Center. The major streets in this area like Willow Road and Middlefield Road have sidewalks on both sides of the street. Other minor arterials in the area like Bay Road and Coleman Avenue have sidewalks on at least one side of the street. Bay Road has speed humps. There are limited sidewalks along the surrounding local streets.

Bohannon Business Park Area

Class II bicycle facilities are provided on Bay Road between Marsh Road and Willow Road.

Pedestrian facilities consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections. The proposed housing sites are located in an area that consists of predominantly single-family housing and office/industrial uses. The major street in this area, Marsh Road, has sidewalks on both sides of the street. There are limited sidewalks along the surrounding local streets.

South Belle Haven Area

Class II bicycle facilities are provided along Willow Road. Willow Road, between the US-101 ramps, has Class IV bicycle facilities. There is also an east-west bicycle overpass over US-101 at Ringwood Avenue.

Pedestrian facilities consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections. The proposed housing sites are located in an area that consists of predominantly single-family housing. Most streets in this area have sidewalks on both sides of the street.

North Bayfront Area

Class II bicycle facilities are provided on the following streets: Haven Avenue between Sleepy Hollow Lane and Haven Court, Chrysler Drive between Independence Drive and Bayfront Expressway, Constitution Drive between Independence Drive and Chilco Street, Chilco Street between Constitution Drive and Bayfront Expressway, and Jefferson Drive between Chrysler Drive and Constitution Drive. Class III bicycle facilities are provided on the following streets: Independence Drive between Constitution Drive and Chrysler Drive, Market Place between Hamilton Avenue and Newbridge Street, Ivy Drive between Market Place and Almanor Avenue, Hamilton Avenue between Market Place and Chilco Street. Class IV facilities (protected bike lanes) are provided on Chilco Street between Menlo Park Fire District Station No. 77 and Constitution Drive.

Pedestrian facilities consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections. Crosswalks with pedestrian signal heads and push buttons are found on one or more approaches at all the signalized study intersections. As the land parcels in the subarea redevelop, new sidewalks are planned for the street frontages, which will improve pedestrian facilities.

South Bayfront Area

Class II bicycle facilities are provided on the following streets: Willow Road between Bayshore Expressway and Bay Road west of US-101 and University Avenue between Donohoe Street and Bayfront Expressway. Class III bicycle facilities are provided on the following streets: Newbridge Street in the northbound direction between Bay Road and Menalto Avenue and along Hacker Way. Class IV bicycle facilities are provided on Willow Road between the US-101 NB and SB ramps.

The San Francisco Bay Trail, a Class I bike trail, provides connections to the East Bay, East Palo Alto, and Redwood City. In the South Bayfront area, it generally runs parallel to Bayfront Expressway.

Pedestrian facilities consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections. The proposed housing is located in a commercial and industrial area, and pedestrian facilities are very limited. There are no sidewalks along any of the surrounding local streets including Adams Court, Adams Drive, and O'Brien Drive. Crosswalks are found on one or more approaches at all the signalized intersections. Most of the unsignalized intersections do not have crosswalks.

Existing Transit Service

Existing transit service in Menlo Park is provided by the San Mateo County Transit District (SamTrans), AC Transit, Stanford Marguerite Shuttle, Menlo Park Shuttle, and Caltrain. The bus routes that provide services near and within the City are shown on **Figure 4.14-2** and described in **Table 4.14-1**.

Caltrain

Commuter rail service between San Francisco and Gilroy is provided by Caltrain, which currently operates 92 weekday trains. The Menlo Park Caltrain station is located near Santa Cruz Avenue and El Camino Real. Trains stop frequently at the Menlo Park station between 4:57 AM and 11:41 PM in the northbound direction, and between 5:56 AM and 1:09 AM in the southbound direction. Caltrain provides passenger train service seven days a week and provides extended service to Morgan Hill and Gilroy during commute hours.

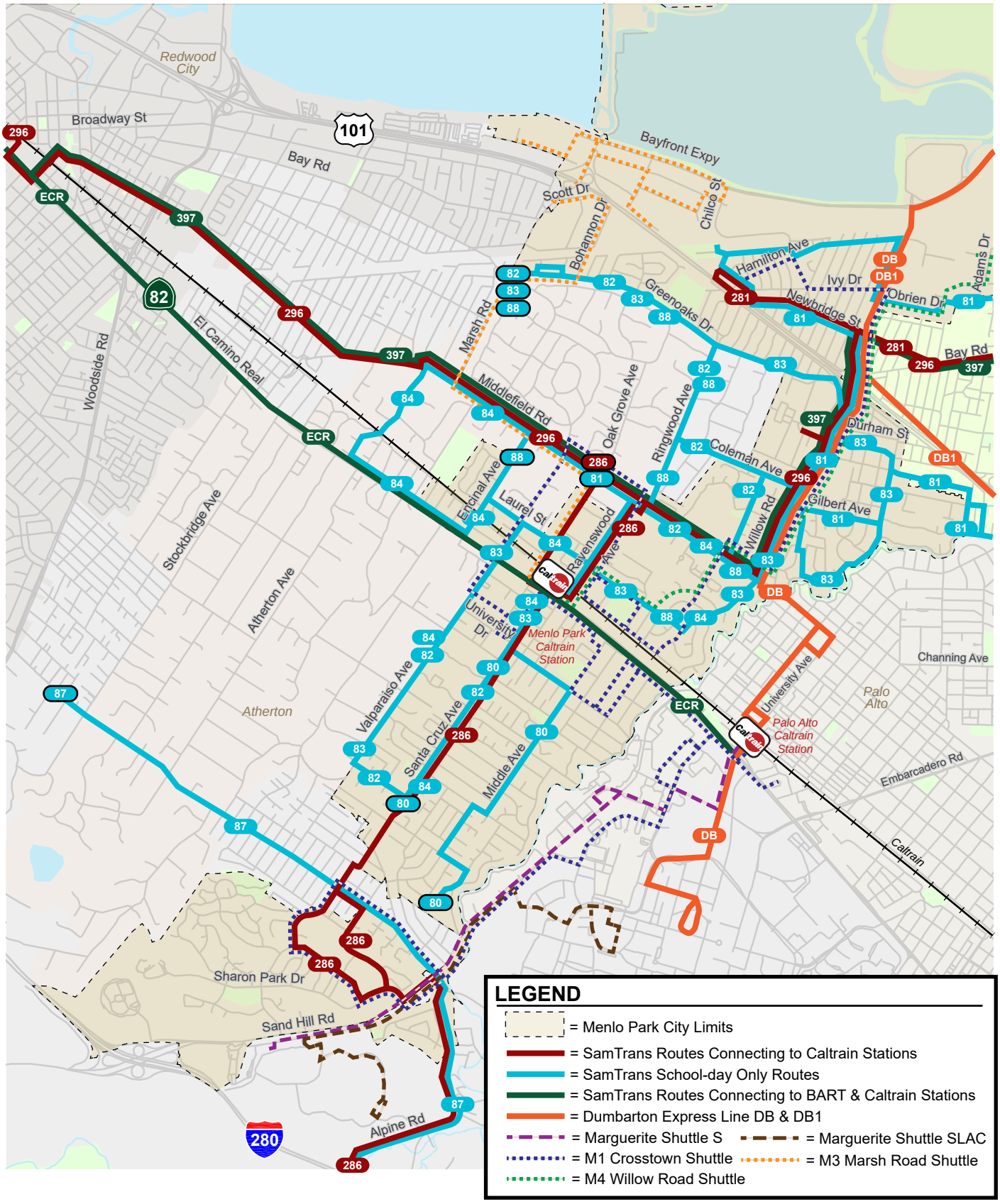

Figure 4.14-2
Existing Transit Services

NORTH
Not to Scale

TABLE 4.14-1
EXISTING TRANSIT SERVICE, AS OF MAY 2022

Bus Route	Route Description	Travelled Roadways	Weekday Hours of Operation	Headway
Dumbarton Express Line DB	Union City BART - Stanford University	Dumbarton Bridge, Bayfront Expressway, Willow Road, Middlefield Road	5:25 AM - 8:46 PM	25 - 65 min
Dumbarton Express Line DB1	Union City BART - Stanford Research Park	Dumbarton Bridge, Bayfront Expressway, Willow Road, US-101	5:10 AM - 8:28 PM	30 - 65 min
SamTrans Route 80 (School Route)	Oak Knoll ES - Santa Cruz/Elder	Santa Cruz Avenue, Oak Knoll Lane, Middle Avenue	3:10 PM - 3:30 PM	--
SamTrans Route 81 (School Route)	Menlo-Atherton High School - Clarke & Bayshore	Middlefield Road, Willow Road, University Avenue, Pulgas Avenue, Kavanaugh Drive, Hamilton Avenue	6:48 AM - 8:45 AM 3:20 PM - 4:21 PM	--
SamTrans Route 82 (School Route)	Bay/Marsh - Hillview School	Santa Cruz Avenue, Valparaiso Avenue, Willow Road, Middlefield Road, Bay Road	7:40 AM - 8:10 AM 2:45 PM - 3:44 PM	--
SamTrans Route 83 (School Route)	Hillview School - Bay/Marsh	Santa Cruz Avenue, Valparaiso Avenue, Willow Road, Middlefield Road, Bay Road	7:18 AM - 8:05 AM 2:43 PM - 4:05 PM	--
SamTrans Route 84 (School Route)	Middlefield Lane-Hillview School	Santa Cruz Avenue, Valparaiso Avenue, Middlefield Road, Laurel Street	7:41 AM - 8:10 AM 2:40 PM - 3:56 PM	--
SamTrans Route 87 (School Route)	Woodside High-Portola Valley	Portola Road, Alameda de las Pulgas	7:10 AM - 7:45 AM	--
SamTrans Route 88 (School Route)	Bay/Marsh - Encinal School	Middlefield Road, Ringwood Avenue, Laurel Street, Bay Road	2:00 PM - 2:21 PM	--
SamTrans Route 281	Onetta Harris Center - Stanford Mall	Newbridge Street, Bay Road, University Avenue	6:00 AM - 10:37 PM	30 min
SamTrans Route 286	Ringwood/Arlington - Monte Rosa/Eastridge	Santa Cruz Avenue, Avy Avenue	6:42 AM - 6:15 PM	60 mins
SamTrans Route 296	Redwood City Transit Center - Bayshore/Donohoe	Middlefield Road, Willow Road, Newbridge Street, Bay Road	All Day	20 min
SamTrans Route 397	San Francisco - Palo Alto Transit Center	Middlefield Road, Willow Road, Newbridge Street, Bay Road, University Avenue	12:46 AM - 4:37 AM	60 min
ECR	Daly City BART - Palo Alto Transit Center	El Camino Real	4:06 AM - 1:50 AM	15 mins
Marguerite Shuttle S	Palo Alto Transit Center - Rosewood Hotel	Sand Hill Road	6:30 AM - 9:27 AM 4:20 PM - 6:30 PM	50-60 mins
Marguerite Shuttle SLAC	SLAC - Cypress hall	Sand Hill Road	7:00 AM - 8:20 PM	40 mins
M1 - Crosstown Shuttle	Sharon Heights - Belle Haven	Willow Road, Linfield Drive, Ravenswood Avenue, Santa Cruz Avenue, Middle Avenue, Sand Hill Road	8:15 AM - 5:52 PM	90 - 120 mins
M3 - Marsh Road Shuttle	Menlo Park Caltrain - Marsh Road Business Parks	Bayfront Expressway, Bohannan Drive, Marsh Road, Middlefield Road, Oak Grove Avenue	6:41 AM - 9:27 AM 4:27 PM - 6:27 PM	60 mins
M4 Willow Road Shuttle	Menlo Park Caltrain Station - Marsh Road Business Parks	Willow Road, O'Brien Drive, Laurel Street	7:41 AM - 9:23 AM 4:27 PM - 6:27 PM	60 mins

NOTES:

This table represents approximate weekday operation hours and headways in Menlo Park, as of 2022.
SamTrans recently completed the Reimagine SamTrans project and adopted an updated network that will begin to be implemented in Summer 2022. The new network will remove some services, consolidate others, and add on demand service in East Palo Alto and parts of the Belle Haven neighborhood of Menlo Park. More information is available at https://www.reimaginesamtrans.com/new-network/.

4.14.3 Regulatory Setting

The following section focuses on any changes to the regulatory setting that have occurred since certification of the *ConnectMenlo* EIR. Draft EIR Section 4.13, *Transportation and Circulation*, evaluated effects to transportation. There, Section 4.13.1.1, *Regulatory Framework*, described regulations applicable to this topic, and that description is still current for this SEIR, except as noted below. The Local subsection describes all applicable policies, most of which are new since the certification of the *ConnectMenlo* EIR.

Federal

No federal plans, policies, regulations, or laws related to transportation and circulation are applicable to the HEU.

State

This section summarizes applicable new State regulations guiding transportation planning in Menlo Park since certification of the *ConnectMenlo* EIR.

Senate Bill 743

Senate Bill 743 (CEQA section 21099(b)(1)) requires that the State Office of Planning and Research (OPR) develop revisions to the CEQA Guidelines establishing criteria for determining the significance of transportation impacts of projects that "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." CEQA section 21099(b)(2) states that upon certification of the revised guidelines for determining transportation impacts pursuant to CEQA section 21099(b)(1), automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion, shall not be considered a significant impact on the environment under CEQA.

In January 2016, the OPR published for public review and comment a Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA recommending that transportation impacts for projects be measured using a VMT metric[4]. In December 2018, the California Natural Resources Agency certified and adopted the CEQA Guidelines update package, including the section implementing SB 743 (section 15064.3). OPR developed a Technical Advisory on Evaluating Transportation Impacts in CEQA, which contains OPR's technical recommendations regarding assessment of VMT, thresholds of significance, and mitigation measures.[5]

Regional

This section summarizes applicable new regional regulations guiding transportation planning in Menlo Park since certification of the *ConnectMenlo* EIR.

[4] OPR. 2016. Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA, Implementing Senate Bill 743 (Steinberg, 2013). January 20.

[5] OPR. 2018, op. cit.

Plan Bay Area

Plan Bay Area 2050 is a State-mandated, integrated long-range transportation and land use plan. As required by SB 375, all metropolitan regions in California must complete a Sustainable Communities Strategy as part of a Regional Transportation Plan. This strategy integrates transportation, land use and housing to meet greenhouse gas reduction targets set by the California Air Resources Board. The plan meets those requirements. In addition, the plan sets a roadmap for future transportation investments and identifies what it would take to accommodate expected growth. The plan neither funds specific transportation projects nor changes local land use policies.

In the Bay Area, the Metropolitan Transportation Commission and the Association of Bay Area Governments adopted the latest plan in 2021. Under Plan Bay Area 2050's strategies, just under half of all Bay Area households would live within one half-mile of frequent transit by 2050, with this share increasing to over 70 percent for households with low incomes. Transportation and environmental strategies that support active and shared modes, combined with a transit-supportive land use pattern, are forecasted to lower the share of Bay Area residents that drive to work alone from 50 percent in 2015 to 33 percent in 2050. Greenhouse gas emissions from transportation would decrease significantly as a result of these transportation and land use changes, and the Bay Area would meet the State mandate of a 19 percent reduction in per capita emissions by 2035.

Under the previous Plan Bay Area 2040, to meet the greenhouse gas reduction targets, that plan identifies priority development areas. The agencies estimate approximately 77 percent of housing and 55 percent of job growth will occur in the priority development areas between 2010 and 2040. Some of the proposed HEU housing Opportunity Sites and land use strategy sites are located within a priority development area. It will be several years before the regional transportation model (and therefore county and local transportation models) are updated to reflect Plan Bay Area 2050; the models currently incorporate data from Plan Bay Area 2040.

City/County Association of Governments of San Mateo County (C/CAG) Congestion Management Program

The purpose of the Congestion Management Program (CMP) is to identify strategies to respond to future transportation needs, develop procedures to alleviate and control congestion, and promote countywide transportation solutions. The CMP is required to be consistent with the MTC planning process that includes regional goals, policies, and projects for the RTIP. In order to monitor attainment of the CMP, the San Mateo County/City Association of Governments (C/CAG) adopted the roadway LOS standards. The LOS standards established for San Mateo County vary by roadway segments and conform to current land use plans and development differences among the coast, bayside, older downtowns, and other areas of San Mateo County. The CMP also requires new development projected to generate 100 or more daily trips to implement Travel Demand Management (TDM) measures that would reduce project impacts. Future projects within the Housing Element that generate more than 100 daily trips would be required to develop and implement TDM measures to reduce vehicle trips.

Local

Menlo Park General Plan

The Menlo Park General Plan is a comprehensive long-range general plan for the physical development of the City of Menlo Park (City of Menlo Park, 2016a). The General Plan contains the current City of Menlo Park Housing Element, which was adopted in 2014 (City of Menlo Park, 2014). The various elements within the General Plan include goals and policies for the physical development of the City. Goals and policies related to transportation are listed below.

Goal CIRC-1: Provide and maintain a safe, efficient, attractive, user-friendly circulation system that promotes a healthy, safe, and active community and quality of life throughout Menlo Park.

***Policy CIRC-1.7: Bicycle Safety*.** Support and improve bicyclists safety through roadway maintenance and design efforts.

Policy CIRC-1.8: Pedestrian Safety. Maintain and create a connected network of safe sidewalks and walkways within the public right of way ensuring that appropriate facilities, traffic control, and street lighting are provided for pedestrian safety and convenience, including for sensitive populations.

Goal CIRC-2: Increase accessibility for and use of streets by pedestrian, bicyclists, and transit riders.

Policy CIRC-2.1: Accommodating All Modes. Plan, design and construct transportation projects to safely accommodate the needs of pedestrians, bicyclists, transit riders, motorists, people with mobility challenges, and persons of all ages and abilities.

Policy CIRC-2.2: Livable Streets. Ensure that transportation projects preserve and improve the aesthetics of the City.

Policy CIRC-2.3: Street Classification. Utilize measurements of safety and efficiency for all travel modes to guide the classification and design of the circulation system, with an emphasis on providing "complete streets" sensitive to neighborhood context.

Policy CIRC-2.4: Equity. Identify low-income and transit-dependent districts that require pedestrian and bicycle access to, from, and within their neighborhoods.

Policy CIRC-2.7: Walking and Biking. Provide for the safe, efficient, and equitable use of streets by pedestrians and bicyclists through appropriate roadway design and maintenance, effective traffic law enforcement, and implementation of the City's Transportation Master Plan.

Policy CIRC-2.8 Pedestrian Access at Intersections. Support full pedestrian access across all legs of signalized intersections.

Policy CIRC-2.9 Bikeway System Expansion. Expand the Citywide bikeway system through appropriate roadway design, maintenance, effective traffic law enforcement, and implementation of the City's Transportation Master Plan.

Policy CIRC-2.11 Design of New Development. Require new development to incorporate design that prioritizes safe pedestrian and bicycle travel and accommodates senior citizens, people with mobility challenges, and children.

Policy CIRC-2.14 Impacts of New Development. Require new development to mitigate its impacts on the safety (e.g., collision rates) and efficiency (e.g., vehicle miles traveled (VMT) per service population or other efficiency metric) of the circulation system. New development should minimize cut-through and high-speed vehicle traffic on residential streets; minimize the number of vehicle trips; provide appropriate bicycle, pedestrian, and transit connections, amenities and improvements in proportion with the scale of Proposed Projects; and facilitate appropriate or adequate response times and access for emergency vehicles.

Goal CIRC-3: Increase mobility options to reduce traffic congestion, greenhouse gas emissions, and commute travel time.

Policy CIRC-3.1 Vehicle Miles Traveled. Support development and transportation improvements that help reduce per service population (or other efficiency metric) vehicle miles traveled.

Policy CIRC-3.2 Greenhouse Gas Emissions. Support development, transportation improvements, and emerging vehicle technology that help reduce per capita (or other efficiency metric) greenhouse gas emissions.

Policy CIRC-3.3 Emerging Transportation Technology. Support efforts to fund emerging technological transportation advancements, including connected and autonomous vehicles, emergency vehicle pre-emption, sharing technology, electric vehicle technology, electric bikes and scooters, and innovative transit options.

Goal CIRC-4: Improve Menlo Park's overall health, wellness, and quality of life through transportation enhancements.

Policy CIRC-4.1 Global Greenhouse Gas Emissions. Encourage the safer and more widespread use of nearly zero-emission modes, such as walking and biking, and lower emission modes like transit, to reduce greenhouse gas emissions.

Policy CIRC-4.2 Local Air Pollution. Promote non-motorized transportation to reduce exposure to local air pollution, thereby reducing risks of respiratory diseases, other chronic illnesses, and premature death.

Policy CIRC-4.3 Active Transportation. Promote active lifestyles and active transportation, focusing on the role of walking and bicycling, to improve public health and lower obesity.

Policy CIRC-4.4 Safety. Improve traffic safety by reducing speeds and making drivers more aware of other roadway users.

Goal CIRC-5: Support local and regional transit that is efficient, frequent, convenient, and safe.

Policy CIRC-5.2 Transit Proximity to Activity Centers. Promote the clustering of as many activities as possible within easy walking distance of transit stops, and locate any new transit stops as close as possible to housing, jobs, shopping areas, open space, and parks.

Goal CIRC-6: Provide a range of transportation choices for the Menlo Park community.

Policy CIRC-6.3 Shuttle Service. Encourage increased shuttle service between employment centers and the Downtown Menlo Park Caltrain station.

Policy CIRC-6.4 Employers and Schools. Encourage employers and schools to promote walking, bicycling, carpooling, shuttles, and transit use.

Menlo Park Municipal Code

The HEU includes proposed housing in locations currently zoned as Office Zoning District (O), and pending projects that were under development review prior to the HEU effort in the Residential Mixed Use District (R-MU). The Zoning Ordinance requires the development and implementation of a Transportation Demand Management (TDM) plan for land use developments in these zones.

Chapters 16.43.100 and 16.45.090 Transportation Demand Management

As stated in Chapters 16.43.100 (applicable to the O Office District) and 16.45.090 (applicable to the R-MU Residential Mixed Use District) of the City's Zoning Ordinance, all new construction, regardless of size, and building additions of 10,000 or more square feet of gross floor area, or a change of use of 10,000 or more square feet of gross floor area shall develop a TDM plan necessary to reduce associated vehicle trips to at least 20 percent below standard generation rates for uses on the Project Site.

The Transportation Demand Management Program Guidelines[6] provide options for the City to mitigate the traffic impacts of new developments. The guidelines include an extensive list of TDM measures accompanied with the number of trips credited to each measure and the rationale for each measure. The list of recommended measures and the associated trip credit is maintained by C/CAG as part of the San Mateo County CMP.

Pursuant to the City's Zoning Ordinance, eligible TDM measures may include but are not limited to those listed below.

- Participation in a local transportation management association (TMA) that provides documented, ongoing support for alternative commute programs;
- Appropriately located transit shelter(s);
- Preferred parking for carpools or vanpools;
- Designated parking for car share vehicles;
- Paid parking;
- Public and/or private bike share program; Provision or subsidy of carpool, vanpool, shuttle, or bus service, including transit passes for site occupants;

6 Menlo Park, City of. 2015. *Transportation Demand Management Program Guidelines*. Website: www.menlopark.org/DocumentCenter/View/303/Transportation-Demand-Management-TDM-Guidelines (accessed September 24, 2020). Adopted July 15.

- Passenger loading zones for carpools and vanpools at main building entrance;
- Safe, well-lit, accessible, and direct route to the nearest transit or shuttle stop or dedicated, fully accessible bicycle and pedestrian trail;
- Car share membership for employees or residents;
- Emergency ride home programs;
- Green trip certification;

Pursuant to the City's Zoning Ordinance, measures receiving TDM credit shall be:

- Documented in a TDM plan developed specifically for each project and noted on Project Site plans, if and as appropriate;
- Guaranteed to achieve the intended reduction over the life of the development, as evidenced by annual reporting provided to the satisfaction of the City's transportation manager;
- Required to be replaced by appropriate substitute measures if unable to achieve intended trip reduction in any reporting year;
- Administered by a representative whose updated contact information is provided to the transportation manager.

Complete Streets Policy

The Complete Streets Policy was adopted by the City in 2013. The policy confirms the City's commitment to provide safe, comfortable, and convenient travel along and across streets for all users. Complete Streets infrastructure should be considered for incorporation into all significant planning, funding, design, approval, and implementation processes for new, maintenance, and retrofit construction.

Neighborhood Traffic Management Plan

The Neighborhood Traffic Management Plan was developed to mitigate the adverse effects of increased vehicle speeds and vehicle volumes on neighborhood streets. The primary goal of this plan is to correct unsafe conditions at prioritized locations with higher incidences and higher speeds. The plan recommends two levels of measures, Level I "Express" and Level II. Level I "Express" measures include education and enforcement initiatives, and Level II measures are traffic management features that can be implemented to divert traffic and to restrict access to certain properties. The traffic management measures that need to be implemented are recommended by City staff at the request of the community.

Transportation Master Plan

The Transportation Master Plan identifies appropriate projects to enhance the transportation network and prioritizes projects based on need for implementation. It includes an update to the City's Bicycle and Sidewalk Plans.

Transportation Impact Fee

The City of Menlo Park initiated a Transportation Impact Fee (TIF) codified in Municipal Code Chapter 13.26 to help fund transportation improvements as new development occurs in the City.

New development and redevelopment projects are subject to the TIF to contribute to the cost of new transportation infrastructure associated with the development. The types of developments that are subject to the TIF are:

- All new development in all land use categories identified in the City's zoning ordinance
- Any construction adding additional floor area to a lot with an existing building
- New single-family and multi-family dwelling units
- Changes of use from one land use category to a different land use category that requires Planning Commission approval.

The TIF provides a mechanism to modernize the City's fee program to collect funds towards construction of the improvements identified and prioritized in the Transportation Master Plan.

Transportation Impact Analysis Guidelines

The City's TIA Guidelines specify which projects must complete a TIA prior to obtaining approval from the City. The City requires that a TIA be prepared by a qualified consultant selected by the City and paid for by the project applicant. The TIA Guidelines also specify the requirements of the analyses that must be included in a TIA. The TIA Guidelines require analysis of both VMT and LOS transportation metrics independently using the methodologies approved by the City for all projects except those meeting established exemption criteria.

4.14.4 Environmental Impacts and Mitigation Measures

The analysis in this SEIR describes impacts identified in the 2016 *ConnectMenlo* EIR, and describes how the impacts of the HEU would differ, as applicable.

Traffic Impact Assessment under CEQA

For purposes of disclosing potential transportation impacts, projects in Menlo Park use the City's current TIA Guidelines to ensure compliance with both State and local requirements[7]. Up until July 1, 2020, the City's TIA Guidelines used roadway congestion or LOS as the primary study metric. However, SB 743 required OPR to establish a new metric for identifying and mitigating transportation impacts within CEQA in an effort to meet the State's goals to reduce GHG emissions, encourage infill development, and improve public health through use of more active transportation (bicycles and walking). OPR identified VMT as the required transportation metric.

The City updated its Transportation Impact Analysis Guidelines in July 2020 to include guidelines on evaluating VMT. The local VMT threshold was subsequently modified by the City Council on January 11, 2022, and those thresholds are used in this analysis. Therefore, this analysis evaluates VMT impacts using local VMT thresholds included in the updated TIA Guidelines for purposes of determining potentially significant environmental impacts.

VMT is the total miles of travel by personal motorized vehicles (cars and light trucks) that a project is expected to generate in a day. VMT measures the full distance of personal motorized

7 Menlo Park, City of. 2020a, op. cit.

vehicle-trips that originate or end within the project. Heavy duty trucks are not included in the VMT modeling. According to OPR guidelines, the VMT of heavy-duty trucks can be excluded from analysis under SB 743.

The HEU VMT was estimated using the City's travel demand model. The model estimates the HEU's effect on total daily VMT in accordance with the City's TIA Guidelines. The evaluated daily VMT accounts for the entire distance of a trip associated with the HEU. For example, the entire length of a trip made by a resident going away and returning to their home would be captured in the daily VMT analysis. The model is used to estimate average daily VMT within the City's transportation analysis zones (TAZs) and to determine VMT thresholds for residential uses that are identified in the City's TIA Guidelines.

The Menlo Park travel demand model encompasses the nine Bay Area counties divided into thousands of TAZs. Each TAZ is comprised of several streets, neighborhoods, or City blocks depending on the geographical features and surrounding land uses. There are 81 TAZs within the boundaries of Menlo Park.

Significance Thresholds

The significance criteria used to evaluate the HEU's impacts on transportation under CEQA are based on Appendix G of the State CEQA Guidelines, as well as VMT thresholds of significance outlined by the City's TIA guidelines.

The following describes the significance criteria used to identify impacts on the transportation for the proposed HEU. A significant impact would occur if implementation of the HEU would:

- Conflict with an applicable program, plan, ordinance, or policy establishing measures of effectiveness for the performance of addressing the circulation system, including transit, bicycle, and pedestrian facilities.
- Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b). For the purposes of this evaluation, this impact would be significant if the Citywide average residential VMT per capita would increase with the addition of the HEU. Future multifamily housing development projects allowed by the HEU may also generate a potentially significant impact if the project's residential VMT per capita is greater than 85 percent of the regional average.
- Result in designs for on-site circulation, access, and parking areas that fail to meet City or industry standard design guidelines.
- Result in inadequate emergency access to development sites.

Impacts and Mitigation Measures

Impact TRANS-1: Implementation of The HEU would conflict with an applicable program, plan, ordinance, or policy establishing measures of effectiveness for the performance of addressing the circulation system, including transit, bicycle, and pedestrian facilities. (*Significant and Unavoidable Impact*)

Implementation of the HEU would be subject to and implement plans, ordinances, and policies applicable to transit, bicycle, and pedestrian facilities and service. Additionally, development projects under the HEU would be subject to all applicable City guidelines, standards, and specifications related to transit, bicycle, or pedestrian facilities.

The *ConnectMenlo* EIR identifies impacts related to roadways, bicycle, pedestrian, and transit facilities. As noted in the Regulatory Framework discussion above, CEQA no longer considers automobile delay, including roadway segment LOS, intersection LOS, and routes of regional significance, to be an environmental impact. Impacts to bicycle, pedestrian, and transit facilities would be a CEQA impact.

Bicycle and Pedestrian Facilities

The *ConnectMenlo* Final EIR found that the development potential under *ConnectMenlo* would generate new transit riders, bicyclists, and pedestrians, and that implementation of *ConnectMenlo* and other existing City standards and regulations would include goals, policies, and programs that provide for an integrated network of bicycle and pedestrian facilities as well as for the needs of transit users. Further, the EIR found that future development would be concentrated on sites either already developed and/or in close proximity to existing development, and would be served by existing transit, bicycle, and pedestrian infrastructure. However, since much of the anticipated development under the *ConnectMenlo* project would occur in the Bayfront Area, including properties located east of US-101 that are not adequately connected to the pedestrian and bicycle circulation network locally or west of US-101, and properties bordering existing streets such as Constitution Drive that lack continuous sidewalks, the *ConnectMenlo* Final EIR found that implementation of *ConnectMenlo* would not provide adequate pedestrian or bicycle facilities to connect to the area-wide circulation system. Mitigation Measure TRANS-6a was provided to update the City's TIF program to secure a funding mechanism for future pedestrian and bicycle improvements to mitigate impacts from future projects (based on the current standards at the time the Final EIR was certified) but did not reduce the impact to less than significant levels because the nexus study (pursuant to AB 1600) had not yet been prepared, the City could not guarantee improvements, and no additional mitigation measures were feasible and available. For these reasons, the EIR concluded that implementation of *ConnectMenlo* would not provide adequate pedestrian or bicycle facilities to connect to the area-wide circulation system and the impact was considered significant and unavoidable.

Subsequently, the City's TIF program was updated and approved by the City Council. The City's Transportation Master Plan has also been updated, and the City Council approved the updated plan on November 17, 2020. However, the identified bicycle and pedestrian improvements would not be fully funded by the TIF, and therefore the *ConnectMenlo* impact would remain. While most of the HEU's units would be located west of US-101, the units included in the HEU

east of US-101 (in the Bayfront area) would contribute to the identified impact that was caused by the proposed development in the Bayfront area. Therefore the HEU impact on bicycle and pedestrian facilities would also be **significant and unavoidable**.

Transit

The *ConnectMenlo* Final EIR found that implementation of *ConnectMenlo* would generate a substantial increase in transit riders that could not be adequately serviced by existing public transit services, and the implementation of *ConnectMenlo* would generate demand for transit services at sites more than one-quarter mile from existing public transit routes. Mitigation Measure TRANS-6b was provided to update the City's existing Shuttle Fee program to guarantee funding for operations of City sponsored shuttle service that is necessary to mitigate impacts from future projects based on the then-current City standards. Implementation of Mitigation Measure TRANS-6b was found to reduce the impacts but not to a less than significant level. As the nexus study (pursuant to AB 1600) had not yet been prepared, the City could not guarantee improvements, and no additional mitigation measures were feasible and available. For these reasons, impacts to transit were considered significant and unavoidable. OPR's guidance regarding implementation of SB 743 indicates that increased transit demand is no longer considered an adverse effect under CEQA.

The *ConnectMenlo* Final EIR found that implementation of *ConnectMenlo* would result in increased peak hour traffic delay at intersections on Bayfront Expressway, University Avenue, and Willow Road that could decrease the performance of transit service and increase the cost of transit operations. Mitigation Measure TRANS-6c was provided to potentially result in the provision of transit service on the Dumbarton Corridor to mitigate the impact. However, because provision of Dumbarton transit service would require approval of other public agencies and is not under the jurisdiction of the City of Menlo Park, implementation of this mitigation could not be guaranteed. No additional mitigation measures were feasible and available. For these reasons, impacts to transit were considered significant and unavoidable. With the transition to using VMT rather than LOS, vehicle delay is no longer considered an adverse effect under CEQA, which instead considers whether transit routes would be blocked, or whether there would be safety issues or conflicts with applicable plans. While the HEU proposes development potential above and beyond *ConnectMenlo* without any increase in transit service, the development would not physically block transit routes, create an obvious safety issue, or conflict with an applicable transit plan and therefore the HEU impact on transit facilities would also be **less than significant**.

Impact TRANS-2: Implementation of the HEU would exceed an applicable VMT threshold of significance. (Significant and Unavoidable Impact, with Mitigation)

The City of Menlo Park Transportation Impact Analysis Guidelines adopted in June 2020 and updated in January 2022 state that residential projects are considered to have a significant VMT impact if the project's VMT exceeds a threshold of 15 percent below the regional average VMT per capita. Residential VMT is defined as home-based VMT as calculated by the Citywide travel demand model. Per the City's guidelines, the regional average residential VMT per capita is estimated at 13.7, and the residential VMT impact threshold at 11.6, which is 15 percent below

the regional average residential VMT per capita. This impact threshold will be used for individual projects' VMT analysis.

For the HEU plan, at a plan-level, the City's guidelines do not outline any thresholds for plan-level analysis. For the purpose of this SEIR, the HEU plan is considered to generate a significant VMT impact if the buildout of the HEU plan causes Menlo Park's Citywide average residential VMT per capita to increase beyond existing baseline Citywide average residential VMT per capita.

The analysis described below is thus conducted in two steps. First described is the HEU's plan-level VMT impact. The project-level VMT impacts for individual projects within the HEU plan are generally described afterwards.

VMT Evaluation Methodology

Travel Demand Model

VMT is defined as the total distance traveled by vehicles to and from a project site over a typical day. In order to estimate the HEU's effect on Citywide residential VMT, the Citywide travel demand forecast model was used. The Citywide model is the best available model to represent travel within the City of Menlo Park, and serves as the primary forecasting tool for the City. The model is a mathematical representation of travel within the nine Bay Area counties, as well as the Santa Cruz, San Benito, Monterey and San Joaquin counties. The base model structure was developed by the Metropolitan Transportation Commission (MTC) and further refined by the City/County Association of Governments and Santa Clara Valley Transportation Authority for use within San Mateo County and Santa Clara County. The City further refined this model for application with Menlo Park to add more detail to the zone structure and transportation network.

There are four main components of the model: 1) trip generation, 2) trip distribution, 3) mode choice, and 4) trip assignment. The model uses socioeconomic inputs (i.e., population, income, employment) aggregated into geographic areas, called transportation analysis zones (TAZs) to estimate travel within the model area. There are 81 TAZs within the model to represent the City of Menlo Park.

VMT Evaluation

As outlined in Table 3-5 in Chapter 3 of this SEIR, *Project Description*, the baseline scenario for the HEU's CEQA evaluation is assumed as the year 2021 existing conditions, plus projects that have been approved but not yet occupied. The baseline scenario assumes 15,464 households and 40,438 persons residing in the City of Menlo Park. As shown below in **Table 4.14-2**, the Citywide model estimated the Citywide average residential VMT for this baseline as 12.18 home-based VMT per capita.

TABLE 4.14-2
VMT EVALUATION

Scenario	Home-Based VMT	Population	Home-Based VMT per Capita
City of Menlo Park			
Baseline	492,487	40,438	12.18
Baseline + HEU	680,399	57,960	11.74

SOURCE: Menlo Park Citywide travel demand forecast model, Hexagon Transportation Consultants, Inc., May 2022

The Citywide residential VMT under the Baseline + HEU scenario was compared against the baseline scenario to determine the HEU's impact on VMT. The Baseline + HEU scenario, as defined in Chapter 3, Table 3-5, includes in addition to baseline conditions, all pending projects, forecasted accessory dwelling unit (ADU) construction, and the additional 4,000 HEU units. In total, the Baseline + HEU scenario assumes an additional 6,818 households and 17,522 people, compared to the baseline scenario (see **Figure 4.14-3** for the TAZ level distribution of these units). For analysis purposes, the Baseline + HEU scenario uses a year 2021 horizon, the same as the baseline scenario. As shown in Table 4.14-2, the model estimated the Citywide average residential VMT for the Baseline + HEU scenario as 11.74 home-based VMT per capita.

The Citywide residential VMT per capita is shown to decrease with the addition of the HEU, therefore, the HEU Plan would generate a less-than-significant VMT impact. This is likely the case because many of the HEU units would be located within close proximity to the Menlo Park Caltrain station, and/or could take advantage of the complementary land uses in the downtown area to reduce vehicular trip making and reduce vehicular trip length, both of which reduce VMT.

In addition to considering VMT impacts associated with the HEU as a whole, this analysis considers the potential impacts associated with individual multifamily development projects allowed by the HEU, recognizing that some future development projects will likely be ministerial, meaning they will not be subject to additional CEQA review. In other cases, the development projects may be exempt from additional VMT analysis under the City's VMT guidelines, which provide various screening criteria to exempt residential projects from VMT, including:

- Projects generating fewer than 100 vehicle trips per day.
- Projects located in a low VMT area (less than 85 percent of regional average) and within ½-mile of an existing "major transit stop" or within ½-mile of a "high-quality transit corridor."
- Affordable housing developments with 100 percent affordable units, either in a low VMT area or within ½-mile of an existing major transit stop or within ½-mile of a high-quality transit corridor.
- Projects in compliance with the El Camino Real and Downtown Specific Plan.

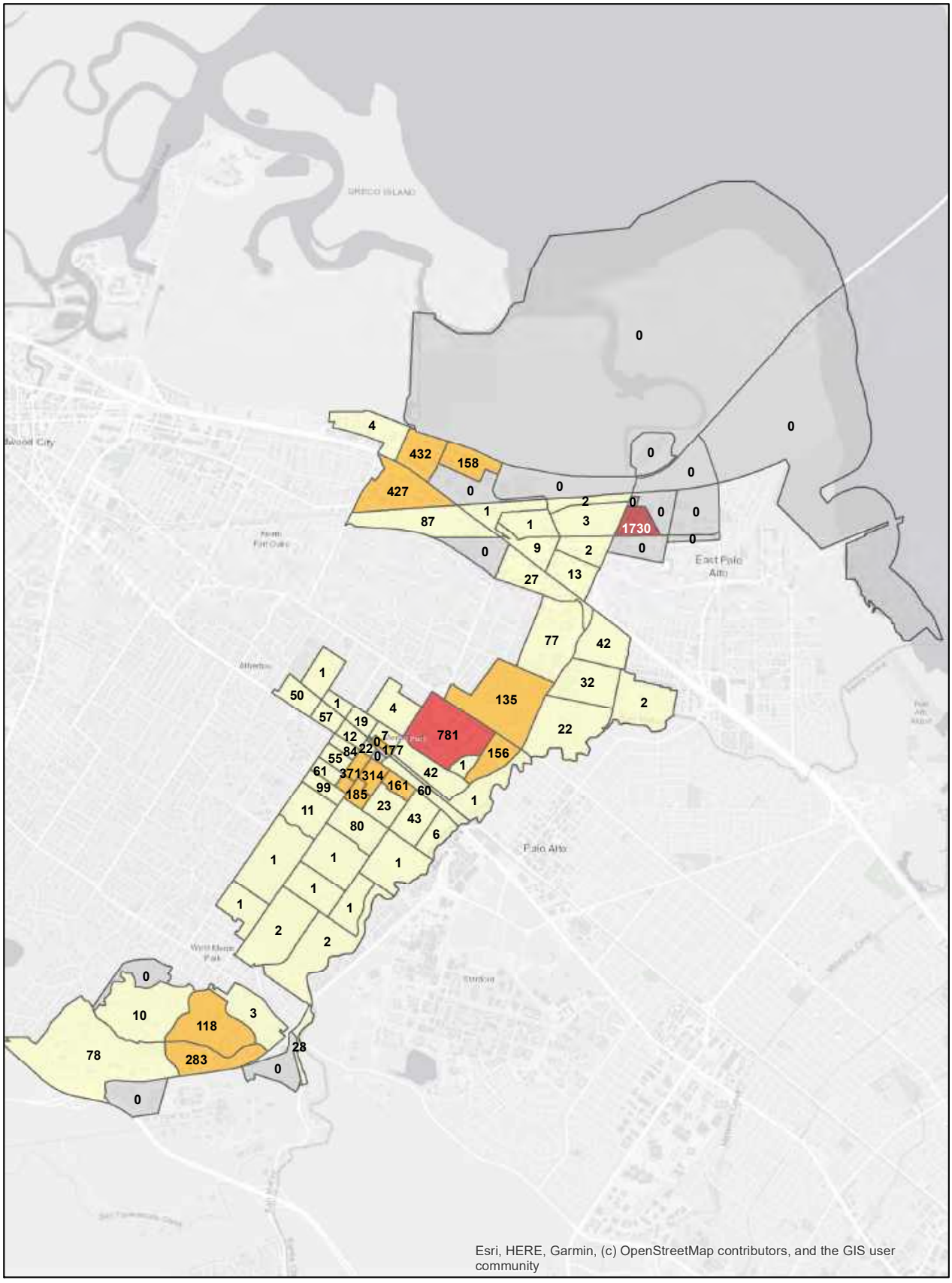

Figure 4.14-3
TAZ Level Increase in Units (Baseline + HEU Scenario vs. Baseline Scenario)

NORTH
Not to Scale

Future individual development projects allowed by the HEU that are subject to additional review and do not screen out of a VMT analysis would require a separate, project-specific VMT analysis. This analysis, which would be based on characteristics of the proposed project and its location, may result in exceedances of the VMT criteria of 15 percent below the regional average VMT per capita, particularly for housing sites that have limited access to transit. For this reason, the impact of the HEU is conservatively considered **Potentially Significant**, requiring mitigation.

Mitigation Measure TRANS-2: Implement VMT Reduction Measures.

Individual multifamily housing development proposals that do not screen out from VMT impact analysis shall provide a quantitative VMT analysis using the methods outlined by the City's most recent VMT guidelines. Projects that result in a significant impact shall include travel demand management measures and/or physical measures (i.e. improving multimodal transportation network, improving street connectivity) to reduce VMT, including but not limited to the measures below, which have been identified as potentially VMT reducing in the California Air Pollution Control Officers Association (CAPCOA) Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity (December 2021). Potential VMT reduction estimates are included below, but detailed requirements, calculation steps, and limitations are described in the CAPCOA Handbook. Additional measures may be proposed by individual projects and/or required by City staff to achieve the necessary VMT reductions or to meet applicable TDM reduction requirements.

- Unbundle parking costs (i.e. sell or lease parking separately from the housing unit). Effectiveness: up to 15.7 percent reduction in GHG from VMT per the CAPCOA Handbook.
- Provide car-sharing, bike sharing, or scooter sharing programs. Effectiveness: 0.15 – 0.18 percent reduction in GHG from VMT for car share, 0.02 – 0.06 percent for bike share, and 0.07 percent for scooter share, per the CAPCOA Handbook. The higher car share and bike share values are for electric car and bike share programs.
- Subsidize transit passes for residents of affordable housing. Effectiveness: up to 5.5 percent reduction in GHG from VMT per the CAPCOA Handbook.

Significance after Mitigation: Because the effectiveness of the above measures in reducing an individual project's VMT impact to a less than significant level cannot be determined until the specific characteristics of the project are known, the impact for projects which do not screen out from VMT impact analysis would conservatively remain **significant and unavoidable with mitigation**.

Impact TRANS-3: Implementation of the HEU would not result in designs for on-site circulation, access, and parking areas that fail to meet City or industry standard design guidelines. (Less than Significant Impact)

Subsequent projects under the HEU, including any new roadway, bicycle, pedestrian, and transit infrastructure improvements would be designed according to *ConnectMenlo* and other City standards and subject to existing regulations that are aimed at reducing hazardous conditions with respect to circulation. Additionally, future development would be concentrated on sites that are

already developed where impacts related to incompatible traffic related land uses would not likely occur. Therefore, the HEU would result in a **less than significant impact** to transportation hazards.

Mitigation Measure: None required.

Impact TRANS-4: Implementation of the HEU would not result in inadequate emergency access to development sites. (*Less than Significant Impact*)

There are no specific development projects associated with the HEU; and thus, specific housing sites developed under the HEU cannot be analyzed for their adequacy of emergency access at this time.

ConnectMenlo and other City standards and regulations include policies that would ensure efficient circulation and adequate access are provided in the City, which would help facilitate emergency response. Additionally, future development would be concentrated on sites that are already developed where impacts related to inadequate emergency access would not likely occur.

Additional vehicles associated with new development sites could increase delays for emergency response vehicles during peak commute hours. However, emergency responders maintain response plans that include use of alternate routes, sirens and other methods to bypass congestion and minimize response times. In addition, California law requires drivers to yield the right-of-way to emergency vehicles and remain stopped until the emergency vehicle passes to ensure the safe and timely passage of emergency vehicles.

Based on the above considerations, adequate emergency access would be provided to new development sites, and the impact would be **less than significant**. See Section 4.8, *Hazards and Hazardous Materials*, and Section 4.17, *Wildfire*, for further information regarding emergency access and egress.

Mitigation Measure: None required.

Cumulative Impacts

This section presents an analysis of the cumulative effects of the HEU in combination with other past, present, and reasonably foreseeable future development that could cause cumulatively significant impacts. Significant cumulative impacts related to transportation could occur if the incremental impacts of the HEU combined with the incremental impacts of cumulative development would be significant, and if the HEU's contribution would be considerable. Cumulative development projections for 2040 are included in the project description and described in Section 4.0.3, *Cumulative Impacts*.

Impact TRANS-5: Implementation of the HEU, in combination with cumulative development, would conflict with an applicable program, plan, ordinance, or policy establishing measures of effectiveness for the performance of addressing the circulation system, including transit, bicycle, and pedestrian facilities. (*Significant and Unavoidable Impact*)

As outlined in the discussion for Impact TRANS-1, the *ConnectMenlo* Final EIR identified significant and unavoidable impacts for pedestrian, bicycle, and transit facilities due to the lack of funding for necessary improvements, an impact that would also occur with the HEU. Under cumulative conditions, as shown in Table 3-5 in Chapter 3 of this SEIR, *Project Description*, the City would experience growth associated with *ConnectMenlo* and the HEU that is above and beyond the *ConnectMenlo* housing totals. No additional funding for necessary transportation improvements has been identified, and therefore the cumulative impact on pedestrian, bicycle and transit facilities would also be **significant and unavoidable**.

Impact TRANS-6: Implementation of the HEU, in combination with cumulative development, would exceed an applicable VMT threshold of significance. (Significant and Unavoidable Impact, with Mitigation)

The cumulative VMT evaluation analyzes whether the Citywide average residential VMT per capita would increase with the addition of the HEU in comparison to the baseline scenario.

The Cumulative + HEU scenario, as defined in Chapter 3, Table 3-5, includes buildout of *ConnectMenlo* and the currently pending General Plan Amendments, the 4,000 HEU units, and an estimated 299 units resulting from the buildout of parcels proposed for up-zoning. In total, the Cumulative + HEU scenario assumes an additional 4,299 households and 11,048 population compared to the cumulative no project scenario (see **Figure 4.14-4** for the TAZ level distribution of these units). The Cumulative + HEU scenario assumes a year 2040 horizon. As shown in Table 4.14-3 the model estimated the Citywide average residential VMT under the Cumulative + HEU scenario at 11.92 home-based VMT per capita.

TABLE 4.14-3
CUMULATIVE VMT EVALUATION

Scenario	Home-Based VMT	Population	Home-Based VMT per Capita
City of Menlo Park			
Baseline	492,487	40,438	12.18
Cumulative + HEU	758,444	63,610	11.92

SOURCE: Menlo Park Citywide travel demand forecast model, Hexagon Transportation Consultants, Inc., May 2022.

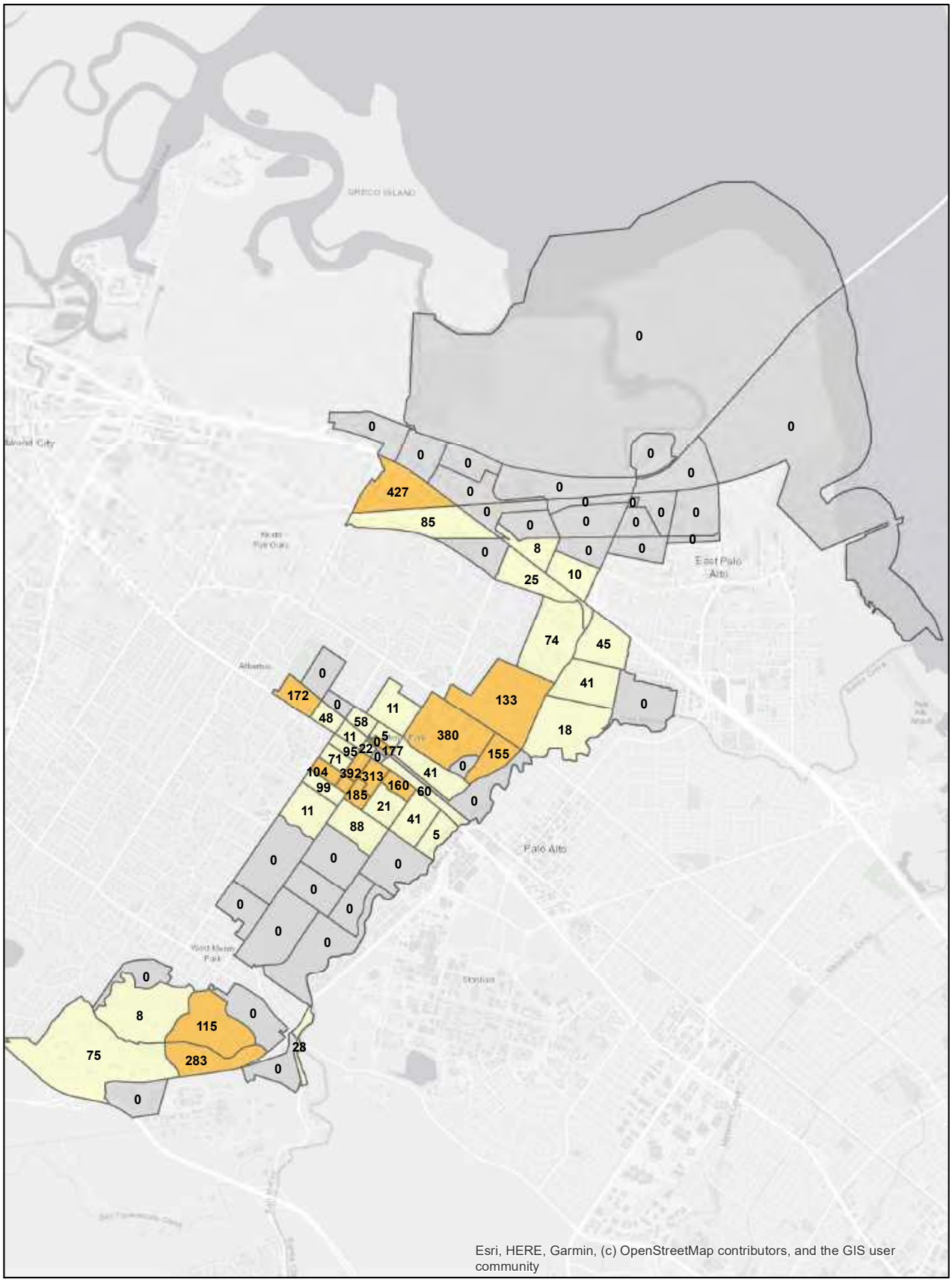

Figure 4.14-4
TAZ Level Increase in Units (Cumulative + HEU Scenario vs. Cumulative Scenario)

Although the Citywide residential VMT per capita under Cumulative + HEU scenario would be lower than the baseline scenario, and therefore, the HEU Plan would generate a less than significant cumulative VMT impact, as discussed under Impact TRANS-2, this analysis also considers the potential for impacts associated with future development allowed by the HEU. Not all future individual development proposals under the HEU will be able to screen out of a VMT analysis. Those that cannot be screened out will require a separate project-specific VMT analysis once the project characteristics and location are known. The results of that analysis may exceed the VMT criteria. For this reason, the cumulative impact of the HEU is conservatively considered **Potentially Significant**, requiring mitigation.

> **Mitigation Measure TRANS-2: Implement VMT Reduction Measures.**
>
> **Significance after Mitigation:** Mitigation Measure is the same as outlined under Mitigation Measure TRANS-2. Because the effectiveness of the above measures in reducing an individual project's VMT impact to a less than significant level cannot be determined in this analysis, the impact for projects which do not screen out from VMT impact analysis would conservatively remain cumulatively **significant and unavoidable with mitigation**.

Impact TRANS-7: Implementation of the HEU, in combination with cumulative development, would not result in designs for on-site circulation, access, and parking areas that fail to meet City or industry standard design guidelines. (Less than Significant Impact)

Subsequent projects under the HEU or the buildout of the upzoned areas, including any new roadway, bicycle, pedestrian, and transit infrastructure improvements would be designed according to *ConnectMenlo* and other City standards and subject to existing regulations that are aimed at reducing hazardous conditions with respect to circulation. Additionally, future development would be concentrated on sites that are already developed where impacts related to incompatible traffic related land uses would not likely occur. Therefore, the HEU would result in a **less than significant cumulative impact** to transportation hazards.

> **Mitigation Measure:** None required.

Impact TRANS-8: Implementation of the HEU, in combination with cumulative development, would not result in inadequate emergency access to development sites. (*Less than Significant Impact*)

There are no specific development projects associated with the HEU or the buildout of the upzoned areas; and thus, specific housing sites developed under the HEU or the buildout of the upzoned areas cannot be analyzed for adequacy of emergency access at this time.

ConnectMenlo and other City standards and regulations includes policies that would ensure efficient circulation and adequate access are provided in the City, which would help facilitate emergency response. Additionally, future development would be concentrated on sites that are already developed where impacts related to inadequate emergency access would not likely occur.

Additional vehicles associated with new development sites could increase delays for emergency response vehicles during peak commute hours. However, emergency responders maintain response plans which include use of alternate routes, sirens, and other methods to bypass congestion and minimize response times. In addition, California law requires drivers to yield the right-of-way to emergency vehicles and remain stopped until the emergency vehicle passes to ensure the safe and timely passage of emergency vehicles.

Based on the above considerations, adequate emergency access would be provided to new development sites, and the cumulative impact would be **less than significant**. See Section 4.8, *Hazards and Hazardous Materials*, and Section 4.17, *Wildfire*, for further information regarding emergency access and egress.

Mitigation Measure: None required.

4.14.5 References

City of Menlo Park. 2016a. *City of Menlo Park General Plan*. Available online: https://www.menlopark.org/146/General-Plan. Accessed February 23, 2022.

City of Menlo Park. 2016b. *Draft EIR for ConnectMenlo: General Plan Land Use & Circulation Elements and M-2 Area Zoning Update*. Available online: https://www.menlopark.org/1013/Environmental-Impact-Report. Accessed February 23, 2022.

City of Menlo Park. 2014. *City of Menlo Park Housing Element, 2015-2023*. Available online: https://beta.menlopark.org/files/sharedassets/public/community-development/documents/adopted-housing-element-2015-2023_20141202185715361 9.pdf. Accessed February 23, 2022.

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4.15 Tribal Cultural Resources

4.15.1 Introduction

This section evaluates the effects of the Housing Element Update (HEU) on tribal cultural resources, focusing on changes to the *ConnectMenlo* EIR (certified in 2016) that may result in new or more severe impacts, and describes any mitigation measures needed to address any such impacts.

Findings of the *ConnectMenlo* Final EIR

Tribal cultural resources impacts of the *ConnectMenlo* project were analyzed in Section 4.4 as part of the Cultural Resources impacts analysis of the *ConnectMenlo* Draft EIR. The *ConnectMenlo* Final EIR determined that the project would have the following impacts with respect to tribal cultural resources:

- CULT-5: Implementation of the proposed project would not cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code 21074. (*Less than Significant Impact, with Mitigation*)

Notice of Preparation Comments

The Notice of Preparation (NOP) for this SEIR was circulated on December 23, 2021, and a scoping meeting was held on January 24, 2022. The NOP and the comments received during the public comment period can be found in **Appendix A** of this SEIR. The City received scoping comments from the Native American Heritage Commission (NAHC) which recommended, pursuant to Public Resources Code Section 21074(a) [Assembly Bill 52 (AB 52)] and SB 18, that the City conduct consultation with tribes that are affiliated with the City of Menlo Park. The NAHC also recommended that the City conduct a cultural resources records search of the California Historical Resources Information System (CHRIS) and that an archaeological inventory survey report be prepared along with a search of the NAHC's Sacred Lands File (SLF).

Information Sources

The primary sources of information referenced in this section included those listed below. Please note that a full list of references for this topic can be found at the end of this section.

- City of Menlo Park General Plan (2016a).
- *ConnectMenlo* Draft EIR (2016b).
- City of Menlo Park Housing Element, 2015-2023 (2014).

4.15.2 Environmental Setting

Tribal cultural resources are sites, features, places, cultural landscapes, sacred places or objects, which are of cultural value to a tribe or tribes. These resources may also be on, or eligible for, listing in the National Register of Historic Places (National Register), California Register of Historical Resources (California Register), or be determined by the lead agency to be considered

tribal cultural resources. Tribal cultural resources also include pre-contact archaeological sites and human remains as discussed in Section 4.4, *Cultural Resources*, ethnographic sites, and historic-age landscapes and sites occupied, used, or spiritually and culturally valued by Native Americans.

ConnectMenlo EIR Section 4.4, *Cultural Resources*, contains a description of pre-contact, ethnographic, and historic settings in the City and surrounding area.

Tribal Cultural Resources Identified within the HEU Planning Areas

Native American Consultation

In accordance with the requirements of Senate Bill 18 (SB 18) and AB 52 (Public Resources Code Section 21074(a)), City staff conducted Native American outreach and consultation efforts. ESA submitted a request to the Native American Heritage Commission (NAHC) for a search of the NAHC Sacred Lands File and a list of contacts for tribes with traditional lands or cultural places within or near the housing opportunity sites and land use strategy sites identified in the HEU. The NAHC responded on July 25, 2021, with a letter that indicated the results of the search of the Sacred Lands File were positive. The letter included a list of Native American contacts. On August 23, 2021, the City sent tribal outreach letters to the nine Native American representatives from seven tribes that were identified by the NAHC to consult on the HEU.

The City received one response on November 24, 2021, from the Tamien Nation, who stated that they would like to be consulted regarding the undertaking (Geary, 2021). The City met with Tamien Nation representative Quirina Geary on April 20, 2022. During this meeting City staff discussed the HEU. Tamien Nation did not request any modifications to the DEIR or mitigation measures. No other responses were received within 90 days of receipt of the consultation letters, and no other responses were received as of November 4, 2022, the filing date of the DEIR..

Identification of Tribal Cultural Resources and Indigenous Cultural Resources

The results of the records search undertaken at the Northwest Information Center (NWIC) is detailed in Section 4.4, *Cultural Resources*. No pre-contact resources have been identified within the HEU housing opportunity sites and land use strategy sites, and twenty-two additional archaeological resources with a pre-contact component are recorded within the Menlo Park City boundary. No additional cultural resources were identified as a result of tribal consultation.

4.15.3 Regulatory Setting

The following section focuses on any changes to the regulatory setting that have occurred since certification of the *ConnectMenlo* EIR. In that EIR, Section 4.4, *Cultural Resources*, evaluated effects to cultural resources and tribal cultural resources. Section 4.4.1.1, *Regulatory Framework*, described regulations applicable to this topic, and that description is still current for this SEIR, except as noted below.

State

Assembly Bill 168 – Tribal Consultation under Streamlined Ministerial Approval Process (SB 35)

Assembly Bill 168 (AB 168), enacted in September 2020, amended the Government Code Sections 65400, 65913.4, and 65941.1, to add tribal consultation requirements to housing projects that would otherwise qualify for a streamlined ministerial approval process, which was mandated by Senate Bill 35 (SB 35) in 2017. SB 35 requires cities who are not meeting their demand for housing (as per the Regional Housing Needs Assessments) to allow developers to avoid the requirement of a CEQA document if the proposed housing meets specific requirements, such as the number of units, zoning, affordability, and avoidance of specific environmental impacts. AB 168 added a requirement to SB 35 to prescribe that developers must submit a preliminary application with information about the project and the local government and must conduct tribal consultation with tribes, similar to what is required by CEQA and AB 52, to identify if there are tribal cultural resources that may be impacted by the project. If impacts to tribal cultural resources are identified, the project is ineligible for SB 35 streamlining and is subject to CEQA.

Local

Menlo Park General Plan

The Menlo Park General Plan is a comprehensive long-range general plan for the physical development of the City of Menlo Park (City of Menlo Park, 2016a). The General Plan contains the current City of Menlo Park Housing Element, which was adopted in 2014 (City of Menlo Park, 2014). The various elements within the General Plan include goals and policies for the physical development of the City. Goals and policies related to tribal cultural resources are listed below.

Goal LU-7: Promote the implementation and maintenance of sustainable development, facilities and services to meet the needs of Menlo Park's residents, businesses, workers, and visitors.

***Policy LU-7.8 Cultural Resource Preservation*:** Promote preservation of buildings, objects, and site with historic and/or cultural significance.

Goal OSC-3: Protect and Enhance Historic Resources.

Policy OSC 3.1 Prehistoric or Historic Cultural Resources Investigation and Preservation: Preserve historical and cultural resources to the maximum extent practical.

Policy OSC 3.2 Prehistoric or Historic Cultural Resources Protection: Require significant historic or prehistoric artifacts be examined by a qualified consulting archaeologist or historian for appropriate protection and preservation, and to ensure compliance with local, State and Federal regulations.

Policy OSC 3.3 Archaeological or Paleontological Resources Protection: Protect prehistoric or historic cultural resources either on site or through appropriate documentation as a condition of removal. Require that when a development project has sufficient flexibility, avoidance and preservation of the resource shall be the primary mitigation measure, unless the City identifies superior mitigation. If resources are

documented, undertake coordination with descendants and/or stakeholder groups, as warranted.

Policy OSC 3.4 Prehistoric or Historic Cultural Resources Found During Construction: Require that if cultural resources, including archaeological or paleontological resources, are uncovered during grading or other on-site excavation activities, construction shall stop until appropriate mitigation is implemented.

Policy OSC 3.5 Consultation with Native American Tribes: Consult with those Native American tribes with ancestral ties to the Menlo Park City limits regarding General Plan Amendments and land use policy changes.

4.15.4 Environmental Impacts and Mitigation Measures

Scope of Analysis

The analysis in this SEIR describes impacts identified in the 2016 *ConnectMenlo* EIR, and describes how the impacts of the HEU would differ, as applicable.

Significance Thresholds

The thresholds used to determine the significance of impacts related to tribal cultural resources are based on Appendix G of the *CEQA Guidelines*. Implementation of the HEU would have a significant impact on the environment if it would:

- Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code §21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that: (i) is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code §5020.1(k), or (ii) is determined at the discretion of the lead agency to be significant pursuant to criteria set forth Public Resources Code §5024.1(c).

Methodology and Assumptions

This is a program-level SEIR that considers the potential impacts from implementing the HEU. While the HEU would be applicable Citywide, special focus was given to the HEU housing inventory sites. Impacts on cultural resources are evaluated using the criteria listed above and based on information included in the City of Menlo Park General Plan (2016) and the *ConnectMenlo* EIR (2016b).

Impacts and Mitigation Measures

Impacts

Impact TCR-1: Implementation of the HEU would not cause a substantial adverse change to previously unknown archaeological resources that are also tribal cultural resources, as defined in Public Resources Code Section 21074(a). (*Less than Significant Impact, with Mitigation*)

As stated in Section 4.4 of this SEIR, the *ConnectMenlo* EIR did not identify any archaeological resources within the City, but did identify Native American remains in the study area. The *ConnectMenlo* EIR found that it was 'highly improbable' that archaeological deposits dating to the pre-contact or historic era exist on the locations that were identified for future development, which was focused on the Bayfront portion of the City. The *ConnectMenlo* EIR stated that General Plan goals and policies (described above) and compliance with federal, State, and local laws and regulations would protect recorded and unrecorded archaeological deposits in the study area by providing for the early detection of potential conflicts between development and resource protection, and by preventing or minimizing the material impairment of the ability of archaeological deposits to convey their significance through excavation or preservation. However, the *ConnectMenlo* EIR did note that there was the potential for unrecorded archaeological resources to be significantly impacted.

As described above in the *Environmental Setting* and in *Section 4.4.2* of this SEIR, a records search of the housing opportunity sites and land use strategy sites and the wider Menlo Park City boundary identified previously recorded archaeological resources within both of these areas. Given the long history of pre-contact and historic-age human occupation, the City is considered sensitive for the presence of subsurface pre-contact Native American cultural resources and human remains. Additionally, there may be previously unknown buried archaeological resources and/or tribal cultural resources that have not been recorded. No tribal cultural resources have been identified during tribal consultation. However, the NAHC Sacred Lands File search had a positive result for sacred lands within the HEU housing opportunity sites and land use strategy sites.

Recent revisions to the Public Resources Code and the Government Code by AB 52 and AB 168 (SB 35) require local governments to consult with tribes during the review process for CEQA and for housing development projects that would otherwise be exempt from CEQA under changes made to the Government Code by SB 35.

The *ConnectMenlo* EIR found that there was a potential for the project to significantly impact tribal cultural resources and determined that implementation of Mitigation Measures CULT-2a, CULT-2b, and CULT-4 would mitigate potential impacts to a less than significant level (see Section 4.4 of this SEIR for the *ConnectMenlo* mitigation language).

As stated in Section 4.4 of this SEIR, *Cultural Resources*, Mitigation Measures CULT-2a and CULT-2b do not conform to current best practices with respect to inadvertent discovery. Therefore, this SEIR prescribes that the *ConnectMenlo* Mitigation Measures CULT-2a and CULT-2b be replaced with Mitigation Measures CR-2a and CR-2b, below, to address potential impacts to archaeological resources. Mitigation Measure CULT-4 from the *ConnectMenlo* EIR is

sufficient to address potential impacts to human remains and therefore has been adopted as part of this SEIR as Mitigation Measure CR-3.

While no tribal cultural resources have been identified within the housing opportunity sites and land use strategy sites as a result of tribal consultation, there is the potential for previously unknown archaeological resources or human remains that are also tribal cultural resources to be impacted by the residential development and this impact is **potentially significant.** Implementation of Mitigation Measures CR-2a, CR-2b, and CR-3 is prescribed below.

Mitigation Measure CR-2a. Cultural Resources Study Requirements.

The City shall ensure that a cultural resources records search is performed at the Northwest Information Center (NWIC) of the California Historical Resources Information System for the project area for multi-family development projects arising from the HEU that require ground disturbance (i.e., excavation, trenching, grading, etc.). To receive project approval, an archaeologist meeting the U.S. Secretary of the Interior's Standards (SOIS) for Archeology must review the results and identify if the project would potentially impact cultural resources. If the archaeologist determines that known cultural resources or potential archaeologically sensitive areas may be impacted by the project, a pedestrian survey must be conducted under the supervision of a SOIS-qualified archaeologist of all accessible portions of the project area, if one has not been completed within the previous five years. Additional research, including subsurface testing, monitoring during construction, and/or a cultural resources awareness training may be required to identify, evaluate, and mitigate impacts to cultural resources, as recommended by the SOIS-qualified archaeologist. If avoidance is not feasible, the City shall consult with California Native American tribes identified by the Native American Heritage Commission (NAHC) to be affiliated with Menlo Park for the purposes of tribal consultation under Chapter 905, California Statutes of 2004 (if the resource is pre-contact or indigenous) to determine treatment measures to avoid, minimize, or mitigate any potential impacts to the resource pursuant to PRC Section 21083.2 and CEQA Guidelines Section 15126.4. This shall include documentation of the resource and may include data recovery (according to PRC Section 21083.2), if deemed appropriate, or other actions such as treating the resource with culturally appropriate dignity and protecting the cultural character and integrity of the resource (according to PRC Section 21084.3). A cultural report detailing the results of the research shall be prepared and submitted for review by the City and a final draft shall be submitted to the NWIC. Once the report has been approved by the City, the City may issue appropriate permits.

Mitigation Measure CR-2b. Inadvertent Discovery of Cultural Resources.

If pre-contact or historic-era archaeological resources are encountered during project construction and implementation, the project applicant shall halt all construction activities within 100 feet and notify the City. Pre-contact archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil ("midden") containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-era materials might include stone, concrete, or adobe footings and walls; filled wells or privies; and deposits of metal, glass, and/or ceramic refuse. An archaeologist meeting the U.S. Secretary of the Interior's Standards (SOIS) for Archeology shall inspect the findings and work shall be stopped within 100 feet of the potential archaeological resource until the

material is either determined by the archaeologist to not be an archaeological resource or appropriate treatment has been enacted, with appropriate consultation, as needed.

If the City determines that the resource qualifies as a historical resource or a unique archaeological resource (as defined pursuant to the CEQA Guidelines) and that the project has potential to damage or destroy the resource, mitigation shall be implemented in accordance with PRC Section 21083.2 and CEQA Guidelines Section 15126.4, with a preference for preservation in place. If preservation in place is feasible, this may be accomplished through one of the following means: (1) siting improvements to completely avoid the archaeological resource; (2) incorporating the resource into a park or dedicated open space, by deeding the resource into a permanent conservation easement; (3) capping and covering the resource before building the project on the resource site after the resource has been thoroughly studied by a SOIS qualified archaeologist and a report written on the findings.

If preservation in place is not feasible, the City shall consult with California Native American tribes identified by the Native American Heritage Commissions (NAHC) to be affiliated with Menlo Park for the purposes of tribal consultation under Chapter 905, California Statutes of 2004 (if the resource is pre-contact or indigenous) to determine treatment measures to avoid, minimize, or mitigate any potential impacts to the resource pursuant to PRC Section 21083.2, and CEQA Guidelines Section 15126.4. This shall include documentation of the resource and may include data recovery (according to PRC Section 21083.2), if deemed appropriate by the archaeologist, in consultation with the City, or other actions such as treating the resource with culturally appropriate dignity and protecting the cultural character and integrity of the resource (according to PRC Section 21084.3).

Significance After Mitigation: Implementation of Mitigation Measures CR-2a and CR-2b would reduce the potential impact to a **less than significant** level because all projects with ground-disturbance would be reviewed by an SOIS qualified archaeologist and any potential archaeological resources identified would be evaluated and treated appropriately, including consulting with Native American representatives.

Mitigation Measure CR-3. Inadvertent Discovery of Human Remains.

Procedures of conduct following the discovery of human remains have been mandated by Health and Safety Code Section 7050.5, Public Resources Code Section 5097.98 and the California Code of Regulations Section 15064.5 (CEQA). According to the provisions in CEQA, if human remains are encountered, the project applicant shall ensure that all work in the immediate vicinity of the discovery shall cease and necessary steps are taken to ensure the integrity of the immediate area. The San Mateo County Coroner shall be notified immediately. The Coroner shall then determine whether the remains are Native American. If the Coroner determines the remains are Native American, the Coroner shall notify the NAHC within 24 hours, who will, in turn, notify the person the NAHC identifies as the Most Likely Descendant (MLD) of any human remains. Further actions shall be determined, in part, by the desires of the MLD. The MLD has 48 hours to make recommendations regarding the disposition of the remains following notification from the NAHC of the discovery. If the MLD does not make recommendations within 48 hours, the landowner shall, with appropriate dignity, reinter the remains in an area of the property secure from further disturbance.

Significance After Mitigation Implementation of Mitigation Measures CR-2a, CR-2b, and CR-3 would establish protocols to identify, evaluate, and address any potential impacts to previously unknown tribal cultural resources, and establish appropriate protocols to protect

cultural resources and human remains if they are inadvertently discovered during construction activities. With implementation of these measures, any potential impacts to tribal cultural resources would be reduced to a **less than significant** level.

Cumulative Impacts

This section presents an analysis of the cumulative effects of the HEU in combination with other past, present, and reasonably foreseeable future development that could cause cumulatively significant impacts. Significant cumulative impacts related to tribal cultural resources could occur if the incremental impacts of the HEU combined with the incremental impacts of cumulative development would be significant, and if the HEU's contribution would be considerable. Cumulative development projections for 2040 are included in the project description and described in Section 4.0.3, *Cumulative Impacts*.

Impact TCR-2: Implementation of the HEU, in combination with other cumulative projects, would not cause a substantial adverse change to previously unknown archaeological resources that are also tribal cultural resources, as defined in Public Resources Code Section 21074(a). (*Less than Significant Impact, with Mitigation*)

The geographic scope for cumulative impacts to tribal cultural resources comprises the entire City of Menlo Park. This geographic scope of analysis is appropriate because the archaeological and tribal cultural resources within this radius are expected to be similar to those that occur on the HEU housing opportunity sites and land use strategy sites because their proximity, similar environments, landforms, and hydrology are expected to have resulted in similar land uses over time. Based on the tribal consultation, the professional experience of the SEIR preparers, research, and the pre-contact context, the area of analysis may contain tribal cultural resources that have not been documented or recorded. Therefore, this analysis conservatively assumes that the land within this area contains tribal cultural resources that are not yet known. In this context, the incremental impacts of the HEU could combine with similar incremental impacts of other projects in the cumulative scenario to cause or contribute to a significant cumulative impact.

However, as discussed above under Impact TCR-1, the HEU would contribute a negligible **less than significant** incremental impact after the implementation of Measures CR-2a, CR-2b, and CR-3, which would require a Secretary of the Interior-qualified archaeologist to conduct a review of applicable projects prior to construction, the cessation of activities and buffering of inadvertent finds, training of construction personnel in cultural resource identification and inadvertent discovery procedures, and tribal consultation when indigenous resources are inadvertently identified during project construction. As a result, the HEU's incremental impact would not be cumulatively considerable and would not result in a significant cumulative effect.

Mitigation Measures (see Section 4.4, *Cultural Resources* or Section 4.15 *Tribal Cultural Resources*, of this Draft SEIR for the text of these measures)

Mitigation Measure CR-2a. Cultural Resources Study Requirements.

Mitigation Measure CR-2b. Inadvertent Discovery of Cultural Resources.

Mitigation Measure CR-3. Inadvertent Discovery of Human Remains.

Significance After Mitigation Implementation of Mitigation Measures CR-2a, CR-2b, and CR-3 would establish protocol to identify, evaluate, and address any potential impacts to previously unknown tribal cultural resources and establish appropriate protocols to protect cultural resources and human remains, that may also be tribal cultural resources, if they are inadvertently discovered during construction activities. With implementation of these measures, any cumulative potential impacts to tribal cultural resources would be reduced to a **less than significant** level.

4.15.5 References

City of Menlo Park. 2014. *City of Menlo Park Housing Element, 2015-2023*. Available online: https://beta.menlopark.org/files/sharedassets/public/community-development/documents/adopted-housing-element-2015-2023_201412021857153619.pdf. Accessed February 23, 2022.

City of Menlo Park. 2016a. *City of Menlo Park General Plan*. Available online: https://www.menlopark.org/146/General-Plan. Accessed February 23, 2022.

City of Menlo Park. 2016b. *Draft EIR for ConnectMenlo: General Plan Land Use & Circulation Elements and M-2 Area Zoning Update*. Available online: https://www.menlopark.org/1013/Environmental-Impact-Report. Accessed February 23, 2022.

Geary, 2021. Subject: [Sent to Planning] AB 52 – Request for Notification. Email from Quirina Geary, Tamien Nation to Menlo Park Planning Department. Sent November 24, 2021.

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4.16 Utilities and Service Systems

4.16.1 Introduction

This section evaluates the effects of the Housing Element Update (HEU) on utilities and service systems in Menlo Park, focusing on changes to the *ConnectMenlo* EIR (certified in 2016) that may result in new or more severe impacts, and describes any mitigation measures needed to address any such impacts.

Findings of the *ConnectMenlo* Final EIR

Utilities and service systems impacts of the *ConnectMenlo* project were analyzed in Section 4.14 of the *ConnectMenlo* Draft EIR. The *ConnectMenlo* Final EIR determined that the project would have the following impacts with respect to utilities and service systems:

- UTIL-1: Implementation of the proposed project would have sufficient water supplies available to serve the study area from existing entitlements, conservation plans and resources, and would not require new or expanded entitlements. (*Less than Significant Impact*)

- UTIL-2: Implementation of the proposed project would require or result in the construction of new water facilities or expansion of existing facilities, the construction of which would cause significant environmental effects. (*Less than Significant Impact*)

- UTIL-3: Implementation of the proposed project, in combination with past, present, and reasonably foreseeable projects, would result in less-than-significant cumulative impacts with respect to water service. (*Less than Significant Impact*)

- UTIL-4: Implementation of the proposed project would not exceed wastewater treatment requirements of the San Francisco Bay Regional Water Quality Control Board. (*Less than Significant Impact*)

- UTIL-5: Implementation of the proposed project would not require or result in the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which would cause significant environmental effects. (*Less than Significant Impact*)

- UTIL-6: Implementation of the proposed project would not result in the determination by the wastewater treatment provider, which serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments. (*Less than Significant Impact*)

- UTIL-7: Implementation of the proposed project, in combination with past, present, and reasonably foreseeable projects would result in less-than-significant cumulative impacts with respect to wastewater service. (*Less than Significant Impact*)

- UTIL-8: Implementation of the proposed project would be served by a landfill with sufficient permitted capacity to accommodate the proposed project's solid waste disposal needs. (*Less than Significant Impact*)

- UTIL-9: Implementation of the proposed project would comply with federal, State, and local statutes and regulations related to solid waste. (*Less than Significant Impact*)

- UTIL-10: Implementation of the proposed project, when considered with the other jurisdictions that divert solid waste to the Ox Mountain Landfill, could result in potential lack of landfill capacity for disposal of solid waste under cumulative conditions. (*Significant and Unavoidable Impact, with Mitigation*)

- UTIL-11: Implementation of the proposed project would not require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which would cause significant environmental effects. (*Less than Significant Impact*)

- UTIL-12: Implementation of the proposed project, in combination with past, present, and reasonably foreseeable future projects, would result in less-than-significant cumulative impacts with respect to stormwater infrastructure. (*Less than Significant Impact*)

- UTIL-13: Implementation of the proposed project would not result in a substantial increase in natural gas and electrical service demands, and would not require new energy supply facilities and transmission infrastructure or capacity enhancing alterations to existing facilities. (*Less than Significant Impact*)

- UTIL-14: Implementation of the proposed project, in combination with past, present, and reasonably foreseeable projects, would result in less-than-significant cumulative impacts with respect to energy conservation. (*Less than Significant Impact*)

Notice of Preparation Comments

The Notice of Preparation (NOP) for the SEIR was circulated on December 23, 2021, and a scoping meeting was held on January 24, 2022. The NOP and the comments received during the public comment period can be found in **Appendix A** of this SEIR. No comments relating to utilities and service systems were received during the NOP comment period.

Information Sources

The primary sources of information referenced in this section included those listed below. Please note that a full list of references for this topic can be found at the end of this section.

- City of Menlo Park General Plan (2016a).

- *ConnectMenlo* Draft EIR (2016b).

- Urban Water Management Plans (UWMP) for the Menlo Park Municipal Water and California Water Service (Bear Gulch District) (2021).

- Water Supply Assessment for the City of Menlo Park Housing Element Update (ESA, 2022).

- Willow Village Master Plan Project Draft EIR (2022).

4.16.2 Environmental Setting

The *ConnectMenlo* EIR (City of Menlo Park, 2016b) described utilities and service systems as they existed at the time of the EIR's preparation. The EIR described existing water, wastewater, stormwater, and solid waste facilities. The information provided below provides updates to the existing conditions information provided in the *ConnectMenlo* EIR.

Water Service

Water Service Providers

Potable water service in the City is provided by four service providers: Menlo Park Municipal Water(MPMW), California Water Service's Bear Gulch District , the O'Connor Tract Cooperative Water Company (O'Connor Water), and the Palo Alto Park Mutual Water Company (PAPMWC). **Figure 4.16-1** shows the boundaries of each provider's service area, as well as the HEU's proposed distribution of housing opportunity sites and land use strategy sites.

Menlo Park Municipal Water District

MPMW serves approximately half of the population of the City of Menlo Park with approximately 4,300 service connections. MPMW purchases all its potable water supply from the San Francisco Public Utilities Commission's (SFPUC) Regional Water System (RWS). However, MPMW does have one emergency groundwater well with other emergency wells planned in the future as part of its Emergency Water Storage/Supply Project. The district's potable water distribution system is split into three different pressure zones: (1) the Lower Zone, which serves areas east of El Camino Real; (2) the High Pressure Zone, which serves northern Menlo Park between Highway 101 and Bayfront Expressway, north of Chilco Street; and (3) the Upper Zone, which serves the residential Sharon Heights neighborhood and business parks along Sand Hill Road (MPMW, 2021).

California Water Service Bear Gulch District

Cal Water's Bear Gulch District serves the communities of Portola Valley, Woodside, Atherton, and portions of Menlo Park, Redwood City, and San Mateo County with more than 18,000 service connections. The district's potable water supply consists of local surface water (approximately nine percent) and of annual deliveries and water purchased from SFPUC RWS (Bear Gulch District, 2021). The District's distribution system consists of 57 pressure zones, 77 booster pumps, 35 storage tanks and reservoirs, 2,278 hydrants, and 289 miles of main. The District's tanks provide storage for more than 11 million gallons of potable water (City of Menlo Park, 2016b).

O'Connor Tract Cooperative Water District

O'Connor Water is a small district that serves approximately 300 dwelling units in a small area near Menlo Park's border with East Palo Alto (City of Menlo Park, 2016b). O'Connor Water's supply relies solely on groundwater which is obtained by two deep water wells. Water supply is pumped into a 100,000-gallon tank prior to distribution (O'Connor Water, 2022).

Palo Alto Park Mutual Water Company

The Palo Alto Park Mutual Water Company (PAPMWC) is a small district that serves a small number of residential properties located on eight parcels in the vicinity of Menalto Avenue and US 101 (City of Menlo Park, 2016b). The PAPMWC's supply relies solely on groundwater, which is obtained by five wells that range in depth from 70 to 480 feet. Water supply is pumped into two storage tanks with capacities of 11,500 and 350,000 gallons, respectively, prior to distribution (PAPMWC, 2022).

The housing opportunity sites and land use strategy sites identified in the HEU are not located within the service areas of O'Connor Water or the PAPMWC. Therefore, water supply associated with these districts is not affected by the HEU and is not discussed further in this SEIR.

Water Supply

Purchased Water

As discussed above, both the MPMW and Cal Water's Bear Gulch District purchase water from the SFPUC's RWS, which provides 81 mgd of water to the City and County of San Francisco and 184 mgd of water to 26 water agencies (wholesale customers) in Alameda, Santa Clara, and San Mateo counties. Approximately 85 percent of that water supply is provided by the Hetch Hetchy system, which diverts water from the Tuolumne River in the Sierra Nevada. The balance (approximately 15 percent) comes from runoff in the Alameda Creek watershed, which is stored in the Calaveras and San Antonio reservoirs, and runoff from the San Francisco Peninsula, which is stored in the Crystal Springs, San Andreas, and Pilarcitos reservoirs (which also provide storage for water delivered from the Hetch Hetchy Project) (ESA, 2022).

Both the MPMW and the Bear Gulch District purchase their water in accordance with the November 2018 Amended and Restated Water Supply Agreement between the City and County of San Francisco and its wholesale customers. The term of the agreement is 25 years, with a beginning date of July 1, 2009, and an expiration date of June 30, 2034. Per the agreement, the MPMW has an Individual Supply Guarantee (ISG) of 4.46 million gallons per day (mgd), or 1,630 million gallons per year, while the Bear Gulch District has an ISG of 35.68 mgd, or 39,993 acre-feet per year (AFY), which is shared among its Bear Gulch, Mid-Peninsula, and South San Francisco Districts (MPMW, 2021; Bear Gulch District, 2021).

Both the MPMW and the Bear Gulch District are members of the Bay Area Water Supply and Conservation Agency (BAWSCA), which represents the 26 agencies that depend on the SFPUC RWS. BAWSCA's role is to oversee and coordinate water conservation, water supply, and water recycling activities for member agencies; acquire water and make it available to other agencies on a wholesale basis; finance improvements to the RWS; and build facilities as necessary (City of Menlo Park, 2022).

Surface Water

Water that is self-supplied to agencies from streams, lakes and reservoirs is considered surface water supply. Although MPMW's potable water supply is originally derived from surface water, it is categorized as "purchased" water since the water is obtained from the SFPUC RWS. MPMW

does not currently, nor does it plan to in the future, use self-supplied surface water as part of its water supply portfolio (MPMW, 2021).

As discussed above, the Bear Gulch District obtains a small fraction of its supply (nine percent) from surface water, which supplements its main source of supply, purchased water. The source of this supplemental supply is Bear Gulch Creek, a perennial stream that flows from a watershed in the Coast Range Mountains northeast to its confluence with San Francisquito Creek and eventually into San Francisco Bay. Water from the Bear Gulch system is stored in Bear Gulch Reservoir. It is estimated that the long-term average annual diversion by the district from this source is 840 AFY (Bear Gulch District, 2021).

Recycled Water

West Bay Sanitary District (WBSD) provides wastewater collection services within the MPMW service area. It also acts as the recycled water purveyor. A limited volume of wastewater is treated within the MPMW service area at the Sharon Heights Recycled Water Facility (RWF). The facility is located at the Sharon Heights Golf Course, which is located in the Upper Zone, and is managed by the WBSD in coordination with the MPMW. In 2020, approximately 63 million gallons of wastewater was treated at the Sharon Heights RWF, of which 20 million gallons was supplied to the golf course to offset demand in potable water purchased from SFPUC, with the remaining 43 million gallons discharged by the WBSD into the San Francisco Bay (MPMW, 2021).

Planning for a similar recycled water facility in the Bayfront Area of Menlo Park is ongoing. WBSD anticipates that the project could deliver up to 72 million gallons per year of recycled water for irrigation, cooling towers, and other uses within the Bayfront Area starting around 2030 (MPMW, 2021).

With respect to Cal Water's Bear Gulch District, they and other partners are currently coordinating an effort to potentially develop recycled water for various uses in the San Francisco Peninsula region. However, a recycled water system for beneficial use within the district is not planned at this time (Bear Gulch District, 2021).

Water Treatment

Menlo Park does not own or operate a water treatment plant (WTP). Water from SFPUC's RWS is treated at three plants serving the Hetch Hetchy, Alameda, and Peninsula water delivery systems. Water derived from the Hetch Hetchy system is treated by the Tesla WTP, which has a capacity of 315 mgd. Water derived from Alameda and Peninsula systems is treated at one of two treatment plants, the Sunol Valley WTP or the Harry Tracy WTP. The Sunol Valley WTP treats water from the Alameda system, and has a capacity of 160 mgd, while the Harry Tracy treats water from the Peninsula system, and has a capacity of 140 mgd (City of Menlo Park, 2022).

Water from the Bear Gulch system is treated at the Bear Gulch WTP, which has a capacity of 6.0 mgd.

Wastewater

Wastewater collection and conveyance service for a majority of Menlo Park is provided by the West Bay Sanitary District (WBSD) with small areas along Haven Avenue served by the Fair Oaks Sewer Maintenance District (FOSMD), and small portions of the Willows neighborhood in the O'Connor area served by the East Palo Alto Sanitary District (EPASD) (City of Menlo Park, 2016b). Wastewater collected by the WBSD in the City is treated by Silicon Valley Clean Water (SVCW), a joint powers authority comprised of the City of Belmont, City of Redwood City, City of San Carlos, and WBSD. The SVCW owns and operates a wastewater treatment plant (WWTP), including support facilities necessary for the operation and maintenance of the plant, wastewater conveyance system force mains, five wastewater conveyance pump stations, and an effluent outfall into the San Francisco Bay (SVCW, 2020). Wastewater collected by the FOSMD is also treated at SVCW WWTP while wastewater collected by the EPASD is treated by the City of Palo Alto's Regional Water Quality Control Plant (City of Menlo Park, 2016b).

The housing opportunity sites and land use strategy sites identified in the HEU are not located within the service areas of the FOSMD or EPASD. Therefore, wastewater collection and treatment associated with these districts is not discussed further.

Wastewater Collection

The WBSD operates and maintains approximately 220 miles of gravity sewer mains in size from 2 to 54 inches in diameter. The system serves more than 20,000 connections, including residential, commercial, and industrial users, and contains 150 miles of private lateral sewers (WBSD, 2011, 2022). Raw wastewater in Menlo Park is conveyed to the Menlo Park Pump Station, which is owned by the WBSD, and operated by SVCW, and then conveyed to the SVCW's WWTP via a force main owned and operated by SVCW (City of Menlo Park, 2016b).

Wastewater Treatment

The SVCW WWTP has an average dry weather flow permitted capacity of 29 million gallons per day (mgd), and a peak wet weather flow capacity of 71 mgd (San Francisco Bay RWQCB, 2018). As reported by the RWQCB, from October 2012 through August 2017, the SVCW WWTP treated an average of 13.5 mgd, with a maximum instantaneous flow of 50 mgd (City of Menlo Park, 2022). Both rates are well within the 29 mgd average dry-weather design flow and 71 mgd peak wet-weather design flow.

Stormwater

The storm drain system in Menlo Park is maintained by the Menlo Park Public Works Department and consists of 17 individual systems that serve 17 drainage areas. The system includes 44 miles of storm drain pipe and 1,000 inlets or catch basins. The City's storm drainage facilities include storm drain pipes, pump stations, and street networks which work as an integrated system to collect, convey, and discharge stormwater to the downstream open channels or San Francisco Bay. The major drainage areas are the Pump Station Drainage Area, the Tidal Atherton Major Drainage Area, the San Francisquito Major Drainage Area and the Atherton Major Drainage Area. The facilities include approximately 46.4 miles of pipes, 18 miles of open channels, street curbs and gutters, drainage inlets, and other associated storm drainage structures.

Significant portions of the system continue to be unable to provide conveyance for a 10-year storm event. As a result, unintentional stormwater detention occasionally occurs during periods of high flows (City of Menlo Park, 2016b).

The City requires that new development treat all stormwater be treated on-site through Low Impact Development (LID) features such as biological treatments, detentions, and rain gardens. If the geological conditions of a development site do not allow these kinds of biological treatments (e.g., clay layers), the City continues to require that mechanical treatment be installed and maintained on-site at the owner's expense (City of Menlo Park, 2016b).

Solid Waste

Recology Incorporated provides solid waste collection and conveyance service for Menlo Park. Solid waste collected in the City is first conveyed to the Shoreway Environmental Center in San Carlos for process and shipment. The facility is owned by RethinkWaste, a joint powers authority comprised of 12 public agencies, including Menlo Park, and operated by South Bay Recycling. The Shoreway Environmental Center serves as a regional solid waste and recycling facility for the receipt, handling, and transfer of refuse, recyclables and organic materials collected from the RethinkWaste service area (City of Menlo Park, 2022).

Materials not composted or recycled at Shoreway are sent to several different landfills, with most going to the Ox Mountain Landfill (also known as Corinda Los Trancos Landfill) near Half Moon Bay (City of Menlo Park, 2022). This facility has a permitted throughput capacity of 3,598 tons of solid waste per day and currently averages approximately 1,650 tons of solid waste per day for disposal (including construction/demolition, and municipal waste). The Ox Mountain Landfill has a remaining capacity of 22,180,000 cubic yards and is estimated to reach permitted disposal capacity by the year 2034 (CalRecycle, 2022).

In 2020, Menlo Park had a residential per capita solid waste disposal rate of 4.1 pounds per day (ppd), which was less than the City's target residential per capita rate of 7.5 ppd (CalRecycle, 2020).

Electricity

Electricity service in Menlo Park is provided by Pacific Gas & Electric (PG&E) and Peninsula Clean Energy (PCE), a community choice energy program. The company's electricity distribution system consists of 106,681 circuit miles of electric distribution lines and 18,466 circuit miles of interconnected transmission lines (PG&E, 2022a). "The Grid," or bulk electric grid, is a network of high-voltage transmission lines linking power plants with the PG&E system. The distribution system, comprised of lower voltage secondary lines, is at the street and neighborhood level, and consists of overhead or underground distribution lines, transformers, and individual service "drops" that connect to the individual customer. The PCE uses PG&E's distribution system to serve Menlo Park customers (City of Menlo Park, 2022).

Natural Gas

Natural gas service in Menlo Park is provided by PG&E. The company's natural gas distribution system consists of 42,141 miles of natural gas distribution lines and 6,438 miles of transmission lines (PG&E, 2022a). Natural gas is delivered to the City by regional transmission pipelines that run through the eastern portion of the City along US-101 (Bayshore Freeway) and the western edge of the City along Interstate 280 (PG&E, 2022b). Distribution gas pipelines are located throughout the City.

Telecommunications

Telecommunications service in Menlo Park is provided to residents and businesses in the City by the following providers: Atherton Fiber, Sonic, XFINITY from Comcast, AT&T, Earthlink, Wave Broadband, Viasat Internet, Zayo, Lumen, Verizon, and HughesNet (BroadbandNow, 2022). Telecommunications facilities in the City consist of underground conduits and overhead cables.

4.16.3 Regulatory Setting

The following section focuses on any changes to the regulatory setting that have occurred since certification of the *ConnectMenlo* EIR. Draft EIR Section 4.14, *Utilities and Service Systems*, evaluated effects to Utilities and Service Systems. There, Section 4.14.1.1, *Regulatory Framework*, described regulations applicable to this topic, and that description is still current for this SEIR, except as noted below.

Federal

National Pollutant Discharge Elimination System

The National Pollutant Discharge Elimination System (NPDES) permit program was established in the CWA to regulate municipal and industrial discharges to surface waters in the United States. Wastewater discharges are regulated under the NPDES permit program for direct discharges to receiving waters as well as the National Pretreatment Program for indirect discharges to sewage treatment plants. Operation of the SVCW WWTP and its wastewater conveyance system is governed by the waste discharge requirements found in RWQCB Order No. R2-2018-0005 (NPDES No. CA0038369) effective April 1, 2018, and expiring March 31, 2023 (San Francisco Bay RWQCB, 2018). These permits are typically updated every five years to reflect changes in conditions and new or revised State and federal regulations. Development projects proposed after expiration of the current RWQCB permit would be subject to the most current regulations as provided for in the updated permit.

State

Urban Water Management Planning Act

California Water Code Section 10610 et seq. requires all public water systems that provide water for municipal purposes to more than 3,000 customers, or that supply more than 3,000 AFY, to prepare a UWMP. UWMPs are key water supply planning documents for municipalities and water purveyors in California, and often form the basis of Water Supply Assessments (WSAs)

(refer to the following discussion of Senate Bill [SB] 610 and SB 221) prepared for individual projects. UWMPs must be updated at least every 5 years on or by July 1 in years ending in 1 and 6. The MPMW adopted its 2020 UWMP in May 2021 (MPMW, 2021) and the Cal Water Bear Gulch District adopted its 2020 UWMP in June 2021 (Bear Gulch District, 2021).

Senate Bills 610 and 221

The purpose and legislative intent of SB 610 and SB 221, enacted in 2001, is to require specific evaluations be performed and documented by the local water provider that indicate there are sufficient water supplies available to meet the project's anticipated water demand. SB 610 requires the local water provider for a large-scale development project to prepare a WSA.[1] The WSA evaluates the water supply available for new development based on anticipated demand. The WSA must be included in the environmental document. The lead agency may evaluate the information presented in the WSA, and then must determine whether the projected water supplies would be sufficient to satisfy the project's demands in addition to existing and planned future uses. Completion of a WSA requires collection of proposed water supply data and information relevant to the project in question, an evaluation of existing/current use, a projection of anticipated demand sufficient to serve the project for a period of at least 20 years, delineation of proposed water supply sources, and an evaluation of water supply sufficiency under single-year and multiple-year drought conditions.

A WSA has been prepared addressing water supplies and demand posed by the proposed HEU for the MPWM and Cal Water Bear Gulch District systems and is included as **Appendix D** of this SEIR. The conclusions of the WSA are described and analyzed in Impact UT-2, below.

SB 221 addresses water needs when a project involves a subdivision which will produce more than 500 residential units (hence it does not apply to the HEU, since no specific projects are yet proposed). It requires the local water provider to provide "written verification" of "sufficient water supplies" to serve the subdivision per Government Code Section 66473.7. Sufficiency is different under SB 221 than under SB 610. Under SB 221, sufficiency is determined by considering:

- The availability of water over the past 20 years;
- The applicability of any urban-water shortage contingency analysis prepared in compliance with Water Code Section 10632;
- The reduction in water supply allocated to a specific use by an adopted ordinance; and

[1] All projects that meet any of the following criteria require a WSA: (1) A proposed residential development of more than 500 dwelling units; (2) a proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space; (3) a proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space; (4) a proposed hotel or motel, or both, having more than 500 rooms; (5) a proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area; (6) a mixed-use project that includes one or more of the projects specified in SB 610; or (7) a project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500-dwelling-unit project.

- The amount of water that can be reasonably relied upon from other water supply projects, such as conjunctive use, reclaimed water, water conservation, and water transfer.

As a result of the information contained in the written verification, a city or county may attach conditions during the tentative map approval process to ensure that an adequate water supply is available to serve the proposed plan. If the verification relies on projected water supplies that are not currently available, it must include detailed information about the source of the new water, the financing for any capital outlays required, the securing of applicable federal, state and local permits for any necessary infrastructure to deliver the water, and any necessary regulatory approvals. Typically, following project certification, an additional water supply verification must be completed at the tentative map stage, prior to adoption of the final map, for certain tentative maps.

Senate Bill 1383

SB 1383 established targets to achieve a 50 percent reduction in the level of the statewide disposal of organic waste from the 2014 level by 2020 and a 75 percent reduction by 2025. SB 1383 granted CalRecycle the regulatory authority required to achieve the organic waste disposal reduction targets. It also established a target of recovering not less than 20 percent of currently disposed edible food for human consumption by 2025. A report issued by CalRecycle in 2020 determined that the State was falling short of the law's targets (CalRecycle, 2020).

California Green Building Standards Code

Water and Wastewater

Part 11 of the Title 24 Building Energy Efficiency Standards is referred to as the California Green Building Standards Code (CALGreen Code). The CALGreen Code is intended to encourage more sustainable and environmentally friendly building practices, conserve natural resources, and promote the use of energy-efficient materials and equipment. Since 2011, the CALGreen Code has been mandatory for all new residential and non-residential buildings constructed in the state. Mandatory measures related to water conservation include water-conserving plumbing fixtures and efficient landscape standards for outdoor potable water use in landscape areas, and recycled water systems, where available. The CALGreen Code was most recently updated in 2019 to include new mandatory measures for residential and non-residential uses; the 2019 amendments to the CALGreen Code became effective January 1, 2020. Updates include more stringent requirements for residential metering faucets, and a requirement that all residential and non-residential developments adhere to a local water efficient landscape ordinance or to the State of California's Model Water Efficient Landscape Ordinance, whichever is more stringent.

Solid Waste

As amended, the CALGreen Code (California Code of Regulations Title 24, Part 11) requires that readily accessible areas be provided for recycling by occupants of residential buildings. The CALGreen Code also requires that residential building projects recycle and/or salvage for reuse a minimum of 65 percent of their non-hazardous construction and demolition waste, or comply with a local construction and demolition waste management ordinance, whichever is more stringent (Section 5.408.1). The 2016 version of the code increased the minimum diversion requirement for non-hazardous construction and demolition waste to 65 percent from 50 percent

(in the 2013 and earlier versions) in response to AB 341, which declared the policy goal of the state that not less than 75 percent of solid waste generated would be source reduced, recycled, or composted by 2020.

Executive Order N-10-21

Executive Order N-10-21, signed by Governor Newsom on July 8, 2021, aimed to preserve California's surface and groundwater supplies, and better prepare for the potential of continued dry conditions. The order, in joining existing efforts by agricultural water users, public water systems, and governmental agencies to respond to water shortages, urged Californians to reduce their water use by 15 percent from their 2020 levels. The State Water Resources Control Board tracks and reports monthly on the State's progress toward achieving a 15 percent reduction in statewide urban water use as compared to 2020 use.

January 2022 Drought Water Conservation Emergency Regulation

On January 4, 2022, the State Water Resources Control Board (SWRCB) adopted an emergency regulation by resolution, which became effective on January 18, 2022. It establishes water conservation requirements to address California's continued drought state of emergency by reducing outdoor water use.

May 2022 Drought Water Conservation Emergency Regulation

On May 24, 2022, the SWRCB adopted an additional emergency resolution specific to outdoor landscape watering restrictions. Among other restrictions, the regulation restricts landscape irrigation to two days per week, and restrictions on the watering of turf.

Regional

2018 Bay-Delta Plan Amendment

In December 2018, the SWRCB adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, which establishes water quality objectives to maintain the health of the rivers and the Bay-Delta ecosystem (SWRCB, 2018). Among the goals of the adopted Bay-Delta Plan Amendment is to increase salmonid populations in the San Joaquin River, its tributaries (including the Tuolumne River), and the Bay-Delta. Specifically, the plan amendment requires increasing flows in the Stanislaus, Tuolumne, and Merced rivers to 40 percent of unimpaired flow[2] from February through June every year, whether it is wet or dry. During dry years, this would result in a substantial reduction in the SFPUC's water supplies from the Tuolumne River watershed.

If this plan amendment is implemented, the SFPUC would be able to meet the projected water contractual obligations to its wholesale customers as presented in the SFPUC 2020 UWMP in normal years but would experience significant supply shortages in dry years. Implementation of the Bay-Delta Plan Amendment would result in substantial dry-year water supply shortfalls throughout the SFPUC's RWS service area, including Menlo Park and the areas served by BGD.

[2] "Unimpaired flow" represents the water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds.

In single dry years, supply shortages for SFPUC's wholesale customers collectively, would range from 36 to 46 percent. In multiple dry years for SFPUC's wholesale customers collectively, supply shortages would range from 36 to 54 percent. Implementation of the Bay-Delta Plan Amendment will require rationing in all single dry and multiple dry years through 2045. If the Bay-Delta Plan Amendment is not implemented, SFPUC would be able to meet 100 percent of the projected purchases of its wholesale customers during all year types through 2045 except during the fourth and fifth consecutive dry years for base year 2045 when 15 percent wholesale supply shortages are projected.

The SWRCB has stated that it intends to implement the plan amendment by the year 2022, assuming all required approvals are obtained by that time. However, at this time, implementation of the Bay-Delta Plan Amendment has not occurred and is uncertain for several reasons. First, since adoption of the Bay-Delta Plan Amendment, over a dozen lawsuits have been filed in both state and federal court challenging the SWRCB's adoption of the Bay-Delta Plan Amendment, including two legal challenges filed by the federal government at the request of the U.S. Department of Interior, Bureau of Reclamation in state and federal courts. These cases are in the early stage and there have been no dispositive court rulings to date or projections when the cases may be resolved.

Second, the Bay-Delta Plan Amendment is not self-executing and does not allocate responsibility for meeting its new flow requirements to the SFPUC or any other water rights holders. Rather, the plan amendment merely provides a regulatory framework for flow allocation, which must be accomplished by other regulatory and/or adjudicatory proceedings, such as a comprehensive water rights adjudication or, in the case of the Tuolumne River, the Clean Water Act section 401 certification process in the Federal Energy Regulatory Commission's (FERC) relicensing proceeding for Don Pedro Dam. The license amendment process is currently expected to be completed in the 2022–2023 timeframe. This process and other regulatory and/or adjudicatory proceedings would likely face legal challenges and have lengthy timelines, and quite possibly could result in a different assignment of flow responsibility for the Tuolumne River than currently exists (and therefore a different water supply effect on the SFPUC).

Third, in recognition of the obstacles to implementation of the Bay-Delta Plan Amendment, the SWRCB directed its staff to help complete a "Delta watershed-wide agreement, including potential flow measures for the Tuolumne River" by March 1, 2019, and to incorporate such agreements as an "alternative" for a future amendment to the Bay-Delta Plan to be presented to the [SWRCB] as early as possible after December 1, 2019." In accordance with the SWRCB's instruction, on March 1, 2019, SFPUC, in partnership with other key stakeholders, submitted a proposed project description for the Tuolumne River that could be the basis for a voluntary substitute agreement with the SWRCB ("March 1st Proposed Voluntary Agreement"). On March 26, 2019, the SFPUC adopted Resolution No. 19-0057 to support SFPUC's participation in the Voluntary Agreement negotiation process. To date, those negotiations are ongoing under the California Natural Resources Agency and California Environmental Protection Agency and the leadership of the Governor Newsom administration. The negotiations for a voluntary agreement have made significant progress since an initial framework was presented to the SWRCB on

December 12, 2018. The package submitted on March 1, 2019 is the product of renewed discussions since Governor Newsom took office.[3]

In June 2021, in response to various comments from wholesale customers regarding the reliability of the RWS as described in SFPUC's 2020 UWMP, the SFPUC provided a memorandum describing SFPUC's efforts to remedy the potential effects of the Bay-Delta Plan Amendment. As described in the memorandum, SFPUC's efforts include the following:

- Pursuing a Tuolumne River Voluntary Agreement
- Evaluating the drought planning scenario in light of climate change
- Pursuing alternative water supplies
- Litigating with the State over the Bay-Delta Plan Amendment
- Litigating with the State over the proposed Don Pedro FERC Water Quality Certification

For these reasons it is unknown whether, when, and the form in which the Bay-Delta Plan Amendment will be implemented, and how those amendments will affect the SFPUC's water supply.

Water Shortage Allocation Plan

In anticipation of the Bay-Delta Plan Amendment adoption, the SFPUC and the wholesale members agreed upon and adopted the Water Shortage Allocation Plan (WSAP) as part of the November 2018 Amended and Restated Water Supply Agreement. The plan provides a formula for the SFPUC to use to determine the available water supply in drought years for shortages up to 20 percent on an average, system-wide basis. Under the agreement, reductions to wholesale customers are to be based on each agency's proportional purchases of water from the SFPUC during the year immediately preceding the onset of shortage, unless this formula is supplanted by a water conservation plan agreed to by all parties.

The WSAP was necessary because the default formula in the previous agreement, signed in 2009, discouraged wholesale customers from reducing purchases during normal or wet years by applying demand management programs (conservation measures) or pursuing alternative supplies (groundwater, water recycling, transfers, etc.). The WSAP somewhat addressed this issue by basing the allocation formula on the three immediate years preceding the shortage and allowing transfers of banked water credits (water within a drought allotment that is not used).

The WSAP consists of two components. The Tier One component allocates water between San Francisco and the wholesale customer agencies collectively. In a called 20 percent reduction by the SFPUC, the City and County of San Francisco will only face an 18 percent reduction. The Tier Two component allocates the collective wholesale customer share among each of the 26 wholesale customers. This allocation is based on a formula that considers three factors, the first

[3] In late October 2021, State regulators announced that these negotiations stopped before an agreement was reached. It is unclear whether or when negotiations might be reinitiated.

two of which are fixed: 1) each agency's ISG from SFPUC, with certain exceptions, and 2) each agency's purchases from SFPUC during the three years preceding adoption of the Plan. The third factor is the agency's rolling average of purchases of water from SFPUC during the three years immediately preceding the onset of shortage.

Alternative Water Supply Program

In early 2020, the SFPUC began implementation of the Alternative Water Supply Planning Program (AWSP), a program designed to investigate and plan for new water supplies to address future long-term water supply reliability challenges and vulnerabilities of the RWS, particularly in light of the possible implementation of the Bay-Delta Plan Amendment.

Included in the AWSP is a suite of diverse, non-traditional supply projects that, to a great degree, leverage regional partnerships and are designed to meet the water supply needs of the SFPUC Retail and Wholesale Customers through 2045SFPUC has budgeted $264 million over the next ten years to fund water supply projects. The drivers for the program include: 1) adoption of the Bay-Delta Plan Amendment and resulting potential limitations to RWS supply during dry years; 2) the net supply shortfall following implementation of SFPUC's Water System Improvement Plan (WSIP)[4]; 3) San Francisco's perpetual obligation to supply 184 mgd to the Wholesale Customers; 4) adopted Level of Service Goals to limit rationing to no more than 20 percent system-wide during droughts; and 5) the potential need to identify water supplies that would be required to offer permanent status to interruptible customers.

The SFPUC is considering several water supply options and opportunities to meet all foreseeable water supply needs, including surface water storage expansion, recycled water expansion, water transfers, desalination, and potable reuse. These efforts and their expected benefit to supply reliability are listed below, and described in further detail in the 2020 UWMPs prepared by the MPMW and Bear Gulch District, and the SFPUC 2020 UWMP:

- Daly City Recycled Water Expansion (Regional; Normal and Dry-Year Supply)
- Alameda County Water District – Union Sanitary District Purified Water Partnership (Regional; Normal and Dry-Year Supply)
- Crystal Springs Purified Water (Regional; Normal and Dry-Year Supply)
- Los Vaqueros Reservoir Expansion (Regional; Dry-Year Supply)
- Bay Area Brackish Water Desalination (Regional; Normal and Dry-Year Supply)
- Calaveras Reservoir Expansion (Regional; Dry-Year Supply)

[4] The Water System Improvement Program (WSIP) is a $4.8 billion-dollar, multi-year capital program to upgrade the SFPUC's regional and local water systems. The program repairs, replaces, and seismically upgrades crucial portions of the Hetch Hetchy Regional Water System. The program consists of 87 projects (35 local projects located within San Francisco and 52 regional projects) spread over seven counties from the Sierra foothills to San Francisco. The San Francisco portion of the program is 100 percent complete as of October 2020. The Regional portion is approximately 99 percent complete. The current forecasted date to complete the overall WSIP is May 2023.

- Groundwater Banking (Dry-Year Supply)
- Inter-Basin Collaborations

Capital projects under consideration would be costly and are still in the early feasibility and conceptual planning stages. The exact yields from these projects are not quantified at this time, as these supply projects would take 10 to 30 years to implement and the exact amount of water that can be reasonably developed is currently unknown.

As with traditional infrastructure projects, there is a need to progress systematically from planning to environmental review, and then on to detailed design, permitting and construction of these alternative water supply projects. Given the complexity and inherent challenges, these projects will require a long lead time to develop and implement. SFPUC staff have developed an approach and timeline to substantially complete planning and initiate environmental review by July 2023 for a majority of the alternative water supply projects under consideration.

National Pollutant Discharge Elimination System Waste Discharge Regulations

Discharges of stormwater runoff from municipal separate storm sewer systems (MS4s) are regulated by the Municipal Regional Stormwater NPDES permit, under Order No. R2-2015-0049: NPDES Permit No. CAS612008, issued by the San Francisco Bay Regional Water Board.

Municipal Regional Permit 3.0

Under CWA Section 402(p), stormwater permits are required for discharges from MS4s that serve populations of 100,000 or more. The Municipal Regional Permit (MRP) manages the Phase I Permit Program (serving municipalities of more than 100,000 people), the Phase II Permit Program (for municipalities of fewer than 100,000 people), and the Statewide Storm Water Permit for the California Department of Transportation.

The SWRCB and the individual water boards implement and enforce the MRP. Multiple municipalities, including the City of Menlo Park, along with San Mateo County, are co-permittees.

Under Provision C.3 of the MRP, new and redevelopment projects that create or replace 10,000 square feet or more of impervious surface area, or 5,000 square feet or more of impervious surface area for regulated projects involving special land use categories (i.e., auto service, retail gasoline station, restaurant, and/or uncovered parking), are required to implement site design, source control, and LID–based stormwater treatment controls to treat post-construction stormwater runoff. LID–based treatment controls are intended to maintain or restore the site's natural hydrologic functions, maximizing opportunities for infiltration and evapotranspiration, and for using stormwater as a resource (e.g., rainwater harvesting for non-potable uses). The MRP also requires that stormwater treatment measures be properly installed, operated, and maintained.

In addition, the MRP requires new development and redevelopment projects that create or replace one acre or more of impervious surface to manage development-related increases in peak runoff

flow, volume, and duration, where such hydromodification is likely to cause increased erosion, generate silt pollutants, or cause other impacts on local rivers, streams, and creeks. Projects may be deemed exempt from these requirements if they do not meet the minimum size threshold, drain into tidally influenced areas or directly into San Francisco Bay, or drain into hardened channels, or if they are infill projects in sub-watersheds or catchment areas that are at least 65 percent impervious.

Local

Menlo Park General Plan

The Menlo Park General Plan is a comprehensive long-range general plan for the physical development of Menlo Park (City of Menlo Park, 2016a). The General Plan contains the current City of Menlo Park Housing Element, which was adopted in 2014. The various elements within the General Plan include goals and policies for the physical development of the City. Goals and policies related to utilities and services systems are listed below.

Goal LU-2: Maintain and enhance the character, variety and stability of Menlo Park's residential neighborhoods.

***Policy LU-2.6: Underground Utilities*.** Require all electric and communications lines serving new development to be placed underground.

Goal LU-7: Promote the implementation and maintenance of sustainable development, facilities and services to meet the needs of Menlo Park's residents, businesses, workers, and visitors.

***Policy LU-7.1: Sustainability*.** Promote sustainable site planning, development, landscaping, and operational practices that conserve resources and minimize waste.

***Policy LU-7.2: Water Supply*.** Support the efforts of the Bay Area Water Supply and Conservation Agency or other appropriate agencies to secure adequate water supplies for the Peninsula, to the extent that these efforts are in conformance with other City policies.

***Policy LU-7.3: Supplemental Water Supply*.** Explore and evaluate development of supplemental water sources and storage systems, such as wells and cisterns, for use during both normal and dry years, in collaboration with water providers and users.

***Policy LU-7.4: Water Protection*.** Work with regional and local jurisdictions and agencies responsible for ground water extraction to develop a comprehensive underground water protection program in accordance with the San Francisquito Creek Watershed Policy, which includes preservation of existing sources and monitoring of all wells in the basin to evaluate the long-term effects of water extraction.

***Policy LU-7.5: Reclaimed Water Use*.** Implement use of adequately treated "reclaimed" water (recycled/nonpotable water sources such as graywater, blackwater, rainwater, stormwater, foundation drainage, etc.) through dual plumbing systems for outdoor and indoor uses, as feasible.

***Policy LU-7.6: Sewage Treatment Facilities*.** Support expansion and improvement of sewage treatment facilities to meet Menlo Park's needs, as well as regional water quality standards, to the extent that such expansion and improvement are in conformance with other City policies.

Policy LU-7.9: Green Building. Support sustainability and green building best practices through the orientation, design, and placement of buildings and facilities to optimize their energy efficiency in preparation of State zero-net energy requirements for residential construction in 2020 and commercial construction in 2030.

Goal OSC-4: Promote Sustainability and Climate Action Planning. Promote a sustainable energy supply and implement the City's Climate Action Plan to reduce greenhouse gas emissions and improve the sustainability of actions by City government, residents, and businesses in Menlo Park. This includes promoting land use patterns that reduce the number and length of motor vehicle trips, and encourage recycling, reduction and reuse programs.

Policy OSC-4.2: Sustainable Building. Promote and/or establish environmentally sustainable building practices or standards in new development that would conserve water and energy, prevent stormwater pollution, reduce landfilled waste, and reduce fossil fuel consumption from transportation and energy activities.

Policy OSC-4.3: Renewable Energy. Promote the installation of renewable energy technology, such as, on residences and businesses through education, social marketing methods, establishing standards and/or providing incentives.

Policy OSC-4.4: Vehicles Using Alternative Fuel. Explore the potential for installing infrastructure for vehicles that use alternative fuel, such as electric plug in recharging stations.

Policy OSC-4.5: Energy Standards in Residential and Commercial Construction. Encourage projects to achieve a high level of energy conservation exceeding standards set forth in the California Energy Code for Residential and Commercial Development.

Policy OSC-4.6: Waste Reduction Target. Strive to meet the California State Integrated Waste Management Board per person target of waste generation per person per day through their source reduction, reuse, and recycling programs.

Policy OSC-4.7: Waste Management Collaboration. Continue to support and participate in efforts such as the South Bayside Waste Management Authority, which provides waste reduction, recycling, and solid waste programs and solutions.

Policy OSC-4.8: Waste Diversion. Develop and implement a zero-waste policy, or implement standards, incentives, or other programs that would lead the community towards a zero-waste goal.

Goal S-1: Ensure a Safe Community. Minimize risk to life and damage to the environment and property from natural and human-caused hazards, and assure community emergency preparedness and a high level of public safety services and facilities.

Policy S-1.6: Design and Location of Utilities. Monitor appropriate location, design, construction, maintenance and inspection standards for utility systems traversing hazard areas within the City limits. This would include evaluation and upgrading outdated systems and infrastructure, coordination with the State Public Utilities Commission and locating new utility systems away from potential hazard areas.

Menlo Park Municipal Code

Title 7, Health and Sanitation, and Title 12, Buildings and Construction, of the City of Menlo Park Municipal Code, include regulations relevant to water conservation as discussed below.

Chapter 7.35, Water Conservation

This chapter contains regulations and restrictions regarding water use in order to conserve water resources and eliminate wasteful water uses. Menlo Park Municipal Code Section 7.35.020 allows the City Council to adopt by resolution a water conservation plan and mandate water conservation measures in the event of adoption of emergency water conservation regulations by the SWRCB, SFPUC or the City.

Chapter 12.44, Water Efficient Landscaping Ordinance

This chapter, adopted in 2016 (Ordinance No. 968), establishes water-efficient landscaping standards to conserve water used for irrigation. The ordinance applies to all new landscapes greater than 500 square feet and rehabilitated landscapes greater than 1,000 square feet associated with projects that require City review and approval.

Menlo Park Municipal Water– Urban Water Management Plan

In May 2021, the Menlo Park City Council approved the 2020 UWMP for the MPMW, which is a foundational document containing source information about MPMW's historical and projected water demands, regionally available water supplies, an assessment of water supply reliability and vulnerabilities, water shortage contingency planning, and demand management measures (MPMW, 2021).

Menlo Park Municipal Water – Water Shortage Contingency Plan

Concurrent with the UWMP, MPMW developed a water shortage contingency plan (WSCP), a standalone document to be engaged in the case of a water shortage event, such as a drought or supply interruption, and defines specific policies and actions that will be implemented at various shortage level scenarios. The primary objective of the WSCP is to ensure that the district has in place the necessary resources and management responses needed to protect health and human safety, minimize economic disruption, and preserve environmental and community assets during water supply shortages and interruptions (MPMW, 2021).

California Water Service Bear Gulch District – Urban Water Management Plan

The UWMP for the California Water Service Company's Bear Gulch District is a long-range planning document for water supply and system planning. The UWMP provides a source for data on populations, housing, water demands, water supplies and capital improvement projects used in regional water resource management plans, city and county general plans, and statewide regional water resource plans. The UWMP describes the water supply and delivery system reliability, water demand (or use) characterization, shortage contingency planning, and demand management measures (Bear Gulch District, 2021).

California Water Service Bear Gulch District – Water Shortage Contingency Plan

Cal Water's Bear Gulch District has also developed a WSCP, to be engaged in the case of a water shortage event, such as a drought or supply interruption, and defines specific policies and actions that will be implemented at various shortage level scenarios. The primary objective of the WSCP is to ensure that the district has in place the necessary resources and management responses

needed to protect health and human safety, minimize economic disruption, and preserve environmental and community assets during water supply shortages and interruptions (Bear Gulch District, 2021).

San Mateo Countywide Integrated Waste Management Plan

The California Integrated Waste Management Act directs counties to prepare a Countywide Integrated Waste Management Plan (CIWMP). This plan consists of the Source Reduction and Recycling Elements (SRREs), the Household Hazardous Waste Elements (HHWEs), and the Nondisposal Facility Elements (NDFEs) of each jurisdiction, the Countywide Siting Element, and the Countywide Integrated Waste Management Summary Plan. The CIWMP addresses waste management conditions and provides an overview of the actions that will be taken to achieve the diversion requirements of Public Resources Code section 41780 and to maintain 15 years of disposal capacity. California statute requires the County of San Mateo to review its CIWMP every five years and then report on its adequacy to the California Integrated Waste Management Board. The last review of the CIWMP was completed in 2019 (County of San Mateo, 2019). The evaluation concluded that the County has sufficient landfill capacity equal to or greater than 15 years duration.

4.16.4 Environmental Impacts and Mitigation Measures

Scope of Analysis

The analysis in this SEIR identifies impacts identified in the 2016 *ConnectMenlo* EIR, and describes how the impacts of the HEU would differ, as applicable.

Significance Thresholds

The thresholds used to determine the significance of impacts related to utilities and service systems are based on the current version of Appendix G of the *CEQA Guidelines*. Note that the criteria used to evaluate impacts to utilities and service systems differ from those used for the certified 2016 *ConnectMenlo* EIR, as Appendix G was substantially updated in 2019, partly in response to the *California Building and Industry Association v. Bay Area Air Quality Management District* decision. The Appendix G Checklist questions for utilities and services systems were revised as a result. Accordingly, for this SEIR, implementation of the HEU could have a significant impact on utilities and service systems if it would:

- Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which would cause significant environmental effects

- Not have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years

- Result in a determination by the wastewater treatment provider which serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments

- Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals

- Not comply with federal, state, and local management and reduction statutes and regulations related to solid waste

Methodology and Assumptions

Impacts to utilities and service systems are evaluated using the current CEQA Guidelines Appendix G criteria listed above. Impacts are evaluated based on information included in the City of Menlo Park General Plan, the 2020 UWMPs for the MPMW and the Cal Water's Bear Gulch District, the West Bay Sanitary District Master Plan, and the Menlo Park Municipal Code.

Residential development projects that could result from the HEU's implementation would be regulated by the various laws, regulations, and policies summarized in the *ConnectMenlo* EIR and above in Section 4.16.3. Compliance with applicable federal, state, and local laws and regulations is assumed in this analysis and local and state agencies would be expected to continue to enforce applicable requirements to the extent that they do so now. Note that compliance with many of the regulations is a condition of permit approval.

Impacts and Mitigation Measures

Impacts

Impact UT-1: Implementation of the HEU would not require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which would cause significant environmental effects. (*Less than Significant Impact*)

The *ConnectMenlo* EIR found that impacts related to the construction or relocation of utilities were less than significant as it is expected that the City will implement General Plan programs that require expansion of the MPMW's conservation programs and future development to employ green building best practices. These same findings apply to implementation of the HEU, as discussed below.

Water

Treatment

Purchased water demanded by development allowed under the HEU would be treated at one of three WTPs operated by the SFPUC: the Tesla Treatment Facility, the Sunol Valley WTP, or the Harry Tracy WTP. The treatment capacity for each facility is approximately 315 mgd, 160 mgd, and 140 mgd, respectively. The total increase in potable water demand associated with the HEU is estimated to be approximately 1.5 mgd. Although it is not known exactly which of the three WTPs would treat water demanded by development allowed under the HEU, the increase in demand (i.e., about 1.5 mgd) would not be considered a significant increase for the SFPUC system, which can treat approximately 615 mgd with the combined capacity of its three WTPs.

Any surface water demanded by development under the HEU would be treated by Cal Water's Bear Gulch District's WTP, which has a capacity of 6.0 mgd. Surface water treated at the plant

supplements the Bear Gulch District's supply of purchased water, and thus is not the district's primary source of supply. Any increase in water demand associated with the HEU would be offset with purchased water, and thus expansion of the Bear Gulch District's WTP to serve the development under the HEU would not be required.

For these reasons, sufficient capacity exists to treat purchased and surface water demanded by development allowed under the HEU, and no new or expanded water treatment facilities would be required.

Conveyance

Improvements to the existing water distribution system may be necessary to serve development allowed under the HEU. For example, existing water distribution lines in the City may be undersized and require upgrading to serve future development. The installation of new or expanded water lines would require excavation, trenching, soil movement, and other activities that are typical during construction of development projects. The potential impacts that would result from construction of these facilities are evaluated programmatically in the various topical sections of this SEIR.

In addition, development allowed under the HEU would be required to comply with the regulations discussed above and regulations and policies described in the *ConnectMenlo* EIR that promote water conservation, thus reducing the amount of water requiring treatment and conveyance. Furthermore, larger residential development projects (500 or more units) would be required to coordinate with the City and either the MPMW or Cal Water's Bear Gulch District to address water-flow requirements through the subdivision mapping process to ensure that existing and proposed water delivery infrastructure would be adequate for each project.

Wastewater

Treatment

Wastewater generated by development allowed under the HEU would be treated at the SVCW WWTP. Operation of the facility and its wastewater conveyance system is governed by waste discharge requirements found in RWQCB Order No. R2-2018-0005 (NPDES No. CA0038369). This order has a dry-weather facility design flow of 29 mgd and a peak wet-weather design flow of 71 mgd. The NPDES permit does not have a limitation on flow quantity. As noted above, the SVCW reports that the WWTP has a capacity of 80 mgd. However, certain upstream pump station and pipe improvements would be required to provide the necessary inflow to allow the plant to operate at its full design capacity. Therefore, the WWTP design is not necessarily limited to the peak wet-weather flow of 71 mgd mentioned in the NPDES permit, but for the purpose of this analysis 71 mgd is considered the maximum flow under current conditions.

Assuming that 90 percent of potable water demanded by development allowed under the HEU (1.5 mgd) would become wastewater (see Impact UT-3 below), the estimated increase in wastewater generation would be approximately 1.35 mgd. As reported by the RWQCB, from October 2012 through August 2017, the WWTP treated an average of 13.5 mgd, with a maximum instantaneous flow of 50 mgd (City of Menlo Park, 2022). Both rates are well within the 29 mgd average dry-weather design flow and 71 mgd peak wet-weather design flow, and the HEU's 1.35

mgd increase in wastewater generation would not be significant relative to the currently available excess dry-weather and wet weather design flow capacities. Thus, wastewater flows associated with the HEU represent a very small percentage of the total daily wastewater capacities of the SVCW WWTP.

Furthermore, as discussed in the *ConnectMenlo* EIR, SVCW is continuously planning operational upgrades, maintenance, and capital improvements for the WWTP. This is expected to continue in the future, independent of development allowed under the HEU. Environmental impacts from construction of new or expanded wastewater treatment facilities deemed necessary through the planning process would be addressed in the CEQA review conducted by the lead agency for such facility expansion or development (i.e., SVCW), as required (City of Menlo Park, 2016b). Therefore, an evaluation of the possible environmental effects of future expansion/development of such facilities would be speculative and beyond the scope of this SEIR.

Conveyance

Wastewater in Menlo Park is collected by the WBSD. To ensure that enough capacity is available to convey wastewater generated by future development in the WBSD's service area, the district has identified several projects in its Sanitary Sewer Master Plan (2011) to increase system capacity, and the WBSD has prioritized the construction of these projects as part of its Capital Improvement Program (CIP). As discussed in the *ConnectMenlo* EIR, the design and planning of operation, maintenance, and capital improvements to the WBSD collection system is expected to continue in the future, independent of the proposed project. Environmental impacts from construction of new or expanded water treatment facilities deemed necessary through the planning process would be addressed in the CEQA review conducted by the lead agency for such facility expansion or development (i.e., WBSD), as required (City of Menlo Park, 2016b). Therefore, an evaluation of the possible environmental effects of future expansion/development of such facilities would be speculative and beyond the scope of this SEIR.

Future development allowed under the HEU would be required to connect to the existing WBSD conveyance system. As discussed in the *ConnectMenlo* EIR, potential construction-related impacts from such project-level improvements would be evaluated during project-level analysis, as needed (City of Menlo Park, 2016b). In addition, future development allowed under the HEU would be required to comply with the regulations described above and regulations and policies described in the *ConnectMenlo* EIR that promote water conservation, thus reducing the amount of wastewater requiring treatment and conveyance. Finally, individual development projects would be required to coordinate with the City and WBSD to address wastewater-flow requirements through the development approval and review process to ensure that existing and proposed wastewater conveyance infrastructure would be adequate for each project.

Storm Drain

Development allowed under the HEU could result in an increase in impervious surface area on individual project sites, and thus would increase the amount of stormwater runoff. As discussed above, significant portions of the system continue to be unable to provide conveyance for a 10-year storm event. However, the new development would be located on parcels that are already developed or otherwise covered by impervious surfaces. As a result, post-development runoff

rates would not be significantly different than pre-development runoff rates. Furthermore, projects that create or replace 10,000 square feet of more of impervious surface area would be required to prepare a stormwater control plan to comply with C.3 provisions of the MRP. Measures in the stormwater control plan, such as source controls and treatment, would ensure that post-development runoff rates do not exceed pre-development rates and durations. Finally, regulated projects for which building or grading permits are issued (after January 1, 2016) must include LID-based design measures (such as pervious paving or bioretention areas) for stormwater capture and pretreatment.

If improvements to the existing stormwater system are necessary to serve development allowed under the HEU, this activity would require excavation, trenching, soil movement, and other activities that are typical during construction of development projects. Potential impacts that would result from construction of these facilities are programmatically evaluated throughout this SEIR (e.g., refer to Section 4.4, *Air Quality*; Section 4.9, *Hydrology and Water Quality*; and Section 4.11, *Noise and Vibration*). At the project level, environmental impacts from construction of new or expanded stormwater facilities deemed necessary through the planning process would be addressed in the CEQA review conducted by the lead agency for such facility expansion or development, as required (City of Menlo Park, 2016b). Therefore, a detailed evaluation of the possible environmental effects of future expansion/development of such facilities would be speculative and beyond the scope of this SEIR.

Electricity and Natural Gas

Residents and businesses in Menlo Park have the option to have their electricity provided by either PG&E or PCE. PG&E would also supply natural gas to development allowed under the HEU, if needed (and if permitted given regulations and mitigation measures restricting natural gas use described in Section 4.7 of this SEIR, *Greenhouse Gas Emissions*). Improvements to the existing electrical and natural gas distribution system may be necessary to serve development allowed under the HEU. Any upgrades would require excavation, trenching, soil movement, and other activities that are typical during construction of development projects. Potential impacts that would result from construction of these facilities are evaluated programmatically throughout this SEIR (e.g., refer to Section 4.4, *Air Quality*; Section 4.9, *Hydrology and Water Quality*; and Section 4.11, *Noise and Vibration*). At the project level, environmental impacts from construction of new or expanded electricity and natural gas facilities deemed necessary through the planning process would be addressed in the CEQA review conducted by the lead agency for such facility expansion or development, as required (City of Menlo Park, 2016b). Therefore, a detailed evaluation of the possible environmental effects of future expansion/development of such facilities would be speculative and beyond the scope of this SEIR.

Telecommunications Facilities

Telecommunication services in Menlo Park are provided by a number of service providers, and telecommunication lines may need to be extended or relocated to serve development allowed under the HEU. The installation of new or expanded telecommunication lines would require excavation, trenching, soil movement, and other activities that are typical during construction of development projects. Potential impacts that would result from construction of these facilities are evaluated programmatically throughout this SEIR (e.g., refer to Section 4.4, *Air Quality*; Section

4.9, *Hydrology and Water Quality*; and Section 4.11, *Noise and Vibration*). At the project level, environmental impacts from construction of new or expanded telecommunications facilities deemed necessary through the planning process would be addressed in the CEQA review conducted by the lead agency for such facility expansion or development, as required (City of Menlo Park, 2016b). Therefore, a detailed evaluation of the possible environmental effects of future expansion/ development of such facilities would be speculative and beyond the scope of this SEIR.

Summary

As discussed above, development allowed under the HEU would not require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects beyond the construction impacts discussed throughout this SEIR. This finding is consistent with that found in the *ConnectMenlo* EIR. The HEU's impact with respect to construction or relocation of utilities would therefore be **less than significant**.

Mitigation Measure: None required.

Impact UT-2: Implementation of the HEU would have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years. (*Less than Significant Impact*)

The *ConnectMenlo* EIR found that impacts related to water supply were less than significant as water supply would be adequate to serve existing and future needs during a normal year, and that water shortages could be managed through demand reductions during single and multiple dry years. In addition, all future development under *ConnectMenlo* would be required to comply with existing regulations, including City General Plan policies and zoning requirements, to minimize impacts related to water supplies. These same findings apply to implementation of the HEU, as discussed below.

Development allowed under the HEU would result in an increase in City-wide population and thus an increase in demand for water. As discussed in Section 4.16.2, water purchased from the SFPUC's RWS is the primary source of supply for the MPMW and Cal Water's Bear Gulch District, with a small amount of recycled water offsetting MPMW's supply and a small amount of surface water from the Bear Gulch watershed supplementing Cal Water's Bear Gulch District supply. Per the requirements of SB 610, a WSA was prepared for the proposed HEU by Environmental Science Associates on behalf of the MPMW and Cal Water Bear Gulch District and is included with this SEIR as Appendix D. On October 18, 2022, the City Council of the City of Menlo Park, by resolution adopted the WSA as it pertains to MPMW's service area and new dwelling units contemplated in the HEU and within MPMW's service area boundaries pursuant to California Water Code 1910 et seq. and CEQA Guidelines 15155. The resolution is attached to the WSA (Appendix D). Notably, Cal Water Bear Gulch District has the same responsibility and will take a similar action to consider and approve the WSA through its own approval process. Cal

Water Bear Gulch District's approval is pending and upon approval will the appended to the final WSA.

Table 4.16-1 below shows the land uses, residential units, and population growth that could occur as a result of implementation of the HEU and the City's anticipated buildout scenario. The table shows the total residential units that could occur as a result of implementation of the HEU (4,000 dwelling units and 85 ADUs) plus 414 new residential dwelling units outside of the Bayfront area that are already on file and pending review by the City. As shown in the table, an additional 299 residential dwelling units are also anticipated to be implemented under the City's 2040 buildout scenario. Table 4.16-1 demonstrates all new water demand that is anticipated to occur with implementation of the HEU and associated zoning changes between 2024 and 2040 if the City reaches its proposed cumulative build out scenario.

The land use changes proposed in the HEU would create a net yearly increase in water demand of 670 AFY or an average demand of 598,367 gallons per day (gpd) or 0.598 MGD. The HEU changes proposed to occur by 2040 under the Cumulative (Maximum Buildout) scenario would potentially create an additional net increase in water demand of 45 AFY or an average demand of 39,767gpd (0.040 MGD). The calculated demand associated with implementation of the HEU is assumed to be new demand that would be served by either MPMW or the Cal Water Bear Gulch District. It should be noted that the actual net change in water demand would be lower as some existing uses on the housing opportunity sites would be removed to accommodate new residential units. It is anticipated that actual demand increases at housing opportunity sites may be lower than calculated demand because of the net change from existing uses to new residential uses with higher water use efficiencies. The WSA prepared for the HEU is a program-level analysis of water supply and demand; therefore, at the time of preparation it was not feasible to accurately calculate the net change in demand from replacing existing uses with new residential uses. In addition, the HEU would be implemented over a 25-year planning horizon and the net change in demand would likely occur over time commensurate with new development proposals. Considering the increase of 670 AFY generated from the HEU and 45 AFY from additional cumulative growth, the Updated 2040 Cumulative Growth Build Out scenario is calculated to be 715 AFY or 0.638 MGD (without deducting water demand by existing uses on the housing sites that will be replaced under the HEU).

As previously discussed, MPMW and the Cal Water Bear Gulch District would provide water service to the new developments proposed in the HEU and also to the additional 299 residential units of cumulative growth expected to be developed by 2040. As shown below in **Table 4.16-2**, based on the proposed distribution of new residential dwelling units (see Figure 4.16-1), Cal Water's Bear Gulch District would serve approximately 63 percent or 3,008 of the HEU's new residential units and MPMW would serve approximately 37 percent or 1,790 new residential units.

TABLE 4.16-1
WATER DEMAND - HOUSING ELEMENT UPDATE AND ADDITIONAL 2040 GROWTH PROJECTIONS

	New Residential Units			Demand Factor (GPD/DU)[d]	GPD[e]	AFY[e]
	Pending Projects[a]	ADUs[b]	Residential Units			
Housing Element Update (HEU) Demand	414	85	4,000	133	598,367	670
Additional 2040 Cumulative Demand	0	0	299[c]		39,767	45
Totals	**414**	**85**	**4,798**		**638,134**	**715**

SOURCE: Menlo Park Housing Element Update, Table 2-2; Menlo Park Water Supply Assessment Housing Element Update, Table 5-1, ESA 2022

NOTES: ADU = accessory dwelling unit; GPD = gallons per day; AFY = acre-feet per year;

a Pending projects (414) reflect applications that are currently on file for residential development. Water demand generated by these Pending Projects was not accounted for in the adopted 2020 UWMPs and would contribute to new water demand associated with implementation of the HEU.
b Future locations of ADUs are currently unknown and contribute to the Citywide Totals. For water supply planning purposes, these ADUs would be assumed to be developed throughout the City.
c 299 units that may result from development on small sites between 2031 and 2040 affected by zoning and Specific Plan changes as part of the HEU.
d The estimated annual indoor and outdoor water demand at buildout is based on and consistent with the Water Supply Evaluation Study, ConnectMenlo – General Plan and M-2 Area Zoning Update, pages 9-10.
e The estimated total annual water demand for residential units is calculated in gallons per day and acre-feet per year and is the sum of indoor and outdoor water demands. Totals may not sum exactly due to rounding.

TABLE 4.16-2
HEU RESIDENTIAL UNITS, DISTRIBUTION IN WATER SERVICE AREAS AND DEMAND

	New Residential Units	Percent of new Residential Units	GPD	MGD	AFY
Cal Water Bear Gulch District	3,008	63%	400,064	0.400	448
MPMW	1,790	37%	238,070	0.238	267
Totals	**4,798**	**100%**	**638,134**	**0.638**	**715**

SOURCE: Menlo Park Housing Element Update, Table 2-2; Menlo Park Water Supply Assessment Housing Element Update, Table 5-2, ESA 2022

NOTES: ADU = accessory dwelling unit; GPD = gallons per day; AFY = acre-feet per year

For water supply planning purposes, as shown in Table 4.16-2, this distribution of water service equates to 400,064 gallons per day (0.400 MGD) or 448 AFY within the Cal Water Bear Gulch District's service area and 238,070 gallons per day (0.238 MGD) or 267 AFY within MPMW's service area.

According to the WSA prepared for the proposed HEU, which relies on water supply planning information contained in each of the water suppliers' 2020 UWMPs, both MPMW and the Cal Water Bear Gulch District as shown in **Tables 4.16-3** and **4.16-4** are expected to have adequate water supplies during normal or above-normal precipitation (years of normal supply) to meet projected demand through 2040 and 2045.

TABLE 4.16-3
BEAR GULCH DISTRICT NORMAL YEAR WATER SUPPLY AND DEMAND PROJECTIONS (AFY)

	2025	2030	2035	2040	2045
2020 UWMP Supply[a]	13,244	13,147	13,178	13,123	13,142
2020 UWMP Demand	12,796	12,699	12,730	12,675	12,694
HEU Demand plus Additional 2040 Demand[b]	448	448	448	448	448
HEU Demand plus Cumulative 2040 Demand[c]	**13,244**	**13,147**	**13,178**	**13,123**	**13,142**
Difference [Surplus/(Deficit)]	**0**	**0**	**0**	**0**	**0**

SOURCE: Cal Water Bear Gulch District 2020 UWMP. Table 7-3. Normal Year Supply and Demand Comparison; Menlo Park Water Supply Assessment Housing Element Update, Table 6-2, ESA 2022

NOTES:
a SFPUC Supply plus additional SFPUC purchases within Cal Water's ISG to meet 448 AFY of new demand generated by implementation of the HEU purchased from SFPUC or transferred within Cal Water's Peninsula Districts and distributed within Cal Water Bear Gulch District.
b City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – Cal Water Bear Gulch District portion of 715 AFY of new demand generated by implementation of the HEU and Additional 2040 Growth. New water demand of 448 AFY associated with the HEU area is assumed to occur instantaneously. Actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.
c City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – Cal Water Bear Gulch District 2020 UWMP Demand plus demand generated by implementation of the HEU and Additional 2040 Growth.

TABLE 4.16-4
MPMW NORMAL YEAR WATER SUPPLY AND DEMAND PROJECTIONS (AFY)

	2025	2030	2035	2040
2020 UWMP Supply[a]	5,150	5,371	5,371	5,371
2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
Updated 2040 Cumulative Demand	**4,244**	**4,395**	**4,594**	**4,818**
Difference [Surplus/(Deficit)]	**906**	**976**	**777**	**553**

SOURCE: MPMW 2020 UWMP. Table 7-4 Normal Year Supply and Demand Comparison and Menlo Park Housing Element WSA Table 6-5, ESA 2022

NOTES:
a Supply and demand include both potable water and recycled water. MPMW expects to receive 120 MGD (368 AFY) of recycled water from the Sharon Heights and Bayfront recycled water facilities.
b City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – MPMW portion of 715 AFY of new demand generated by implementation of the HEU and Additional 2040 Growth. New water demand of 267 AFY associated with the HEU area is assumed to occur instantaneously. Actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.

With respect to single dry and multiple dry years, the reliability of the RWS is anticipated to vary greatly in different year types. Both the MPMW and Cal Water's Bear Gulch District have relied on the supply reliability estimates provided by the SFPUC for the RWS and the drought allocation structure provided by SFPUC and BAWSCA to estimate available RWS supplies in dry year types through 2045. These projections indicated that without the Bay-Delta Plan Amendment being implemented, the SFPUC would be able to supply 100 percent of projected RWS demands in all year types through 2045, except for the 4th and 5th consecutive dry year in 2045, during which 90 percent of projected RWS demands (85 percent of the wholesale demands) would be met.

As shown below in **Tables 4.16-5** and **4.16-6** significant water supply shortfalls are currently projected in single dry years and with increasing shortfalls in multiple dry years if the Bay-Delta Plan Amendment is implemented as adopted.[5] For Cal Water's Bear Gulch District and MPMW, supply shortfalls are projected in single dry years (ranging from 27 to 32 percent) and in multiple dry years (ranging from 27 to 44 percent (refer to Tables 6-4 and 6-7 in the WSA, Appendix D of this SEIR) through 2040, with similar findings through 2045 based on SFPUC's analysis.

Notably, numerous uncertainties regarding Bay-Delta Plan Amendment implementation remain, and thus this represents a worst-case water supply scenario in which the Bay-Delta Plan Amendment is implemented. Under this worst-case scenario, insufficient supplies are expected and this would be a potentially significant impact under single dry and multiple dry year scenarios.

Therefore, as discussed in the WSA, Cal Water Bear Gulch District, MPMW, SFPUC, and BAWSCA have developed strategies and actions to address the projected dry year supply shortfalls. Regional and local strategies, plans and programs are discussed below.

TABLE 4.16-5
MPMW SINGLE-DRY-YEAR POTABLE WATER SUPPLY AND DEMAND PROJECTIONS (AFY) WITH BAY-DELTA PLAN AMENDMENT

	2025	2030	2035	2040
2020 UWMP Supply[a]	2,691	3,001	3,124	3,259
2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
Updated 2040 Cumulative Demand	**4,244**	**4,395**	**4,594**	**4,818**
Difference [Surplus/(Deficit)]	**(1,553)**	**(1,393)**	**(1,470)**	**(1,559)**
Percent Demand Reduction to balance Supply	**(37%)**	**(32%)**	**(32%)**	**(32%)**

SOURCE: MPMW 2020 UWMP; Menlo Park Housing Element WSA Table 6-6, ESA 2022

NOTES:

a Supply and demand include both potable water and recycled water. MPMW expects to receive 120 MG (368 AFY) of recycled water from the Sharon Heights and Bayfront recycled water facilities.

b City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – MPMW portion of 715 AFY of new demand generated by implementation of the HEU and Additional 2040 Growth. New water demand of 267 AFY associated with the HEU area is assumed to occur instantaneously. Actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.

5 In December 2018, the SWRCB adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento San Joaquin Delta Estuary (referred to as the Bay-Delta Plan Amendment) to establish water quality objectives to maintain the health of the Bay-Delta ecosystem. The Bay-Delta Plan Amendment requires the release of 30-50 percent of the "unimpaired flow" on the three tributaries from February through June in every water year type including below normal, dry and critical dry years. As of the date of circulation of this SEIR, SWRCB indicated that it intended to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, assuming all required approvals are obtained by that time. However, as discussed in the WSA, implementation of the Bay-Delta Plan Amendment has been delayed and is uncertain, due to pending litigation, the need for action by various agencies, and other factors.

TABLE 4.16-6
BEAR GULCH DISTRICT SINGLE DRY YEAR POTABLE WATER SUPPLY AND DEMAND PROJECTIONS (AFY) WITH BAY-DELTA PLAN AMENDMENT

	2025	2030	2035	2040	2045
2020 UWMP Supply[a]	8,546	8,482	8,503	8,334	7,154
2020 UWMP Demand	13,354	13,253	13,285	13,228	13,248
HEU Demand plus Additional 2040 Demand[b]	448	448	448	448	448
HEU Demand plus Cumulative 2040 Demand[c]	**13,802**	**13,701**	**13,733**	**13,676**	13,696
Difference [Surplus/(Deficit)]	(5,256)	(5,219)	(5,230)	(5,342)	(6,542)
Percent Demand Reduction to balance Supply	**(38%)**	**(38%)**	**(38%)**	**(39%)**	**(48%)**

SOURCE: Cal Water Bear Gulch District 2020 UWMP. Table 7-4. Single Dry Year Supply and Demand Comparison and Menlo Park Housing Element WSA Table 6-3, ESA 2022

NOTES:

a Dry year RWS supply availability is calculated in accordance as a percentage of projected RWS demands for each base year consistent with the revised BAWSCA Drought Methodology that assumes equal percent cutbacks across all Wholesale Agencies. SFPUC Supply plus additional SFPUC purchases within Cal Water's ISG to meet 448 AFY of new demand generated by implementation of the HEU purchased from SFPUC or transferred within Cal Water's Peninsula Districts and distributed within Cal Water Bear Gulch District.

b City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – Cal Water Bear Gulch District portion of 715 AFY of new demand generated by implementation of the HEU and Additional 2040 Growth. New water demand of 448 AFY associated with the HEU area is assumed to occur instantaneously. Actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.

c City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – Cal Water Bear Gulch District 2020 UWMP Demand plus demand generated by implementation of the HEU and Additional 2040 Growth.

Dry Year Water Supply Projects

The Water Supply Improvement Program (WSIP) adopted by the SFPUC authorized the SFPUC to undertake a number of water supply projects to meet dry-year demands with no greater than 20 percent system-wide rationing in any one year. Implementation of these projects is also expected to mitigate impacts of the implementation of the Bay-Delta Plan Amendment.

Those projects include the following:

- **Calaveras Dam Replacement Project.** The new dam replacement was completed in 2018, and began filling with water in 2019. In December 2020, the Calaveras Reservoir reached 67 percent of capacity but as a result of dry year conditions has subsequently lost water in the last few years. As the reservoir receives water and is subsequently filling, dam safety inspections evaluate the structural integrity of the dam and its associated facilities. These inspections were on hold during dry years but were reinstated in 2021.

- **Alameda Creek Recapture Project.** The Alameda Creek Recapture Project will recapture the water system yield that is either lost due to instream flow releases at Calaveras Reservoir or bypassed around the Alameda Creek Diversion Dam and return this yield to the RWS through facilities in the Sunol Valley. Construction of this project began in 2021 is currently ongoing and is scheduled to completed in late 2022 or by spring 2023.

- **Lower Crystal Springs Dam Improvements.** The Lower Crystal Springs Dam (LCSD) Improvements Project was completed in May 2012 and associated projects in support of the LCSD were completed in 2019. While the main improvements to the dam have been completed, environmental permitting issues for reservoir operation remain significant, while

the endangered Fountain Thistle is incrementally reinstated above reservoir capacity levels. As a result, it may be several years before pre-project water storage volumes can be realized.

- **Regional Groundwater Storage and Recovery Project.** The Regional Groundwater Storage and Recovery (GSR) Project is a partnership between the SFPUC and three San Mateo County agencies: California Water Service Company (serving South San Francisco and Colma), and the cities of Daly City and San Bruno. The GSR is a conjunctive use program to sustainably manage groundwater and surface water resources to provide the RWS with additional supplies during times of drought. In normal or wet years, supplemental surface water would be provided to the San Mateo County partners allowing them to reduce the amount of groundwater extractions. Over time, the groundwater pumping reductions would allow natural recharge to occur and increase groundwater in storage by up to 61,000 acre feet that would be available during dry years.

  Phase 1 of the GSR installed thirteen well sites. Final construction of Phase 1 was completed in 2021. Phase 2 will complete construction of the South San Francisco Main well station. Phase 2 design work began in early 2020 and the 100 percent design commenced in 2021. The new Regional Groundwater Treatment Improvements (RGTI) was approved in the 10-Year Water Enterprise Capital Improvement Program (2021 – 2030). The RGTI includes treatment facilities for several of the GSR wells to address groundwater quality issues. The RGTI commenced in 2021.

- **Dry-year Water Transfer**. The SFPUC pursued a long-term agreement to transfer 2 MGD from MID to the SFPUC in drought years. Unsuccessful negotiations with MID ended in 2012. The dry-year transfer project is now being included as part of the new SFPUC Alternative Water Supply Program, as discussed in the next section.

Alternative Water Supply Program

In early 2020, the SFPUC began implementation of the Alternative Water Supply Planning Program (AWSP), a program designed to investigate and plan for new water supplies to address future long-term water supply reliability challenges and vulnerabilities on the RWS. Included in the AWSP is a suite of diverse, non-traditional supply projects that, to a great degree, leverage regional partnerships and are designed to meet the water supply needs of the SFPUC Retail and Wholesale Customers through 2045. In February 2022's Alternative Water Supply Planning Quarterly Update, SFPUC's 10-year capital improvement program budgeted $404 million to fund Alternative Water Supply Projects. BAWSCA is heavily engaged with the SFPUC on its AWSP efforts.

SFPUC's Alternative Water Supply Program

The SFPUC is pursuing additional supplies to meet increasing demand and accelerating its efforts to acquire additional water supplies and explore other projects that would increase overall water supply resilience through the AWSP. The drivers for the program include:

- The "potential" adoption of the Bay-Delta Plan Amendment and the resulting potential limitations to RWS supply during dry years;
- The net supply shortfall following the implementation of WSIP;
- San Francisco's perpetual obligation to supply 184 MGD to the Wholesale Customers;

- Adopted Level of Service Goals (potable water service deliveries) to limit rationing to no more than 20 percent system-wide during droughts; and
- The potential need to identify water supplies that would be required to offer permanent status to interruptible customers.

Developing additional supplies through this program would reduce water supply shortfalls and reduce rationing associated with such shortfalls.

The planning priorities guiding the framework of the AWSP are as follows:

- Offset instream flow needs and meet regulatory requirements;
- Meet existing obligations to existing permanent customers;
- Make interruptible customers permanent; and
- Meet increased demands of existing and interruptible customers.

In conjunction with these planning priorities, the SFPUC considers how the program fits within the Level of Service Goals and Objectives related to water supply and sustainability when considering new water supply opportunities. The key Level of Service Goals and Objectives relevant to this effort can be summarized as:

- Meet dry-year delivery needs while limiting rationing to a maximum of 20 percent system-wide reduction in water service during extended droughts;
- Diversify water supply options during non-drought and drought periods;
- Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers;
- Meet, at a minimum, all current and anticipated legal requirements for protection of fish and wildlife habitat;
- Maintain operational flexibility (although this Level of Service Goal was not intended explicitly for the addition of new supplies, it is applicable here).

Together, the planning priorities and Level of Service Goals and Objectives provide a lens through which the SFPUC considers water supply options and opportunities to meet all foreseeable water supply needs. The SFPUC has taken action to fund the study of potential additional water supply projects.

Following are capital projects under consideration to develop additional water supplies including surface water storage expansion, recycled water expansion, water transfers, desalination, and potable reuse.

- **Daly City Recycled Water Expansion** (Regional, Normal- and Dry-Year Supply): This project can produce up to 3 MGD of tertiary recycled water during the irrigation season (~7 months). On an average annual basis, this is equivalent to 1.25 MGD or 1,400 AFY. This

potential project was identified in the SFPUC's 2015 UWMP and has since been approved by the City of Daly City.

- **Alameda County Water District -USD Purified Water Partnership** (Regional, Normal- and Dry-Year Supply). This project could provide a new purified water supply utilizing Union Sanitary District's (USD) treated wastewater. Purified water produced by advanced water treatment at USD could be transmitted to the Quarry Lakes Groundwater Recharge Area to supplement recharge into the Niles Cone Groundwater Basin or put to other uses in Alameda County Water District's service area. With the additional water supply to ACWD, an in-lieu exchange with the SFPUC would result in more water left in the RWS.

- **Crystal Springs Purified Water** (Regional, Normal- and Dry-Year Supply). The Crystal Springs Purified Water Project is a purified water project that could provide 6-12 MGD of water supply through reservoir water augmentation at Crystal Springs Reservoir, which is a facility of the RWS.

- **Los Vaqueros Reservoir Expansion** (Regional, Dry Year Supply). The Los Vaqueros Reservoir Expansion Project is a storage project that will enlarge the existing reservoir located in northeastern Contra Costa County from 160,000 acre-feet to 275,000 acre-feet. While the existing reservoir is owned and operated by the Contra Costa Water District (CCWD), the expansion will have regional benefits and will be managed by a Joint Powers Authority.

- **Bay Area Brackish Water Desalination** (Regional, Normal- and Dry-Year Supply). The Bay Area Brackish Water Desalination (Regional Desalination) Project is a partnership between CCWD, the SFPUC, Santa Clara Valley Water Agency, and Zone 7 Water Agency. The SFPUC is considering a water supply benefit of between 5 and 15 MGD during drought conditions when combined with storage at the LVE Project.

- **Calaveras Reservoir Expansion** (Regional, Dry Year Supply). Calaveras Reservoir would be expanded to create 289,000 acre-feet additional capacity to store excess Regional Water System supplies or other source water in wet and normal years.

- **Groundwater Banking.** Groundwater banking in the MID and TID service areas could be used to provide some additional water supply to meet instream releases in dry years reducing water supply impacts to the SFPUC service area.

- **Inter-Basin Collaborations.** Inter-Basin Collaborations could provide net water supply benefits in dry years by sharing responsibility for in-stream flows in the San Joaquin River and Delta more broadly among several tributary reservoir systems.

If all the projects identified through the current planning process can be implemented, there would still be a supply shortfall to meet projected needs. Furthermore, each of the supply options being considered has its own inherent challenges and uncertainties that may affect the SFPUC's ability to implement it.

Given the limited availability of water supply alternatives – unless the supply risks are significantly reduced or needs change significantly – the SFPUC will continue to plan, develop and implement all project opportunities that can help bridge the anticipated water supply gaps during droughts.

Local Strategies and Actions

Cal Water Bear Gulch District is currently in the process of developing multiple regional water supply reliability studies using integrated resource planning practices to create a long-term supply reliability strategy through 2050 for Cal Water districts throughout California. The studies will create long-term strategies to address a wide range of water supply challenges including climate change, new regulatory requirements (e.g., the Bay-Delta Plan Amendment), and potential growth in demands due to new development. These water supply reliability studies will be completed on a rolling basis over the next several years, with all studies anticipated to be complete by 2024.

Through its Emergency Water Storage/Supply Project, Menlo Park Municipal Water anticipates providing augmented supply in the event of significant water shortage due to severe drought conditions, loss of SFPUC supply, or other emergency. The project consists of constructing up to three wells, an underground reservoir, and pump station. The first well, located at the City's Corporation Yard, has been constructed and is awaiting final approval from the State. MPMW is currently in the process of identifying locations for the two other wells, the underground reservoir, and pump station. The wells, underground reservoir, and pump station are identified in the 2018 Water System Master Plan as priority projects and funding has been included in the current five-year capital improvement program. In addition, MPMW's 2020 UWMP includes utilizing well water for drought stage 5 (up to 50 percent reduction) and drought stage 6 (greater than 50 percent reduction) to augment supplies if necessary as part of its Water Shortage Contingency Plan.

Water Demand Reductions and Conservation Savings

Cal Water Bear Gulch District also has its own aggressive and comprehensive water conservation program that has and will continue to reduce per-capita usage and therefore demands on critical water sources. Cal Water Bear Gulch District is committed to helping its customers use water efficiently and has developed a range of water conservation programs to support this goal. To ensure that it is providing the right mix of programs in the most cost-effective manner possible, Cal Water Bear Gulch District routinely conducts comprehensive conservation program analysis and planning. This is done on a five-year cycle in tandem with the UWMPs.

Cal Water Bear Gulch District's Conservation Master Plan provides the basis for the information on the implementation of and expected water savings from Demand Management Measures.

Demand Management Measures (DMMs)

DMMs are codified in the California Water Code, Sections 10608.12 and 10608.20, and discussed in detail in the Cal Water Bear Gulch District and MPMW UWMPs. DMMs are used universally across California as the means to achieve water savings through demand reduction. Essentially, DMMs are used to provide education, assistance, and incentives to help customers use water efficiently. These programs have been grouped in accordance with the DMM categories in California Water Code, Section 10631(e). These categories are:

- Water waste prevention ordinances,
- Metering,

- Conservation pricing,
- Public education and outreach,
- Programs to assess and manage distribution system real loss,
- Water conservation program coordination and staffing support, and
- Other demand management measures.

Dry-Year Shortage and Demand Reduction

A water shortage contingency plan allows the Cal Water Bear Gulch District and MPMW to reduce water deliveries to customers and implement demand reductions during periods of water shortage. Therefore, to overcome the potential supply deficit expected to occur during critical dry years or over multiple dry years, both the Cal Water Bear Gulch District and MPMW will follow their adopted water shortage contingency plans (WSCPs) to implement drought-planning sequences and associated operating procedures that subsequently initiate different levels of demand management relative to regional water supply rationing imposed by the SFPUC. The WSCPs can be found in each of the UWMPs (Cal Water Bear Gulch District Appendix L and MPMW Appendix K).

The WSCP requires water suppliers to adopt six water shortage stages, which correspond to progressively severe water shortage conditions (up to 10%, 20%, 30%, 40%, 50%, and greater than 50% shortage) as compared to the normal reliability condition. The following six stages list the shortage response actions:

- **Stage 1 (Up to 10 percent shortage)** – Stage 1 is a "Water Alert" where voluntary conservation is encouraged.
- **Stage 2 (Up to 20 percent shortage)** – Stage 2 is a "Moderate Shortage" and will be implemented if the Stage 1 restrictions are deemed insufficient to achieve necessary demand reductions due to water supply shortages.
- **Stage 3 (Up to 30 percent shortage)** – Stage 3 is a "Severe Shortage" that requires water allocations and mandatory conservation.
- **Stage 4 (Up to 40 percent shortage)** – Stage 4 is a "Critical Shortage" that includes all steps taken in prior stages regarding allocations and mandatory conservation.
- **Stage 5 (Up to 50 percent shortage)** – Stage 5 is a "Shortage Crisis" that includes all steps taken in prior stages regarding allocations and mandatory conservation. This stage will be implemented in the event that the source of supply is severely curtailed to the level that requires each customer to restrict their water use for only human health and safety purposes.
- **Stage 6 (Greater than 50 percent shortage)** – Stage 6 is an "Emergency Shortage" condition that includes all steps taken in prior stages regarding allocations and mandatory conservation.

Because of the numerous agencies involved, various project complexities, schedules, timing, approvals and environmental clearance requirements, the results of the previously described plans, projects, and programs may not overcome the single dry and multiple dry year shortages –

at least during early years of the HEU timeframe. Therefore, the MPMW and Cal Water's Bear Gulch District would need to implement their WSCPs as described above to further reduce water demand to potentially meet the supply reductions. The WSCP for each district includes six levels to address shortage conditions ranging from up to 10 percent to greater than 50 percent of demand, identifies a suite of demand reduction measures for the City to implement at each level, and identifies procedures for the City to annually assess whether or not a water shortage is likely to occur in the coming year, among other things. Under the scenario which assumes Bay-Delta Plan Amendment implementation, the projected single dry year and multiple dry year shortfalls would require implementation of Stages 3, 4 or 5 of each WSCP. Development allowed under the HEU would be subject to the same water conservation and water use restrictions as other water users within the Bear Gulch District and MPMW system.

Development allowed under the HEU would also be required to comply with the CALGreen Code, which requires that new construction use high-efficiency plumbing fixtures, such as high-efficiency toilets, urinals, showerheads, and faucet fixtures. For outdoor water use, the CALGreen Code requires that irrigation controllers be weather- or soil moisture–based and automatically account for rainfall, or be attached to a rainfall sensor. Finally, all new development would be required to adhere to the City's Water Efficient Landscaping Ordinance. These potential savings were not considered in the WSA, and thus the demand reported above is conservative.

Based on the above, while water supply shortfalls are projected in single dry and multiple dry years with implementation of the Bay-Delta Plan Amendment, these projected shortfalls could be overcome through the SFPUC's various projects, programs and plans and further addressed through implementation of the WSCPs by MPMW and Cal Water's Bear Gulch District. In addition, development under the HEU would be required to adhere to all applicable regulations that promote water conservation and water use efficiencies. While results of the previously mentioned projects, programs and plans and demand reductions cannot be quantified, it is reasonable to expect that many of the projects, programs and plans would be successful and additional water supplies and demand reductions can be obtained. For these reasons, implementation of the HEU would have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal years. In single dry and multiple dry years, DMMs and implementation of the WSCPs by MPMW and Cal Water's Bear Gulch District would further reduce demand to meet the water supply shortage. This finding is consistent with that found in the *ConnectMenlo* EIR. The HEU's impact with respect to water supply would therefore be **less than significant**.

Mitigation Measure: None required.

Impact UT-3: Implementation of the HEU would not result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments. (*Less than Significant Impact*)

The *ConnectMenlo* EIR found that impacts related to wastewater capacity would be less than significant as all future development under *ConnectMenlo* is expected to tie into existing collection facilities, and thus would have to comply with applicable sewer permits, which require that projects reduce impacts on sewer capacity. In addition, the EIR found that all future projects would be required to comply with existing regulations that promote water conservation and minimize impacts related to wastewater generation. These same findings apply to implementation of the HEU, as discussed below.

As discussed under Impact UT-1, the SVCW reports that the WWTP has a capacity of 80 mgd. However, certain upstream pump station and pipe improvements would be required to provide the necessary inflow to allow the plant to operate at its full design capacity. Therefore, the WWTP design is not necessarily limited to the peak wet-weather flow of 71 mgd mentioned in the NPDES permit, but for the purpose of this analysis 71 mgd is considered the maximum flow under current conditions.

Assuming that 90 percent of potable water demanded by development allowed under the HEU (1.5 mgd) would become wastewater (see Impact UT-3 below), the estimated increase in wastewater generation would be approximately 1.35 mgd. As reported by the RWQCB, from October 2012 through August 2017, the WWTP treated an average of 13.5 mgd, with a maximum instantaneous flow of 50 mgd (City of Menlo Park, 2022). Both rates are well within the 29 mgd average dry-weather design flow and 71 mgd peak wet-weather design flow, and the HEU's 1.35 mgd increase in wastewater generation would not be significant relative to the currently available excess dry-weather and wet weather design flow capacities. Thus, wastewater flows associated with the HEU represent a very small percentage of the total daily wastewater capacities of the SVCW WWTP.

In addition, future development allowed under the HEU would be required to comply with the regulations described above and regulations and policies described in the *ConnectMenlo* EIR that promote water conservation, thus reducing the amount of wastewater requiring treatment and conveyance.

For these reasons, the SVCW has adequate capacity to serve development allowed under the HEU in addition to its existing commitments. This finding is consistent with that found in the *ConnectMenlo* EIR. The HEU's impact with respect to wastewater generation would therefore be **less than significant**.

Mitigation Measure: None required.

Impact UT-4: Implementation of the HEU would not generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals. (*Less than Significant Impact*)

The *ConnectMenlo* EIR found that impacts related to solid waste generation would be less than significant as all future development under *ConnectMenlo* would be required to comply with existing regulations to minimize impacts related to solid waste disposal and attain solid waste reduction goals. These same findings apply to implementation of the HEU, as discussed below.

Construction

Development allowed under the HEU would be required to comply with the City's Construction and Demolition Recycling Ordinance, which calls for salvage or recycling at least 60 percent of construction-related solid waste through recycling, reuse, salvage, or other diversion programs. The Shoreway Environmental Center serves the City and accepts mixed construction and demolition waste. The remaining residue from the materials that could not be recovered will be landfilled. As most construction-related solid waste would be diverted from landfills, construction of the residential development allowed under the HEU would not generate solid waste in excess of local landfill capacity.

Operation

As discussed in Section 4.12, *Population and Housing*, the new housing units provided for in the HEU, pipeline, and cumulative projects could conservatively add 17,522 residents to the City, and based on the City's existing residential disposal rate of 4.1 ppd, these new residents would generate approximately 71,840 ppd or 35.9 tons of solid waste per day. The estimated amount of solid waste generated during operation of development allowed under the HEU would represent approximately one percent of the daily capacity (3,598 tons per day) of the Ox Mountain landfill. In addition, the Ox Mountain landfill has approximately 22,180,000 cubic yards of remaining capacity (31,052,000 tons[6]), and an expected closure date of 2034, although the County's most recent review of the CIWMP in 2019 indicated that Ox Mountain Landfill had an estimated 19 remaining years of capacity, which would extend the closure date to 2038, which is beyond the horizon year of 2031 for the HEU. The County is currently revising the Siting Element of its CIWMP, which will identify facilities and proposed programs that would provide San Mateo County with sufficient disposal capacity to meet the required minimum of 15 years of combined permitted disposal capacity per the requirements of Public Resources Code Section 41260 (County of San Mateo, 2019). In addition, development allowed under the HEU would be required to comply with the regulations discussed above and regulations and policies described in the *ConnectMenlo* EIR that promote recycling and solid waste reduction and diversion, thus reducing the amount of solid waste requiring processing and disposal. Therefore, operation of development allowed under the HEU would not generate solid waste in excess of the local landfill infrastructure.

Summary

As discussed above, construction and operation of development allowed under the HEU would not generate solid waste in excess of the local landfill infrastructure. This finding is consistent

6 One cubic yard of municipal solid waste = 1.4 tons.

with that found in the *ConnectMenlo* EIR. The HEU's impact with respect to solid waste generation would therefore be **less than significant**.

Mitigation Measure: None required.

Impact UT-5: Implementation of the HEU would comply with federal, state, and local management and reduction statutes and regulations related to solid waste. (*Less than Significant Impact*)

The *ConnectMenlo* EIR found that impacts related to solid waste regulations would be less than significant as all future development under *ConnectMenlo* would be required to comply with existing regulations to minimize impacts related to solid waste disposal and attain solid waste reduction goals, thereby complying with applicable status and regulations related to solid waste. These same findings apply to implementation of the HEU, as discussed below.

During construction and operation associated with development under the HEU, development projects would be required to comply with the regulations described above and regulations and policies described in the *ConnectMenlo* EIR, such as AB 939, SB 1016, AB 341, AB 1826, the CALGreen Code, and the Menlo Park Municipal Code. RethinkWaste oversees the collection, transfer, and disposal of residential garbage, recycling, and organics in the City. RethinkWaste keeps the City compliant with state-mandated recycling requirements (AB 341 and AB 1826), including recycling of organics. As a result, development allowed under the HEU would not conflict with applicable waste reduction policies. This finding is consistent with that found in the *ConnectMenlo* EIR. The HEU's impact with respect to compliance with solid waste regulations would therefore be **less than significant**.

Mitigation Measure: None required.

Cumulative Impacts

This section presents an analysis of the cumulative effects of the HEU in combination with other past, present, and reasonably foreseeable future development that could cause cumulatively significant impacts. Significant cumulative impacts related to utilities and service systems could occur if the incremental impacts of the HEU combined with the incremental impacts of cumulative development would be significant, and if the HEU's contribution would be considerable. Cumulative development projections for 2040 are included in the project description and described in Section 4.0.3, *Cumulative Impacts*.

Impact UT-6: Implementation of the HEU, in combination with past, present, existing, approved, pending, and reasonably foreseeable future projects in the vicinity, would not contribute considerably to cumulative impacts on utilities and service systems. (*Less than Significant Impact*)

Water

Cumulative impacts with respect to water service in the *ConnectMenlo* EIR were considered within the geographic context of the SFPUC retail and wholesale service area. The *ConnectMenlo* EIR found that through compliance with existing state and SFPUC conservation measures, development under *ConnectMenlo*, in combination with other new development within the SFPUC retail and wholesale service area, would not contribute to a significant cumulative impact with respect to water service demands. Furthermore, any new or expanded local water distribution facilities would require permitting and review in accordance with CEQA, which would ensure environmental impacts are disclosed and mitigated to the extent possible. Thus, the cumulative impact with respect to water service was determined to be less than significant. This same finding applies to the cumulative effects of the HEU, as discussed below.

As discussed in section 4.16 Utilities, the adoption and potential implementation of the Bay-Delta Plan Amendment establishes a new paradigm of region-wide water supply issues within the geographic context of the SFPUC retail and wholesale service areas. All water suppliers on the San Francisco Bay Peninsula along with every other water supplier that receives surface water through the Bay-Delta are also grappling with these pending water supply challenges imposed under the Bay-Delta Plan Amendment. As previously discussed, development allowed under the HEU, in combination with cumulative development within the SFPUC retail and wholesale service areas would increase demand for water supply. As discussed above under Impact UT-2, the MPMW and Cal Water Bear Gulch District's water service areas along with all other water suppliers on the San Francisco Bay Peninsula would have adequate water supplies during normal or above-normal precipitation (years of normal supply) to meet projected demand through 2040 and 2045.

With respect to single dry and multiple dry years, the reliability of the RWS is anticipated to vary greatly in different year types. All water suppliers on the San Francisco Bay Peninsula have relied on the supply reliability estimates provided by the SFPUC for the RWS and the drought allocation structure provided by SFPUC and BAWSCA to estimate available RWS supplies in dry year types through 2045. These projections indicated that without the Bay-Delta Plan Amendment being implemented, the SFPUC would be able to supply 100 percent of projected RWS demands in all year types through 2045, except for the 4th and 5th consecutive dry year in 2045, during which 90 percent of projected RWS demands (85 percent of the wholesale demands) would be met. In those years, 4th and 5th dry years, DMMs and implementation of the WSCPs by MPMW and Cal Water's Bear Gulch District and all other water suppliers San Francisco Bay Peninsula would further reduce demand to meet the water supply shortage.

In single dry and during multiple dry years with implementation of the Bay-Delta Plan Amendment the reliability of the RWS is anticipated to vary greatly and is expected to experience substantial water supply shortages. Water suppliers that currently depend on water conveyed through the Bay-Delta are expected to face supply shortfalls in single dry years (ranging from 27

to 32 percent) and in multiple dry years (ranging from 27 to 44 percent through 2040, with similar findings through 2045 based on SFPUC's analysis. Notably, numerous uncertainties regarding Bay-Delta Plan Amendment implementation remain, and thus this represents a worst-case water supply scenario in which the Bay-Delta Plan Amendment is implemented. Therefore, this worst-case water supply scenario establishes a new paradigm of region-wide potentially significant cumulative impacts within the geographic context of the SFPUC retail and wholesale service areas.

As presented and discussed in detail in UT-2, the regional water suppliers including SFPUC, and BAWSCA along with other water suppliers that rely on the Bay-Delta as a supply source have developed strategies and actions to address the projected dry year supply shortfalls. The regional and local strategies, plans and programs are discussed in detail in UT-2 and further discussed in the WSA for the proposed project (Appendix D of this SEIR).

Because of the numerous agencies involved, various project complexities, schedules, timing, approvals and environmental clearance requirements, the results of the previously described plans, projects, and programs may not overcome the single dry and multiple dry year shortages – at least during early years of the HEU timeframe. Therefore, all water suppliers would need to implement their WSCPs as described above to further reduce water demand to potentially meet the supply reductions. The WSCP for each district includes six levels to address shortage conditions ranging from up to 10 percent to greater than 50 percent of demand, identifies a suite of demand reduction measures to implement at each level, and identifies procedures to annually assess whether or not a water shortage is likely to occur in the coming year, among other things. Under the scenario which assumes Bay-Delta Plan Amendment implementation, the projected single dry year and multiple dry year shortfalls would likely require implementation of Stages 3, 4 or 5 of each WSCP. All new development on the San Francisco Bay Peninsula would be subject to the same water conservation and water use restrictions.

Development allowed under the HEU would also be required to comply with the CALGreen Code, which requires that new construction use high-efficiency plumbing fixtures, such as high-efficiency toilets, urinals, showerheads, and faucet fixtures. For outdoor water use, the CALGreen Code requires that irrigation controllers be weather- or soil moisture–based and automatically account for rainfall, or be attached to a rainfall sensor. Finally, all new development would be required to adhere to the City's Water Efficient Landscaping Ordinance. These potential savings were not considered in the WSA, and thus the demand reported above is conservative.

Based on the above, while water supply shortfalls are projected in single dry and multiple dry years with implementation of the Bay-Delta Plan Amendment, these projected shortfalls could be overcome through the SFPUC's various projects, programs and plans and further addressed through implementation of the WSCPs. In addition, development under the HEU would be required to adhere to all applicable regulations that promote water conservation and water use efficiencies. While results of the projects, programs and plans and demand reductions cannot be quantified, it is reasonable to expect that many of the projects, programs and plans would be successful and additional water supplies and demand reductions can be obtained. For these reasons, implementation of the HEU would have sufficient water supplies available to serve the

project and reasonably foreseeable future development during normal years. In single dry and multiple dry years, DMMs and implementation of the WSCPs by all water suppliers would further reduce demand to meet the water supply shortage. This finding is consistent with that found in the *ConnectMenlo* EIR. The HEU's impact with respect to water supply would therefore be **less than significant**.

Mitigation Measure: None required.

Wastewater

Cumulative impacts with respect to wastewater service in the *ConnectMenlo* EIR were considered within the geographic context of the services areas for the WBSD and SVCW. The *ConnectMenlo* EIR determined that, through compliance with General Plan policies and zoning regulations that promote water conservation and minimize impacts related to wastewater generation, development under *ConnectMenlo*, in combination with other new development within WBSD and SVCW service areas, would not contribute to a cumulative impact with respect to wastewater service demands. Furthermore, the EIR indicated that the WBSD's CIPs would ensure that the WBSD's wastewater collection system would have sufficient capacity to accommodate the cumulative growth. Thus, the cumulative impact with respect to wastewater service was determined to be less than significant. This same finding applies to the cumulative effects of the HEU, as discussed below.

Development allowed under the HEU, in combination with cumulative development within the service areas of the WBSD and SVCW, would increase the amount of wastewater requiring conveyance and treatment. Assuming an average annual growth of one percent within the service area of the SVCW, future growth would generate an additional 1.1 mgd over the HEU's eight-year planning horizon (2023-2031) (before factoring in regulations requiring new development to conserve water). When added to the existing amount of wastewater treated by the SVCW WWTP (13.5 mgd), and the amount of wastewater generated by residential development allowed under the HEU (0.72 mgd), the amount of cumulative wastewater requiring treatment at the end of the HEU's planning horizon (2031) would be approximately 15.3 mgd, which is less that SVCW WWTP's existing treatment capacity (29 mgd). In addition, like development allowed under the HEU, all future development in the SVCW's service area would be required to comply with applicable regulations that promote water conservation, thus reducing the amount of wastewater requiring treatment. Finally, with respect to conveyance, with adherence to its Sanitary Sewer Master Plan (2011) and CIP, the WBSD's wastewater collection system would have sufficient capacity to service future growth within its service area. For these reasons, the SVCW WWTP and WBSD wastewater collection system would have sufficient capacity available to serve cumulative development, including development allowed under the HEU.

Stormwater

Cumulative impacts with respect to stormwater service in the *ConnectMenlo* EIR were considered within the geographic context of the San Francisquito Creek watershed. The *ConnectMenlo* EIR determined that through compliance with existing state and local regulations, as well as general plan design guidelines, Menlo Park Municipal Code requirements, and other applicable City requirements, development under *ConnectMenlo* in combination with other new development

within the San Francisquito watershed would not contribute to a significant cumulative impact with respect to stormwater service. Furthermore, the EIR determined that all cumulative projects would be subject to similar permit requirements and would be required to comply with City ordinances and to be consistent with *ConnectMenlo* as well as numerous water quality regulations that control construction-related and operational discharge of stormwater. Thus, the cumulative impact with respect to stormwater service was determined to be less than significant. This same finding applies to the cumulative effects of the HEU, as discussed below.

Development allowed under the HEU, in combination with cumulative development within the San Francisquito Creek watershed would increase the amount of impervious surface in the watershed, and thus would increase the amount of stormwater runoff. However, similar to development allowed under the HEU, cumulative development would be required to adhere to State and local standards that would ensure that post-development runoff rates do not exceed pre-development rates and durations and that LID measures be implemented. Therefore, the stormwater collection system in the San Francisquito Creek watershed would have sufficient capacity available to serve cumulative development, including development allowed under the HEU.

Solid Waste

Cumulative impacts with respect to solid waste service in the *ConnectMenlo* EIR were considered within the geographic context of landfills that serve the City and the region. The *ConnectMenlo* EIR determined that implementation of *ConnectMenlo* when considered with the other jurisdictions that divert solid waste to the same facilities, in particular Ox Mountain Landfill, may eventually experience insufficient future capacity at a specific landfill to accommodate existing or increased population and employment levels. Implementation of Mitigation Measure UTIL-10 requires the City to continue its reduction programs and diversion requirements in an effort to further reduce solid waste that is diverted to the landfill and lower its per capita disposal rate. Furthermore, proposed development in Menlo Park would be required to comply with the City's regulations prepared to reduce solid waste and therefore, reduce impacts related to landfill capacity. Thus, and because the growth under *ConnectMenlo* would occur incrementally over a period of 24 years,[7] implementation of *ConnectMenlo* would not contribute to a significant cumulative impact on solid waste service, and the cumulative impact with respect to solid waste service was considered determined to be less than significant.

Development allowed under the HEU, in combination with cumulative development within the region would increase the amount of solid waste requiring processing and disposal at landfills that serve the City and the region. As discussed above under Impact UT-4, the Ox Mountain landfill has approximately 22,180,000 cubic yards of remaining capacity (31,052,000 tons), and an expected closure date of 2034, although the County's most recent review of the CIWMP in 2019 indicated that Ox Mountain Landfill had an estimated 19 remaining years of capacity, which would

[7] Although the *ConnectMenlo* Final EIR assumed a buildout horizon of 2040, it is possible that the maximum development potential may be reached sooner than anticipated. However, the *ConnectMenlo* Final EIR evaluated the maximum development potential that could occur at any given time and did not consider the phased buildout of the development potential; therefore, no new or additional impacts are anticipated as a result of any expedited buildout that might occur.

extend the closure date to 2038, which is beyond the horizon year of 2031 for the HEU. In addition, cumulative development projects would also be required to comply with federal, state, and local solid waste standards, including waste diversion during construction, and during operation, including recycling and organic material diversion requirements. As such, non-renewable sources of solid waste and the solid waste disposal requirements of cumulative development would be reduced. For these reasons, the Ox Mountain landfill would have sufficient capacity available to serve cumulative development, including development allowed under the HEU.

Electricity and Natural Gas

Cumulative impacts with respect to electrical and natural gas service in the *ConnectMenlo* EIR were considered within the geographic context of PG&E's 70,000 square mile service area. The *ConnectMenlo* EIR determined that, through compliance with existing state and local regulations, as well as general plan design guidelines, Menlo Park Municipal Code requirements, and other applicable City requirements, development under *ConnectMenlo* in combination with other new development within the PG&E service territory would not contribute to a cumulative impact with respect to natural gas and electrical service. Thus, the cumulative impact with respect to electrical and natural gas service was determined to be less than significant.

Development allowed under the HEU, in combination with cumulative development within the PG&E's service area would increase demand for electricity and natural gas. However, development projects would be required to comply with applicable state and local regulations pertaining to energy conservation. Furthermore, as noted in the *ConnectMenlo* EIR, PG&E routinely updates its long-range plans to incorporate potential growth in its service area (City of Menlo Park, 2016b). Therefore, the electrical and natural gas infrastructure would be sufficient to serve cumulative development, including development allowed under the HEU.

Telecommunications

The geographic context with respect to telecommunication service is the service areas for the telecommunication providers that serve the City. Development allowed under the HEU, in combination with cumulative development within the service areas for the telecommunication providers that serve the City would increase demand for telecommunication service. However, similar to the development provided for under the HEU, cumulative development of underground conduits and overhead cables to facilitate telecommunications services would be required to comply with applicable federal, state, and local standards pertaining to underground and overhead utility infrastructure. Therefore, the telecommunications infrastructure would be sufficient to serve cumulative development, including development allowed under the HEU.

Summary

As discussed above, utilities and service systems would have capacity and/or be adequate to serve cumulative development, including development allowed under the HEU. Therefore, the HEU, in combination with past, present, existing, approved, pending, and reasonably foreseeable future projects in the vicinity, would not contribute considerably to cumulative impacts on utilities and service systems, and this cumulative impact would be **less than significant**. This finding is consistent with that found in the *ConnectMenlo* EIR.

Mitigation Measure: None required.

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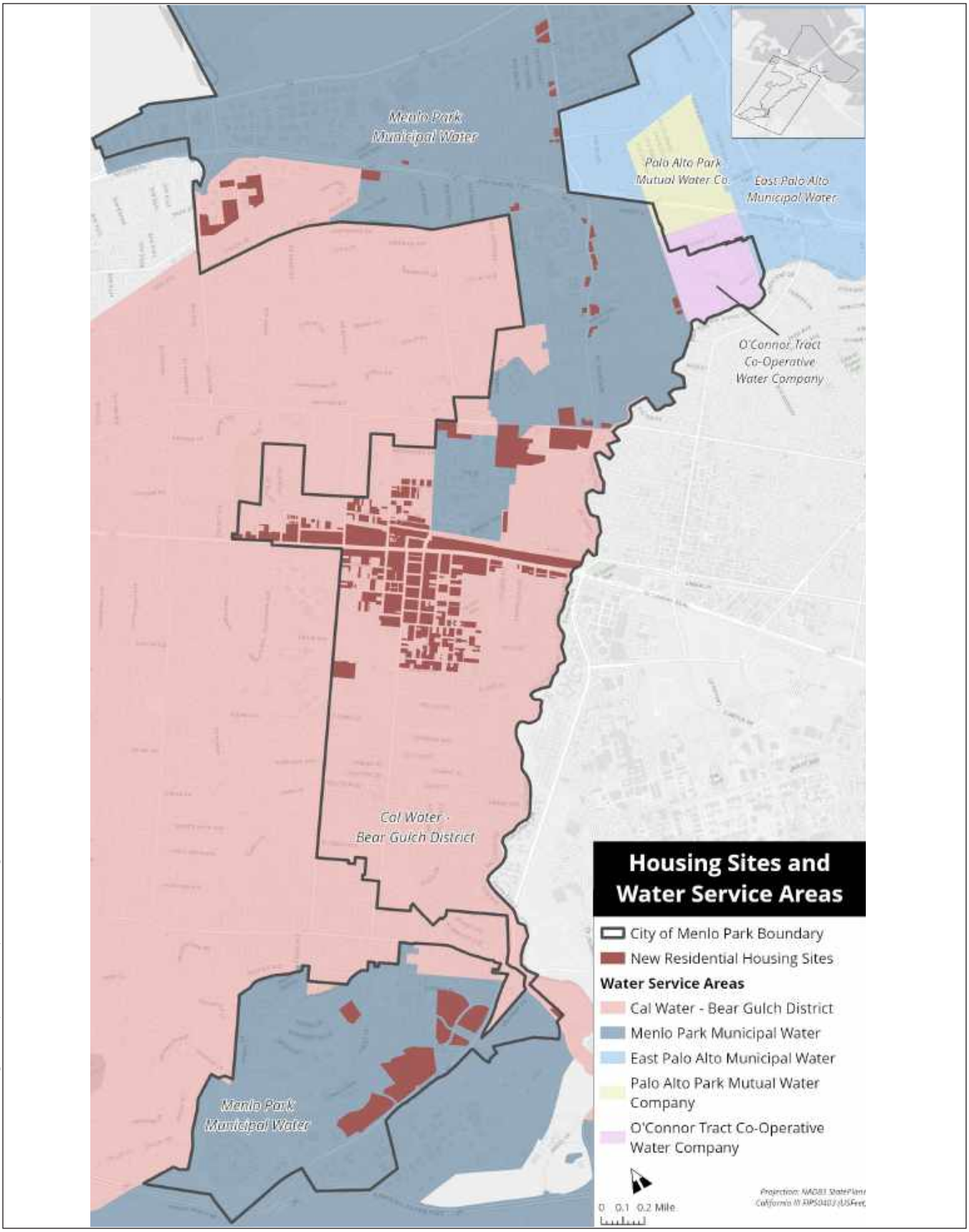

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Menlo Park Housing Element Update EIR

Figure 4.16-1
Housing Sites and Water Service Areas

ESA

4.17 Wildfire

4.17.1 Introduction

This section evaluates the effects of the Housing Element Update (HEU) associated with wildfire, focusing on changes to the *ConnectMenlo* EIR (certified in 2016) that may result in new or more severe impacts, and describes any mitigation measures needed to address any such impacts.

Findings of the *ConnectMenlo* Final EIR

Preparation of the *ConnectMenlo* EIR predated the inclusion of wildfire as a stand-alone topic within the CEQA Guidelines Appendix G environmental checklist. Issues related to wildfire were evaluated in Section 4.7 of the Draft EIR, *Hazards and Hazardous Materials*. The *ConnectMenlo* Final EIR determined that the project would have the following impacts with respect to wildfire:

- HAZ-7: The proposed project would not impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. (*Less than Significant Impact*)
- HAZ-8: The proposed project would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. (*Less than Significant Impact*)

Notice of Preparation Comments

The Notice of Preparation (NOP) for the SEIR was circulated on December 23, 2021 and a scoping meeting was held on January 24, 2022. The NOP and the comments received during the public comment period can be found in **Appendix A** of this *SEIR*. No comments relating to wildfire were received during the NOP comment period.

Information Sources

The primary sources of information referenced in this section included those listed below. Please note that a full list of references for this topic can be found at the end of this section.

- City of Menlo Park General Plan (2016a).
- Connect Menlo Draft EIR (2016b).
- CalFire Fire Hazard Severity Zone Maps (2007, 2008).
- Menlo Park Fire Protection District Community Risk Assessment Standards of Cover (2020).
- San Mateo County Multijurisdictional Local Hazard Mitigation Plan (2021).

4.17.2 Environmental Setting

A wildfire is any uncontrolled fire on undeveloped land that requires fire suppression. Wildfires can occur naturally and are important to many ecosystem processes, but most are human-caused. The City of Menlo Park is highly developed, with essentially no wildland areas within the City of

the types that are typically associated with wildfire. This condition also applies to adjoining jurisdictions. Generally speaking, the entirety of the City is either developed with urban uses or is under some form of land management (golf courses, Bay wetlands, etc.) that are not conducive to wildfire.

Fire Protection Responsibility

The entirety of the City is designated as a Local Responsibility Area (LRA) by the California Department of Forestry and Fire Protection (CalFire). The same is true for the surrounding incorporated communities of Atherton, East Palo Alto, and Palo Alto. Fire protection in the City is provided by the Menlo Park Fire Protection District (MPFPD). In addition to Menlo Park, MPFPD covers the communities of Atherton, Menlo Park, East Palo Alto, and some of the unincorporated areas of San Mateo County. MPFPD responds to approximately 8,500 emergencies a year with about 60 percent of them being emergency medical incidents. MPFPD maintains seven fire stations within its service area (ESCI, 2020):

- Station #1 at 300 Middlefield Road in Menlo Park. The station serves the City of Menlo Park and parts of the Town of Atherton. In addition to its response area in the MPFPD service area, the station also responds to the City of Palo Alto as part of mutual aid. The station currently houses one Type 1 engine, one Type 1 reserve engine, one Type 1 training engine, and one specialized firefighting truck.[1]
- Station #2 at 2290 East University Avenue in East Palo Alto. This station provides fire protection and EMS service to the City of East Palo Alto, which is in the southernmost part of the MPFPD service area. The station currently houses one Type 1 engine and one specialized firefighting truck.
- Station #3 at 32 Almendral Avenue in Atherton. This station serves the Town of Atherton. In addition to Atherton, Station 3 also covers areas that are in the unincorporated parts of Redwood City. The station currently houses one Type 1 engine.
- Station #4 at 3322 Alameda de Las Pulgas in Menlo Park. This station serves the unincorporated area of West Menlo Park and surrounding incorporated areas of Menlo Park and Atherton. The station currently houses two Type 1 engines and one Type 6 engine.

[1] As defined in the MPFPD Community Risk Assessment (ESCI, 2020), the City's firefighting apparatus are as follows: 1) Engine – primary response unit from each station for most types of service requests, equipped with a pump and ability to carry water; 2) Truck – a specialized apparatus used for structure fires, rescues, and other service requests equipped with long ladders, salvage, overhaul equipment, and rescue tools; 3) Tender – a vehicle used for fires in areas without fire hydrants that is designed to carry large quantities of water to a fire incident; 4) Wildland Engine – a smaller vehicle with a pump and water tank designed to be used for brush and grass fires in wildland areas; 5) HazMat – a vehicle that carries specialized equipment for use in hazardous materials emergencies.

A Type 1 fire engine is designed for structural firefighting. It will typically include a pump that operates at 1,000 gallons per minute (gpm), a 400 gal/tank, 1,200 ft. of 2 1/2″ hose, 400 ft. of 1 1/2" hose, 200 ft. of 1″ hose, 20+ feet of ladder, a 500 gpm Master Stream, and minimum staffing of four firefighters. A Type 3 fire engine is typically four-wheel-drive, and is designed for rapid deployment, pick up, and relocation during wildfires. Technically, a Type 3 fire engine includes a pump operating at 120 gpm, a large 500 gal/tank, 1,000 ft. of 1 1/2″ hose, 800 ft. of 1″ hose, and a minimum of four firefighters. A Type 5 engine is normally an initial attack engine on a medium duty chassis. A Type 6 fire engine is a smaller wildland engine, usually mounted on a pickup chassis. A quint engine is a fire-fighting apparatus that serves the dual purpose of an engine and a ladder truck. These standards can vary slightly depending on the needs of the community where they are deployed (California Fire Prevention Organization, 2021).

- Station #5 at 4101 Fair Oaks Avenue in Menlo Park. This station serves the North Fair Oaks area of the MPFPD service area and unincorporated areas of Redwood City. Since its response area borders Redwood City, the station also provides automatic aid to the Redwood City Fire Department. The station currently houses one Type 1 engine.
- Station #6 at 700 Oak Grove Avenue in Menlo Park. This station serves areas of the MPFPD service area that include portions of the Town of Atherton and City of Menlo Park, including the downtown area where the station is located. The station currently houses one Type 1 engine.
- Station #77 at 1467 Chilco Street in Menlo Park. This station is located in the northern portion of the City in the Bayfront area. The station currently houses two Type 1 engines, one Type 5 engine, one Type 6 engine, and one quint engine.

MPFPD has entered into various cooperative and fire assistance agreements with other federal, state, and local jurisdictions within the region and state. Most wildfire events and other large-scale incidents are responded to by multiple agencies operating under the varying levels of the incident command structure, which is a standardized approach to the command, control, and coordination of emergency response providing a common hierarchy within which responders from multiple agencies can be effective. In such instances, MPFPD personnel and equipment could respond to incidents outside of MPFPD's formal area of responsibility. Conversely, other emergency services organizations throughout the region and state could respond to incidents within MPFPD's area of responsibility if needed.

Fire Hazard Severity Zones and Wildfire Risk

As part of its Fire and Resources Assessment Program (FRAP), CalFire has modeled and mapped wildfire hazard zones using a computer model that designates moderate, high or very high fire hazard severity zones (FHSZ). FHSZ ratings are derived from a combination of fire frequency (how often an area burns) and expected fire behavior under severe weather conditions. CalFire's model derives fire frequency from 50 years of fire history data. Fire behavior is based on factors such as the following:

- **Fuel:** Fuel may include living and dead vegetation on the ground, along the surface as brush and small trees, and above the ground in tree canopies. Lighter fuels such as grasses, leaves and needles quickly expel moisture and burn rapidly, while heavier fuels such as tree branches, logs and trunks take longer to warm and ignite. Trees killed or defoliated by insects and disease are more susceptible to wildfire.
- **Weather:** Relevant weather conditions include temperature, relative humidity, wind speed and direction, cloud cover, precipitation amount and duration, and the stability of the atmosphere. When the temperature is high, relative humidity is low, wind speed is increasing and coming from the east (offshore flow), and there has been little or no precipitation so vegetation is dry, conditions are very favorable for extensive and severe wildfires. These conditions occur more frequently inland where temperatures are higher and fog is less prevalent.
- **Terrain:** Topography includes slope and elevation. The topography of a region influences the amount and moisture of fuel; the impact of weather conditions such as temperature and wind; potential barriers to fire spread, such as highways and lakes; and elevation and slope of landforms (fire spreads more easily uphill than downhill).

The model is also based on frequency of fire weather, ignition patterns, and expected rate of spread. It accounts for flying ember production, which is the principal driver of the wildfire hazard in densely developed areas. A related concern in built-out areas is the relative density of vegetative fuels that can serve as sites for new spot fires within the urban core and spread to adjacent structures. The model refines the zones to characterize fire exposure mechanisms that cause ignitions to structures. Significant land-use changes need to be accounted for through periodic model updates. Detailed discussions of the zones and how they are developed are available on the CalFire website.[2]

Based on the fire hazard severity zone maps prepared for San Mateo County by CalFire (CalFire, 2007 and 2008), there are no areas of the City located within areas of moderate, high, or very high fire hazard severity, though the southwestern-most portions of the City south of the Sharon Heights area are located adjacent to an area that is designated as a High Fire Hazard Severity Zone.

A Community Risk Assessment prepared for the MPFPD (ESCI, 2020) described the City as having only a moderate risk of wildfire due to urbanization, but noted that consideration should be given to any vacant areas with cured fuels (generally grass or shrubs). Consistent with the previously referenced CalFire mapping, the assessment also noted that a high wildfire risk was present in the foothills located just outside of the MPFPD's boundaries to the southwest. The assessment found that these foothill areas outside of the City could burn readily but would likely not result in a major threat to the MPFPD service area, other than poor air quality or small spot fires near the boundaries closest to the foothills. The assessment concluded that the greatest fire risk in the City is from within the community's buildings in the urban area or smaller grass fires that could develop next to structures and spread to infrastructure before fire resources can arrive. The assessment found that structural and automobile fires are the most common fire risks for residents of the MPFPD service area.

Emergency Response and Evacuation Plans

The City adopted an Emergency Operations Plan in 2014. The plan aligns with the National Incident Management System (NIMS) and the California Standardized Emergency Management System (SEMS). The plan provides Emergency Operations Center (EOC) responders with procedures, documentation, and user friendly checklists to effectively manage emergencies, and it also provides detailed information of supplemental requirements such as Public Information, Damage Assessment, and Recovery Operations.

Neither the City nor the MPFPD have an adopted emergency evacuation plan. In 2011, the MPFPD Board adopted Resolution No. 1476-2011, which identified a system of primary response routes in the MPFPD service area (MPFPD, 2011). The routes generally correspond to the area's arterial roadways, and provide for execution of rapid deployment and maintenance of acceptable response times in the community. The resolution provides that traffic mitigation devices not acceptable to the MPFPD are prohibited unless approved by the Fire Chief.

[2] See https://osfm.fire.ca.gov/divisions/community-wildfire-preparedness-and-mitigation/wildland-hazards-building-codes/fire-hazard-severity-zones-maps/

MPFPD adopted time-based performance standards for emergency response in 2015 (MPFPD, 2015). The adopted response standard directs first response units to arrive on the scene of all Code 3 emergencies within seven minutes from the receipt of the 911 call in the dispatch center at least 90 percent of the time. This would equate to a one-minute dispatch time, a two-minute company turnout time, and a four-minute response or drive time.

In addition to social media and the City's website, the City also participates in and uses the countywide SMC Alert system that provides emergency notifications via voice calls, SMS texts, and email. The City also participates in and uses Zonehaven, which is an evacuation platform that is tied into SMC Alert for providing emergency notifications to zones within the City and larger region.

As part of the HEU and Safety Element Update, the City is currently evaluating areas of the City with only one point of ingress/egress, per the requirements of Senate Bill (SB) 99 (see Section 4.17.3, *Regulatory Setting*, below).

4.17.3 Regulatory Setting

The following section focuses on any changes to the regulatory setting that have occurred since certification of the *ConnectMenlo* EIR. Draft EIR Section 4.7, *Hazards and Hazardous Materials* evaluated effects associated with wildfire. There, Section 4.7.1.1, *Regulatory Framework*, described regulations applicable to this topic. Since the *ConnectMenlo* EIR did not evaluate impacts associated with wildfire in a stand-alone topical section and therefore did not list a number of regulations specific to the topic, a more complete listing of applicable regulations is provided here.

Federal

There are no federal regulations pertaining to wildfire that are applicable to the proposed HEU.

State

California Department of Forestry and Fire Protection

Title 14 of the California Code of Regulations (CCR), Division 1.5, establishes regulations for CalFire in State Responsibility Areas (SRAs) where CalFire is responsible for wildfire protection. These regulations constitute the basic wildland fire protection standards of the California Board of Forestry and Fire Protection. They have been prepared and adopted for the purpose of establishing minimum wildfire protection standards in conjunction with building, construction, and development in SRAs. Additionally, Title 14, Division 1.5, Chapter 7, Subchapter 2 sets forth the minimum standards for emergency access and egress (Article 2), signage (Article 3), water supply (Article 4), and fuel modification standards (Article 5) for lands within SRAs.

While the project site is located within a LRA, areas north of the City are within a SRA. For LRA lands where the MPFPD is the fire protection service provider (i.e., all lands within the City's corporate boundaries), the District has its own requirements for fire protection, as described later in this section.

Emergency Services Act

Under the Emergency Services Act, Government Code Section 8550, et seq., the State developed an emergency response plan to coordinate emergency services provided by federal, state, and local agencies. Rapid response to incidents involving wildfire and other natural and/or human-caused incidents is an important part of the plan, which is administered by the Governor's Office of Emergency Services (OES). The office coordinates the responses of other agencies, including the California Environmental Protection Agency (CalEPA), the California Highway Patrol (CHP), regional water quality control boards, air quality management districts, and county disaster response offices.

California Public Resources Code

Fire Hazards Severity Zones – Public Resources Code Sections 4201-4204

California Public Resources Code Sections 4201 through 4204 require CalFire to prepare fire hazard severity zone maps for all lands within SRAs, and to make recommendations for such zones in LRAs. Each zone is to embrace relatively homogeneous lands and is to be based on fuel loading, slope, fire weather, and other relevant factors present, including areas where winds have been identified as a major cause of wildfire spread. CalFire adopted Fire Hazard Severity Zone maps for the City of Menlo Park in 2007 and 2008 (CalFire 2007, 2008). There are no areas of the City located within areas of moderate, high, or very high fire hazard severity, though the southwestern-most portions of the City in the Sharon Heights area are located adjacent to an area that is designated as a High Fire Hazard Severity Zone.

California Building Code

In January of 2008, California officially switched from the Uniform Building Code to the International Building Code. The International Building Code specifies construction standards to be used in urban interface and wildland areas where there is an elevated threat of fire.

California Wildland Urban Interface Code

The California Wildland Interface Code provides building code directives that are now mandatory within the Wildland Urban Interface (WUI). The code is directed towards providing defensible space and constructing more ignition-resistant structures. The code provides specifications for fuel modification zones around structures and fire resistant building materials and construction techniques. All new buildings located in any FHSZ within State Responsibility Areas, any Local Agency Very-High FHSZ, or any WUI Fire Area designated by the enforcing agency for which an application for a building permit is submitted must comply with all sections of the code.

Assembly Bill 747

AB 747 was adopted in 2019, and requires safety elements to be reviewed and updated as necessary to identify evacuation routes and their capacity, safety, and viability under a range of emergency scenarios. The law authorizes a local jurisdiction that has adopted a local hazard mitigation plan, emergency operations plan, or other document that fulfills commensurate goals and objectives to use that information in the safety element to comply with this requirement by summarizing and incorporating by reference that other plan or document in the safety element.

Senate Bill 99

SB 99 was adopted in 2019, and requires a local jurisdiction, upon the next revision of the housing element on or after January 1, 2020, to review and update the safety element to include information identifying residential developments in hazard areas that do not have at least two emergency evacuation routes.

County

San Mateo County 2021 Multijurisdictional Local Hazard Mitigation Plan

San Mateo County has developed a local hazard mitigation plan that encompassed 20 cities and towns in the County, as well the County's fire districts and other special purpose districts. (San Mateo County, 2021). The plan defines measures to reduce risks from natural disasters in the San Mateo County planning area, which consists of the entire county, including unincorporated areas, incorporated cities, and special purpose districts. The plan complies with federal and state hazard mitigation planning requirements to establish eligibility for funding under Federal Emergency Management Agency (FEMA) grant programs for all planning partners. It updates the County's previous plan, the *2016 San Mateo County Hazard Mitigation Plan.*

Local

Menlo Park General Plan

The Menlo Park General Plan is a comprehensive long-range general plan for the physical development of the City of Menlo Park (City of Menlo Park, 2016a). The General Plan contains the current City of Menlo Park Housing Element, which was adopted in 2014 (City of Menlo Park, 2014). The various elements within the General Plan include goals and policies for the physical development of the City. Goals and policies related to wildfire are listed below.

Goal S1: Assure a Safe Community. Minimize risk to life and damage to the environment and property from natural and human-caused hazards, and assure community emergency preparedness and a high level of public safety services and facilities.

Policy S1.1: Location of Future Development. Permit development only in those areas where potential danger to the health, safety and welfare of the residents of the community can be adequately mitigated.

Policy S1.3: Hazard Data and Standards. Integrate hazard data (geotechnical, flood, fire, etc.) and risk evaluations into the development review process and maintain, develop and adopt up-to-date standards to reduce the level of risk from natural and human-caused hazards for all land use.

Policy S1.5: New Habitable Structures. Require that all new habitable structures incorporate adequate hazard mitigation measures to reduce identified risks from natural and human-caused hazards.

Policy S1.8: Safety Element Updates. Review and comprehensively revise the Safety Element whenever substantial new scientific data or evidence related to prevention of natural and human hazards becomes available, and coordinate with other General Plan elements and City emergency plans.

Policy S1.10: Safety Review of Development Projects. Continue to require hazard mitigation, crime prevention, fire prevention and adequate access for emergency vehicles in new development.

Policy S1.11: Visibility and Access to Address Safety Concerns. Require that residential development be designed to permit maximum visibility and access to law enforcement and fire control vehicles consistent with privacy and other design considerations.

Policy S1.29: Fire Equipment and Personnel Access. Require adequate access and clearance, to the maximum extent practical, for fire equipment, fire suppression personnel and evacuation for high occupancy structures in coordination with the Menlo Park Fire Protection District.

Policy S1.30: Coordination with the Menlo Park Fire District. Encourage City-Fire District coordination in the planning process and require all development applications to be reviewed and approved by the Menlo Park Fire Protection District prior to project approval.

Policy S1.31: Fire Resistant Design. Require new homes to incorporate fire resistant design and strategies such as the use of fire resistant materials and landscaping, and creating defensible space (e.g. areas free of highly flammable vegetation).

Policy S1.34: Disaster Preparedness Planning. Ensure disaster preparedness in cooperation with other public agencies and appropriate public-interest organizations. Expand abilities of residents to assist in local responses to disasters. Ensure adequate resources, facilities, and other support for emergency response equitably throughout the City.

Policy S1.36: Emergency Notification System. Continue to support and improve on the Emergency Notification System for disaster information release in emergencies.

Policy S1.37: Emergency Connectors and Evacuation Routes. Maintain a system of emergency connectors and evacuation routes as part of the City's disaster planning.

Policy S1.38: Emergency Vehicle Access. Require that all private roads be designed to allow access for emergency vehicles as a prerequisite to the granting of permits and approvals for construction.

Policy S1.39: Emergency Preparedness for Sensitive Populations. Review and improve disaster response capabilities, recovery operations and evacuation planning for sensitive populations in the event of earthquake or other disasters.

Goal CIRC-1: Provide and maintain a safe, efficient, attractive, user-friendly circulation system that promotes a healthy, safe, and active community and quality of life throughout Menlo Park.

Policy CIRC-1.3: ***Engineering***. Use data-driven findings to focus engineering efforts on the most critical safety projects.

Policy CIRC-1.6: ***Emergency Response Routes***. Identify and prioritize emergency response routes in the Citywide circulation system.

Program CIRC-1.E: ***Emergency Response Routes Map***. In collaboration with the Menlo Park Fire Protection District and Menlo Park Police Department, adopt a map of

emergency response routes that considers alternative options, such as the Dumbarton Corridor, for emergency vehicle access. Modifications to emergency response routes should not prevent or impede emergency vehicle travel, ingress, and/or egress.

Program CIRC-1.F: ***Coordination with Emergency Services***. Coordinate and consult with the Menlo Park Fire Protection District in establishing circulation standards to assure the provision of high quality fire protection and emergency medical services within the City.

Goal CIRC-2: Increase accessibility for and use of streets by pedestrians, bicyclists, and transit riders.

Policy CIRC-2.14: ***Impacts of New Development***. Require new development to mitigate its impacts on the safety (e.g., collision rates) and efficiency (e.g., vehicle miles traveled (VMT) per capita) of the circulation system. New development should minimize cut-through and high-speed vehicle traffic on residential streets; minimize the number of vehicle trips; provide appropriate bicycle, pedestrian, and transit connections, amenities and improvements in proportion with the scale of proposed projects; and facilitate appropriate or adequate response times and access for emergency vehicles.

Goal CIRC-3: Increase mobility options to reduce traffic congestion, greenhouse gas emissions, and commute travel time.

Policy CIRC-3.3: ***Emerging Transportation Technology***. Support efforts to fund emerging technological transportation advancements, including connected and autonomous vehicles, emergency vehicle pre-emption, sharing technology, electric vehicle technology, electric bikes and scooters, and innovative transit options.

Program CIRC-3.B: ***Emergency Response Coordination***. Equip all new traffic signals with pre-emptive traffic signal devices for emergency services. Existing traffic signals without existing pre-emptive devices will be upgraded as major signal modifications are completed.

Menlo Park Emergency Operations Plan

As discussed above, the City adopted an Emergency Operations Plan in 2014. The plan aligns with the NIMS and the California SEMS. The plan provides EOC responders with procedures, documentation, and user friendly checklists to effectively manage emergencies, and it also provides detailed information of supplemental requirements such as Public Information, Damage Assessment, and Recovery Operations.

Menlo Park Municipal Code

Menlo Park Municipal Code Section 13.18.020 requires that any activity occurring within City rights-of-way first obtain an encroachment permit to do so from the Director of Public Works. The Code specifies that no encroachment of any kind which impedes, obstructs or denies pedestrian, vehicular, or other lawful travel within the limits of the public right-of-way or which impairs adequate sight-distance or safe pedestrian or vehicular traffic will be permitted.

Menlo Park Fire Protection District Resolution No. 1476-2011

As discussed above, in 2011, the MPFPD Board adopted a resolution that identified a system of primary response routes in the MPFPD service area (MPFPD, 2011). The routes generally

correspond to the area's arterial roadways, and provide for management of rapid deployment and maintenance of acceptable response times in the community. The resolution provides that traffic mitigation devices not acceptable to the MPFPD are prohibited unless approved by the Fire Chief.

Menlo Park Fire Protection District Fire Prevention Code

Ordinance 45-2019 of the Menlo Park Fire Protection District adopted the District's Fire Code, which is based on the 2019 California Fire Code, California Code of Regulations, Title 24, Part 9, which prescribes regulations governing conditions to life and property from fire or explosion through building standards and non-building standards, modified by local amendments specific to the District. Project applications for development in Menlo Park are plan-checked by the District for compliance with the code.

Menlo Park Fire Protection District Standards and Guidelines Manual

The District's Standards and Guidelines Manual serves as a supplemental instruction and interpretation manual for the District's Fire Prevention Code. The manual provides detail on the District's requirements related to roadways and circulation, access, fire protection equipment, hydrants, fire sprinklers, water supply, vegetation management, and home hardening against wildfire in areas with heightened fire risk.

4.17.4 Environmental Impacts and Mitigation Measures

Scope of Analysis

The analysis in this SEIR describes impacts identified in the 2016 *ConnectMenlo* EIR, and describes how the impacts of the HEU would differ, as applicable.

Significance Thresholds

The thresholds used to determine the significance of impacts related to wildfire are based on Appendix G of the *CEQA Guidelines*. Implementation of the HEU would have a significant impact on the environment if the Project were located in or near a SRA or lands classified as a Very High FHSZ, and if it would:

- Substantially impair an adopted emergency response plan or emergency evacuation plan.
- Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire.
- Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment.
- Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

Methodology and Assumptions

As noted earlier, the City of Menlo Park is highly developed, with essentially no wildland areas within the City of the types that are typically associated with wildfire, and the City is not in or near any SRAs and/or lands classified as Very High FHSZs. Nonetheless, the analysis below considers whether the development of new housing permitted by the HEU would increase fire risk and the related secondary impacts mentioned in the Appendix G thresholds, and whether the new housing would substantially impair emergency response or emergency evacuation from surrounding areas.

Impacts and Mitigation Measures

Impacts

Impact WILD-1: Implementation of the HEU would not substantially impair an adopted emergency response plan or emergency evacuation plan. (*Less than Significant Impact*)

The *ConnectMenlo* EIR found that the project would not impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. The EIR found that the project would not include potential land use changes that would impair or physically interfere with the ability to implement the City's Emergency Operations Plan. The EIR further found that the Land Use and Circulation Elements, which were adopted as part of the *ConnectMenlo* project, and the existing Open Space/Conservation, Noise and Safety Elements contained general goals, policies, and programs that would require local planning and development decisions to consider impacts to the environment related to an adopted emergency response plan. These goals and policies were outlined above in Section 4.17.3, *Regulatory Setting*. These same findings apply to implementation of the HEU.

The construction of residences as part of residential development projects that could result from implementation of the HEU would include the transportation and movement of equipment, materials, and construction workers. If located along designated evacuation and emergency response routes or in areas subjected to limited or constrained access, these construction activities could impair or interfere with adopted emergency response plans or emergency evacuation plans, and could be potentially significant.

However, as discussed in Section 4.17.3, *Regulatory Setting*, Section 13.18.020 of the City's Municipal Code outlines requirements for encroachment permits when development projects encroach into public rights-of-way during construction. Examples of encroachment could include temporary use of public rights-of-way for staging, construction, or traffic control purposes. Projects with high volumes of truck traffic are also required to take out an encroachment permit to ensure that trucks do not create undue damage to public roadways. For larger projects, preparation and implementation of a construction traffic control/traffic management plan is also required to manage construction traffic in a manner that would ensure adequate traffic flow and to keep key routes open.

Further, MPFPD has identified key routes within the City that must remain open for purposes of emergency response and evacuation. During the permit review process, impacts from residential development to those routes would be identified and addressed through compliance with

restrictions on operational interference as specified in MPFPD's Resolution No. 1476-2011. In this manner, construction of residential projects that might arise as a result of the HEU's implementation would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan during construction.

Once constructed, the residential projects would not restrict or interfere with the flow of emergency vehicles or evacuation because they would not reconfigure or physically block routes used for emergency access or evacuation. While additional traffic volumes could be expected on these routes with the development of more housing, emergency responders would be able to access all areas of the City with the help of traffic signal prioritization and vehicular lights/sirens. Similarly, while there could be increased roadway volumes on streets near new development, the City's urban form, with a grid of streets providing multiple ways to travel in each direction, suggests traffic would be sufficiently dispersed to avoid substantially impairing emergency evacuation by nearby residents.

Also, the City would be required to periodically update its emergency response and evacuation plan(s) as required under AB 747 and the City's General Plan. The City is currently in the process of updating the General Plan's Safety Element concurrent with the HEU. This ongoing and periodic reevaluation would address these changed conditions, and would adjust the emergency response and evacuation plans accordingly.

For these reasons, the adoption of the HEU would result in **less-than-significant** impacts with respect to interference with an adopted emergency response plan or emergency evacuation plan. This conclusion is the same as that found in the *ConnectMenlo* EIR.

Mitigation Measure: None required.

Impact WILD-2: Implementation of the HEU would not exacerbate wildfire risks due to slope, prevailing winds, and other factors, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. (*Less than Significant Impact*)

Though utilizing criteria that have since been replaced by updates to the CEQA Guidelines Appendix G Checklist, the *ConnectMenlo* EIR found that the project would have a less-than-significant impact with respect to exposure of people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. These same findings apply to implementation of the HEU.

The City is located in a highly urbanized area and is not surrounded by woodlands or vegetation that would provide fuel loads for wildfires. Menlo Park does not contain areas of moderate, high, or very high Fire Hazard Severity for the LRA, nor does it contain any areas of moderate, high, or very high Fire Hazard Severity for a SRA. However, zones of high Fire Hazard Severity designated as SRAs are present adjacent to the southwestern City limits.

Future development under the HEU, as part of the City's project approval process, would be required to comply with existing regulations as described in Section 4.17.3, *Regulatory Framework*. Specifically, all development would be constructed pursuant to applicable building codes and the California Building Code and the MPFPD Fire Prevention Code. Per standard procedure, project applications for development in Menlo Park are plan-checked by the MPFPD for compliance with the code, and those requirements would apply to any future development. In addition, MPFPD conducts a weed-abatement program throughout its jurisdiction to minimize fire risk on empty or unmaintained parcels.

Also, as discussed above in Section 4.17.3, General Plan policies have been adopted to minimize impacts from wildfire. Specifically, Policy S1.1 permits development only in those areas where potential danger to the health, safety and welfare of the residents of the community can be adequately mitigated. Policy S1.5 requires that all new habitable structures incorporate adequate hazard mitigation measures to reduce identified risks from natural and human-caused hazards. Policy S1.13 requires new residential structures to incorporate fire resistant design and strategies such as the use of fire resistant materials and landscaping, and to create defensible space.

Based upon these considerations, implementation of the HEU would have a **less than significant impact** with respect to enhanced wildfire risk.

Mitigation Measure: None required.

Impact WILD-3: Implementation of the HEU would not require the installation or maintenance of infrastructure such as roads, fuel breaks, emergency water sources, power lines or other utilities that could exacerbate fire risk or that could result in temporary or ongoing impacts to the environment. (*Less than Significant Impact*)

The *ConnectMenlo* EIR did not consider this impact because this criteria was not a part of the CEQA Guidelines at the time of the *ConnectMenlo* EIR's adoption. As discussed above under Impact WILD-2, the City is located in a highly urbanized area and is not surrounded by woodlands or vegetation that would provide fuel loads for wildfires, nor is any portion of the City located within a CalFire-designated wildfire hazard severity zone. As such, installation of infrastructure related to abating wildfire risks would not be required, and the impact would be **less than significant**.

Mitigation Measure: None required.

Impact WILD-4: Implementation of the HEU would not expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

The *ConnectMenlo* EIR did not consider this impact because this criteria was not a part of the CEQA Guidelines at the time of the *ConnectMenlo* EIR's adoption. All of the HEU housing opportunity sites and land use strategy sites are in developed and urbanized areas, and are similarly surrounded by areas that are already developed. Post-fire impacts such as slope

instability and downstream flooding are more typically associated with steep wildland areas that burn and then erode or slide onto downslope areas. These conditions do not apply to lands within the City or to the HEU housing opportunity sites and land use strategy sites. Further, the City's low potential for wildfire largely negates the potential for substantial post-fire effects to occur due to increased risk within the City. Based on these considerations, the effect of the HEU's implementation would be **less than significant**.

Mitigation Measure: None required.

Cumulative Impacts

This section presents an analysis of the cumulative effects of the HEU in combination with other past, present, and reasonably foreseeable future development that could cause cumulatively significant impacts. Significant cumulative impacts related to wildfire could occur if the incremental impacts of the HEU combined with the incremental impacts of cumulative development would be significant, and if the HEU's contribution would be considerable. Cumulative development projections for 2040 are included in the project description and described in Section 4.0.3, *Cumulative Impacts*.

Impact WILD-5: Implementation of the HEU, when combined with other past, present, or reasonably foreseeable projects, would/would not result in a cumulative impact related to wildfire. (*Less than Significant Impact*)

The *ConnectMenlo* EIR evaluated cumulative impacts related to wildland fire using the CEQA Appendix G Checklist criteria that were in effect at the time of the EIR's certification. Those criteria considered effects related to emergency response and evacuation, as well as significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. The *ConnectMenlo* EIR did not consider cumulative effects related to the construction of wildfire-related infrastructure or post-fire effects.

Emergency Response and Evacuation

Construction of two or more projects that occur at the same time and use the same roads could interfere with an adopted emergency response plan or emergency evacuation plan. As discussed previously under Impact WILD-1, the City has standard requirements in place to address potential impacts to critical routes and traffic flow during the construction process. As with projects that could arise from the HEU's implementation, cumulative projects would be required to receive an encroachment permit and to prepare and implement similar traffic management plans to maintain traffic flow and prevent interference with emergency access during construction. As such, as with development projects resulting from the HEU, any cumulative projects would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. The cumulative impact would therefore be **less than significant**. This conclusion is the same as that found in the *ConnectMenlo* EIR.

Very High Fire Hazard Severity Zones and Uncontrolled Spread of Wildfire

No portion of the City lies within a Very High Fire Hazard Severity Zone. Regardless, as a condition of approval, and pursuant to the regulatory requires outlined above in Section 4.17.3, above, all development projects would be required to comply with building code and General Plan requirements relating to fire service features, building services and systems, access requirements, water supply, fire and smoke protection features, building materials, construction requirements, and defensible space and vegetation management.

Each of the code requirements outlined above have been developed over many decades to reduce the risks associated with wildfire and public safety in general. As a condition of approval for any cumulative project that may be developed in addition to those that might be developed as part of the HEU's adoption, the implementation of these standard requirements would reduce impacts associated with accidental ignitions emanating from project sites, and would also reduce impacts associated with wildfires encroaching onto project sites from adjacent areas. There would therefore be no cumulatively considerable effect, and the cumulative impact would therefore be **less than significant**. This conclusion is the same as that found in the *ConnectMenlo* EIR.

Wildfire-Related Infrastructure

The *ConnectMenlo* EIR did not consider this cumulative impact because this criteria was not a part of the CEQA Guidelines at the time of the *ConnectMenlo* EIR's adoption. As discussed above under Impacts WILD-2 and WILD-3, the City is located in a highly urbanized area and is not surrounded by woodlands or vegetation that would provide fuel loads for wildfires, nor is any portion of the City located within a CalFire-designated wildfire hazard severity zone. As such, installation of infrastructure related to abating wildfire risks would not be required. Regardless, the environmental effects of installing such facilities, if required, would be evaluated at the time of project application, and would follow established regulations and development protocols as defined in City regulation and General Plan policy. Based on these considerations, the combined effect of the HEU and the other cumulative projects would be **less than significant**.

Post-Fire Effects

The *ConnectMenlo* EIR did not consider this cumulative impact because this criteria was not a part of the CEQA Guidelines at the time of the *ConnectMenlo* EIR's adoption. As noted above under Impact WILD-4, nearly all of the HEU housing opportunity sites and land use strategy sites are developed and urbanized, and are similarly surrounded by areas that are already developed. Post-fire impacts such as slope instability and downstream flooding are typically associated with steep wildland areas that burn and then erode or slide onto downslope areas. These conditions do not apply to the City. Further, the City's low potential for wildfire largely negates the potential for substantial post-fire effects to occur. Based on these considerations, the effect of the cumulative projects and the HEU's implementation would be **less than significant**.

Mitigation Measure: None required.

4.17.5 References

CalFire. 2008a. *Very High Fire Hazard Severity Zones in SRA*. November 7, 2008. Available online: https://osfm.fire.ca.gov/divisions/community-wildfire-preparedness-and-mitigation/wildland-hazards-building-codes/fire-hazard-severity-zones-maps/. Accessed March 22, 2022.

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California Fire Prevention Organization. 2021. *Apparatus Descriptions*. Available at: https://www.calfireprevention.org/fire-apparatus/. Accessed April 6, 2022.

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City of Menlo Park. 2016b. *Draft EIR for ConnectMenlo: General Plan Land Use & Circulation Elements and M-2 Area Zoning Update*. Available online: https://www.menlopark.org/1013/Environmental-Impact-Report. Accessed February 23, 2022.

City of Menlo Park. 2014. *City of Menlo Park Housing Element, 2015-2023*. Available online: https://beta.menlopark.org/files/sharedassets/public/community-development/documents/adopted-housing-element-2015-2023_20141202185715361 9.pdf. Accessed February 23, 2022.

Emergency Services Consulting International (ESCI). 2020. *Menlo Park Fire Protection District Community Risk Assessment: Standards of Cover*.

Menlo Park Fire Protection District. 2011. *Resolution of the Board of the Menlo Park Fire Protection District Adopting the Primary Emergency Response Routes for the Menlo Park Fire Protection District*. Resolution No. 1476-2011. Adopted April 16, 2011.

Menlo Park Fire Protection District. 2015. *Resolution of the Board of the Menlo Park Fire Protection District Adopting a Time-Based Performance Measure Standard for the Menlo Park Fire Protection District*. Resolution No. 1476-2011. Adopted September 15, 2015.

Menlo Park Fire Protection District. 2019. *Standards and Guidelines Manual*. Available online: https://www.menlofire.org/media/Fire%20Prevention/Guidelines%20and%20Standards/Policy%20Manual.pdf. Accessed March 29, 2022.

San Mateo County. 2021. *Multijurisdictional Local Hazard Mitigation Plan*. October, 2021. Available online: https://www.smcgov.org/cmo/2021-multijurisdictional-lhmp. Accessed March 23, 2022.

4.18 Issues Not Subjected to Detailed Analysis

Pursuant to CEQA Guidelines Section 15128, this subsection describes the reasons that various possible effects of the Housing Element Update (HEU) were determined not to be significant, or to have no impact, and, therefore, were not discussed in detail in this SEIR. These determinations were generally made because the identified environmental resources are not present within or around the HEU area or because implementation of the HEU would clearly have no effect with respect to these topical issue areas. These issue areas are described in this section with an explanation of why they are not evaluated further in this SEIR.

4.18.1 Agricultural and Forestry Resources

The *ConnectMenlo* EIR evaluated Agricultural and Forestry Resources in Section 6.1.1 of the EIR (City of Menlo Park, 2016b). The EIR found that there would be no impact to these resources. These same findings are applicable to the proposed HEU, as outlined below.

Appendix G of the CEQA *Guidelines* specifies that an impact to agricultural and forestry resources would occur if a project would: 1) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use; 2) conflict with existing zoning for agricultural use, or a Williamson Act contract; 3) conflict with existing zoning, or cause rezoning of, forest land or timberland; 4) result in loss of forest land or conversion of forest land to non-forest use; or; 5) involve other changes that could result in conversion or farmland of forest land to non-agricultural use.

With respect to agricultural resources in the City, the entirety of the City is mapped as "Urban and Built-Up Land" or "Other Land" by the California Farmland Mapping and Monitoring Program (FMMP). According to the FMMP map for San Mateo County, there is no Prime Farmland, Unique Farmland, or Farmland of Statewide Importance designated in any portion of the City (California Department of Conservation, 2018).

No existing farming or forestry operations are present within any area of the City. No areas of the City are specifically designated or zoned for agricultural use, and no agricultural zoning districts are provided for in the City's Zoning Code (City of Menlo Park, 2016a, 2022a, 2022b).

With respect to forestry resources, no existing timber-harvest uses are located on or in the vicinity of the City. No areas of the City are designated or zoned for such use (City of Menlo Park, 2016a, 2022a, 2022b).

Based on these considerations, implementation of the HEU would result in **no impacts** to agricultural or forestry resources. This conclusion is the same as that found in the *ConnectMenlo* EIR. Accordingly, this issue was not subjected to detailed analysis in this SEIR.

4.18.2 Mineral Resources

The *ConnectMenlo* EIR evaluated Mineral Resources in Section 6.1.2 of the EIR (City of Menlo Park, 2016b). The EIR found that there would be no impact to these resources. These same findings are applicable to the proposed HEU, as outlined below.

For the purposes of this analysis, mineral resources are defined as any non-fuel mineral resource that is obtained from the ground, including sand and gravel, cement, boron, crushed stone, gold, limestone, and other important excavated resources. Appendix G of the CEQA *Guidelines* specifies that an impact to mineral resources would occur if a project would: 1) result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; or 2) or result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

No areas of the City are known to contain existing mineral resources, and there are no mineral resources extraction activities currently occurring in the City. Neither the State of California, San Mateo County, nor the City of Menlo Park have designated mineral resource recovery areas or preservation sites in any portion of the City. Implementation of the HEU would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; and would not result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Based on these considerations, implementation of the HEU would have **no impact** on mineral resources. This conclusion is the same as that found in the *ConnectMenlo* EIR. Accordingly, this issue was not subjected to detailed analysis in this SEIR.

4.18.3 References

California Department of Conservation. 2018. *San Mateo County Important Farmland 2018*. Available: https://www.conservation.ca.gov/dlrp/fmmp/Pages/SanMateo.aspx. Accessed April 12, 2022.

City of Menlo Park. 2016a. *City of Menlo Park General Plan*. Available online: https://www.menlopark.org/146/General-Plan. Accessed February 23, 2022.

City of Menlo Park. 2016b. *Draft EIR for ConnectMenlo: General Plan Land Use & Circulation Elements and M-2 Area Zoning Update*. Available online: https://www.menlopark.org/1013/Environmental-Impact-Report. Accessed February 23, 2022.

City of Menlo Park. 2022a. *City of Menlo Park Zoning Map*. Available online: https://menlopark.maps.arcgis.com/apps/View/index.html?appid=0798b044d1b541f9b0498d94f5c804e0. Accessed April 11, 2022.

City of Menlo Park. 2022b. *Zoning Regulations* (Menlo Park Municipal Code Title 16). Available online: https://www.codepublishing.com/CA/MenloPark/html/MenloPark16/MenloPark16.html. Accessed April 12, 2022.

CHAPTER 5
Alternatives

Pursuant to the provisions of CEQA, this chapter describes and evaluates alternatives to the proposed Housing Element Update (HEU) project, including a "No Project" alternative, and identifies an "environmentally superior" alternative. The primary purpose of this section is to provide decision-makers and the public with a qualitative review of project alternatives that eliminate or substantially reduce any of a project's adverse environmental impacts while, at the same time, attaining most of the project objectives.

5.1 CEQA Requirements

CEQA requires that an EIR describe and evaluate a range of reasonable alternatives to the proposed project, and evaluate the comparative merits of the alternatives (*CEQA Guidelines* Section 15126.6(a), (d)). The "range of alternatives" is governed by the "rule of reason," which requires the EIR to set forth only those alternatives necessary to foster informed decision-making and public participation (Section 15126.6(a), (f)).

The range of alternatives shall include alternatives that would feasibly attain most of the basic objectives of the project and would avoid or substantially lessen any of the significant effects of the project (*CEQA Guidelines* Section 15126.6(a)-(c)). CEQA generally defines "feasible" to mean an alternative that is capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, technological, and legal factors. In addition, the following may be taken into consideration when assessing the feasibility of alternatives: site suitability; economic viability; availability of infrastructure; general plan consistency; other plans or regulatory limitations; jurisdictional boundaries; and the ability of the proponent to attain site control (Section 15126.6(f)(1)). The EIR should briefly describe the rationale for selecting the alternatives to be discussed and identify any alternatives that were rejected as infeasible, briefly explaining the reasons (15126.6(c)).

The description or evaluation of alternatives does not need to be exhaustive, and an EIR need not consider alternatives for which the effects cannot be reasonably determined and for which implementation is remote or speculative. An EIR need not describe or evaluate the environmental effects of alternatives in the same level of detail as the proposed project, but must include enough information to allow meaningful evaluation, analysis, and comparison with the proposed project (*CEQA Guidelines* Section 15126.6(d)).

The "no project" alternative must be evaluated. This analysis shall discuss the existing conditions, as well as what could be reasonably expected to occur in the foreseeable future if the project were

not approved, based on current plans and consistent with available infrastructure and community services (*CEQA Guidelines* Section 15126.6(e)(2)).

CEQA also requires that an environmentally superior alternative be selected from among the alternatives. The environmentally superior alternative is the alternative with the fewest or least severe adverse environmental impacts. When the "no project" alternative is the environmentally superior alternative, the EIR must also identify an environmentally superior alternative from among the other alternatives (*CEQA Guidelines* Section 15126.6(e)(2)).

5.1.1 Project Objectives

CEQA Guidelines Section 15124(b) requires the description of the project in an EIR to state the objectives sought by the project.

> "A clearly written statement of objectives will help the lead agency develop a reasonable range of alternatives to evaluate in the EIR and will aid the decision makers in preparing findings or a statement of overriding considerations, if necessary. The statement of objectives should include the underlying purpose of the project."

In keeping with this requirement, the City's project objectives are as follows:

- Update the General Plan's Housing Element to comply with State-mandated housing requirements and to address the maintenance, preservation, improvement, and development of housing in the City between 2023 and 2031;
- Include an adequate inventory of housing sites and rezone the sites as necessary to meet the required Regional Housing Needs Allocation and to provide an appropriate buffer;
- To affirmatively further fair housing (AFFH). In particular, integrate AFFH into the process of site selection, outreach and policy/program development;
- Incentivize the development of housing, particularly affordable housing, suited to special needs and all income levels;
- Amend land use designations in the Land Use Element of the City's General Plan as needed to maintain internal consistency between the elements, and update the Safety Element to enhance community safety and improve consistency with the County's Multijurisdictional Local Hazard Mitigation Plan and comply with recent changes in State law;
- Address climate adaptation and resiliency; and
- Address environmental justice and community health issues and promote civic engagement and investment in disadvantaged communities.

5.1.2 Elimination and/or Reduction of Identified Significant Impacts

CEQA *Guidelines* § 15126.6(b) states that "Because an EIR must identify ways to mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code Section 21002.1), the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the

project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly."

Potentially significant environmental impacts that would result from the proposed HEU project are evaluated in Chapter 4, *Environmental Setting, Impacts, and Mitigation Measures*, of this SEIR. With implementation of standard conditions and requirements, as well as mitigation measures identified for each resource area significantly impacted, many of the potentially significant impacts resulting from the proposed project would be reduced to a less-than-significant level. The proposed project impacts listed below would remain significant and unavoidable even after mitigation, and the alternatives evaluated in this SEIR have been selected because they are anticipated to reduce and/or eliminate one or more of the listed significant and unavoidable impacts associated with the proposed project.

Air Quality Impact AQ-2: Implementation of the HEU would result in a cumulatively considerable net increase of criteria air pollutants for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (*Significant and Unavoidable Impact, with Mitigation*).

Cultural Resources Impact CR-1: Implementation of the HEU could cause a substantial adverse change in the significance of an architectural historic resource pursuant to CEQA Guidelines Section 15064.5. (*Significant and Unavoidable Impact, with Mitigation*)

Cultural Resources Impact CR-4: Implementation of the proposed project, in combination with past, present and reasonably foreseeable projects, could result in a significant cumulative impact with respect to historic architectural resources (*Significant and Unavoidable Impact, with Mitigation*)

Transportation Impact TRANS-1: Implementation of the HEU would conflict with an applicable program, plan, ordinance, or policy establishing measures of effectiveness for the performance of addressing the circulation system, including transit, bicycle, and pedestrian facilities. (*Significant and Unavoidable Impact*)

Transportation Impact TRANS-2: Implementation of the HEU would exceed an applicable VMT threshold of significance (*Significant and Unavoidable Impact, with Mitigation*)

Transportation Impact TRANS-5: Implementation of the HEU, in combination with cumulative development, would conflict with an applicable program, plan, ordinance, or policy establishing measures of effectiveness for the performance of addressing the circulation system, including transit, bicycle, and pedestrian facilities. (*Significant and Unavoidable Impact*)

Transportation Impact TRANS-6: Implementation of the HEU, in combination with cumulative development, would exceed an applicable VMT threshold of significance (*Significant and Unavoidable Impact, with Mitigation*)

5.2 Factors in the Selection of Alternatives

The nature and scope of the range of alternatives to be discussed is governed by the "rule of reason." The CEQA *Guidelines* recommend that an EIR should briefly describe the rationale for selecting the alternatives to be discussed (Section 15126.6[c]). This alternatives analysis considers the following factors:

- The extent to which the alternative would accomplish most of the basic objectives of the proposed project;
- The extent to which the alternative would avoid or lessen the identified significant, or less-than-significant with mitigation, environmental effects of the proposed project;
- The feasibility of the alternative, taking into account site suitability, availability of infrastructure, general plan consistency, and consistency with other applicable plans and regulatory limitations;
- The extent to which an alternative contributes to considering a "reasonable range" of alternatives necessary to permit a reasoned choice; and
- The requirement of the CEQA *Guidelines* to consider a "No-Project" alternative, and to identify an "environmentally superior" alternative in addition to the no-project alternative (Section 15126.6[e]).

5.2.1 Alternatives Considered but Rejected from Further Evaluation

A number of alternatives were considered for analysis and determined not to be feasible for the reasons explained in this section. These alternatives were not carried forward for analysis in this SEIR.

Off-Site Alternative

The primary objective of the HEU is to ensure the City's conformance with State law. There would be no way to meet this objective with an alternative that did not focus on the city itself, and therefore this alternative was not analyzed further.

Less Intensive HEU or HEU with a Smaller Buffer

Consideration was given to developing an HEU with substantially less density and a correspondingly fewer number of housing units, either by simply not meeting the Regional Housing Needs Allocation (RHNA) or incorporating a substantially reduced buffer. However, the City's obligations to provide for additional housing are determined by State law, and are manifested through the RHNA, as promulgated by the State Department of Housing and Community Development (HCD) and the Association of Bay Area Governments (ABAG). **Table 5-1** shows the RHNA distribution of required units in Menlo Park across the four income categories with and without additional units as a buffer (which HCD recommends equal at least 30 percent of the RHNA allocation). Of note are the number of units designated for lower income levels. In the Bay Area, housing for these income categories typically can be accommodated only through higher density development which reduces the per unit land and construction costs.

TABLE 5-1
REGIONAL HOUSING NEEDS ALLOCATION

	Very Low Income Units[a] (0-50% AMI)	Low Income Units (51-80% AMI)	Moderate Income Units (81-120% AMI)	Above Moderate Income Units (>120% AMI)	Total New Units
6th Cycle RHNA without buffer	740	426	496	1,284	2,946
6th Cycle RHNA with 30% buffer[b]	962 (740+222)	554 (426+128)	645 (496+149)	1,669 (1,284+385)	3,830 (2,946+884)

NOTES:

a 47 percent of Very Low Income Units would be Extremely Low Income or less than 30% AMI]
b The California Department of Housing and Community Development (HCD) recommends a buffer of additional units above the RHNA. With a 30 percent buffer included (884 units), Menlo Park's RHNA is 3,830 total new units.

SOURCE: Association of Bay Area Governments (ABAG), *Final Regional Housing Needs Allocation (RHNA) Plan: San Francisco Bay Area, 2023-2031* adopted December 2021, and City of Menlo Park, December 2021.

Preparation of an HEU with a smaller buffer (that is, no buffer at all or a buffer smaller than the 30 percent recommended by HCD) could incrementally lessen the overall effects of the HEU, but owing to the types of significant und unavoidable impacts that have been identified in this SEIR, those particular impacts would be unlikely to be substantially lessened. This is because the specific impacts that have been identified are not a function of the number of units provided for in the HEU, and would be likely to occur regardless of the buffer chosen.

Ultimately, preparation of an HEU that does not meet the City's RHNA allocation or provide a suitable buffer would run counter to the requirements of State law, and the City does not have the option of considering alternatives that are not legally feasible. Meeting the State-mandated housing requirements as manifested in the RHNA is the foremost objective of the HEU. Based upon these considerations, this alternative was rejected from further consideration and was not carried forward for detailed analysis.

More Intensive HEU

Consideration was given to developing an HEU and housing inventory with substantially greater density and a correspondingly greater number of housing units in consideration of comments received in response to the Notice of Preparation (NOP) for the SEIR that was circulated on December 23, 2021. Comments received during the NOP comment period included concerns that the proposed HEU housing opportunity sites and land use strategy sites might not be sufficient to meet the City's current and future housing needs. Comments raised concerns that the identified housing opportunity sites and land use strategy sites in the proposed HEU would be unlikely to lead the City to meet its RHNA goals; requests for more aggressive strategies and policies to ensure a lack of barriers for housing to be built on selected sites; and a desire for the proposed HEU to support affordable housing development to the fullest extent and support more below market rate (BMR) development.

Accordingly, and in response to these comments, consideration was given to developing an HEU and housing inventory with substantially greater density and a correspondingly greater number of

housing units. However, as discussed in Chapter 3, *Project Description*, of this SEIR, the proposed HEU identifies specific sites, densities, new residential units, and strategies appropriate for development of housing (in particular affordable units) necessary to meet the requirements of State-mandated housing requirements as manifested in the RHNA. An HEU and housing inventory alternative that would include sites, densities, and new residential units that would exceed the requirements of State law and the City's RHNA requirement would result in greater environmental impacts than those identified for the proposed HEU due to the increased extent and intensity of new development. Consequently, a more-intensive HEU alternative would not meet the CEQA requirement to consider alternatives to the project that would avoid or substantially lessen any significant effects of the project. Based upon these considerations, this alternative was rejected from further consideration and was not carried forward for detailed analysis.

5.2.2 Alternatives to Lessen Identified Significant Effects

As noted in several of the topical sections of Chapter 4 of this SEIR, a number of significant and unavoidable effects were identified that would result from the proposed HEU's implementation. These impacts are listed above in Section 5.1.2, and generally relate to three broad categories: 1) air quality; 2) cultural resources; and 3) transportation. CEQA Guidelines Section 15126.6(b) notes that a principal purpose of alternatives is to identify alternatives to a project or its location that are capable of avoiding or substantially lessening the significant effects of a project. To that end, the City contemplated feasible alternatives that could avoid or lessen the effects identified in the three categories listed above.

Air Quality

In Section 4.2 of this SEIR, *Air Quality*, Impact AQ-2 found that construction and operation of individual development projects following adoption of the proposed HEU could result in a cumulatively considerable net increase in criteria pollutants for which the region is in nonattainment status, even with prescribed mitigations. This impact is most closely associated with larger projects and the analysis conservatively found that since the type and extent of larger residential development projects cannot currently be known, the potential impact must be considered significant and unavoidable until those projects are actually proposed and further analysis is conducted to determine if they would, in fact, exceed applicable emissions thresholds.

Developing an alternative that would avoid this impact is problematic because prescribing mitigation measures or other restrictions that require individual development projects to be small in scale would constrain the development of housing and run counter to the goals of the HEU. For instance, if the City were to adopt an alternative that would limit the size of developments in order to keep them below emissions screening thresholds, such an alternative could have the effect of discouraging developers from pursuing projects since required economies-of-scale might not be possible. This is particularly true for housing projects in the lower income ranges, where the scale of the project can have a direct bearing on the economic feasibility of a given project.

Further, an insistence on smaller projects would also limit the City's ability to effectively meet its RHNA requirements, since it is likely that one or more larger projects would be required to meet the unit goals articulated in the RHNA and the subsequent HEU. Adoption of such an alternative

would therefore be disingenuous and would run counter to the requirements of State housing law, in that it would create direct obstacles to realization of the proposed HEU's intent. Meeting the State-mandated housing requirements as manifested in the RHNA and applicable State law is the foremost objective of the proposed HEU.

For each of these reasons, an alternative that would lessen the proposed HEU's air quality impacts associated with larger projects was not carried forward for further analysis.

Cultural Resources

In Section 4.4 of this SEIR, *Cultural Resources*, Impacts CR-1 and CR-4 determined that implementation of the proposed HEU could result in a significant and unavoidable impact to historic architectural resources (i.e., historic buildings), even with implementation of regulations, policies, and prescribed mitigations aimed to prevent or minimize impacts to historic architectural resources. As discussed in Impact CR-1, Mitigation Measure CULT-1 in the *ConnectMenlo* EIR required evaluation and recordation of buildings more than 50 years old, and required that the character-defining features of buildings deemed eligible for the California Register of Historical Resources be preserved. The measure essentially precludes demolition of eligible structures, which was unlikely to present a substantial constraint on development in the Bayfront Area since the area was determined to contain no such structures. However, as discussed in Impact CR-1, broader development under the proposed HEU has the potential to result in more severe impacts since it covers the entire City of Menlo Park, whereas the *ConnectMenlo* Final EIR was limited to the Bayfront Area. As discussed in the Impact CR-1 analysis, of the 73 potential housing opportunity sites identified in the proposed HEU, one includes a National Register-listed property, 10 are vacant (no buildings are present), and 23 have buildings that are historic-era that have not yet been evaluated. It is likely that there are additional historic resources outside of the housing opportunity sites, but within the boundary of the City. Furthermore, as time passes, additional sites and buildings may qualify for consideration (i.e., existing buildings will become 45 years old or older) as historic resources in the future. If a structure meeting the definition of a historic resource were to be demolished to make way for development of housing, then that impact would be significant. While the prescribed mitigation measures would require identification and documentation of the resource, they would not fully mitigate the impact to a less-than-significant level if that resource were permanently lost. This is a conservative conclusion, and is not intended to suggest that such impacts or that the demolition of historic structures are being contemplated. Rather, the conclusion is based on the fact that such impacts cannot be entirely ruled out when considering any and all projects that could arise in the City with implementation of the proposed HEU and housing development in general.

As with the previous discussion on significant and unavoidable impacts related to air quality, developing an alternative that would avoid this impact by guaranteeing that no impacts could occur is problematic. For this topic, the only manner in which a significant impact could be guaranteed to not occur would be to disallow entirely any demolition of any structure that could be deemed historic. An alternative that would forbid any impacts to historic structures would place substantial limitations on the development of housing intended to meet the goals of the HEU.

Accordingly, consideration of an alternative that would impose such a condition was not carried forward for further analysis. Rather, this impact will be dealt with in the manner prescribed in Section 4.4 of this SEIR, by requiring structures of eligible age to be assessed for eligibility as an historic resource, per federal and State criteria, and for prescribed actions to be taken prior to removal in the event that an affirmative finding is made.

Transportation

In Section 4.14 of this SEIR, *Transportation*, Impacts TRANS-1 and TRANS-5 evaluate whether implementation of the proposed HEU would conflict with an applicable program, plan, ordinance, or policy establishing measures of effectiveness for the performance of addressing the circulation system, including transit, bicycle, and pedestrian facilities. The analysis notes that, while the *ConnectMenlo* EIR identified impacts related to automobile delay, including traffic congestion, CEQA no longer considers automobile delay, as measured by roadway segment and intersection level of service (LOS), to be an environmental impact, and vehicle miles traveled (VMT) is the required CEQA metric for determining potentially significant transportation impacts.[1] Accordingly, Impacts TRANS-1 and TRANS-5, which are summarized below, evaluated impacts to bicycle, pedestrian, and transit facilities and service that could result from implementation of the proposed HEU, and, in accordance with CEQA, do not consider automobile delay. Potential HEU impacts related to VMT are addressed in Impacts TRANS-2 and TRANS-6, which are also summarized below.

Transit

The *ConnectMenlo* Final EIR found that implementation of *ConnectMenlo* would result in increased peak hour traffic delay at intersections on Bayfront Expressway, University Avenue, and Willow Road that could decrease the performance of transit service and increase the cost of transit operations. Mitigation Measure TRANS-6c was provided to potentially result in the provision of transit service on the Dumbarton Corridor to mitigate the impact. However, because provision of enhanced or improved transit service would require approval of other public agencies and is not under the jurisdiction of the City of Menlo Park, implementation of this mitigation could not be guaranteed. No additional mitigation measures were feasible and available. For these reasons, impacts to transit were considered significant and unavoidable. With the transition to using VMT rather than LOS, vehicle delay is no longer considered an adverse effect under CEQA, which instead considers whether transit routes would be blocked, or whether there would be safety issues or conflicts with applicable plans. While the HEU proposes development potential above and beyond *ConnectMenlo* without any increase in transit service, the development would not physically block transit routes, create an obvious safety issue, or

[1] The passage of Senate Bill (SB) 743 required the Governor's Office of Planning and Research (OPR) to establish a new metric for identifying and mitigating transportation impacts under CEQA in an effort to meet the State's goals to reduce GHG emissions, encourage infill development, and improve public health through more active transportation (non-driving transportation modes such as walking and biking). CEQA Section 21099(b)(2) states that upon certification of the revised guidelines for determining transportation impacts pursuant to CEQA Section 21099(b)(1), automobile delay, as described solely by LOS or similar measures of vehicular capacity or traffic congestion, shall not be considered a significant impact on the environment under CEQA. OPR identified vehicle miles traveled (VMT) as the required CEQA transportation metric for determining potentially significant environmental impacts.

conflict with an applicable transit plan, and therefore this SEIR finds that HEU impacts on transit facilities would also be less than significant.

Bicycle and Pedestrian Facilities

As discussed in Impacts TRANS-1 and TRANS-5, the *ConnectMenlo* EIR found that the development potential under *ConnectMenlo* would generate new transit riders, bicyclists, and pedestrians, and that implementation of *ConnectMenlo* and other existing City standards and regulations would include goals, policies, and programs that provide for an integrated network of bicycle and pedestrian facilities as well as for the needs of transit users. However, since much of the anticipated development under the *ConnectMenlo* project would occur in the Bayfront Area, including properties located east of US-101 that are not adequately connected to the pedestrian and bicycle circulation network locally or west of US-101, the *ConnectMenlo* EIR found that implementation of *ConnectMenlo* would not provide adequate pedestrian or bicycle facilities to connect to the area-wide circulation system. Mitigation Measure TRANS-6a was provided to update the City's Transportation Impact Fee (TIF) program to secure a funding mechanism for future pedestrian and bicycle improvements to mitigate impacts from future projects (based on the current standards at the time the Final EIR was certified) but did not reduce the impact to less-than-significant levels because the nexus study (pursuant to AB 1600) had not yet been prepared, the City could not guarantee improvements, and no additional mitigation measures were feasible and available. For these reasons, the *ConnectMenlo* EIR concluded that implementation of *ConnectMenlo* would not provide adequate pedestrian or bicycle facilities to connect to the area-wide circulation system and the impact was considered significant and unavoidable.

As discussed in Impacts TRANS-1 and TRANS-5 in Section 4.14 of this SEIR, the City's TIF program and Transportation Master Plan were updated in 2020. However, the identified bicycle and pedestrian improvements might not be fully funded by the TIF, and therefore the *ConnectMenlo* impact would remain. While most of the HEU's units would be located west of US-101, the units included in the HEU east of US-101 (in the Bayfront Area) would contribute to the identified impact that was caused by the development in the Bayfront Area. Therefore, the HEU impact on bicycle and pedestrian facilities would also be significant and unavoidable.

As with the previous discussions on significant and unavoidable impacts related to air quality and historic architectural resources, developing an alternative that would avoid this impact by guaranteeing that no impacts could occur is problematic. For this topic, the only manner in which a significant impact could be guaranteed to not occur would be to require, as a condition of HEU approval, funding for all pedestrian and bicycle improvements to mitigate impacts from future projects in the City, including housing development that would occur with implementation of the proposed HEU. As there is no mechanism in place to provide or guarantee this funding, and because imposition of this condition would effectively discourage development of housing that could occur under the proposed HEU, and ultimately prevent the City from meeting its State-mandated housing requirements, consideration of an alternative that would impose such a condition was not carried forward for further analysis

Vehicle Miles Traveled

Potential HEU impacts related to VMT are addressed in Impacts TRANS-2 and TRANS-6 of this SEIR. As discussed in Impact TRANS-2, the City of Menlo Park Transportation Impact Analysis (TIA) Guidelines state that residential projects are considered to have a significant VMT impact if the project's VMT exceeds a threshold of 15 percent below the regional average VMT per capita. Residential VMT is defined as home-based VMT as calculated by the Citywide travel demand model. Per the City's TIA Guidelines, the regional average residential VMT per capita is estimated at 13.7. Accordingly, the threshold of significance for residential VMT per capita is 11.6, which is 15 percent below the regional average. This impact threshold is used for the VMT evaluation for individual projects in this SEIR.

As discussed in Impact TRANS-2, the City's TIA Guidelines do not specify significance thresholds for plan-level analysis of VMT impacts. As discussed in Impact TRANS-2, for the purpose of this SEIR, the HEU is considered to generate a significant VMT impact if the buildout of the HEU causes Menlo Park's Citywide average residential VMT per capita to increase beyond existing baseline Citywide average residential VMT per capita.

The analysis in Impact TRANS-2 determines that the Citywide residential VMT per capita is shown to decrease with the addition of the proposed HEU. Therefore, the proposed HEU would generate a less-than-significant VMT impact. This is likely the case because many of the HEU units would be located within close proximity to the Menlo Park Caltrain station, and/or could take advantage of the complementary land uses in the downtown area to reduce vehicular trip making and reduce vehicular trip length, both of which reduce VMT.

In addition to considering VMT impacts associated with the proposed HEU as a whole, the analysis in Impact TRANS-2 considers the potential impacts associated with individual multifamily development projects allowed by the proposed HEU, recognizing that some future development projects will likely be ministerial, meaning they will not be subject to additional CEQA review. In other cases, the development projects may be exempt from additional VMT analysis under the City's TIA Guidelines, which provide various screening criteria to exempt residential projects from VMT, including:

- Projects generating fewer than 100 vehicle trips per day.
- Projects located in a low-VMT area (less than 85 percent of the regional average) and within a half-mile of an existing "major transit stop" or within a half-mile of a "high-quality transit corridor."[2]
- Affordable housing developments with 100 percent affordable units, either in a low-VMT area or within a half-mile of an existing major transit stop or within a half-mile of a high-quality transit corridor.

[2] "Major transit stop" means an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods. A "high-quality transit corridor" means a fixed bus route with service intervals no longer than 15 minutes during peak commute hours.

- Projects in compliance with the El Camino Real/Downtown Specific Plan.

The analysis noted that future individual development projects allowed by the proposed HEU that are subject to additional review and do not screen out of a VMT analysis would require a separate, project-specific VMT analysis. This analysis, which would be based on characteristics of the proposed project and its location, could potentially identify exceedances of the VMT criteria of 15 percent below the regional average VMT per capita, particularly for housing sites that have limited access to transit. For this reason, the impact of the proposed HEU was conservatively considered potentially significant, requiring mitigation. Accordingly, Mitigation Measure TRANS-2 requires that individual multifamily housing development proposals that do not screen out from VMT impact analysis provide a quantitative VMT analysis using the methods outlined by the City's most recent transportation impact analysis guidelines. Projects that result in a significant impact would be required to include travel demand management measures and/or physical measures as described in the prescribed mitigation measure (e.g., improving the multimodal transportation network, improving street connectivity) to reduce VMT.

However, because the effectiveness of the measures included in Mitigation Measure TRANS-2 to reduce an individual project's VMT impact to a less-than-significant level cannot be determined until the specific characteristics of the projects are known, Impacts TRANS-2 and TRANS-6 conservatively found that the impact for projects which do not screen out from VMT impact analysis would remain significant and unavoidable, even with mitigation.

In considering an alternative to avoid this impact, consideration was given to an alternative that would concentrate all upzoning associated with the proposed HEU to those areas of the City that lie within a designated Priority Development Area (described in Section 5.3.2 below), along with adjoining areas of the City that have been identified as generating low VMT. Generally, these areas are close to quality transit facilities and are developed at relatively high densities. As stated in this SEIR's transportation analysis, and as specified under the City's transportation impact analysis guidelines, projects located in a low-VMT area are generally presumed to have a less-than-significant impact to VMT, assuming certain conditions are met. This is done by bringing transit, jobs, and housing together in downtowns, along main streets, and around rail stations. By concentrating all HEU development within the low-VMT area, the City could potentially meet its RHNA obligations and also reduce the adverse VMT impacts of the proposed HEU.

This alternative is potentially feasible. This alternative would presumably require greater densification within the low-VMT area than is currently envisioned under the proposed HEU. Regardless, this alternative was determined to be suitable for further analysis, and is therefore presented as Alternative 2 in Section 5.3.2 below.

5.3 Description of Alternatives Selected for Analysis

The screening process detailed above resulted in the selection of one alternative to be carried forward for detailed evaluation and the conclusion that no other alternative was feasible and appropriate for further consideration. The City determined that this alternative, along with the No Project Alternative, represents a reasonable range of alternatives described and analyzed in this SEIR. These alternatives are described in further detail and analyzed below.

- **Alternative 1: No Project**. This alternative assumes that the proposed HEU would not be adopted and that the goals and policies within the existing Housing Element would remain unchanged. An update of the General Plan's Safety Element, preparation and adoption of a new Environmental Justice Element, and conforming amendments to other elements of the General Plan would not occur under this alternative. Housing opportunity sites and land use strategy sites proposed as part of the HEU to meet the requirements of State law, such as rezoning, increased densities, and/or updates to the Zoning Ordinance, would not occur under this alternative. However, approved and pending development and continued ADU development identified in Chapter 3, *Project Description*, of this SEIR would be assumed to proceed under this alternative. In addition, residential development within the City would continue to be directed and governed in the manner that it is currently pursuant to the City's General Plan and Zoning Ordinance in their present form.

- **Alternative 2: Low VMT Area Alternative.** This alternative would concentrate all residential upzoning associated with the proposed HEU to those areas of the City that lie within a designated Priority Development Area (described in Section 5.3.2 below), along with adjoining areas of the City that have been identified as generating low VMT. Generally, these areas are close to quality transit facilities and are developed at relatively high densities. By concentrating all HEU development within the low-VMT area, the City could potentially meet its RHNA obligations and also reduce the adverse VMT impacts of the proposed HEU.

5.3.1 Alternative 1: No Project Alternative

CEQA requires consideration of the No Project Alternative, which addresses the impacts associated with not moving forward with the project. The purpose of analyzing the No Project Alternative is to allow decision-makers to compare the impacts of the project versus no project. Under the No Project Alternative, the proposed HEU would not be adopted and the goals and policies within the existing Housing Element would remain unchanged. Update of the General Plan's Safety Element, preparation and adoption of a new Environmental Justice Element, and conforming amendments to other elements of the General Plan would not occur under this alternative. Housing sites inventory strategies proposed as part of the proposed HEU to meet the requirements of State law, such as rezoning, increased densities, and/or updates to the Zoning Ordinance, which are assumed to result in the production of approximately 4,000 housing units, would not occur under this alternative. However, approved and pending development listed in Table 3-3, *Major Pipeline Projects*, in Chapter 3, *Project Description*, of this SEIR projected to result in 3,642 new units would be assumed to proceed under this alternative and potentially count towards Menlo Park's RHNA requirement. In addition, the projected 85 accessory dwelling units (ADUs) assumed under baseline conditions would also be assumed to proceed under this alternative and potentially count towards the City's RHNA requirement. Finally, residential development within the City would continue to be directed and governed in the manner that it is currently under the No Project Alternative.

This alternative would not meet any of the objectives of the proposed HEU as defined above in Section 5.1.1. The No Project Alternative would not update the General Plan's Housing Element to comply with State-mandated housing requirements and to address the maintenance, preservation, improvement, and development of housing in the City between 2023 and 2031; would not include an adequate inventory of housing sites and rezone the sites as necessary to meet the required RHNA and to provide an appropriate buffer; and would not amend land use designations in the

Land Use Element of the City's General Plan as needed to maintain internal consistency between the elements, update the Safety Element to enhance community safety and improve consistency with the County's Multijurisdictional Local Hazard Mitigation Plan and comply with recent changes in State law. The new Environmental Justice Element would also not be adopted.

5.3.2 Alternative 2: Low VMT Area Alternative

This alternative would concentrate all of the proposed HEU's multifamily housing sites in those areas of the City that lie within a designated Priority Development Area (PDA), along with adjoining areas of the City that have been identified as generating low VMT. Generally, these areas are close to quality transit facilities and are developed at relatively high densities. As stated in this SEIR's transportation analysis, and as specified under the City's transportation impact analysis guidelines, projects located in a low-VMT area are generally presumed to have a less-than-significant impact to VMT, assuming certain conditions are met. This is done by bringing transit, jobs, and housing together in downtowns, along main streets, and around rail stations. By concentrating all HEU development within low-VMT areas, the City could potentially meet its RHNA obligations and also reduce the adverse VMT impacts of the proposed HEU.

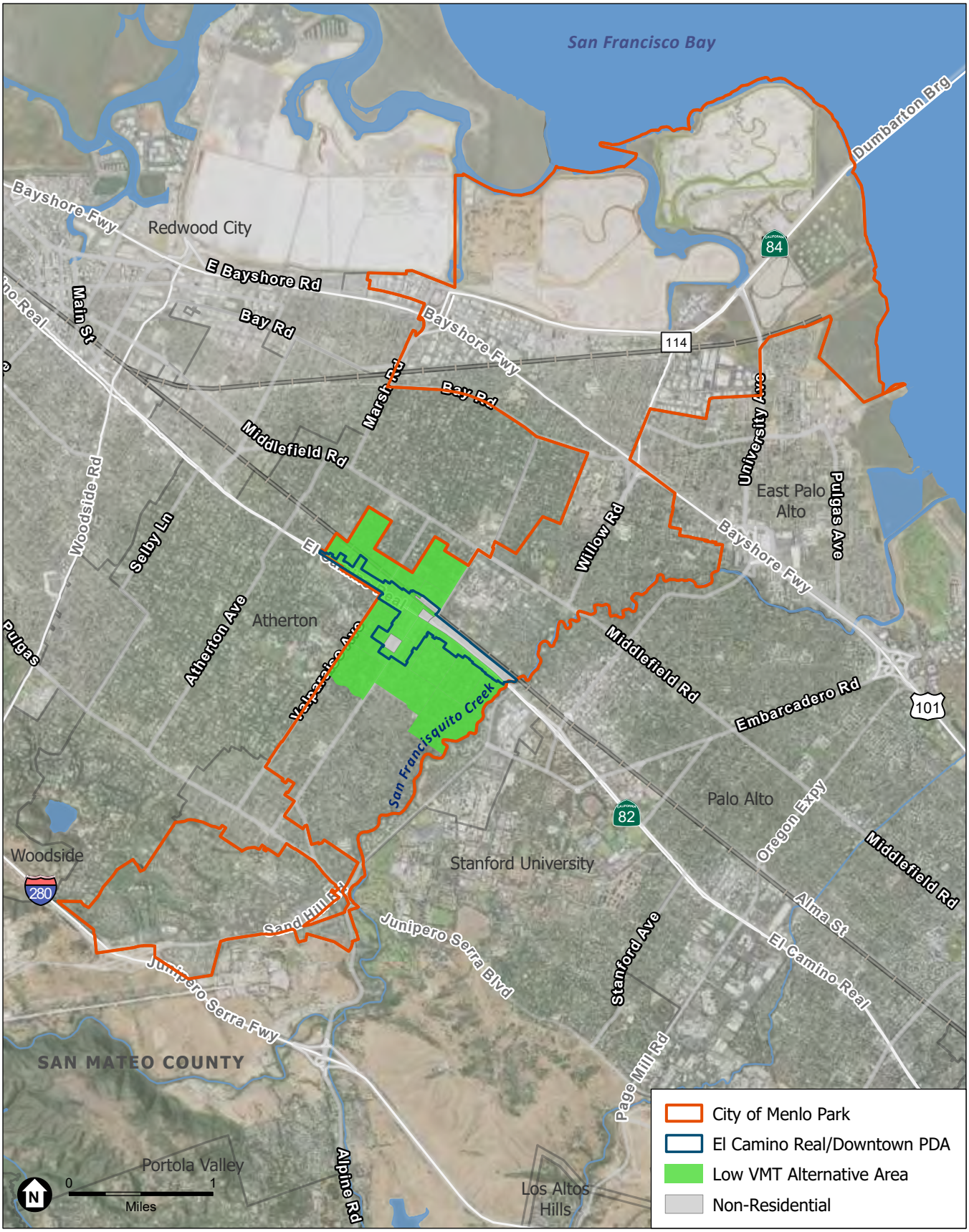
PDAs are places near public transit facilities that are planned for new homes, jobs, and community amenities.[3] PDAs are identified and planned by local governments, and cities and counties nominate these areas to ABAG for adoption. A PDA has been designated in Menlo Park that is generally centered around the Menlo Park Caltrain station and along El Camino Real. **Figure 5-1** shows the boundaries of the ABAG-designated PDA in Menlo Park.

In addition, during the course of work for this SEIR, other areas of the City have been identified as generating lower VMT. These areas are also generally located in vicinity to the Caltrain station and along El Camino Real, but extend slightly beyond the area designated as part of the City's PDA. These additional areas are also shown in Figure 5-1.

Combined, the City's PDA and these additional low-VMT areas form the boundaries for this alternative, as shown in Figure 5-1. Development within this area would be presumed to generate VMT per resident that is less than 85 percent of the regional average VMT per capita, and would therefore result in a less-than-significant impact to VMT. Under this alternative, the upzoning that would occur in the low-VMT area would presumably yield about the same number of housing units and the required buffer as the proposed HEU.

This alternative was selected for analysis because it would lessen the proposed HEU's project-level and cumulative impacts to VMT, which were determined in Impact TRANS-2 and TRANS-6 of this SEIR to be significant and unavoidable, even with mitigation. By concentrating all HEU development within the identified low-VMT area, the City could meet its RHNA obligations and

[3] CEQA uses a slightly different but very similar nomenclature to describe development areas around transit. Public Resources Code 21099(a)(7) defines a "Transit Priority Area" (TPA) as an area within one-half mile of a major transit stop that is existing or planned, if the planned stop is scheduled to be completed within the planning horizon included in a Transportation Improvement Program or applicable regional transportation plan. While TPAs and PDAs are not precisely synonymous in their definitions, they are both directed towards the goal of developing housing and other uses in proximity to transit and therefore decreasing vehicle travel.



SOURCE: Esri, 2022; City of Menlo Park, 2022; M-Group, 2022; ESA, 2022

Menlo Park Housing Element Update EIR

Figure 5-1
Alternative 2: Low VMT Area Alternative

ESA

also reduce the adverse VMT impacts of the proposed HEU. This alternative would presumably require greater densification within the low-VMT area than is currently envisioned under the proposed HEU. In other words, all of the HEU's housing units would be developed in a smaller area.

5.4 Comparative Analysis of the Alternatives

This section presents a discussion of the comparative environmental effects of No Project Alternative (Alternative 1) and the Low VMT Area Alternative (Alternative 2).

5.4.1 Comparison of Impacts Identified for the Proposed HEU and the Alternatives

Alternative 1: No Project Alternative

Under the No Project Alternative, the proposed HEU would not be adopted and the goals and policies within the existing Housing Element would remain unchanged. An update of the General Plan's Safety Element, preparation and adoption of a new Environmental Justice Element, and conforming amendments to other elements of the General Plan would not occur. Housing opportunity sites and land use strategy sites proposed as part of the HEU to meet the requirements of State law, such as rezoning, increased densities, and/or updates to the Zoning Ordinance, would not occur under this alternative. Approved and pending development listed in Table 3-3, *Major Pipeline Projects*, in Chapter 3, *Project Description*, of this SEIR would be assumed to proceed under this alternative. In addition, the projected 85 accessory dwelling units (ADUs) assumed under baseline conditions would also be assumed to proceed under this alternative. This alternative would not preclude additional development in the City under existing land use and zoning regulations.

Impacts

Aesthetics

The No Project Alternative would result in less-than-significant effects to aesthetics, similar to the proposed HEU. Under the No Project Alternative, residential development in the City could still take place, but at a lesser intensity than that provided for under the proposed HEU. The City's existing land use and zoning designations would remain as they are currently, as would the City's development standards. While development would still occur, it would conform to existing land use designations and zoning requirements.. This is not to say that the No Project Alternative could not result in changes to the visual environment. Under the existing land use designations and zoning rules, substantial development could still occur in areas of the City, and some of that development could be much higher density than is present currently. However, this impact would not be adverse, since development thus constructed would be required to conform to the design requirements that are currently in place, similar to the HEU.

Air Quality

The No Project Alternative would likely result in lesser impacts to air quality, but would likely remain significant and unavoidable, the same as the proposed HEU. Under the No Project Alternative, residential development in the City could still take place, but at a lesser intensity than that provided for under the proposed HEU. This lesser-intensity development would presumably emit fewer emissions, although larger projects could still potentially surpass applicable regulatory criteria, and therefore it cannot be stated with certainty that the potential impact would not remain unavoidably adverse. In addition, just because expanded residential development would not be provided for in the City, this doesn't mean that residential development might not occur elsewhere to meet the demand for housing for the many people who work in the City. Some of this demand could be met by developing housing in areas that are far removed from the City, thus increasing commute distances, VMT, and associated air quality emissions, though it is not possible to speculate as to the ultimate effect since providing housing elsewhere would be outside of the City's control. Generally speaking, however, it could be reasonably assumed that VMT under the No Project Alternative could be greater than the proposed HEU, and thus so would the associated air quality emissions.

Biological Resources

The No Project Alternative would result in less-than-significant impacts to biological resources, similar to the proposed HEU. Under the No Project Alternative, residential development in the City could still take place, but at a lesser intensity than that provided for under the proposed HEU. Regardless, potential impacts to biological resources would be subject to the same standards and regulatory requirements as the proposed HEU, and the impacts of the No Project Alternative would therefore be similar to that of the proposed HEU.

Cultural

The No Project Alternative would result in the same significant and unavoidable impacts to cultural resources as the proposed HEU. Under the No Project Alternative, residential development in the City could still take place, but at a lesser intensity than that provided for under the proposed HEU. However, since the location and extent of that development is not currently known, there is no guarantee that individual projects proposed under the existing Housing Element would not adversely affect cultural resources during development, particularly historic buildings. Such an effect and loss of those resources would be significant and unavoidable, similar to the proposed HEU.

Energy

The No Project Alternative would result in less-than-significant impacts to energy, similar to the proposed HEU. Under the No Project Alternative, residential development in the City could still take place, but at a lesser intensity than that provided for under the proposed HEU. Regardless, any development would still be held to the same energy standards, regardless of which alternative is adopted, and the impact would be less than significant.

Geology and Paleontological Resources

The No Project Alternative would result in less-than-significant impacts to geology and paleontological resources, similar to the proposed HEU. Under the No Project Alternative, residential development in the City could still take place, but at a lesser intensity than that provided for under the proposed HEU. Regardless, potential impacts related to geology and paleontological resources would be subject to the same standards and regulatory requirements as the proposed HEU, and the impacts of the No Project Alternative would therefore be similar to that of the proposed HEU.

Greenhouse Gas Emissions

The No Project Alternative would result in less-than-significant effects to greenhouse gas emissions, similar to the proposed HEU. Under the No Project Alternative, residential development in the City could still take place, but at a lesser intensity than that provided for under the proposed HEU. This lesser-intensity development would presumably emit fewer greenhouse emissions then the proposed HEU. However, just because expanded residential development would not be provided for in the City, this doesn't mean that residential development might not occur elsewhere to meet the demand for housing for the many people who work in the City. Some of this demand could be met by developing housing in areas that are far removed from the City, thus increasing commute distances, VMT, and associated GHG emissions, though it is not possible to speculate as to the ultimate effect since providing housing elsewhere would be outside of the City's control. Generally speaking, however, it could be reasonably assumed that VMT under the No Project Alternative could be greater than the proposed HEU, and thus so would the associated GHG emissions.

Hazards and Hazardous Materials

The No Project Alternative would result in less-than-significant impacts to hazards and hazardous materials, similar to the proposed HEU. Under the No Project Alternative, residential development in the City could still take place, but at a lesser intensity than that provided for under the proposed HEU. Regardless, potential impacts related to hazards and hazardous materials would be subject to the same standards and regulatory requirements as the proposed HEU, and the impacts of the No Project Alternative would therefore be similar to that of the proposed HEU.

Hydrology and Water Quality

The No Project Alternative would result in less-than-significant impacts to hydrology and water quality, similar to the proposed HEU. Under the No Project Alternative, residential development in the City could still take place, but at a lesser intensity than that provided for under the proposed HEU. Regardless, potential impacts related to hydrology and water quality would be subject to the same standards and regulatory requirements as the proposed HEU, and the impacts of the No Project Alternative would therefore be similar to that of the proposed HEU.

Land Use and Planning

The No Project Alternative would result in significant and unavoidable impacts related to land use and planning, as compared to the less-than-significant impacts associated with the

proposed HEU. Under the No Project Alternative, residential development in the City could still take place, but at a lesser intensity that that provided for under the proposed HEU. Under the No Project Alternative, the proposed HEU would not be adopted and the goals and policies within the City's existing Housing Element would remain unchanged. The land use and zoning designations currently in place would continue under the land use decisions and development parameters that currently exist in the City. However, this alternative would not provide housing to fulfill the requirements of State law or to meet the City's RHNA requirements, which would be a significant and unavoidable impact, as compared to the less-than-significant impacts associated with the proposed HEU.

Noise and Vibration

The No Project Alternative would result in less-than-significant impacts to noise and vibration, similar to the proposed HEU. Under the No Project Alternative, residential development in the City could still take place, but at a lesser intensity than that provided for under the proposed HEU. Regardless, potential impacts related to noise and vibration would be subject to the same standards and regulatory requirements as the proposed HEU, and the impacts of the No Project Alternative would therefore be similar to that of the proposed HEU.

Population and Housing

The No Project Alternative would result in a significant-and-unavoidable impact to population and housing, greater than the proposed HEU. Under the No Project Alternative, the proposed HEU would not be adopted and the goals and policies within the City's existing Housing Element would remain unchanged. Resulting population growth would be less and would be consistent with the City's current General Plan and zoning, thus constituting "planned" growth. However, this alternative would not provide housing to fulfill the requirements of State law or to meet the City's RHNA requirements, which would be a significant and unavoidable impact, as compared to the less-than-significant impacts associated with the proposed HEU.

Public Services and Recreation

The No Project Alternative would result in less-than-significant impacts to public services and recreation, similar to the proposed HEU. Under the No Project Alternative, residential development in the City could still take place, but at a lesser intensity than that provided for under the proposed HEU. Regardless, potential impacts related to public services and recreation would be subject to the same standards and regulatory requirements as the proposed HEU, and the impacts of the No Project Alternative would therefore be similar to that of the proposed HEU.

Transportation

The No Project Alternative would result in the same significant and unavoidable (with mitigation) impacts identified with the proposed HEU. Under the No Project Alternative, residential development in the City could still take place, but at a lesser intensity than that provided for under the proposed HEU. Nevertheless, the amount of development that could occur would conform to that described in the *ConnectMenlo* EIR, which provided for substantial development in portions of the City. That EIR determined that significant and unavoidable

impacts would occur to pedestrian facilities, bicycle facilities, and transit services, similar to the HEU. It can therefore be assumed that these same significant and unavoidable effects would remain under the No Project Alternative.

Under the No Project Alternative, per capita VMT would vary depending on the location and type of new development, and each project would require separate environmental analysis. As with the HEU, some projects developed under the No Project Alternative could surpass VMT reduction targets. A general assumption could be made that total VMT would be less since there would be less development. However, just because expanded residential development would not be provided for in the City, this doesn't mean that residential development might not occur elsewhere to meet the demand for housing for the many people who work in the City. Some of this demand could be met by developing housing in areas that are far removed from the City, thus increasing commute distances and VMT. It is not possible to speculate as to the ultimate effect of this possibility since providing housing elsewhere would be outside of the City's control. Generally speaking, however, it could be reasonably assumed that VMT under the No Project Alternative could be greater than the proposed HEU, and thus the effect could be more severe.

Tribal Cultural Resources

The No Project Alternative would result in less-than-significant impacts to tribal cultural resources, similar to the proposed HEU. Under the No Project Alternative, residential development in the City could still take place, but at a lesser intensity than that provided for under the proposed HEU. Regardless, potential impacts to tribal cultural resources would be subject to the same tribal consultation and regulatory requirements as the proposed HEU, and the impacts of the No Project Alternative would therefore be similar to that of the proposed HEU.

Utilities and Service Systems

The No Project Alternative would result in less-than-significant impacts to utilities and public services, similar to the proposed HEU. Under the No Project Alternative, residential development in the City could still take place, but at a lesser intensity than that provided for under the proposed HEU. Regardless, potential impacts related to utilities and service systems would be subject to the same standards and regulatory requirements as the proposed HEU, and the impacts of the No Project Alternative would therefore be similar to that of the proposed HEU.

Wildfire

The No Project Alternative would result in less-than-significant impacts to wildfire, similar to the proposed HEU. Under the No Project Alternative, residential development in the City could still take place, but at a lesser intensity than that provided for under the proposed HEU. Regardless, potential impacts related to wildfire would be subject to the same standards and regulatory requirements as the proposed HEU, and the impacts of the No Project Alternative would therefore be similar to that of the proposed HEU.

Alternative 2: Low VMT Area Alternative

This alternative would concentrate all of the proposed HEU's multifamily housing sites in those areas of the City that lie within a designated Priority Development Area (described above in Section 5.3.2), along with adjoining areas of the City that have been identified as generating low VMT. Generally, these areas are close to quality transit facilities and are developed at relatively high densities. As stated in this SEIR's transportation analysis, and as specified under the City's transportation impact analysis guidelines, projects located in a low-VMT area are generally presumed to have a less-than-significant impact to VMT, assuming certain conditions are met. This is done by bringing transit, jobs, and housing together in downtowns, along main streets, and around rail stations. By concentrating all HEU development within the low-VMT area, the City could potentially meet its RHNA obligations and also reduce the adverse VMT impacts of the proposed HEU. The boundaries of the Low VMT Area Alternative are shown in Figure 5-1.

Impacts

Aesthetics

The Low VMT Area Alternative would result in less-than-significant aesthetics impacts, the same as the proposed HEU, albeit with higher densities and more noticeable visual change. Development under this alternative would concentrate development within those areas of the City that lie within a designated Priority Development Area (described above in Section 5.3.2), along with adjoining areas of the City that have been identified as generating low VMT (as shown in Figure 5-1). The resulting densification would result in substantial changes to the area through increased density, greater scale, and increased height of residential structures. Some viewers could view these changes as adverse. These changes would also occur under the proposed HEU, although with the proposed HEU densities would be somewhat less and would be spread over a larger area, with a resulting lessening in the severity of the overall visual effect.

Air Quality

The Low VMT Area Alternative would result in a significant and unavoidable air quality impact, the same as the proposed HEU. Under the Low VMT Area Alternative, some benefits to air quality might be realized based upon the higher density development that could result under the alternative, which would presumably lower VMT and its associated operational emissions. However, the analysis of the proposed HEU conservatively found that since emissions of larger residential development projects cannot currently be known, the potential criteria pollutant emissions must be considered significant and unavoidable despite required mitigation. Like the proposed HEU, the Low VMT Area Alternative would also provide for large residential development projects and would therefore result in the same impacts,

Biological Resources

The Low VMT Area Alternative would result in less-than-significant biological resources impacts, the same as the proposed HEU. Some impacts to biological resources under the Low VMT Area Alternative could be expected to be less, given that fewer sites would be developed, which would result in fewer tree removals and overall disturbance since all of the alternative's development would be located in areas that are already highly urbanized. Regardless, potential

impacts related to biological resources under this alternative would be subject to the same standards and regulatory requirements as the proposed HEU, and the impacts under each would therefore be similar.

Cultural and Tribal Cultural Resources

The Low VMT Area Alternative would result in the same significant and unavoidable impacts to cultural resources as the proposed HEU. Development under this alternative would concentrate development within those areas of the City that lie within a designated Priority Development Area (described above in Section 5.3.2), along with adjoining areas of the City that have been identified as generating low VMT (as shown in Figure 5-1). While development under this alternative would be concentrated onto fewer sites than the proposed HEU, there is no guarantee that individual projects proposed under this alternative would not adversely affect cultural resources on those sites during development, particularly historic buildings. Such an effect and loss of those resources would be significant and unavoidable, similar to the proposed HEU.

Energy

The Low VMT Area Alternative would result in less-than-significant energy impacts, the same as the proposed HEU. It could be expected that the higher density development under this alternative would reduce VMT and its associated use of fuel and electricity. Regardless, potential impacts related to energy under this alternative would be subject to the same standards and regulatory requirements as the proposed HEU, and the impacts under each would therefore be similar.

Geology and Paleontological Resources

The Low VMT Area Alternative would result in less-than-significant impacts related to geology and paleontological resources, the same as the proposed HEU. Potential impacts related to geology and paleontological resources under this alternative would be subject to the same standards and regulatory requirements as the proposed HEU, and the impacts under each would therefore be similar.

Greenhouse Gas Emissions

The Low VMT Alternative would result in less-than-significant effects to greenhouse gas emissions, similar to the proposed HEU. . Under the Low VMT Area Alternative, some benefits to GHG emissions might be realized based upon the higher density development that could result under the alternative, which would presumably lower VMT and its associated operational emissions. Generally, however, potential impacts related to greenhouse gas emissions under this alternative would be subject to the same standards and regulatory requirements as the proposed HEU, and the impacts under each would therefore be similar.

Hazards and Hazardous Materials

The Low VMT Area Alternative would result in less-than-significant impacts related to hazards and hazardous materials, the same as the proposed HEU. Potential impacts related to hazards and hazardous materials under this alternative would be subject to the same standards and

regulatory requirements as the proposed HEU, and the impacts under each would therefore be similar.

Hydrology and Water Quality

The Low VMT Area Alternative would result in less-than-significant impacts related to hydrology and water quality, the same as the proposed HEU. Fewer sites would be developed under this alternative, which could have a beneficial effect related to areas of disturbance and less potential erosion during construction. Regardless, potential impacts related to hydrology and water quality under this alternative would be subject to the same standards and regulatory requirements as the proposed HEU, and the impacts under each would therefore be similar.

Land Use and Planning

The Low VMT Area Alternative would result in less-than-significant impacts to land use and planning, the same as the proposed HEU. Potential impacts related to land use and planning under this alternative and the proposed HEU would be less than significant because each would amend the City's General Plan polices and zoning standards as needed to ensure consistency with City policies and standards, and the impacts under each would therefore be similar. However, the greater densification required in the El Camino Real/Downtown area would represent a significant departure from the "village" character envisioned under the El Camino Real/Downtown Specific Plan, which required that buildings be kept low with limited massing. While the El Camino Real/Downtown Specific Plan would necessarily need to be amended to accommodate the greater building heights and massing required to accommodate all of the HEU's units within the El Camino Real/Downtown area, the overall effect would be a substantially modified El Camino Real/Downtown area from that currently provided for under the existing Specific Plan. Therefore, the overall land use effect would be greater under the Low VMT Alternative than the HEU as currently proposed.

Noise and Vibration

The Low VMT Area Alternative would result in less-than-significant impacts to noise and vibration, the same as the proposed HEU. The development of potentially fewer sites under this alternative could subject fewer receptors to noise impacts during construction, though during operation it is possible that noise impacts would b greater due to the concentration of housing into smaller areas and in taller buildings. Regardless, potential impacts related to noise and vibration under this alternative would be subject to the same standards and regulatory requirements as the proposed HEU, and the impacts under each would therefore be similar.

Population and Housing

The Low VMT Area Alternative would result in less-than-significant impacts to population and housing, the same as the proposed HEU. Potential population and housing growth under this alternative and the proposed HEU would be "planned" growth because the growth would be consistent with General Plan polices and zoning standards (amended as needed), and the impacts under each would therefore be similar.

Public Services and Recreation

The Low VMT Area Alternative would result in less-than-significant impacts to public services and recreation, the same as with the proposed HEU. It is possible that concentrating development in a smaller area of the City could impact adjacent and nearby recreational facilities more than would be the case if development were more dispersed across the City. Similarly, greater populations in a more centralized area could create more students that would need to be accommodated in nearby schools, which could create capacity constraints and thus require new and improved school facilities. Taller buildings could require investment in specialized firefighting equipment and firefighting water capacity than would be the case if development were more dispersed and in shorter buildings. Regardless, potential impacts related to public services and recreation under this alternative and the proposed HEU would be subject to the same standards and regulatory requirements, and the impacts under each would therefore be similar.

Transportation and Traffic

The Low VMT Area Alternative would result in significant and unavoidable impacts to pedestrian facilities, bicycle facilities, and transit services, similar to the proposed HEU. Impacts related to VMT would be less than the proposed HEU, and would perhaps avoid the HEU's significant and unavoidable impact to VMT. The *ConnectMenlo* EIR determined that significant and unavoidable impacts would occur to pedestrian facilities, bicycle facilities, and transit services, similar to the HEU. The conditions that would result in this level of impact for both *ConnectMenlo* and the HEU would remain in play under the Low VMT Area Alternative, and therefore the impact of the alternative relative to those topics would remain significant and unavoidable.

With respect to VMT impacts, in Section 4.14 of this SEIR, *Transportation*, Impacts TRANS-2 and TRANS-6 determined that future individual development projects allowed by the proposed HEU that are subject to additional review and do not screen out of a VMT analysis would require a separate, project-specific VMT analysis. This analysis, which would be based on characteristics of the proposed project and its location, could potentially identify exceedances of the VMT criteria of 15 percent below the regional average VMT per capita, particularly for housing sites that have limited access to transit. For this reason, the impact of the proposed HEU was conservatively considered potentially significant, requiring mitigation. Accordingly, Mitigation Measure TRANS-2 requires that individual multifamily housing development proposals that do not screen out from VMT impact analysis provide a quantitative VMT analysis using the methods outlined by the City's most recent transportation impact analysis guidelines. Projects that result in a significant impact would be required to include travel demand management measures and/or physical measures as described in the measure (e.g., improving multimodal transportation network, improving street connectivity) to reduce VMT. However, because the effectiveness of the measures included in Mitigation Measure TRANS-2 to reduce an individual project's VMT impact to a less-than-significant level cannot be determined until the specific characteristics of the project are known, Impacts TRANS-2 and TRANS-6 found that the impact for projects which do not screen out from VMT impact analysis would conservatively remain significant and unavoidable with mitigation.

The Low VMT Area Alternative, on the other hand, would concentrate all of the proposed HEU's multifamily housing sites in those areas of the City that lie within a designated Priority Development Area (described above in Section 5.3.2), along with adjoining areas of the City that have been identified as generating low VMT. Generally, these areas are close to quality transit facilities and community amenities, and are developed at relatively high densities. As stated in this SEIR's transportation analysis, and as specified under the City's transportation impact analysis guidelines, projects located in a low-VMT area are generally presumed to have a less-than-significant impact to VMT, assuming certain conditions are met. This is done by bringing transit, jobs, and housing together in downtowns, along main streets, and around rail stations. By concentrating all HEU development within the low-VMT area, the City could potentially meet its RHNA obligations and also reduce the adverse VMT impacts of the proposed HEU. The boundaries of the Low VMT Area Alternative are shown in Figure 5-1.

Tribal Cultural Resources

The Low VMT Area Alternative would result in less-than-significant impacts to tribal cultural resources, the same as the proposed HEU. Development under this alternative would be concentrated onto fewer sites than the proposed HEU, and therefore could lessen the overall impacts to tribal cultural resources. Regardless, potential impacts to tribal cultural resources under this alternative and the proposed HEU would be subject to the same regulatory requirements and mitigation, and the impacts under each would therefore be similar.

Utilities and Service Systems

The Low VMT Area Alternative would result in less-than-significant impacts to utilities and service systems, the same as the proposed HEU. Potential impacts to utilities and service systems under this alternative and the proposed HEU would be subject to the same regulatory requirements and mitigation, and the impacts under each would be generally similar. However, the degree of densification required to accommodate all of the HEU's housing units within a smaller area could require more upgrades to utility and transportation infrastructure in the El Camino Real/Downtown area. While the specific impacts associated with providing that infrastructure is beyond the scope of this qualitative program-level analysis, it is reasonable to assume that the effects of providing this infrastructure would be greater than that which would be realized under the HEU as proposed. Therefore, the overall effect would presumably be greater than the proposed HEU.

Wildfire

The Low VMT Area Alternative would result in less-than-significant impacts to wildfire, the same as the proposed HEU. This alternative would concentrate development in the downtown area, well away from the wildland-urban interface and the heightened wildfire risks associated with those areas. Regardless, potential impacts related to wildfire under this alternative and the proposed HEU would be subject to the same regulatory requirements and mitigation, and the impacts under each would therefore be similar.

5.4.2 Overall Comparison of the Alternatives

The analysis of the alternatives is summarized in **Table 5-2**. Overall, this table shows that one alternative performs better or worse than the other in reducing or avoiding the proposed HEU impacts.

TABLE 5-2
ALTERNATIVE IMPACT SUMMARY AND COMPARISON

Impact	HEU	Alternative 1: No Project	Alternative 2: Low VMT Area Alternative
Aesthetics	Less than Significant	Less than Significant ⇩	Less than Significant ⇧
Air Quality	**Significant and Unavoidable**	Less than Significant ⇧/⇩	**Significant and Unavoidable ⇧/⇩**
Biological Resources	Less than Significant	Less than Significant ⇩	Less than Significant ⇩
Cultural Resources	**Significant and Unavoidable**	**Significant and Unavoidable ⇩**	**Significant and Unavoidable ⇩**
Energy	Less than Significant	Less than Significant ⇩	Less than Significant ⇩
Geology & Paleontological Resources	Less than Significant	Less than Significant ⇩	Less than Significant ⇩
Greenhouse Gas Emissions	Less than Significant	Less than Significant ⇩	Less than Significant ⇩
Hazards and Hazardous Materials	Less than Significant	Less than Significant ⇩	Less than Significant ⇧/⇩
Hydrology and Water Quality	Less than Significant	Less than Significant ⇩	Less than Significant ⇩
Land Use and Planning	Less than Significant	**Significant and Unavoidable ⇧**	Less than Significant ⇧/⇩
Noise	Less than Significant	Less than Significant ⇩	Less than Significant ⇧/⇩
Population and Housing	Less than Significant	**Significant and Unavoidable ⇧**	Less than Significant ⇧/⇩
Public Services and Recreation	Less than Significant	Less than Significant ⇩	Less than Significant ⇧
Transportation	**Significant and Unavoidable**	Less than Significant ⇧/⇩	Less than Significant ⇩
Tribal Cultural Resources	Less than Significant	Less than Significant ⇩	Less than Significant ⇩
Utilities and Service Systems	Less than Significant	Less than Significant ⇩	Less than Significant ⇧
Wildfire	Less than Significant	Less than Significant ⇩	Less than Significant ⇩

5.5 Environmentally Superior Alternative

Based on the evaluation described in this section, both the No Project Alternative and the Low VMT Area Alternative would be environmentally superior alternatives with the fewest environmental impacts, though the No Project Alternative could result in the need to develop housing further from the City, and could thus contribute to greater impacts related to air quality, GHG emissions, and VMT. Regardless, the No Project Alternative would not meet any of the basic objectives of the project, nor is it legally feasible to adopt and implement.

CEQA requires that a second alternative be identified when the "No Project" alternative is the environmentally superior alternative (CEQA *Guidelines*, Section 15126.6(e)). Therefore, the Low VMT Area Alternative would be the Environmentally Superior Alternative for the purpose of this analysis.

Under the Low VMT Area Alternative, the following significant and unavoidable impacts would no longer occur:

Transportation Impact TRANS-2: Implementation of the HEU would exceed an applicable VMT threshold of significance (*Significant and Unavoidable Impact, with Mitigation*)

Transportation Impact TRANS-6: Implementation of the HEU, in combination with cumulative development, would exceed an applicable VMT threshold of significance (*Significant and Unavoidable Impact, with Mitigation*)

Under the Low VMT Area Alternative, the following significant impacts would remain:

Air Quality Impact AQ-2: Implementation of the HEU would result in a cumulatively considerable net increase of criteria air pollutants for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (*Significant and Unavoidable Impact, with Mitigation*).

Cultural Resources Impact CR-1: Implementation of the HEU could cause a substantial adverse change in the significance of an architectural historic resource pursuant to CEQA Guidelines Section 15064.5. (*Significant and Unavoidable Impact, with Mitigation*)

Cultural Resources Impact CR-4: Implementation of the proposed project, in combination with past, present and reasonably foreseeable projects, would result in a significant cumulative impact with respect to historic architectural resources (*Significant and Unavoidable Impact, with Mitigation*)

Transportation Impact TRANS-1: Implementation of The HEU would conflict with an applicable program, plan, ordinance, or policy establishing measures of effectiveness for the performance of addressing the circulation system, including transit, bicycle, and pedestrian facilities. (*Significant and Unavoidable Impact*)

Transportation Impact TRANS-5: Implementation of the HEU, in combination with cumulative development, would conflict with an applicable program, plan, ordinance, or policy establishing measures of effectiveness for the performance of addressing the

circulation system, including transit, bicycle, and pedestrian facilities. (*Significant and Unavoidable Impact*)

Even though the Low VMT Area Alternative would still result in the significant-and-unavoidable impacts identified above associated with the proposed HEU, it would eliminate the significant-and-unavoidable (with mitigation) impact related to VMT while still meeting the basic objectives of the proposed project.

However, the Low VMT Area Alternative would also result in other effects that would not be present with the proposed HEU. Most notably, development of the Low VMT Area alternative would require substantial densification within the downtown and El Camino Real/Downtown area to accommodate the HEU's residential units. Building heights and massing would be increased, which would increase the overall aesthetic effect, which some viewers could perceive as adverse. This change would represent a significant departure from the "village" character envisioned under the El Camino Real/Downtown Specific Plan, which required that buildings be kept low with limited massing. While the El Camino Real/Downtown Specific Plan would necessarily need to be amended to accommodate the greater building heights and massing required to accommodate all of the HEU's units within the El Camino Real/Downtown area, the overall effect would be a substantially modified El Camino Real/Downtown area from that currently provided for under the existing Specific Plan. In addition, greater impacts associated with improvements to the area's existing utility and transportation infrastructure would also be realized, and impacts to public services like parks and schools would likely be greater. Therefore, the overall effects related to aesthetics, land use, noise, public services, and utilities and infrastructure would be greater under the Low VMT Area Alternative than the HEU as currently proposed.

In summary, while the Low VMT Alternative would potentially reduce VMT based on the alternative's location within a PDA and low VMT area, impacts related to aesthetics, land use, noise, public services, utilities, and transportation infrastructure would be more severe than the HEU as proposed. While it cannot be stated with certainty whether these effects would rise to a level of significantly adverse and unavoidable, the overall effect would be greater than the HEU as currently proposed, which would tend to distribute these effects over a broader area.

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CHAPTER 6
Other CEQA Considerations

Consistent with CEQA *Guidelines* Section 15126.2, this chapter discusses significant and unavoidable impacts, significant irreversible environmental changes, growth-inducing impacts, cumulative impacts, and impacts found to be less than significant. The chapter also provides rationale concerning the scope of the SEIR's analysis with respect to the proposed updated Safety Element and new Environmental Justice Element to the General Plan.

6.1 Significant and Unavoidable Adverse Impacts

Potentially significant environmental impacts that would result from implementation of the HEU are evaluated in the various subsections of Chapter 4.0, *Environmental Setting, Impacts, and Mitigation Measures*, of this EIR. With implementation of standard conditions and requirements, and mitigation measures identified for each resource area significantly impacted, many of the potentially significant impacts resulting from implementation of the HEU would be reduced to a less than significant level. The impacts listed below would remain significant and unavoidable even after mitigation.

Air Quality Impact AQ-2: Implementation of the HEU would result in a cumulatively considerable net increase of criteria air pollutants for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (*Significant and Unavoidable Impact, with Mitigation*).

Cultural Resources Impact CR-1: Implementation of the HEU could cause a substantial adverse change in the significance of an architectural historic resource pursuant to CEQA Guidelines Section 15064.5. (*Significant and Unavoidable Impact, with Mitigation*)

Cultural Resources Impact CR-4: Implementation of the proposed project, in combination with past, present and reasonably foreseeable projects, could result in a significant cumulative impact with respect to historic architectural resources (*Significant and Unavoidable Impact, with Mitigation*)

Transportation Impact TRANS-1: Implementation of the HEU would conflict with an applicable program, plan, ordinance, or policy establishing measures of effectiveness for the performance of addressing the circulation system, including transit, bicycle, and pedestrian facilities. (*Significant and Unavoidable Impact*)

Transportation Impact TRANS-2: Implementation of the HEU would exceed an applicable VMT threshold of significance (*Significant and Unavoidable Impact, with Mitigation*)

Transportation Impact TRANS-5: Implementation of the HEU, in combination with cumulative development, would conflict with an applicable program, plan, ordinance, or policy establishing measures of effectiveness for the performance of addressing the circulation system, including transit, bicycle, and pedestrian facilities. (*Significant and Unavoidable Impact*)

Transportation Impact TRANS-6: Implementation of the HEU, in combination with cumulative development, would exceed an applicable VMT threshold of significance (*Significant and Unavoidable Impact, with Mitigation*)

6.2 Significant Irreversible Impacts

Pursuant to Section 15126.2(c) of the CEQA *Guidelines*, an EIR must consider any significant irreversible environmental changes that would be caused by a project should it be implemented. Section 15126.2(c) states:

> *"Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified."*

Resources that would be permanently and continually consumed by implementation of the HEU include water, electricity, natural gas, and fossil fuels; however, the amount and rate of consumption of these resources would not result in significant environmental impacts or the unnecessary, inefficient, or wasteful use of resources. Construction activities related to the various development projects that could result from implementation of the HEU, though analyzed in the applicable technical section of this EIR, would result in the irretrievable commitment of nonrenewable energy resources, primarily in the form of fossil fuels, natural gas, and gasoline for automobiles and construction equipment. With respect to the operational activities associated with the HEU's implementation, compliance with all applicable building codes, as well as EIR mitigation measures, would ensure that all natural resources are conserved to the maximum extent practicable. It is also possible that new technologies or systems would emerge, or would become more cost-effective or user-friendly, and would further reduce reliance upon nonrenewable energy resources. Further, development of new housing under the HEU would generally occur in areas that are already urbanized, and would not occupy undeveloped land where mineral or other resources might be available, or eliminate biological resources permanently, as the designated housing sites are already in use.

The CEQA *Guidelines* also require a discussion of the potential for irreversible environmental damage caused by an accident associated with proposed projects. During the construction phase of the various development projects that could result from implementation of the HEU, construction equipment and materials would include fuels, oils and lubricants, solvents and cleaners, cements and adhesives, paints and thinners, degreasers, cement and concrete, and asphalt mixtures, which are all commonly used in construction. Once constructed, the completed structures would use and

store small quantities of chemicals typical in residences, such as household cleaning solutions, paints and thinners, and motor fuel (e.g., motor vehicles and lawn mowers). As stated in Section 4.8, *Hazards and Hazardous Materials*, of this EIR, these materials are regulated through a series of federal, state, and local laws and regulations. Compliance with these existing requirements would ensure that the potential to cause significant irreversible environmental damage from an accident or upset of hazardous materials would be less than significant.

6.3 Growth-Inducing Impacts

The CEQA *Guidelines* require that an EIR evaluate the growth-inducing impacts of a proposed action (Section 15126.2[d]). A growth-inducing impact is defined by the CEQA *Guidelines* as:

> *[T]he ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth.... It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.*

A project can have direct and/or indirect growth-inducement potential. Direct growth inducement could result if a project involved construction of new housing. A project can have indirect growth-inducement potential if it would establish substantial new permanent employment opportunities (e.g., commercial, industrial or governmental enterprises) or if it would involve a substantial construction effort with substantial short-term employment opportunities and indirectly stimulate the need for additional housing and services to support the new employment demand. Similarly, under CEQA, a project would indirectly induce growth if it would remove an obstacle to additional growth and development, such as removing a constraint on a required public service. Increases in population could tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. The CEQA *Guidelines* also require analysis of the characteristics of projects that may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively.

The timing, magnitude, and location of land development and population growth is based on various interrelated land use and economic variables. Key variables include regional economic trends, market demand for residential and non-residential uses, land availability and cost, the availability and quality of transportation facilities and public services, proximity to employment centers, the supply and cost of housing, and regulatory policies or conditions. Because general plans define the location, type, and intensity of growth within a given jurisdiction, they are the primary means of regulating development and growth in California. Since the Housing Element is a part of the City's General Plan, any updates to that element would by definition provide a means to plan for and regulate development in the areas considered as part of the HEU.

The growth inducing impacts analysis addresses the potential of the HEU's implementation for unplanned growth inducement in the City of Menlo Park and broader area. Under CEQA, a project is generally considered to be growth-inducing if it results in any one of the following:

1. Extension of urban services or infrastructure into a previously unserved area;
2. Extension of a transportation corridor into an area that may be subsequently developed; or
3. Removal of obstacles to population growth (such as provision of major new public services to an area where those services are not currently available).

6.3.1 Extension of Urban Services or Infrastructure

The City of Menlo Park, including the housing inventory sites identified in the HEU, is essentially built out. Urban services and infrastructure like roadways, utilities, and public services police and fire protection are already established and have been in place for decades. The absence of these types of services is not a constraint to development on housing inventory sites. All of the housing inventory sites identified in the HEU are already developed with residential or commercial uses, and are served by existing urban infrastructure and services. Therefore, implementation of the HEU would not induce unplanned growth in the City or broader area due to extension of urban services or infrastructure.

6.3.2 Extension of Transportation Corridors

As stated in the discussion above, the City is largely built out and is already served by existing transportation facilities and roadways that lie immediately adjacent to the housing inventory sites identified in the HEU. The established transportation network in the City and adjoining areas offers local and regional access to and from all of the HEU planning areas. Any onsite circulation that would be required on individual housing sites would be facilitated by construction of internal streets that would connect to existing and adjacent roadways. Consequently, implementation of the HEU would not induce unplanned growth in the City or broader area due to extension of transportation corridors.

6.3.3 Removal of Obstacles to Population Growth

Section 15126.2(d) of the CEQA *Guidelines* states that an EIR should discuss "the ways in which the project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment." Growth can be induced in a number of ways, including through the elimination of obstacles to growth, through the stimulation of economic activity within the region, or through precedent-setting action. CEQA requires a discussion of how a project could increase population, employment, or housing in the areas surrounding the project site as well as an analysis of the infrastructure and planning changes that would be necessary to implement the project.

Projects that are characterized as having significant impacts associated with the inducement of growth are frequently those that would remove obstacles to additional growth, such as the expansion of sewer or water facilities that would permit construction of more development in the service area covered by the new facilities. The HEU's implementation would not remove obstacles to additional growth in this manner, as it would be undertaken in an area that currently is served by all utilities and services. Similarly, if a project would overburden existing infrastructure so as to require construction of new facilities that could result in significant impacts, then the project may be

deemed to have a significant growth-inducing impact. Similarly, revising the General Plan and the City's Zoning Ordinance to allow intensified development would increase the City's population, which could trigger indirect commercial growth, or new public services or facilities, to serve the new residents. As discussed in Section 4.13, *Public Services and Recreation*, and Section 4.16, *Utilities and Service Systems*, the implementation of the HEU is not anticipated to require such additional public service facilities, and no such facilities are currently proposed. It is therefore not possible to speculate as to the location, type, size, and timing of construction for such facilities. However, in the event that a need for new or expanded facilities is identified at some point during the timeframe of the HEU (through 2031), any such undertaking would require its own environmental review, mitigation, and compliance with applicable regulations in effect at the time of construction.

Section 4.12, *Population and Housing*, analyzes the project's overall effect on population and housing, including growth-inducing considerations. In terms of housing, development allowed under the HEU (4,000 units), pending projects (2,733 units) and accessory dwelling unit production (85 units) could result in a population increase of 17,522 persons, based on a ratio of 2.57 persons per household.[1]

This planned population growth in the City has been projected and directed by the Association of Bay Area Governments (ABAG) as part of the 6th Housing Element Cycle to meet the region's housing needs allocation. Implementation of the HEU would require an amendment to the City's General Plan and Zoning Code to accommodate the projected growth. Because general plans define the location, type, and intensity of growth within a given jurisdiction, they are the primary means of regulating development and growth in California. Since the Housing Element is a part of the City's General Plan, any updates to that element would by definition provide a means to plan for and regulate development in the areas considered as part of the HEU. Additional new residential development that could derive from the HEU's implementation would therefore be consistent with the growth projections in the City's General Plan as well as applicable regional plans adopted by ABAG and other relevant entities, and would help the region meet its regional housing allocation requirements. Consequently, implementation of the HEU would not induce substantial unplanned population growth that was not previously anticipated.

6.3.4 Conclusions

Implementation of the HEU would facilitate increased development of residential uses on specific sites in the City. However, it is important to note that while the law requires the HEU to include an inventory of housing sites and requires the City to zone those sites for multifamily housing, the City is not required to actually develop housing on these sites. Future development on the identified sites will be up to the property owners and will be largely dependent on market forces and (in the case of affordable housing) available subsidies.

Regardless, any increased development that could arise on these sites following the HEU's implementation would be developed in compliance with the General Plan land use and zoning designations. Although on-site infrastructure improvements would occur as part of this

[1] 6,818 housing units x 2.57 persons per household = 17,522 persons.

development, these improvements would connect to existing infrastructure. No extensions or expansions of infrastructure systems or roads would be required beyond what is needed to serve project-specific demand. Consequently, the HEU's implementation would not induce unplanned growth in the City or broader area due to extension of urban services or infrastructure. For the above-described reasons, implementation of the HEU would not cause a new impact related to a substantial increase in population growth, and would be in line with the projected growth planned for the area as defined in the City's General Plan and applicable regional planning directives.

6.4 Cumulative Impacts

CEQA defines cumulative impacts as two or more individual impacts which, when considered together, are substantial or which compound or increase other environmental impacts. The cumulative analysis is intended to describe the "incremental impact of the project when added to other, closely related past, present, or reasonably foreseeable future projects" that can result from "individually minor but collectively significant projects taking place over a period of time." (CEQA Guidelines Section 15355). The analysis of cumulative impacts is a two-phase process that first involves the determination of whether a project, together with existing and reasonably foreseeable projects, would result in a significant impact. If there would be a significant cumulative impact of all such projects, the EIR must determine whether the project's incremental "contribution" is cumulatively considerable, in which case, the cumulative impact would be significant (CEQA Guidelines Section 15130).

The analysis of each environmental topic included in Chapter 4, *Environmental Setting, Impacts, and Mitigation Measures*, of this EIR considers possible cumulative impacts and identifies circumstances in which the project would contribute to significant cumulative impacts.

Cumulative significant and unavoidable impacts to air quality (Impact AQ-2), cultural resources (Impact CR-4), and transportation (Impacts TRANS-5 and TRANS-6) were identified in the analysis. These cumulative analyses assumed that the mitigation measures identified in this EIR would be implemented. Nonetheless, these identified impacts would be cumulatively considerable and not fully mitigable. No other cumulative impacts were determined to be significant after mitigation.

6.5 Analysis of the Safety Element and Environmental Justice Element

As discussed in Chapter 3, *Project Description* (specifically, sections 3.3.3 and 3.3.4), the City's adoption of the HEU would also include adoption of an updated Safety Element and a new Environmental Justice Element to the City's General Plan.

Adoption and implementation of the HEU would likely result in physical environmental impacts that can be identified and predicted. Most notably, the HEU and its associated zoning changes could result in the development of more housing in the City, which would have direct physical effects on the environment. In the case of the HEU's impacts, some degree of specificity is possible in identifying environmental effects since the potential development on the housing

opportunity sites and land use strategy sites and the environmental effects thereof are generally predictable and are well understood. Even though no specific development applications or proposals have been advanced for these sites, an upper range of development intensity for those sites has been established and the impacts of that development can therefore be described and analyzed in the SEIR. For this reason, this SEIR has evaluated the environmental effects of the HEU in the SEIR's various topical sections.

Conversely, the Safety Element and the Environmental Justice Element primarily are policy documents that do not identify or propose specific actions in particular locations that could impact the physical environment in those locations. This would make attempting to identify and evaluate potential impacts associated with those polices too general and highly speculative. For instance, some of the polices in the proposed Environmental Justice Element encourage positive action towards providing increased access to community services such as effective transit, quality schools, retail opportunities, and healthcare options in disadvantaged areas, but there are no actions proposed to implement those policies that are direct and specific enough to be effectively identified and analyzed for their probable environmental effects. Doing so would require overly broad speculation as to the type and locations of activities that could arise from those policies, which would run counter to the directives of CEQA and its overall purpose of identifying and analyzing the known environmental effects of a proposal while avoiding undue speculation.

Similarly, the proposed policies in the updated Safety Element have been developed to identify general areas of potential safety risk and to encourage effective City decisions around those risks. As with the new Environmental Justice Element, the updated Safety Element provides broad conceptual direction about the way the City should approach safety challenges, and provides general direction to the City to consider aspects of safety in its decisions. No specific projects are identified in the Safety Element, nor are specific locations of activities. In other words, none of the proposed policies make CEQA analysis possible in anything but a general and highly speculative manner.

The CEQA Guidelines provide clear direction on how lead agencies should approach analysis of environmental effects for general policy measures and speculative activities. CEQA Guidelines Section 15146 notes:

> *The degree of specificity required in an EIR will correspond to the degree of specificity involved in the underlying activity which is described in the EIR…an EIR on a construction project will necessarily be more detailed in the specific effects of the project than will be an EIR on the adoption of a local general plan or comprehensive zoning ordinance because the effects of the construction can be predicted with greater accuracy.*

While the environmental effects of the new housing provided for in the HEU can be predicted with some accuracy, this is not the case with the updated Safety Element and the new Environmental Justice Element. The environmental discussion of both elements can only be provided in the most general terms, and their potential environmental effects cannot be accurately known or assessed without resorting to speculation. CEQA Guidelines Section 15145 is specific in how a lead agency should treat these situations:

> *If, after thorough investigation, a lead agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact.*

Based upon this direction, the City has determined that evaluation of the potential environmental effects of both the updated Safety Element and the new Environmental Justice Element is neither appropriate for nor required in this SEIR. As stated in CEQA Guidelines Section 15187(d), a lead agency "*is not required to, nor should it, engage in speculation or conjecture*." Recent case law has further affirmed that "CEQA does not require an EIR to discuss future developments which are unspecified or uncertain."[2] Attempting such evaluation would not be productive or provide results that would be useful or relevant in considering whether to approve the updated Safety Element or new Environmental Justice Element. Further, if any future physical action associated with implementation of either element is required at some point in the future, such actions would be required to undergo its own environmental analysis per the requirements of CEQA.

Based upon these considerations, this SEIR does not include any evaluation of potential environmental effects of the updated Safety Element and new Environmental Justice Element. The City's decision not to attempt such evaluation is based on the purpose and characteristics of each element, and is informed and supported by statute, regulation, and applicable case law indicating that it is not required by CEQA under these circumstances.

2 *Environmental Council of Sacramento v. County of Sacramento.* March 2, 2020. 45 Cal.App.5th 1020.

CHAPTER 7
Report Preparation

7.1 Lead Agency

City of Menlo Park

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Breanna Sewell ..... Greenhouse Gas Emissions, Energy
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Appendix A
NOP and Responses

ESA

NOTICE OF PREPARATION
ENVIRONMENTAL IMPACT REPORT

HOUSING, SAFETY, AND ENVIRONMENTAL JUSTICE ELEMENTS PROJECT
CITY OF MENLO PARK

December 23, 2021

To: State Clearinghouse
State Responsible Agencies
State Trustee Agencies
Other Public Agencies
Interested Parties and Organizations

From: Tom Smith
Acting Principal Planner
City of Menlo Park
701 Laurel Street
Menlo Park, CA 94025

Subject:	**Notice of Preparation of an Environmental Impact Report for Updates to the City of Menlo Park General Plan 6th Cycle Housing Element Update; Safety Element Update; and a New Environmental Justice Element and Announcement of a Public Scoping Meeting**
Lead Agency:	City of Menlo Park
Project Title:	City of Menlo Park Housing, Safety, and Environmental Justice Elements Project
Project Area:	City of Menlo Park

Purpose of Notice and Public Review Period

Notice is hereby given that the City of Menlo Park will be the lead agency and will prepare a Subsequent Environmental Impact Report (EIR) for the City of Menlo Park 6th Cycle Housing Element Update; Safety Element Update; and a new Environmental Justice Element for the City's General Plan (collectively referred herein as "the Project") in compliance with the requirements of the California Environmental Quality Act (CEQA). The EIR will be a Subsequent EIR to the City's 2016 General Plan EIR (State Clearinghouse Number 2015062054).

Pursuant to CEQA, this Notice of Preparation (NOP) is to inform responsible and trustee agencies, as well as interested public agencies, organizations and individuals of the public, that an EIR is being prepared, and to seek input on the scope and content of the EIR. Any agencies with jurisdiction over the proposed action may need to use the EIR prepared by the City when considering their own approval action and should comment on information germane to the agency's statutory responsibilities. The EIR will evaluate the potential environmental impacts of the Project and recommend mitigation measures for any significant impact, as required. Consistent with State CEQA Guidelines Section 15060(d), no Initial Study has been prepared and the EIR will focus on the significant impacts of the Project. Please send comments on the scope of the EIR to the address shown at the end of this Notice.

The comment period for this NOP has been extended from the required 30 days because City offices will be closed for the winter holidays beginning December 24, 2021 and will reopen on January 3, 2022. The NOP period is from Thursday, December 23, 2021 through Monday, January 31, 2022. Written or emailed comments are due no later than 5:00 p.m. on Monday, January 31, 2022. Verbal comments may be submitted at a public scoping meeting that will occur at the January 24, 2022 meeting of the City's Planning Commission.

Project Location

The City of Menlo Park is located in the San Francisco Bay Area, approximately 30 miles south of downtown San Francisco and about 20 miles northwest of San Jose (latitude 37º27'10"N, longitude 122º11'00"W). The City of Menlo Park is located in the southern edge of San Mateo County and was incorporated in 1927. The City encompasses approximately 17 square miles (approximately seven square miles of which is water) with a population of approximately 35,000 people. The City boundaries and regional location of the City are shown in **Figure 1**. The geographic extent of environmental analysis included in the EIR for the proposed project will be the City limits.

The City of Menlo Park currently includes approximately 14,124 residential dwelling units (State Department of Finance, Table 2: E-5 City/County Population and Housing Estimates, 1/1/2021) and an extensive employment base. The City is generally bounded by San Francisco Bay to the north and east; the Cities of East Palo Alto and Palo Alto and Stanford University to the southeast; and Atherton, unincorporated North Fair Oaks, and Redwood City to the northwest. The City is accessed by Interstate 280 (I-280), U.S. Highway 101 (US 101), Caltrain, State Route 84 via the Dumbarton Bridge, and a variety of streets, as well as regional and local pedestrian and bicycles routes. Menlo

Park has a Caltrain station located near the downtown area and is less than one hour from downtown San Francisco via train.

Menlo Park is known for a range of urban and suburban land uses, including residential neighborhoods of varied densities, its downtown, parks, established business centers, and an emerging center for innovation and technology. **Figure 2** shows the existing General Plan's generalized land uses in Menlo Park, and are noted as follows:

- Residential
- Commercial
- Bayfront
- Specific Plan Area
- Parks and Recreation
- Public/Quasi Public
- Baylands
- Bayfront

Project Background

The City of Menlo Park is updating its required Housing Element and Safety Element, and preparing a new Environmental Justice Element. Collectively, these are referred to as the "Housing Element Update" and comprise the Project.

Purpose of the update to the General Plan Housing Element

State law requires the City to have and maintain a general plan with specific contents in order to provide a vision for the City's future, and inform local decisions about land use and development, including issues such as circulation, conservation, and safety. The City's Land Use and Circulation Elements of the General Plan were most recently updated and adopted in 2016. The City's Safety Element was updated in 2013 and the Housing Element for the 2015-2023 planning period was adopted in 2014.

The Housing Element is one of the state-mandated elements of the General Plan. State law specifically requires the City to update the Housing Element of its General Plan by January 15, 2023, while making any changes to other elements of the General Plan needed to maintain internal consistency and undertaking any related changes to the City's Zoning Ordinance (Menlo Park Municipal Code Title 16). In accordance with State law, the eight-year planning period for the updated Housing Element will extend from 2023 to 2031; this is also referred to as the 6th Cycle Housing Element Update.

The City is proposing to update its Housing Element to comply with the requirements of State law by analyzing existing and projected housing needs, and updating goals, policies, objectives, and implementation programs for the preservation, improvement, and development of housing for all income categories.

Regional Housing Needs Allocation

In addition to including goals, policies, and implementation programs concerning housing issues, housing elements must include an inventory or list of housing sites at sufficient densities to accommodate a specific number of units at various levels of affordability assigned to the City by the Association of Bay Area Governments (ABAG). ABAG assigns unit amounts to Bay Area jurisdictions based on a regional housing production target set by the California Department of Housing and Community Development (HCD). This assignment is referred to as the Regional Housing Needs Allocation (RHNA).

The City's current 5th Cycle Housing Element (2015 to 2023 planning period; adopted on April 1, 2014; certified on April 16, 2014) provides sites sufficient to accommodate the 2015 RHNA allocation of 655 units, along with an appropriate "buffer." This means that the current Housing Element identifies enough land zoned at appropriate densities to accommodate the 2015 RHNA allocation. A buffer is necessary to ensure that if one or more of the identified sites are developed at lower densities than projected, or with non-housing uses, there is remaining capacity to provide an ongoing supply of sites for housing during the eight-year planning period/cycle of the Housing Element. If there were no buffer and an identified site developed with a non-housing project or developed at a density less than that anticipated in the Housing Element, then the City could be obliged to identify new sites and amend the Housing Element prior to the end of the cycle.

The need for a substantial buffer is even more important during the 6th Cycle Housing Element Update because of new rules in the Housing Accountability Act's "no net loss" provisions. California State Senate Bill 166 (2017) requires that the land inventory and site identification programs in the Housing Element always include sufficient sites to accommodate the unmet RHNA. This means that if a site is identified in the Housing Element as having the potential

for housing development that could accommodate lower-income units towards meeting the RHNA but is actually developed with units at a higher income level, then the locality must either: 1) identify and rezone, if necessary, an adequate substitute site; or 2) demonstrate that the land inventory already contains an adequate substitute site. An adequate buffer will be critical to ensuring that the City remains compliant with these provisions without having to identify and rezone sites prior to the end of the cycle.

On December 16, 2021, ABAG adopted the Final RHNA, which distributed the regional housing need of 441,176 units across all local jurisdictions in the Bay Area. Providing housing to meet the needs of all income levels is critical to the social and economic health of Menlo Park. The City must plan for its income-based housing allocation to address its share of the Bay Area region's housing needs. San Mateo County's 2021 Area Median Income (AMI) for a household of four persons is $149,600. Income groups include: "very low income" (less than 50% of AMI); "low income" (51-80% of AMI); "moderate income" (81-120% of AMI); and "above moderate income" (greater than 120% of AMI). Within the 6th Cycle Housing Element Update, the City is required to plan for its fair share allocation of housing units by income group. Table 1 shows the RHNA breakdown of required units in Menlo Park across the four income categories. The 5th Cycle RHNA and 6th Cycle RHNA with and without a 30 percent buffer are included for comparison.

Table 1: 6th Cycle RHNA (2023-2031) Required New Housing Units

	Very Low Income (0-50% AMI)	Low Income (51-80% AMI)	Moderate Income (81-120% AMI)	Above Moderate Income (>120% AMI)	Total New Housing Units
5th Cycle RHNA	233	129	143	150	**655**
6th Cycle RHNA without buffer	740	426	496	1,284	**2,946**
6th Cycle RHNA with 30% buffer	962 (740+222)	554 (426+128)	645 (496+149)	1,669 (1,284+385)	**3,830 (2,946+884)**

Note: The California Department of Housing and Community Development recommends a 15-30% buffer of additional housing units above the RHNA. With the recommended buffer, Menlo Park's 6th Cycle RHNA is 3,388 to 3,830 total new housing units.

The total housing units required in the 6th Cycle RHNA are higher than the 5th Cycle RHNA in part because the Bay Area region's overall allocation of 441,176 units from HCD is more than double the last Housing Element cycle's allocation, which was approximately 189,000 units.

Based on HCD's requirements, the City's 6th Cycle Housing Element (2023-2031) must identify housing sites for at least 2,946 units at specified levels of affordability (income limits/groups based on AMI, adjusted annually by HCD) plus a buffer of additional units at appropriate densities. The City will also need to rezone the identified sites, as necessary, to accommodate the new units and amend other elements of the General Plan (for example, the Land Use Element) to ensure that the General Plan as a whole remains consistent with the 6th Cycle Housing Element Update.

It is important to note that while State law requires the Housing Element to include an inventory of housing sites and requires the City to appropriately zone sites for multifamily housing, the City is not required to actually develop/construct housing on these sites. Future development on identified sites will be at the discretion of individual property owners and will be largely dependent on market forces and in the case of affordable housing, available funding and/or other incentives.

The EIR will consider potential impacts of the 6th Cycle Housing Element Update as well as the associated rezoning(s), Zoning Ordinance, and General Plan amendments that would occur as part of the implementation of the Housing Element and any necessary updates to the El Camino Real/Downtown Specific Plan (adopted June 12, 2012) that would occur as part of the implementation of the Housing Element.

<u>Purpose of the update to the General Plan Safety Element</u>

The Safety Element is also a state-mandated component of a General Plan. The Safety Element focuses on the protection of the community from risks associated with climate change, earthquakes, floods, fires, toxic waste, and other hazards. The Safety Element is the means by which the City defines what measures will be undertaken to reduce potential risk of personal injury, property damage, and economic and social dislocation resulting from natural and human-made hazards.

The extent of a hazard depends on local conditions since most hazards are confined to a particular area or site. Various health and safety hazards should be considered in planning the location, design, intensity, density, and type of land uses in a given area. Long-term costs to the City, such as maintenance, liability exposure, and emergency services, are potentially greater where high hazards exist.

Purpose of the new General Plan Environmental Justice Element

Recent changes in State law require some jurisdictions to include policies related to Environmental Justice in their general plans. Accordingly, the City will be preparing a new Environmental Justice Element concurrent with the updates to the Housing Element and Safety Element. The purpose of the Environmental Justice Element is to address the unique or compounded health risks in "Disadvantaged Communities" within a jurisdiction. These measures could include, but are not limited to, improving air quality, and promoting public facilities, food access, safe and sanitary homes, and physical activity. In addition, the element serves to promote civic engagement in the public decision-making process and prioritize improvements and programs that address the needs of these communities.

Project Description

The Project analyzed in the EIR would include adoption of General Plan amendments that would add or modify goals, objectives, policies, and implementation programs related to housing, safety, and environmental justice that would apply citywide, and that would address the maintenance, preservation, improvement, and development of housing in the city. General Plan amendments would also include conforming amendments to other elements of the General Plan that are necessary to ensure internal consistency.

In addition, as discussed above, the Housing Element would identify specific sites appropriate for the development of multifamily housing (in particular affordable units), and the City would rezone those sites as necessary to meet the requirements of State law. The preliminary list of existing and proposed sites that can accommodate development of multifamily housing includes sites that are located across the City, and is subject to refinement based on additional public input and review of the draft Housing Element by HCD. These proposed sites are listed in **Figure 3** as the "potential housing opportunity sites" for the Housing Element's housing sites inventory, and represent the land use strategy outlined in the following sections. Locations of the potential housing opportunity sites are shown on the maps in **Figure 4**.

Pipeline projects

Adoption of the El Camino Real/Downtown Specific Plan in 2012, the fourth cycle RHNA in 2013, and the ConnectMenlo General Plan Update in 2016 enabled opportunities for over 5,000 new housing units in the City. Currently there are seven major residential projects in the "pipeline" as either approved or pending housing developments that would provide approximately 3,650 new units. These units, as well as smaller projects in the city, could potentially count towards Menlo Park's RHNA requirement if the residential units are completed after June 30, 2022.

Accessory dwelling units (ADUs)

HCD allows the City to determine an annual ADU production rate based on outcomes from 2018-2020. Between 2018-2020, Menlo Park produced an average of 10.6 units per year. At that rate, 85 units could be anticipated during the 6th Cycle Housing Element planning period.

Net RHNA

The City's RHNA can be met through a combination of strategies such as pipeline projects noted above, ADUs, and sites zoned for housing and/or mixed use developments. The latter strategies can include existing sites or sites that are rezoned to allow for residential uses and/or higher density housing. The net RHNA is what the City would need to plan for and is the focus of the preliminary land use scenario described in the next section. Table 2 provides a comparison of the total RHNA and the net RHNA, with a breakdown of the remaining number of housing units in each income category. Accounting for approved and pending pipeline projects (3,647 units) and the anticipated ADU production (85 units), the net RHNA (or net new units remaining to meet the City's RHNA) is 1,490 units affordable to very low, low, and moderate income categories and zero (0) above moderate income, or "market rate" units.

Table 2: Net RHNA					
	Very low 0-50% AMI	Low 51-80% AMI	Moderate 81-120% AMI	Above moderate >120% AMI	Total new housing units
Sixth cycle RHNA without buffer	740	426	496	1,284	**2,946**
30% Buffer	222	128	149	385	**884**
6th cycle RHNA with 30% buffer	962	554	645	1,669	**3,830**
6th cycle RHNA credit					
Pipeline projects	134	230	230	3,053	**3,647**
Accessory dwelling units	26	25	26	8	**85**
Credit subtotal	160	255	256	3,061	**3,732**
Total net new units needed, without buffer considered	**580** (740-160)	**171** (426-255)	**240** (496-256)		**991** (580+171+240)
Total net new units needed, with 30% buffer considered	**802** (962-160)	**299** (554-255)	**389** (645-256)		**1,490** (802+299+389)

Preliminary land use scenario

The EIR would analyze up to 4,000 net new housing units to meet the City's RHNA during the planning period. The housing sites would be geographically dispersed throughout the city, primarily located in Council Districts 2, 3, 4 and 5, and could be produced through a combination of rezoning, increased densities, and/or updates to the Zoning Ordinance and based on the following general strategies:

- "Re-use" sites (for RHNA) from the City's current Housing Element and allow "by right" development for projects that include at least 20 percent affordable units. Densities would allow at least 30 dwelling units per acre (du/ac) on these sites, and the maximum potential density may increase beyond 30 du/ac as part of additional site refinement.
- Increase the permitted densities for sites within the El Camino Real/Downtown Specific Plan area to allow at least 30 du/ac at the base level density and potential increases to the maximum bonus level density. The intent is to remove the existing residential cap of 680 units to allow for greater development potential in the Specific Plan area. These actions would require amendments to the Specific Plan and modifications to the Specific Plan development standards.
- Modify the affordable housing overlay (AHO; Menlo Park Municipal Code Chapter 16.98) to allow up to 100 du/ac for 100 percent affordable housing developments (meaning 100 percent of units would be available to low and very low-income residents) and potential increase in densities for mixed-income developments where the percentage of affordable housing exceeds the City's Below Market Rate requirement.
- Modifications to the retail/commercial zoning districts to allow for residential uses and other potential development standards to encourage the production of mixed-use developments (C-2, C-2-A, C-2-B, C-2-S, C-4, P districts).
- Remove the 10,000 square-foot minimum lot size requirement for R-3 zoned properties located around downtown, which would allow all sites a density of up to 30 du/ac.

Sites and densities may be refined by the City Council based on additional public input and analysis and, in combination with the actions described above, would result in a theoretical capacity for housing production greater than the 4,000 housing units to be studied in the EIR. However, 4,000 housing units represents a conservatively large "umbrella" of study for the purposes of environmental review and exceeds the amount of residential development anticipated over the eight-year planning period from 2023 through 2031. The EIR would also include an update of the cumulative growth projection included in the City's 2016 General Plan EIR for the year 2040.

The City Council may also study a potential reduction of residential densities in the Bayfront area (City Council District 1), with equivalent increases in densities in other areas of the city.

Project Goals and Objectives

The City of Menlo Park is updating its required Housing Element and Safety Element, and preparing a new Environmental Justice Element. Collectively, these are referred to as the "Housing Element Update" and comprise the Project. There are several goals and objectives for the Project. The project has three overarching and interrelated goals as shown in Table 3. These goals will help achieve the objective of creating and adopting a housing element, environmental justice element, and safety element update with conforming amendments to the land use element and other elements as needed that reflect the values of the community and create a place where all residents can enjoy a high quality of living.

Table 3: Project goals

Project goal	Intent
Create a balanced community	Plan for the whole community in a sustainable, healthy and balanced way.
Focus on affordability	Focus on affordable housing given the difficulty of developing it as compared to market rate housing, and the demand for affordable housing options.
Forward social justice	Work with the community to help ensure participation and access to the process, and take intentional steps that improve equity for historically marginalized people and areas.

The objectives help achieve the goals, and include, but are not limited to, the following:

- Address housing needs for the City of Menlo Park
- Meet the State-mandated Regional Housing Needs Allocation (RHNA)
- Provide adequate sites for housing development
- Ensure affirmatively furthering fair housing
- Incentivize the development of affordable housing
- Address climate adaptation and resiliency
- Ensure consistency with the Local Hazard Mitigation Plan (LHMP)
- Enhance community safety
- Address environmental justice and community health issues and promote civic engagement and investment in disadvantaged communities

Potential Environmental Effects of Project

The environmental analyses and technical sections presented in the Draft EIR would describe the existing conditions in the city. Relevant federal, State, and local laws and regulations, including the current City of Menlo Park General Plan goals and policies, would be summarized.

The methods of analysis and any assumptions that are important to understand the conclusions of the analysis would be described, along with the standards of significance used to determine impacts of the project. The standards for determining impact significance would be based on existing State and federal rules, regulations, laws, City ordinances and policies, and past practices. The standards would be used to determine whether an impact is significant and for the effectiveness of recommended mitigation. Feasible mitigation measures would be identified for each significant impact. The description of mitigation measures would identify the specific actions to be taken, the timing of the action, and the parties responsible for implementation of the measure.

At this time, it is anticipated that an EIR with the following issues/technical sections would be addressed:

- Aesthetics/Light and Glare
- Air Quality
- Biological Resources
- Cultural Resources
- Energy
- Geology/Soils/Paleontology
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Land Use and Planning
- Noise and Vibration
- Population and Housing
- Public Services and Recreation
- Utilities and Service Systems
- Transportation
- Tribal Cultural Resources
- Wildfire

- Hydrology and Water Quality

An Initial Study was not completed as it is anticipated this would be a full EIR and no topic areas would be scoped out with the exception of Agricultural and Forestry Resources and Mineral Resources, which are topic areas that are not anticipated to require further analysis.

Alternatives

In order to provide a range of reasonable alternatives to the Housing and Safety Element Updates and new Environmental Justice Element, as required by CEQA Guidelines Section 15126.6, the EIR would examine alternatives to the project, including the required No Project Alternative.

Public Scoping Meeting

The City of Menlo Park is hosting a public hearing for the EIR scoping session during the NOP public comment period on **January 24, 2022** during a regularly scheduled Planning Commission meeting beginning at **7:00 p.m.** or as near as possible thereafter via a virtual meeting.

The meeting link would be available with publication of the Planning Commission agenda and staff report on the City's website at **menlopark.org/planningcommissionagenda**, not less than 72 hours in advance of the meeting.

All interested parties are invited to attend the meeting and provide input on the scope of the EIR. Written comments should be provided as indicated below.

Submittal of Comments

Comments regarding the scope of the EIR analysis are invited from all interested parties to ensure the full range of project issues of interest are considered. Written comments concerning the EIR for the proposed project should be directed to Tom Smith, Acting Principal Planner (contact information below) no later than **5:00 p.m.** on **January 31, 2022**. **Due to the ongoing Covid-19 pandemic, email correspondence is preferred.** All comments will be considered during preparation of the Draft EIR, which will be circulated for public review, and comments received on the Draft EIR will also be considered and responded to prior to preparation of a Final EIR and consideration and approval of the Project.

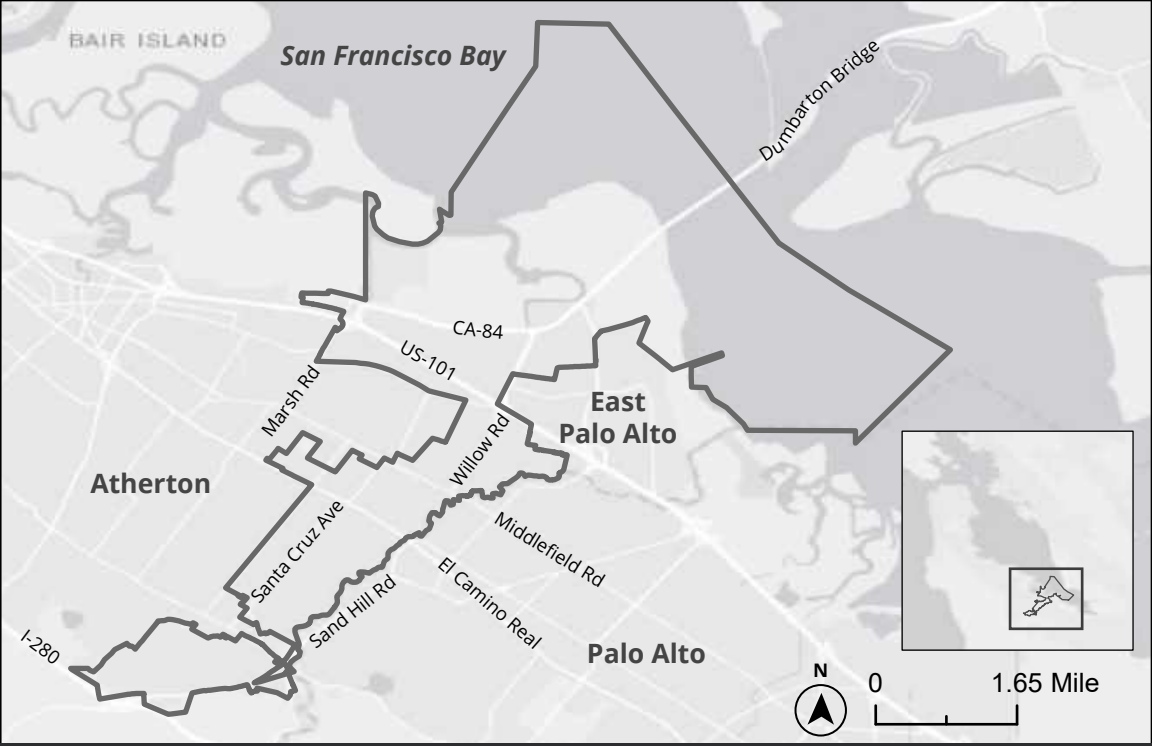
If you have any questions regarding the proposed Project or the EIR process, please contact Tom Smith at the contact information listed below.

Name: Tom Smith
Title: Acting Principal Planner
Department: Community Development, City of Menlo Park
Mail: 701 Laurel Street, Menlo Park, CA 94025
Email: tasmith@menlopark.org
Phone: (650) 330-6730

Throughout the Housing Element Update process, the City will be seeking input through a variety of engagement opportunities both in-person and virtual. Please visit the Housing Element Update webpage at **menlopark.org/HousingElement** to stay informed about the project and to sign up for the email list.

Tom Smith
City of Menlo Park

December 23, 2021



Projection: NAD83 StatePlane California III FIPS 0403 (US Feet)

Figure 1. City Boundaries and Regional Location

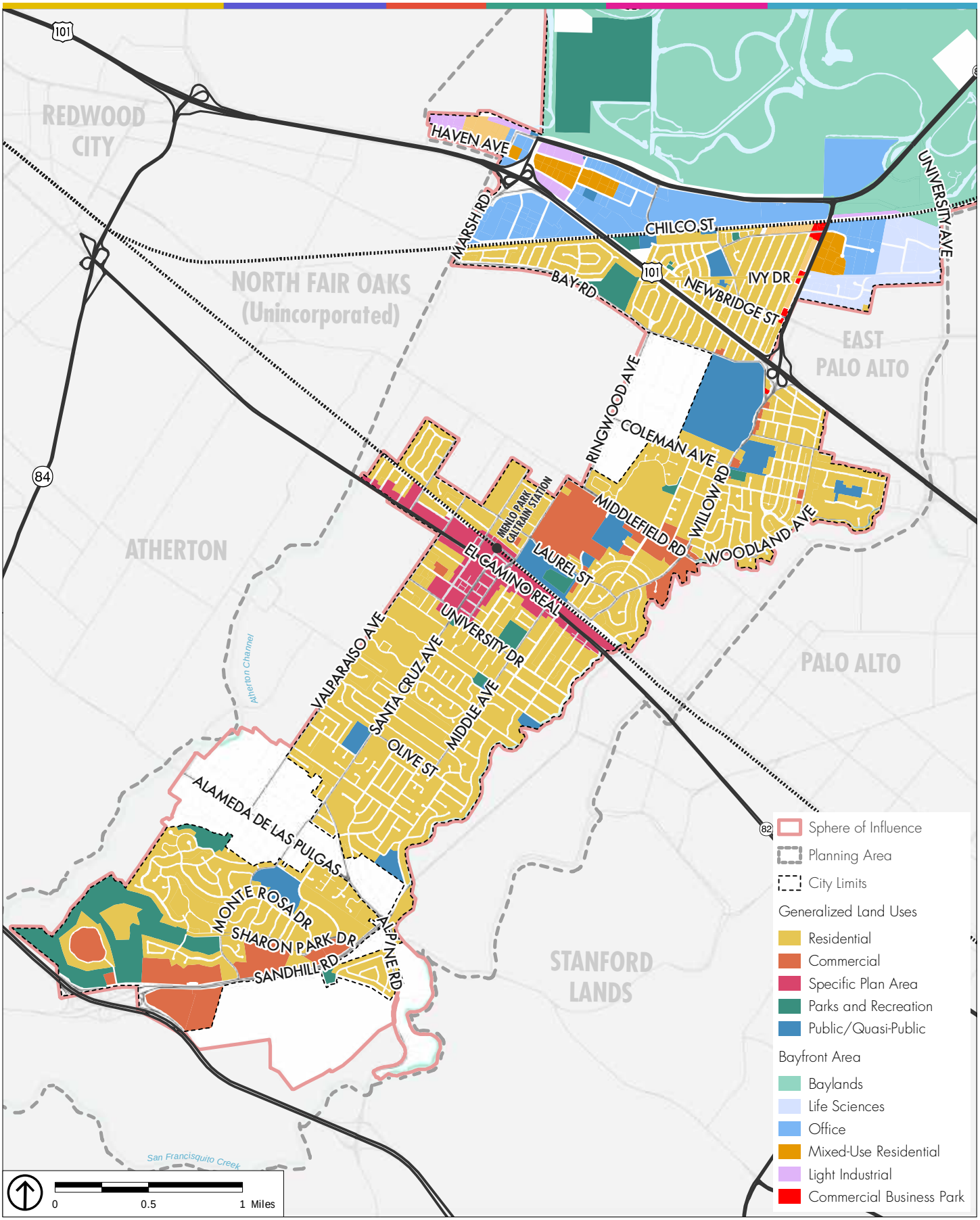


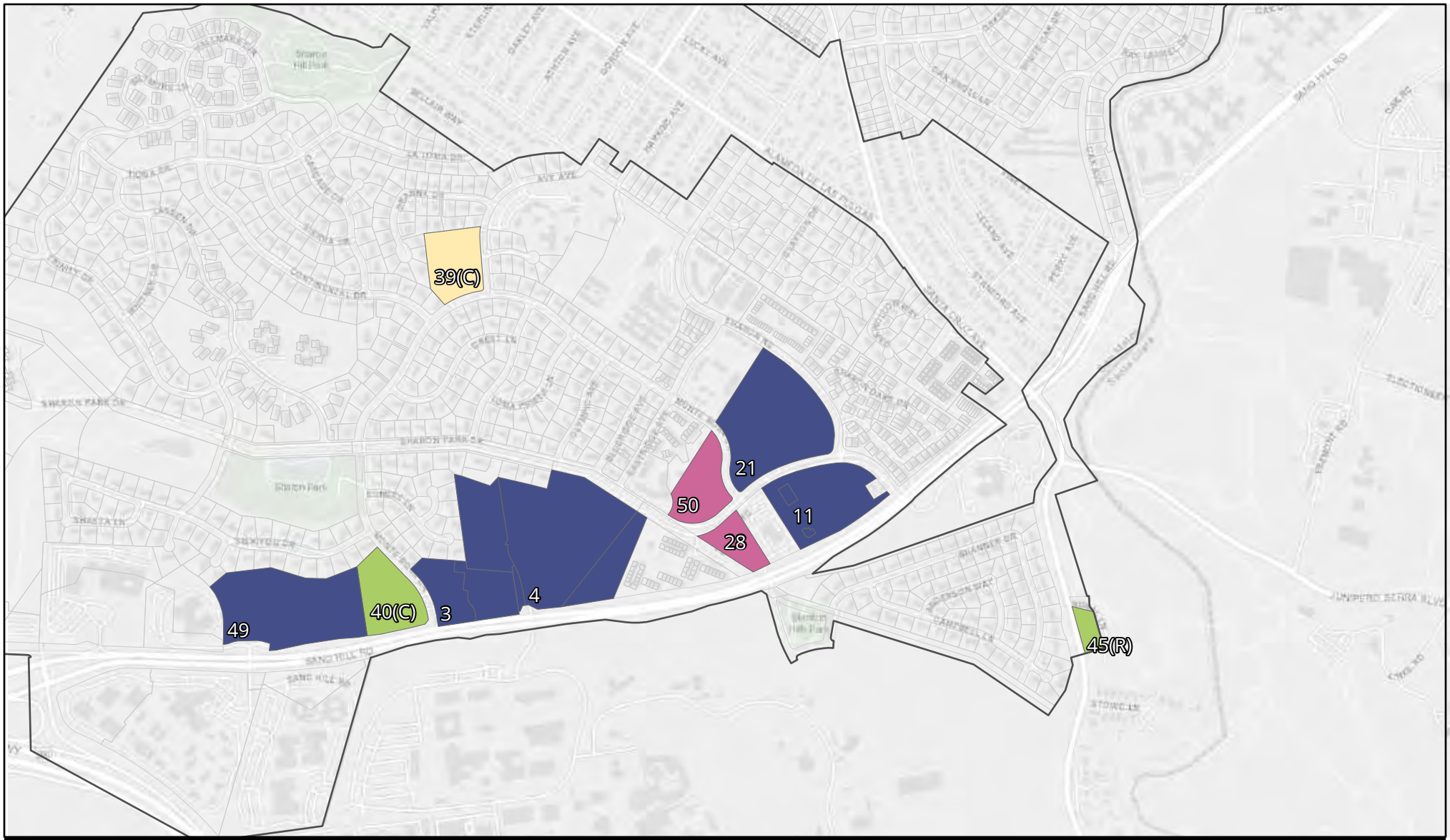
Figure 2. General Plan Land Use Designations

Note: Specific land use designations are shown in the Bayfront Area and generalized land uses are shown elsewhere.

Figure 3. Potential Housing Opportunity Sites List

Potential Housing Opportunity Sites List			
Site Label	Address	Assessor's Parcel Number(s)	Zoning District
1	525 El Camino Real	071332130	SP-ECR-D: SW
2(R)	1620 El Camino Real	060344250; 060344240	SP-ECR-D: NE-L
3	2500 Sand Hill Road	074270240; 074270250	C-1-C
4	2400-2498 Sand Hill Road	074270280; 074270260; 074270170	C-1-C
5(R)	1100 Alma Street	061412440; 061412430	SP-ECR-D: SA E
6	900 Santa Cruz Avenue	071084220; 071084200; 071084090; 071084110; 071084100	SP-ECR-D: DA
7	728 Willow Avenue	062202050; 062202060; 062202210; 062202060	C-4
8	906 Willow Road	062211170; 062211180; 062211050	C-4; R-3
9	Between Chestnut and Curtis	071284100; 071284080	SP-ECR-D: D
10	Between Crane and Chestnut	071283140; 071283050	SP-ECR-D: D
11	325 Sharon Park Drive	074283100; 074283090; 074283040	C-2
12	345 Middlefield Road	062421070; 062390700	P-F
13(C)	1105 Valparaiso Avenue	071071070	R-E
14	Lot between El Camino Real and Chestnut on west side of Santa Cruz	071102400	SP-ECR-D: D
15	Lot between University and Crane on west side of Santa Cruz	071092290	SP-ECR-D: D
16	Lot between Evelyn and Crane	071281160	SP-ECR-D: D
17	Lot between Curtis and Doyle	071285160	SP-ECR-D: D
18	Lot behind Draeger's	071273160	SP-ECR-D: D
19	Lot off Oak Grove	071094180	SP-ECR-D: D
20	275 Middlefield Road	062422120	C-1
21	350 Sharon Park Drive	074281110; 074281120	R-3-A(X)
22	85 Willow Road	062422080	C-1
23	200 Middlefield Road	062271540	C-1
24	250 Middlefield Road	062271010	C-1
25	8 Homewood Place	062421010	C-1
26	401 Burgess Road	062390170	C-1-A
27	570 Willow Road	062370420	C-4
28	2200 Sand Hill Road	074283070	C-1(X)
29	445 Burgess Drive	062390200	C-1-A
30	720 Menlo Avenue	071284110	SP-ECR-D: D
31	800 Oak Grove Avenue	071091520	SP-ECR-D: DA
32	930 Santa Cruz Avenue	071084140	SP-ECR-D: DA
33	1008 University Drive	071274140	SP-ECR-D: DA
34	707 Menlo Road	071288610	SP-ECR-D: DA
35	1300 University Drive	071091310	SP-ECR-D: DA
36	1377 El Camino Real	071103490	SP-ECR-D: ECR NW
37	801-877 El Camino Real	071331180	SP-ECR-D: ECR SW
38	320 Sheridan Drive	055303110	R-1-U
39(C)	2250 Avy Avenue	074351100	R-1-S
40(C)	2650 Sand Hill Road	074260740	R-1-S
41	431 Burgess Drive	062390190	C-1-A
42	425 Burgess Drive	062390180	C-1-A
43(R)	1133-1159 El Camino Real	071102130	SP-ECR-D: SA W
44(R)	1436 El Camino Real	061422350	SP-ECR-D: ECR NE
45(R)	Rural Lane	074311600	R-1-S
46(R)	796 Live Oak Avenue	071288560	R-3 near SP-ECR/D
47	555 Willow Road	062285300	R-3
48(R)	700 El Camino Real	071333200	SP-ECR-D: ECR SE
49	2700-2770 Sand Hill Road	074260750	C-1-A

Potential Housing Opportunity Sites List			
Site Label	Address	Assessor's Parcel Number(s)	Zoning District
50	600 Sharon Park Drive	074282070; 074282090	R-3-A(X)
51	949 El Camino Real	071288570	SP-ECR-D
52	1246 El Camino Real	061430070	SP-ECR-D
53(R)	1189 El Camino Real	071102350	SP-ECR-D
54(R)	607 Menlo Avenue	071288190	SP-ECR-D
55(R)	1161 El Camino Real	071102390	SP-ECR-D
56(R)	1179 El Camino Real	071102370	SP-ECR-D
57	761 El Camino Real	071332080	SP-ECR-D
58	751 El Camino Real	071332090	SP-ECR-D
59(R)	905 El Camino Real	071288580	SP-ECR-D
60	335 Pierce Road	062013170	R3
61(R)	610 Santa Cruz Avenue	071102140	SP-ECR-D
62(R)	550 Ravenswood Avenue	061412160	SP-ECR-D
63	3875 Bohannon Drive	055251120	O
64	795 Willow Road	062470060	PF
65	1000 Marsh Road	055251340	O
66	3885 Bohannon Road	055251220	O
67	3905 Bohannon Drive	055253140	O
68	3925 Bohannon Drive	055253150	O
69	4005 Bohannon Drive	055253240	O
70	4025 Bohannon Drive	055253190	O
71	4060 Campbell Avenue	055253030	O
72	4060 Campbell Avenue	055253200	O
73	4065 Campbell Avenue	055251270	O



Potential Housing Opportunity Sites

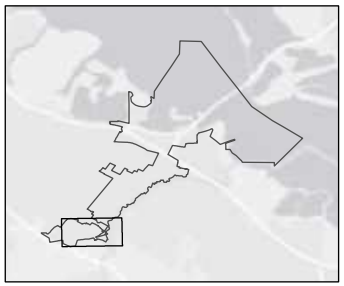
Sharon Heights

Acres (# of Sites)

- < 0.5 ac (18)
- 0.5 - 0.9 ac (21)
- 1 - 5 ac (26)
- > 5 ac (8)

City Boundary

(R) = Reuse Site from 5th Cycle Housing Element
(C) = Religious Facility



0 0.07 0.14 Mile

Projection: NAD83 StatePlane California III FIPS0403 (USFeet)

Figure 4. Potential Housing Opportunity Sites Maps

Potential Housing Opportunity Sites

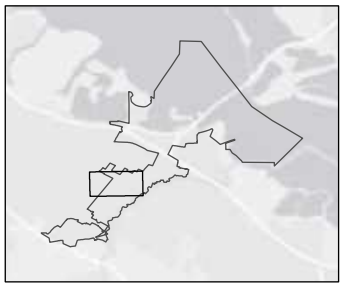
Downtown

Acres (# of Sites)

- < 0.5 ac (18)
- 0.5 - 0.9 ac (21)
- 1 - 5 ac (26)
- > 5 ac (8)

City Boundary

(R) = Reuse Site from 5th Cycle Housing Element
(C) = Religious Facility



0 0.06 0.12 Mile

Projection: NAD83 StatePlane California III FIPS0403 (USFeet)

Potential Housing Opportunity Sites

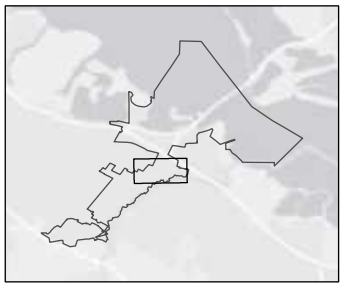
Middlefield and Willow

Acres (# of Sites)

- < 0.5 ac (18)
- 0.5 - 0.9 ac (21)
- 1 - 5 ac (26)
- > 5 ac (8)

City Boundary

(R) = Reuse Site from 5th Cycle Housing Element
(C) = Religious Facility



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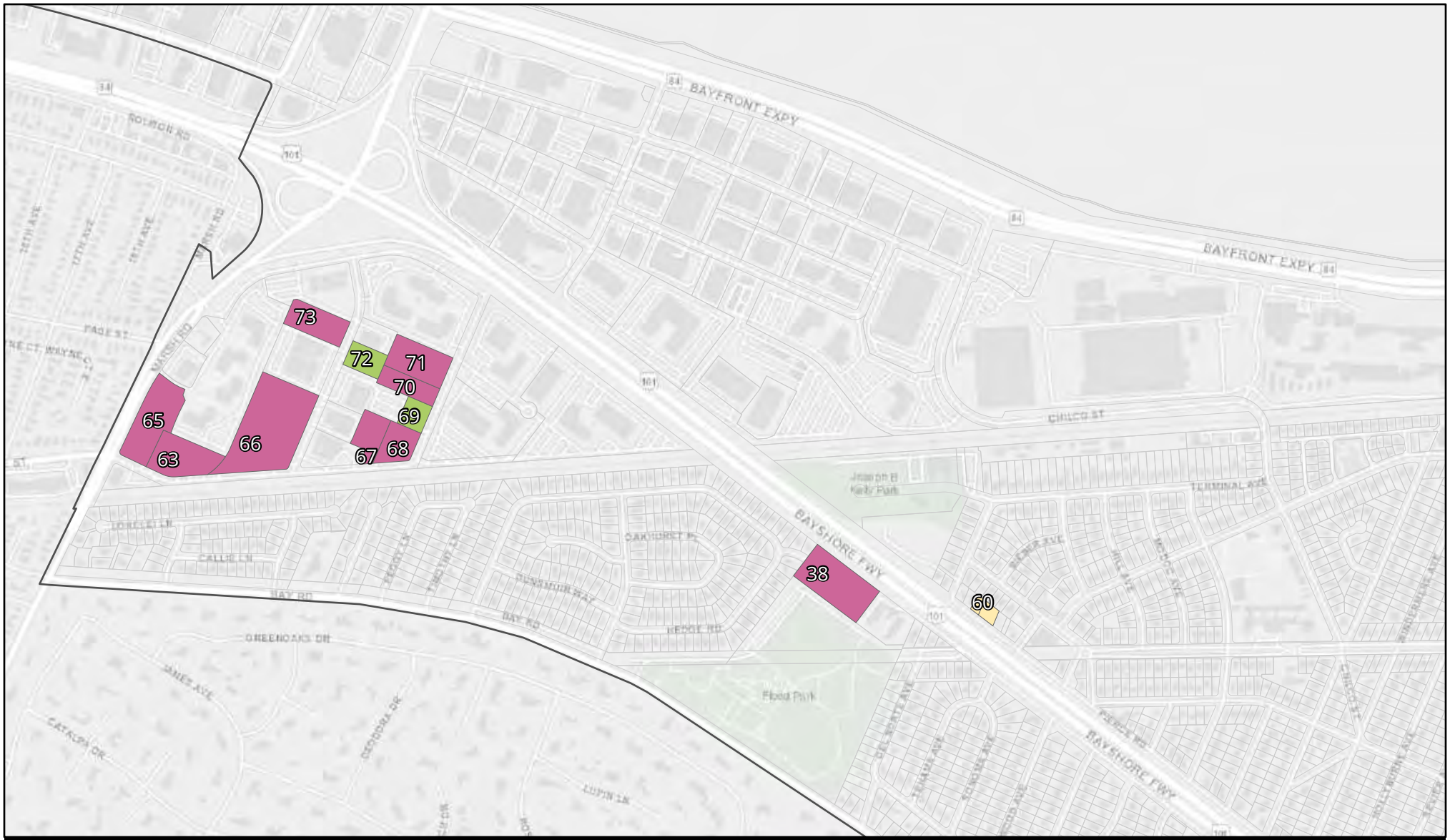
MENLO PARK

GROUP



Potential Housing Opportunity Sites

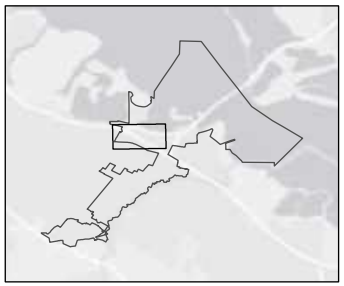
Marsh and US-101

Acres (# of Sites)

- < 0.5 ac (18)
- 0.5 - 0.9 ac (21)
- 1 - 5 ac (26)
- > 5 ac (8)

City Boundary

(R) = Reuse Site from 5th Cycle Housing Element
(C) = Religious Facility



0 0.06 0.12 Mile

Projection: NAD83 StatePlane California III FIPS0403 (USFeet)

MENLO PARK

GROUP

Smith, Tom A

From: Johnston, Jon <JonJ@MenloFire.org>
Sent: Monday, January 3, 2022 3:02 PM
To: PlanningDept
Cc: Smith, Tom A; Johnston, Jon; Coyle, Dan
Subject: [Sent to Planning]Draft NOP EIR - Safety Element

Follow Up Flag: Follow up
Flag Status: Flagged

CAUTION: This email originated from outside of the organization. Unless you recognize the sender's email address and know the content is safe, DO NOT click links, open attachments or reply.

Tom,

Happy New Year! Hope you are doing well. The Menlo Park Fire District is making comment for the Draft NOP EIR for the Safety Element.

The Menlo Park Fire District would like to make note that the Safety Element Update recognize the Fire District Primary Response Routes, adopted Fire District response time standards and the impacts of roads and congestion to those response times, larger housing projects that require higher water fire flow demands to water infrastructure, and Fire District approved traffic calming devices on non-primary response routes only.
Higher population and density projects impacts future fire staffing needs.

Please let me know how we can work to assure we work together to address these impacts.

Thank you!

Jon Johnston
Division Chief/Fire Marshal
Menlo Park Fire Protection District
650-688-8431

From: Jacqueline B Wender
To: Smith, Tom A
Subject: Menlo Park Housing Element NOP Comments
Date: Monday, January 24, 2022 4:22:08 PM

CAUTION: This email originated from outside of the organization. Unless you recognize the sender's email address and know the content is safe, DO NOT click links, open attachments or reply.

Dear Mr. Smith,

Thank you for the opportunity to submit comments on the 2023-2031 Housing Element NOP. I would like to make four points:

1. I have attended a number of Planning and Housing Commission meetings and City Council meetings on this topic, and have read almost all of the reports from staff, consultants, and Commissions. I consider myself informed and engaged. For the first time, the NOP makes explicit, in writing, the distinction between the number of housing units to be studied in the EIR; the number of units to be subsequently zoned for; and the number ultimately to be built. This clear distinction is very helpful and much appreciated. I hope that it will help the community better understand each phase of the Housing Element process.

2. I appreciate the inclusion of transportation and climate change in the objectives and the technical issues to be studied in the EIR. I look forward to a full treatment of those issues, along with all of the others identified in the NOP. Like many community members, I sincerely hope that the City will use this opportunity to engage in holistic long-range planning, not simply a required governmental exercise, or an exercise focused on housing (especially affordable housing) to the exclusion of other considerations.

3. I am surprised that there is no mention of the impacts of increased zoning on school districts and individual schools. This seems a particularly odd omission given the public comments of District officials, and pledges by City officials to work with the Districts in partnership on this plan. Perhaps the NOP means to include school impact under a larger umbrella of "Public Services," but I think the NOP should call out educational impact explicitly.

4. Finally, I would like to endorse the views presented by Commissioners Pimentel and Riggs in their recent Almanac Viewpoint regarding the approach for zoning the downtown area. I am in full agreement with their views and urge the Commission and the Council to adopt those approaches.

Thank you for including these comments in the public record, and for distributing them to the Planning Commission.

Sincerely,

Jacqueline Wender

Jacqueline Wender
https://www.jacquelinewenderart.com

CITY OF MENLO PARK

PLANNING COMMISSION

CERTIFIED TRANSCRIPT

In re:

EIR SCOPING SESSION/6th CYCLE HOUSING ELEMENT AND SAFETY ELEMENT UPDATES AND ENVIRONMENTAL JUSTICE ELEMENT OF THE CITY OF MENLO PARK GENERAL PLAN/CITY OF MENLO PARK

_____/

ENVIRONMENTAL IMPACT REPORT

SCOPING SESSION

REPORTER'S TRANSCRIPT OF PROCEEDINGS

Monday, January 24, 2022

ATTENDEES

THE PLANNING COMMISSION:

Michael C. Doran - Chairperson
Henry Riggs
Michelle Tate
Chris DeCardy - Vice Chairperson
Andrew Barnes
Cynthia Harris
Camille Gonzalez Kennedy

SUPPORT STAFF:

Matt Pruter
Tom Smith

PROJECT PRESENTERS:

Luke Evans, ESA

---o0o---

BE IT REMEMBERED that, pursuant to Notice of the Meeting, and on January 24, 2022, via ZOOM Videoconference, before me, AMBER ABREU-PEIXOTO, CSR 13546, State of California, there commenced a Planning Commission meeting under the provisions of the City of Menlo Park.

---o0o---

MEETING AGENDA

	PAGE
Presentation by Mr. Smith	6
Project Presenters:	
Mr. Evans	18
Public Comment	24
Commission Questions and Comments	28

--o0o--

Monday, January 24, 2022 9:31 p.m.

P R O C E E D I N G S

CHAIR DORAN: Next item on our agenda is Environmental Impact Report Scoping Session/6th Cycle Housing Element and Safety Element Updates and Environmental Justice Element of the City of Menlo Park General Plan/City of Menlo Park: Preparation of an EIR for the 6th Cycle Housing Element and Safety Element Updates and a new Environmental Justice Element for the City's General Plan (collectively referred herein as "the Housing Element Update project") in compliance with the requirements of the California Environmental Quality Act (CEQA).

The EIR will be a Subsequent EIR to the City's 2016 General Plan EIR (State Clearinghouse Number 2015062054). The Project analyzed in the EIR would include adoption of General Plan amendments that would add or modify goals, objectives, policies, and implementation programs related to housing, safety, and environmental justice that would apply citywide.

General Plan amendments would also include conforming amendments to other elements of the General Plan necessary to ensure internal consistency.

Amendments to the El Camino Real and Downtown Specific Plan and the Zoning Ordinance would also be necessary to modify development standards for certain zoning districts and the Affordable Housing Overlay (AHO) district to allow higher residential densities for the production of more housing.

In addition, the Housing Element would identify specific sites appropriate for the development of multifamily housing (in particular affordable units), and the City would rezone those sites as necessary to meet the requirements of State law.

The preliminary list of existing and proposed sites that can accommodate development of multifamily housing includes sites that are located across the City, and is subject to refinement based on additional public input and review of the Draft Housing Element by the Department of Housing and Community Development of the State of California.

It is anticipated the Project would complete a full EIR and no topic areas would be scoped out, with the exception of Agricultural and Forestry Resources and Mineral Resources, which are topic areas that are not anticipated to require further analysis.

We do have a Staff Report by Mr. Smith, who is with us tonight.

Do you have any additions or corrections to the Staff Report?

MR. SMITH: Good evening, Chair Doran and Commission members.

Actually, I have a brief presentation that I would like to give to begin. But while we're loading that, I would note that we received two items of correspondence today on the project, and those have been updated in the Agenda packet. One is from Misha Silin, and it's going into details about concerns of the sites that will be included in the 6th Cycle Housing Element and whether those are feasible for development or if we need to add more sites to the element out of concerns that we may not actually develop the amount of housing that is anticipated from the modifications that are proposed.

And the other item is from Jacqueline Wender. And she provided some comments appreciating the inclusion of transportation and climate change to be studied in the EIR and then wanted more clarification on impacts to school districts and individual schools, and thinks that the NOP should call out specifically educational impacts; and then also endorses the approach to increasing residential housing in the downtown area and on City parking lots.

So I will pull up my presentation here. Bear

with me one moment while I -- it seems to be -- let me see if I can move back. Okay.

All right. Thanks for your patience.

So the purpose of this meeting is a Scoping Session to receive comments on the scope and content of an Environmental Impact Report, which we call an EIR. And an EIR analyzes the effects of a proposed project on the physical environment in areas, like traffic and air quality, greenhouse gas emissions, other topics as well. So it provides -- a Scoping Session provides an early opportunity to comment on topics that should be addressed in an EIR.

And in particular, this EIR will be prepared to evaluate potential environmental effects of changes to the City's General Plan. And the General Plan is a guide to see the vision for the future that informs local decisions about land use and development in various topic areas. And those topic areas are called "elements."

So for this particular project, we are looking at an update to the existing Housing Element and related rezoning in other zoning ordinance amendments, an update to the existing Safety Element, and a new Environmental Justice Element.

There will be no project actions at this meeting. As I mentioned, it is to receive comments on the scope and

content, prior to really digging into the EIR. And more information about the EIR for the Housing Element Update project will be provided in a presentation that will follow mine by the City's environmental consultant, ESA.

So the three elements that I just referenced, we'll start out with the first one, the Housing Element Update. The Housing Element is a state-mandated element of the General Plan. And it will cover an eight-year planning period from 2023 to 2031, which is also referred to as the "6th Cycle."

And the Housing Element must analyze existing and protected housing needs and update goals, policies, objectives and implementation programs for housing at all income levels for the City.

The Housing Element must include an inventory of sites that permit housing development to meet the target set by the state. And this target number, we refer to it as "RHNA," which stands for the Regional Housing Needs Allocation.

So for the 6th Cycle, the City's RHNA is 2,946 units. And if we include a 30 percent buffer, the RHNA is 3,830 units. The California Department of Housing and Community Development advised that a buffer of additional units is necessary so that if one or more of the housing sites that we identify are to develop lower densities than

expected, there's still a remaining supply of housing sites to meet our RHNA during the eight-year planning period.

If there is no buffer and then an identified site develops with non-housing project or a density that was less than what was anticipated in the Housing Element, the City could be required to identify new sites and amend the Housing Element. So it's important to include this buffer to avoid having to go back and reopen the Housing Element later on.

I would also note that while state law requires the Housing Element to include an inventory of housing sites and requires the City to zone the sites for multifamily housing, the City is not actually in the position to develop and construct housing on these sites. The development is going to depend on the interests of the property owners and market forces at work.

So the second element that's being updated is the Safety Element. And Safety Element is also a state-mandated General Plan element. It focuses on protection of the community from risks due to climate change, earthquakes, floods, fires, toxic waste, and other types of hazards. And it specifies the measures that the City will take to reduce the potential risks from those hazards.

The reason that we are updating the Safety Element is to bring it into compliance with recent state law. And so the things that will be evaluated, as examples, are addressing residential development evacuation routes in hazard areas, assessing local vulnerability to different climate hazards, and developing policies and actions towards climate adaptation and resiliency.

The third component that I mentioned earlier on was an Environmental Justice Element for the City's General Plan. And this is the first time that the City has had an Environmental Justice Element in our General Plan.

The purpose of the Environmental Justice Element is to address unique or compounded health risks within Disadvantaged Communities, also called "DACs," as defined by the state. And Disadvantaged Communities are areas throughout California that are most burdened by economic, health, and environmental issues.

And so the types of burdens that could be experienced in these communities would include poverty, high unemployment, hazardous waste exposure, air and water pollution, things like that. And the way -- one way the state identifies these areas is by collecting and analyzing information from communities throughout the

state.

CalEnviroScreen is an analytical tool created by the California Environmental Protection Agency, and it combines different types of census tract specific information into a score to determine which communities are the most burdened or disadvantaged.

So in Menlo Park, according to CalEnviroScreen, the Belle Haven neighborhood is considered a DAC. So measures that could be included in the Environmental Justice Element as examples could be improving air quality and reducing pollution exposure, enhancing public facilities and infrastructure in the area, expanding food access, ensuring safe and sanitary housing, and promoting civic engagement in public decisionmaking.

On December 8th of last year, the City Council supported a preliminary land use scenario with multiple strategies to ensure that the City can meet its 6th Cycle RHNA allocation. And that was really built on the previous meetings that happened throughout the community; meetings of City Council, Planning Commission, Housing Commission. And so some of these are familiar, probably, from previous presentations that we've given at Planning Commission or if you've seen at City Council. I'll walk you quickly through those scenarios.

So this chart is basically an overview of the new

housing needs that we have to meet through our RHNA. The top half of the chart is showing the 6th Cycle RHNA requirement for Menlo Park, broken down by income categories. You can see "Very Low, Low, Moderate, Above Moderate," and a "Total Units" category. And then the bottom half of the chart shows RHNA credits that we can apply against the requirements.

So with the adoption of the El Camino Real and Downtown Specific Plan, our 4th Cycle RHNA in 2013, and the ConnectMenlo General Plan Update, we enabled over 5,000 new housing units in the City. Currently there are seven major residential projects in the pipeline as either approved or pending housing developments that would provide over 3,600 new units. And these units, as well as smaller projects across the City, could potentially count towards Menlo Park's 6th Cycle RHNA. So you can see that on the "Pipeline projects" line here, at the total of 3,647. And then there's another line for ADU credits.

And so between 2018 and 2020, Menlo Park produced an average of 10.6 ADUs per year. And at that rate, we could anticipate about 85 units during the 6th Cycle Housing Element planning period. So you see that total here, under "ADUs."

So if we compare the RHNA credits at each of the income levels with the 6th Cycle requirements and the 30

percent buffer added, you can see that we project enough above-moderate units to meet all of our requirements during the 6th Cycle. So 1,669 required. We anticipate 3,061 units. So well above the requirement there.

But new units would still be needed at the very low, low, and moderate income-affordability levels. So you can see on here, the credits in these income categories are not really enough to make up for the need, including the buffer. So you end up with a total of 1,490 affordable units that are needed as part of our net RHNA. And the income levels are broken out on that last line.

Based on historic trends in Menlo Park and the challenges and incentives that are typically used to produce all affordable housing developments, it's unlikely that all housing opportunity sites that we've identified would be developed with 100 percent affordable units. And so because of that, the EIR would analyze up to 4,000 net new units to meet the City's RHNA requirements. And that total can include a variety of opportunities, either through 100 percent affordable housing development, mixed income development, or market rate developments that include BMR units.

And so the next couple of slides will give an overview of the strategies that would permit the 4,000 units that will be studied in the EIR.

So the first strategy would be to re-use housing opportunity sites from the current 5th Cycle Housing Element that goes through 2023. And for those sites, we would allow by-right development for projects that include 20 percent or more affordable housing. "By-right development" means projects could be approved at the staff level, and it would not require the additional rounds of review and approval by the Planning Commission or City Council. And densities on those sites would be 30 dwelling units per acre or higher.

The second strategy would be to increase permitted residential densities in the Specific Plan area, and we would set a minimum density in the Specific Plan area of 20 dwelling units per acre and then allow at least 30 dwelling units per acre for development at the base level, with potential increases in densities at the bonus level of development in the Specific Plan area.

We would also remove the cap of 680 units in the Specific Plan area that exists now, and it would open up more opportunities for housing around downtown and El Camino Real. And it would also allow residential development on the City-owned parking plazas.

So additional strategies would be to modify the affordable housing overlay, which we call the AHO. And that would allow up to 100 dwelling units per acre, for

100 percent affordable housing developments, and increase allowed densities for mixed-income developments that offer more affordable units than the City's BMR requirements.

Another strategy would be to modify certain retail and commercial zoning district standards and allow residential uses in those areas and encourage mixed-use development. As with other strategies, the densities for these sites would be a minimum of 30 dwelling units per acre. And specifically we're looking at the C-2, C-2-A, C-2-B, C-2-S, C-4, and P-districts to apply these modifications.

And then the final strategy would be to remove the 10,000 square-foot minimum lot size requirement for R-3 zoned properties around downtown and allow those sites a density of up to 30 dwelling units per acre as well.

One additional item here is that the City Council may also study a potential reduction of residential densities in the Bayfront area, which is City Council District 1, and make equivalent increases in densities in other areas of the City. And we're currently evaluating the potential for that. And so that may be a future topic of discussion.

So you can see here, we're showing on these maps -- there's a series of four of them that I'll very quickly walk through. But in total, we're looking at -- these

strategies would target over 70 sites as housing-opportunity sites. And then re-zonings would also allow new housing development or increased housing densities on over 800 parcels citywide.

So this first map shows the housing opportunity sites in the Sharon Heights area. And this is Sand Hill Road, running faintly along here, to help orient you.

But the sites are color-coded according to their size here. And then there's one, which I believe is a gas station parcel off of the Sharon Heights' shopping center that's separate, which would be a rezoned, commercial-only site.

This next map shows housing opportunity sites focused around the central area of the City, including downtown and El Camino Real, which, this is El Camino Real running here; Santa Cruz Avenue running here; Ravenswood. And you can see, in this area we have a number of housing opportunity sites in the yellow, green, pink, and blue.

But then, in the lighter pink, you can also see, there's a number of R-3 properties around downtown that are less than 10,000 square feet, which would have increased residential densities applied.

And then there are also some commercial only. There's one commercial-only site here that you can see. And then the remainder of the teal are other downtown

Specific Plan properties that would see potential increases in densities being allowed, and the cap would be lifted on residential -- more than 680 residential units in this area.

This map shows development primarily along Middlefield Road here and Willow Road. It's running kind of north to south here. So you can see, in this area, there's actually a number of this lighter blue color. These are the rezoned, commercial-only sites. So those would be modified to allow mixed-use development.

And then we also have a number of potential opportunity -- housing opportunity sites on larger parcels, predominantly along Middlefield Road. But there's also a few here, off of Willow.

And then the final map shows additional housing opportunity sites that were identified closer to the bay. So the bay is out here. This is the Bayfront area, Belle Haven neighborhood. This -- Marsh Road running here, and then US 101. So these are primarily office uses at the moment. There's -- at the moment, they're zoned for office. But at the Council meeting in December, they were identified as potential sites for additional study.

And so we'll be also evaluating those, the flood school sites here, and then a couple of smaller parcels located here, off of Pierce Road, I believe.

COMMISSIONER RIGGS: Excuse me, Tom. Just to note, at least I, for one, am not seeing your cursor on any of the...

MR. SMITH: Oh. Sorry about that. Thank you for hopefully being able to follow along. But if you have questions afterwards, we can always walk back to these maps.

And so with that, that concludes my presentation. Happy to turn it over for any clarifying questions -- although, I would note that Luke Evans, of ESA, which is the City's environmental consultant, has some more details about the EIR process and sort of the components of that. And so he will be walking you through that, whether you prefer that now or after clarifying questions.

CHAIR DORAN: I think I would like to hear the other presentation. I think that it might clear up some of the questions people have now. Let's do that. And we'll have clarifying questions, and we'll go to public comment.

MR. EVANS: Okay. Hi, everybody. This is Luke Evans. I'm a Project Manager here at ESA. And we've been hired by the City to prepare your Environmental Impact Report. It's a big project, and we're happy to do it, and appreciate the opportunity.

So it looks like Tom is booting up the

presentation. There we go. Okay. Great.

We can go ahead and go to the next slide. My presentation is going to be pretty brief. The real purpose of this thing is to get public input and also your input on specific environmental topics that you think we should look at, that we might not otherwise think about. And that's really the purpose of this Scoping Session, is to get that kind of input from you and members of the public.

We're going to go over, talk about the type of EIR this is going to be. We're going to talk about this -- kind of the standard list of environmental issues that we -- that typically show up in an EIR, that many of you are probably used to seeing.

We'll go quickly through the environmental review process, schedule, for lack of a better term, of where we're going to be, and how this is going to play out over the next -- I don't know -- 11 months or so.

And then we'll take comments from yourselves and members of the public.

Next slide, please.

So the purpose of scoping, as I said earlier, is really to get comments from the public and from people like yourselves to determine what the scope of the environmental document will be. Certainly, there's a long

list of issues, and we're going to go through some of those in a minute here. And there's a long list of issues that show up in every EIR, that everybody is used to seeing.

But what we really want to hear is, we want to hear specific information that you may have, or members of the public may have, that we should look at in particular. So some of those things we want to get information on from you all would be key environmental issues of concern, any mitigation measures you might have or may think of that may help us reduce or avoid impacts, and then potential alternatives.

CEQA does require that we do look at alternatives. So there are different ways to get out this Housing Element Update. So we want to hear about some ideas for those, if you have any.

And, you know, the ultimate question is, in short, what should we be looking at in the EIR? What should we be analyzing?

Next slide, please.

So this is a Program EIR. And for those of you who have been in this for a while, you know the difference between a Program EIR and a Project EIR. This is a "program." It's big. And it covers a large program. And it doesn't necessarily cover any specific projects.

As of now, there are no applications for these opportunity sites. There's no specific project that's being advanced. So we're going to look at this at a pretty high level.

And so the EIR will be a subsequent EIR to the ConnectMenlo Plan EIR, which was prepared in 2016. There was a lot of work that went into that, and we want to piggyback off of that, to the extent that we can. We don't want to reinvent the wheel, unless we have to. That's really the purpose of the subsequent EIR.

Next slide, please.

So as I said earlier, this is the typical list of topics that would show up in just about any EIR. These are derived from the CEQA guidelines. And for the most part, we're going to be looking at all of the topics in the CEQA guidelines, as you can see here in this top section.

There are a couple that really don't apply to the City, or certainly don't apply to the opportunity sites and the areas that are under consideration for the Housing Element Update. And those would be agricultural and forestry, and then mineral resources. But all these ones up top would apply and will get the full treatment in the EIR.

Next slide, please.

So here is a very broad timeline. And I want to draw everybody's attention to what's in the bottom there, the red part. This is our deadline, January 31st. That's when we have to submit an Adopted Housing Element to HCD. Otherwise, bad things can happen, and you want to avoid those.

So here we are. Right now we are in the Draft Scoping Session. We're kind of coming up on the tail end of the Notice of Preparation Comment Period. We've got a couple of comments, as Tom mentioned earlier. I expect we'll get quite a bit more over the next week or so, before the NOP Comment Period closes.

And then, for the next few months, we'll be working on the Draft EIR. We'll be doing the analysis. We'll be doing the traffic study, doing air quality study, noise study, bio, all those things that we'd normally do.

Then we publish the Draft EIR. We go out on the street for 45 days. And some time during that, there will be a comment session where people could -- where members of the public could comment on the Draft EIR. And at the end of that, we -- with a lot of assistance from the City -- would respond to any comments that were received on the EIR.

And then it would go -- the combination draft and the responses to comments would be kind of melded together

into a Final EIR, and that would go before the City Council for certification. And so that is the overview of the process.

Once again, there's our deadline. We've got -- it sounds like a long time. Sounds like we've got a whole year, but there's a lot of things that have to happen. And so it's going to really take everybody kind of pulling together to get this thing wrapped up in time.

Next slide, please.

Tom put this slide together that just basically has the layout of -- or the information that folks need to comment on. We'll be taking verbal comment here tonight, but people can also submit e-mail, written comments. Lots of different ways to get their comments into us.

And then there's also going to be an upcoming community meeting February 12th, to go over some of these strategies that Tom talked about earlier.

So that's my presentation. Happy to take any questions. I know Tom's happy to take questions, too. It's at what point, I guess, Mr. Chairman -- you know, at what point would we open this up for public comment, but maybe we just want to go through questions first.

So I'll --

CHAIR DORAN: Yeah. What I would like to do is entertain any clarifying questions from the commission

now, for either you or Mr. Paz. And then I'll open it up for public comment. And then I'll return it to the commission for further comments or questions.

So do we have any clarifying questions? Now is the time.

I'm not seeing any. You guys must be very clear.

Let's open it up for public comment.

Mr. Pruter, do we have any hands raised now?

MR. PRUTER: Yes. Thank you, Chair Doran. At this time, I do see one hand raised. So I can go ahead and get that started.

But as a reminder, for members of the public, please raise your hand, with the hand icon on your Zoom interface, or press star 9, if you're calling by phone, to be able to provide public comment.

I have two commenters now. So I will begin with the first one, if that sounds all right with you, Chair Doran?

CHAIR DORAN: Please.

MR. PRUTER: Okay. So we have our first commenter, who goes by the name of Misha Silin. I'm going to allow you to speak. If you can please state your jurisdiction and your name at the beginning, that would be great. And you have three minutes to speak as well.

Thank you very much.

MISHA SILIN: Hello. This is Misha. Good evening. Thank you for taking my comment.

I'm a resident of Allied Arts. I'm the one that sent in a very long e-mail comment earlier today, going over the sites in the NOP and comparing them to the previous 5th Cycle element and just kind of drilling into some of the sites that represent the largest number of units of housing that we expect to be built in the 6th Cycle.

I realize this comment isn't related to the environmental impact of the sites, but I'm kind of still just stepping back to the main issue. And the reason I spent a lot of hours on this and, you know, wrote that up is because I do feel that housing is a very important issue to Menlo Park and to our country.

I think that housing has many different implications, ranging from, you know, nationwide to local. And at the local level, I'm concerned about, you know, not building enough housing, leading to friends and families feeling stressed, priced out, having to commute from very far away.

It does impact, you know, climate change and traffic, as we discussed earlier, with the Facebook project, for example.

If we continue to build lots of office buildings,

without housing for the people that work in those offices, they're going to be driving in from elsewhere, which causes greenhouse gas emissions, et cetera.

So I think, just my main comment is that based on what I saw in the list of sites, it seems like very -- there hasn't been any evidence that these sites are going to lead to a lot of houses being built. Most of the sites are office buildings on Sand Hill Road or Middlefield, that are occupied by very wealthy venture capitalist firms or startups with a lot of money. I don't believe there's been any evidence shown that these companies are looking to move out or that, you know, it's lucrative for the property owners to convert their large office buildings to housing.

And so if we are serious about tackling some of what I think are the biggest problems, especially in our region, like homelessness, climate change, et cetera, and we agree that we need to build more housing, I think we do need to spend more time on the list of sites and make sure that they're realistic. And if they're not, adding more sites to the list.

And, you know, from the process perspective, we've seen HCD, at the state level, rejecting a lot of housing elements from other cities, like Redondo Beach, Beverly Hills, Davis, that are unrealistic. And so I do

fully expect that the same level of reasoning will be applied to our housing element. And as it stands now, it will be rejected. So I think it still does make sense to go back and try to make it more realistic.

Thank you for taking the time to listen to my comment, and I hope you read the written comment I submitted as well.

Thank you.

MR. PRUTER: Thank you very much.

And we have a second commenter, Chair Doran. I will introduce them at this time. Their name is Pam Jones.

And you also have an opportunity to speak. You will be given three minutes to provide public comment. And I will be letting you speak shortly.

If you can please provide your name and jurisdiction at the beginning of your comments. Thank you very much.

PAMELA JONES: Thank you. Pamela Jones, resident of Menlo Park, Belle Haven neighborhood for almost 50 years.

One, I'd like to know what kind of outreach is being done in District I, so that residents that are interested can participate.

And number two, given that there would be no

further construction over here, under the Environmental Justice and how our community is designated, do we still, as a neighborhood, need to make comments to ensure that that aspect of the Housing Element is actually adhered to?

Thank you.

MR. PRUTER: Thank you for your comment.

Chair Doran, as an update, I see no other hands raised. We can wait a moment longer, if you would like, or we can go ahead and close the public comment.

CHAIR DORAN: Let's give it just a few seconds here.

No other hands raised?

MR. PRUTER: That's correct. There are no other hands.

CHAIR DORAN: Okay. I'm going to close public comment now and bring it back to the commission for further comments, for any questions the commission has.

Would anyone like to lead off?

Commissioner DeCardy?

COMMISSIONER DECARDY: Yes. I just have a couple clarifying questions, but I appreciated the opportunity for public comment first, since people have been waiting for a long time.

I have three clarifying questions. On the 4,000 number, for purposes of this discussion, how relevant is

4,000, versus 2,000, versus 6,000, for the EIR? How important is that 4,000 number in -- specific, for the EIR?

MR. EVANS: I can answer that.

For the most part, what -- you can kind of almost think of this -- of what we're going to do as an envelope of possibility.

And another way to think about it might be a worst case scenario. That's not a precise term, but that's one way to think about how we're going to look at this.

We recognize that some of these housing sites may change, you know, as a result of public interaction and public opinion, public comment. Over the period of the Housing Element Update, we might find that some of the housing sites have environmental impacts that are not acceptable, and they may drop off, or some may go up. But what we're looking at is an envelope, kind of a worst case scenario of analysis.

So 4,000 is kind of the number that we're at currently, and that we think would capture the scope of likely impacts associated with the Housing Element Update.

And so that's -- does that answer your question?

COMMISSIONER DECARDY: I guess that answers my question, but if I disagreed that the 4,000 is the outer

edge of that -- I think you said -- worst case scenario, then that feels important.

So -- and this would be to the good comment and letter we had before, about assumptions about what gets built. You look at the maps, and you look at impacts and opportunities in the community that at least geographically are unevenly spread, those kind of questions. So it sounds like that actually is material.

Do I have that right?

MR. EVANS: It is material.

I guess I would just caution that you don't want to make the number too big that you over estimate the impacts. So it is a question of finding the perfect -- kind of the sweet spot.

And I think, based on the RHNA allocation, plus the buffer, the 4,000 number was the agreed-upon number that would make the most sense for this particular Housing Element Update.

And if anybody else wants to -- Tom, if you want to chime in on that, please feel free, for how we got there.

MR. SMITH: Yeah. I think you handled the answer correctly, Luke. It was really looking at the RHNA requirement, plus the buffer, which gets us the 3,800 units, and allowing even a little bit more of padding

there for different development potentials, whether those are 100 percent affordable projects, mixed development, or market rate, with BMR units. So that's how we landed on it.

COMMISSIONER DECARDY: Okay. That's helpful.

And my question was, does SB 9 relate to this in any way, how we're going to implement -- or understanding state opportunities and/or mandates for affordable housing?

And what assumptions are being made for that, in this whole mix?

MR. SMITH: So we haven't incorporated SB 9. This is based on really the strategies that I walked through.

And SB 9 is an allowance by the state, under state law. We have not incorporated potential development there into the strategy.

COMMISSIONER DECARDY: Okay. Thank you very much.

MR. SMITH: Uh-huh.

CHAIR DORAN: Commissioner Barnes, you've got your hands raised?

COMMISSIONER BARNES: I do. Thank you.

So I've got, first, a clarifying question, and then a question to the -- to Luke about what would be

permissible.

First, clarifying question: Would it be possible to go back to the slide that had the downtown primarily on it?

MR. SMITH: Yeah. So I would ask whoever is controlling the presentations, if you could reload the presentation I gave earlier.

COMMISSIONER BARNES: And as you're doing that, my question is this: So many of the lots that are, for instance, off of Santa Cruz and in that area, you see all the -- I'm sorry. That's Sharon. So go two more, I think. The one that's downtown, like Santa Cruz Avenue. Yup. Right there. Awesome.

What can be super problematic about development there is, you need to do some assemblage on these smaller parcels to get any type of size.

And then the other piece is the Downtown Specific Plan and its development standards, by way of calling out certain allocations of retail, and then figuring in an office and residential, then step back.

So both the zoning piece of it and development standards' piece of it would need to really undergo large changes, as it relates to getting any type of scale in these areas.

When we talk about the pink, and it says, "R-3

Zones Parcels," in "Upzoning," does that contemplate, for instance, going back into the Downtown Specific Plan and relooking at the development standards, which are height, and which are setbacks, and which are different things?

MR. SMITH: Right. It does.

You know, density is a key here, but I think we're still evaluating all of the different modifications that we would need to make to the development standards in the Downtown Specific Plan area.

But that could be part of the equation to make sure that we get, you know, a really feasible density and projects that can be built that are realistic.

COMMISSIONER BARNES: Which is quite a lift to modify that specific plan. Okay. Thank you for that.

The other question is to Mr. Evans. And I don't know the answer to this, so I'm going to make my best run at trying to formulate some coherent thoughts around it.

What I'm trying to figure out, and as we talk about increased densities, is the impact on schools and how that potentially that could be reflected in the EIR, and allowing to kind of walk through this.

So when we did the circulation element in 2016, when the City did it, you know, at that time, the state was transitioning -- getting ready to transition from VMT to LOS. What happened was, through the process of the

General Plan Advisory Community, there was a thrust from the community to say, "Hey. Wait a minute. VMT is great, and that's a state-mandated direction we're going in. But we, in Menlo Park, we like the idea of level of service. We like to understand, at intersection X, if Y happens, then I'm going to have to wait X-much longer now, than before, due to Z-development," type of thing.

You know, if I think of education and, you know, education level of service, I mean, we get to a situation where we are adding, you know, bodies to whatever school district it is. I can take, for instance, Menlo Park School District. And every additional body is an impact on the capital budget, facilities, on operating budgets and on -- you know, capital budgets, facility, and operating budgets.

The ability to have a report out on developments, that is, in a way, creating a nexus between, when you do X for a development, it has a Y impact. And I know, like you do an FIA. So you've got -- if -- MenloPort, down in the Bayfront area; right? You get impacts which shows, "Great. You're in Ravenswood School District. It does X. For Menlo School District, it does Y," or whatever -- excuse me. "For Sequoia Union, it does Y."

How is it that this concept of level of service -- this concept of educational level of service could be

baked into the process for reporting out, with some type of metric, as agreed upon with, for instance, the school district, to not rectify it? Because when you're talking affordable housing, you're talking the other pieces, it's very, very hard.

You cannot do something which is going to preclude development of, you know, certain BMI levels, but at the same time allowing for there to be the acknowledgment and then course correction or taking steps necessary to understand what those impacts are.

So maybe the City can, as an environmental impact, go back and look at, should it be provided, general funds, to be able to -- to offset some of these impacts? Should it go back and look at the community amenity fund that comes in, and look at how that gets allocated?

Is there a place in this process, much like level of service for vehicular traffic, to have educational level of service in what we're doing in this Housing Element?

Could you talk at all to that?

MR. EVANS: Yeah. And I think you may be disappointed in the answer, at least from the CEQA perspective.

CEQA is really concerned with a project's impacts

on the physical environment. Issues like -- it is interested in things like school facility capacity and, you know, other public service metrics -- say, for instance, response times from emergency service providers, things like that. But it's only concerned with those issues within the context of how remedying those issues -- those identified problems would impact the environment.

So, for instance, if you were to have a project that were to introduce a substantial number of students to the local school district, and that would require that school district to construct a new school or expand a new school, CEQA would be interested in the impacts of doing that, of constructing that school, of addressing those shortfalls with existing facilities.

It -- just because there is an exceedance in capacity from a school, for instance, that is not -- that, in and of itself, is not an environmental impact under CEQA. It's really what you're going to have to do to address that issue that is the environmental impact.

And I know there's some nuance there. Sometimes it gets a little confusing. But the CEQA case law is really clear on that; that that's really what they're focused on, is the environmental impact providing that additional service.

Now, the problem is, with this kind of project --

and I use the term "project" loosely because it's not a project like someone -- like one of the ones we heard earlier this evening. Those are real projects. Those are being advanced. There's plans on the table for those.

At this point, we don't know what future projects, real projects are going to look like. We don't know where they're going to go, necessarily. We don't know what the densities are, et cetera. So it's really hard for us to project out what the environmental impacts are going to be for those kinds of general, very broad program-level projects.

So does that answer your question? Probably not as well as you hope, but tell me if I can elaborate some more.

COMMISSIONER BARNES: At the risk of paraphrasing, this is not the home for that? In other words, your -- this EIR is not the home for teasing this out, in creating, in effect, the nexus relationship between X-development and Y-impact on the educational system in having -- and it doesn't have a home in the Housing Element.

Or said differently, you're on the EIR side. However, this might have a home in the Housing Element itself, which -- the content of which exists separately from the EIR component of it.

MR. EVANS: That is accurate. Yes, sir.

COMMISSIONER BARNES: Okay. So it might have a political life, but it doesn't have an EIR life. This particular --

MR. EVANS: That's right.

And there is a distinction. And sometimes people are frustrated by that distinction, but not -- that is -- I think you described it pretty accurately.

COMMISSIONER BARNES: Thank you.

So I will close by saying, as important as, you know, many other types of justice, I think educational justice is very important. And the systemic, inability to fund our education, it's easy -- and I'm not talking to you, Mr. Evans. I'm just, in closing -- you know, it's easy. I overreact to cars on the street, in my God-given right to drive my Cutlass down any particular street at 60 miles an hour, with any other traffic.

I do, however, get animated over education and the lack of funding for education in the systemic malnourishment, the starving of it, and who we look to to fund it.

So thank you for that. And I think the Housing Element process has a home for this. And I appreciate your response. Thank you.

CHAIR DORAN: Do we have other commissioners who

want to speak?

Mr. Riggs.

COMMISSIONER RIGGS: Thank you. Trying to keep my comments to EIR scoping in this case.

I -- with all due respect to my friend Pam Jones, I do feel that the EIR should not rule out any locations for housing. At the very least, housing which has already been put in our zoning.

I will not burden this meeting with the reasons, other than to say that if you approve development in an area and want to delete the housing portion, that leaves commercial. And in this environment, that means office buildings. And I, for one, would not like to encourage further construction of office buildings in that area or necessarily any particularly transportation-impacted area.

And I would like to respond to a good point made by a fellow commissioner about the smaller lots downtown being relatively unlikely for development. I think the way that we look at the smaller lots is, you might say, halfway down to ADUs. ADUs, which, by the way, in my opinion, should be figured as more than 10 per year. If last year, 10 were built, given the recent and continuing changes in state law, I would expect 15 to be built in 2022, and 25 to be built in 2024.

But if you look at the downtown lots as sort of

between-size lots, the only thing restraining their construction is that City Council, after 18, almost 20 years, has yet to move forward with a parking structure which was integral to the Downtown Specific Plan, and it still has not moved forward. So I think that is still a reasonable housing expectation downtown, once the roadblock is removed.

And then, while I personally would oppose any further development on Willow Road, that is not an EIR issue.

What I think is an EIR issue is that we are assuming that Menlo Park, and the other cities on the peninsula and the Bay Area, will continue to drive housing need. And I very much hope, at least for my own city, that that is not the case.

I don't see -- and I have challenged others to tell me, those who should be able to give me a good argument -- I don't see why significantly increasing the size of Menlo Park is a benefit to the residents. I'm not talking about the theoretical future residents. I'm talking about the residents who are here.

We are Menlo Park. People who may come in the future, they are not Menlo Park. They are where they live now. And if a relentless and continuing increase in the size and density of our town is not benefitting those of

us who are here, then why are we assuming that this is the inevitable path forward?

So with that in mind -- and I realize this is an uphill request -- I believe there should be an EIR alternate case that is based on significantly-reduced housing need from that which is projected by the state.

I realize that the charge here is for a Housing Element to meet the Bay Area requirement. However, I think the EIR will be more useful to Menlo Park. And we are Menlo Park, not the Bay Area, and not the state, if it includes an alternative, which is for reduced future housing need. That's my suggestion.

Thank you.

CHAIR DORAN: Thank you.

Anyone else on the commission want to speak at this time?

Mr. DeCardy?

COMMISSIONER DECARDY: I appreciate the time and the presentation.

On the 4,000 number, I think that's low. But I will take your word that 4,000 works for the EIR. I think the -- you know, we can look at the history of what we have for housing that is at market rate, and what we get at BMR units, and extrapolate out of that.

I appreciate the comments on ADUs, but we

continue to approve ADUs that clearly are not going for affordable housing again and again and again. So I think those assumptions need to be checked everywhere. I think they are important because ultimately, it's a question around density, and it's a question around spread. And we need to look at all of that. I'm a huge fan of density. I think density is what gets us prosperity and gets us a thriving downtown in this mix.

Relative to the EIR, a Program EIR is in place for a long time. I assume this one is in place for the duration of this 6th RHNA, until we get a 7th. So what assumptions do you make around climate change or around changes in understanding of impacts over time that lock in? You don't need to answer, particularly. But it's something that gets frustrating, when we look at a specific project, and you've got a locked-in assumption on some impact that's based on data that's four, five, six years old, and has been updated.

So when the Final EIR is presented, I would love to understand how we assure those assumptions were actually relevant to a future case. And unfortunately, those changes happen fast these days, and nobody can predict them. So that's a comment for input.

Another one -- essentially, I love that we have an EJL, and I think that's fabulous, with the housing

element.

And as we're looking at the impacts on folks, to make -- assure that we are looking at indoor stuff, in addition to outdoor stuff -- indoor air quality, those sorts of things, are usually important.

And, also, when we are thinking about adaptation issues, when we think adaptation issues that also serve mitigation purposes, first rule of holes is to stop digging. And so reducing use that creates fossil fuel emissions seems like a good idea.

So if you look at something in areas of our community that are going to be particularly susceptible to heat islands, cool roof programs, canopies, that kind of stuff, I hope there's an overemphasize on looking at that intersection, and that the EIR can be helpful in that mix.

But the two main things I want to say about the EIR, the first one is that our EIR process is broken. And continually we have EIRs that present the Goldilocks' scenario, which is, there's only three things to consider.

Consideration number one is that you do absolutely nothing.

Consideration number two is that you do absolutely the maximum of everything else. And lo and behold, you end up taking the thing in the middle because it threads the needle on protecting the environment and

whatever the need was that the project was created for to begin with.

And that is entirely unhelpful for anybody in the community to be able to actually extrapolate and to be able to use it for sunshine and for being able to learn more about what impacts are, and how they think about a particular project.

And so with that in mind, I respectfully disagree with my fellow commissioner about -- Commissioner Riggs and his comment on housing and density, but I do think looking at a fourth makes sense. And I think it's in this space around parking. So we have these assumptions around people, and we're thinking about units of people and density in people.

But the fact that there's a trailing element, which is the assumption around the cars that they come with, and what we build for. And time and time again, we talk to developers who do not want to build the parking because they don't need it. And parking is a disaster for housing. It's a disaster for the embedded carbon and cement. It's a disaster for everything, other than the fact that we can't take our car and carry it with us to work, which would be the best thing.

So I think it's really important that we get a Program EIR that takes a look at the opportunity set for

massively reducing parking so that we can understand what the potential benefit is on pieces of property to actually build more housing for people so we have density for people, and not density for cars and parking cars. So we have to be able to figure out how to do this, and this is a huge and important element in this mix.

So as you consider this, I have said this before, that I will not vote to say that an EIR is adequate without looking at an alternative with massively-reduced parking in that mix. I mean, it's particularly important to look at in this one because it creates an opportunity for us to actually get more housing for people, as opposed to for cars, and a positive feedback within that mix.

So thanks for the time and attention on this, and I'm looking forward to the rest of the process.

CHAIR DORAN: Thank you.

So it is approximately 10:40 now. We will need to stop at 11:00, unless we vote to continue. I just want to keep that in front of everybody as we continue.

Does anyone else want to speak? Anyone else from the commission? Questions or comments?

Commissioner Harris.

COMMISSIONER HARRIS: Thank you. Thanks for the presentation -- both of the presentations.

So as far as the EIR is concerned, I want to --

kind of dove-tailing on what Commissioner DeCardy said, I would like to know how you would analyze the positive environmental impacts of infill housing, and how that might work, if I may.

MR. EVANS: Sure. As far as discussing the positive aspects of infill, I think there has been -- as I'm sure you know, there are lots and lots of laws. Legislature has been put in place over the last ten years or so to encourage infill housing.

And a lot of those things -- a lot of those laws revolve around, for instance, streamlining -- making it easier to develop infill housing -- making it less expensive, making the process easier, less hoops to jump through, et cetera. So clearly the legislature, anyway, has recognized infill housing as a positive thing -- as something that should be happening.

The extent that -- CEQA really doesn't play up manifest, particularly. If we were talking about a federal project under NEPA, which is the National Environmental Policy Act, which is kind of the federal version of CEQA, they do put an emphasis on benefits. And it's actually something you play up in the analysis, if there is in fact a benefit to something.

CEQA really doesn't go there. It kind of says, "If there's going to be a negative" -- let's just call it

a "very negative look" -- "Are there negative impacts that are going to happen?" And that's kind of what we focus on.

And the answer for that is always, kind of, a yes or a no. There is -- it's either negative or it's just nothing. It just is what it is.

So -- did that answer your question? Is there anything that you would --

COMMISSIONER HARRIS: So, I guess, in other words, an alternative, where most of the housing is -- infill housing is going to be less bad than the -- housing other places -- you know, you used the word, "worst case scenario." I don't know what you mean by that.

MR. EVANS: By that I meant that that was -- that is kind of the envelope of our analysis. In other words, we're looking at 4,000 units, even though -- and this may actually help answer some of the other questions, I think, that Commissioner DeCardy was asking about, about that very same question.

Remember, we're looking at an eight-year program here. And we don't have our crystal ball. We don't know who -- what developers are going to come along, what affordable housing subsidies are going to come along, et cetera. So at the end of the eight years, we don't know exactly how many housing units are going to actually get

built in the city. We just have no way of knowing that.

The 4,000 units is a big number. I think most people would agree that if 4,000 units were to be constructed in the city in eight years, that would be a big number.

The answer of what actually is going to be built is probably going to be less than that, realistically; right? So when I say, "worst case scenario," that's kind of what I mean. We're looking at the upper limits of what could happen. The answer may be somewhere lower than that, when it's all said and done, at the end of eight years. You know, we'll find out.

But our -- what we don't want to do is, we don't want to analyze at a lesser level and then find that before the eight years are up, you're already bumping into that level. And then you've got to do more analysis, and you've got to jump through more hoops, et cetera.

Does that help explain --

COMMISSIONER HARRIS: Yeah. I guess I'm a little uncomfortable with the description of "worst case scenario." We're trying to build housing here. So saying that the worst case scenario is that we built too much housing feels -- I realize that you're saying it from an environmental standpoint, but I'm kind of uncomfortable with that use of phrase.

So I know that what we're trying to do is to do this housing in an environmental way. And one way is to consider less parking, per Commissioner DeCardy, and to consider the infill housing. So I'm just hopeful that those are going to help us.

And I'm a little unclear, also, what the different -- like, what would be the alternative? Like, we have to build this housing. So what is -- how do you determine what the alternative would be, given the guardrails that we need to meet with RHNA?

Are you suggesting that you would do one scenario where it's 8,000, and one that is 4,000? Like, how are you going to come up with this alterative scenario?

MR. EVANS: Alternatives are actually driven, in most cases, by what kind of impacts we find, when we do the analysis. Alternatives are kind of the last thing to look at, when you write an EIR, because generally they're constructed around the bad things you've identified with your project.

And so alternatives are directed towards, how can you reduce, minimize, avoid those impacts that you've identified? So in many cases, alternatives would be looking at something that would reduce some of those negative things that we found out during the analysis.

Does that help?

COMMISSIONER HARRIS: Okay. Yeah.

I do have a couple other comments.

I really appreciate the comments both from Ms. Jones and from Misha. And I, too, have had the issue of, I don't -- I don't necessarily understand how this list of sites is going to get us to where we need to be, given that drilling down on them, I see a lot of, you know, office parks or other places that are fully utilized. And I just don't -- I'm a little bit concerned that we're just not even going to get to where we need to get to.

So my question -- I guess this is to staff -- at what point in this process does staff or the M-group, or whoever it may be, contact the landlords or the owners and try to understand -- and developers, to try to understand how realistic each of those sites that we've added to our list are, with respect to housing?

And what's the likelihood that -- you know, what kind of incentive -- with the incentive that we're providing, some of these zoning incentives, is that going to be enough? Kind of, how are we going to determine that? And at what stage in this process?

Because I feel like we're already here at the EIR, but I'm not really sure that we've done that work. And so I'm just wondering, when does that work happen?

MR. SMITH: So we have done outreach to different

property owners that would be affected. We've sent out mailings to each of the property owners for all of the sites that were seen on the maps earlier. And we have received contact from a small number, I would say -- although, even today, I'm still noticing inquiries coming in, and people wanting to talk to us about their sites. And so it's an ongoing process.

And as we get feedback from individuals that would affect whether or not the site would be viable for housing, we are making those updates and making notes on that information as it comes along.

But we have been having outreach events as well. We have upcoming community meetings. Community meeting number five is going to be February 12th. And then even after that, we're going to be turning to another community meeting shortly thereafter.

So on -- outreach is really an ongoing process, and we have been making attempts to reach all of the various property owners about this.

But does that help?

COMMISSIONER HARRIS: Well, I'm just wondering -- okay. So I'm a property owner. I got a mailer. And I'm, like, "Oop. I'm not interested." I mean, at what point do you actually speak with that, like -- try to contact them, maybe, in a different way or make sure that we have this

list that is going to work for us?

MR. SMITH: Right. So, yeah. We've -- with so many properties that we're evaluating, we've relied on mailings up to this point, but we may look into further outreach as we continue to progress through the process to try to make contact.

But we are also trying to remain carefully within the HCD criteria that are set out for sites that they say are -- that the state says are viable for affordable housing. And so that's why we've sort of tuned in on these sites that are of a certain size -- more than half an acre, less than 10 acres in size, et cetera, are the various criteria.

So we've tried to identify all of those opportunities across the city. And we're doing our best for outreach, but also trying to maintain sites that HCD says they believe are viable as well, in the case that we can't make contact with the property owner, for whatever reason.

COMMISSIONER HARRIS: Okay. All right. So I do want to -- well, I guess I don't have a lot more questions on EIR at this point. I have a lot more other questions.

So I'll let somebody else talk.

CHAIR DORAN: So if anyone else has questions or comments on the EIR, I think we need to bear in mind, kind

of, how the EIR fits into everything else that's happening.

This is not the Housing Element. This is the EIR Scoping Session. So if anyone else has comments on that, now is the time.

Not seeing any -- so I'm going to close this Scoping Session and move on to the final item on our agenda, an informational item.

(WHEREUPON, Agenda Item H2 ended.)

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CERTIFICATE OF REPORTER

I, AMBER ABREU-PEIXOTO, hereby certify that the said proceedings were taken in shorthand by me, a Certified Shorthand Reporter of the State of California, and was thereafter transcribed into typewriting, and that the foregoing transcript constitutes a full, true, and correct report of said proceedings which took place;

That I am a disinterested person to the said action.

IN WITNESS WHEREOF, I have hereunto set my hand this 1st day of February, 2022.

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--o0o-- 53:12

1

1 15:19

1,490 13:9

1,669 13:3

10 39:21,22 52:12

10,000 15:13 16:21

10.6 12:20

100 13:16,20 14:25 15:1 31:2

101 17:19

10:40 45:17

11 19:18

11:00 45:18

12th 23:16 51:14

15 39:23

18 40:2

2

2,000 29:1

2,946 8:20

20 14:5,14 40:2

2013 12:9

2015062054 4:18

2016 4:17 21:6 33:22

2018 12:19

2020 12:19

2022 4:1 39:24

2023 8:9 14:3

2024 39:24

2031 8:9

24 4:1

25 39:24

3

3,061 13:4

3,600 12:14

3,647 12:18

3,800 30:24

3,830 8:22

30 8:21 12:25 14:9,15 15:8,15

31st 22:3

4

4,000 13:17,24 28:24 29:1,2,20,25 30:16 41:20,21 47:16 48:2,3 49:12

45 22:18

4th 12:9

5

5,000 12:11

50 27:20

5th 14:2 25:6

6

6,000 29:1

60 38:16

680 14:18 17:3

6th 4:10 6:11 8:10,20 11:17 12:2,16,21,25 13:3 25:8 42:11

7

70 16:1

7th 42:11

8

8,000 49:12

800 16:4

85 12:21

8th 11:15

9

9 24:14 31:6,12,15

9:31 4:1

A

ability 34:16

above-moderate 13:2

absolutely 43:21,23

acceptable 29:17

access 11:13

accommodate 5:13

accurate 38:1

accurately 38:8

acknowledgment 35:9

acre 14:10,14,15,25 15:9,15 52:12

acres 52:12

Act 4:14 46:20

actions 7:24 10:7

adaptation 10:7 43:6,7

add 4:19 6:13

added 13:1 50:15

adding 26:20 34:10

addition 5:7 43:4

additional 5:15 8:23 14:7,23 15:16 17:15,22 34:12 36:24

additions 6:1

address 10:15 36:19

addressed 7:11

addressing 10:4 36:13

adequate 45:8

adhered 28:4

Adopted 22:4

adoption 4:19 12:8

ADU 12:18

ADUS 12:20,23 39:20 41:25 42:1

advanced 21:3 37:4

advised 8:23

Advisory 34:1

affect 51:9

affected 51:1

affordable 5:4,9 13:10, 14,16,20 14:5,24 15:1,3 31:2,8 35:4 42:2 47:23 52:9

Agency 11:3

agenda 4:5 6:9 53:8,10

agree 26:18 48:3

agreed 35:2

agreed-upon 30:16

agricultural 5:21 21:21

ahead 19:2 24:10 28:9

AHO 5:4 14:24

air 7:8 10:22 11:10 22:15 43:4

Allied 25:3

allocated 35:16

allocation 8:19 11:18 30:15

allocations 32:19

allowance 31:15

allowed 15:2 17:2

allowing 30:25 33:21 35:8

alterative 49:13

alternate 41:5

alternative 41:11 45:9 47:10 49:7,9

alternatives 20:12,14 49:14,16,20,22

amend 9:7

amendments 4:19,23, 24 5:1 7:21

amenity 35:15

amount 6:14

analysis 5:23 22:14 29:19 46:22 47:15 48:16 49:16,24

analytical 11:2

analyze 8:11 13:17 46:2 48:14

analyzed 4:18

analyzes 7:7

analyzing 10:25 20:19

and/or 31:8

animated 38:18

answers 29:24

anticipate 12:21 13:3

anticipated 5:19,23 6:15 9:6

applications 21:1

applied 16:22 27:2

apply 4:22 12:7 15:10 21:18,19,23

appreciated 28:21

appreciating 6:17

approach 6:22

approval 14:8

approve 39:10 42:1

approved 12:13 14:6

approximately 45:17

area 6:23 11:12 14:12, 14,17,19 15:18 16:6,14, 17 17:4,7,17 32:10 33:9 34:20 39:11,14,15 40:13 41:8,10

areas 5:20,22 7:8,17,18 10:5,17,24 15:6,20 21:20 32:24 43:11

argument 40:18

Arts 25:3

aspect 28:4

aspects 46:6

assemblage 32:15

assessing 10:5

assistance 22:21

assume 42:10

assuming 40:12 41:1

assumption 42:16 44:16

assumptions 30:4 31:10 42:3,12,20 44:12

assure 42:20 43:3

attempts 51:18

attention 22:2 45:14

Avenue 16:16 32:12

average 12:20

avoid 9:9 20:11 22:5 49:21

Awesome 32:13

B

back 7:2 9:9 18:6 25:12 27:4 28:16 32:3,20 33:2 35:12,14

bad 22:5 47:11 49:18

baked 35:1

ball 47:21

Barnes 31:21,23 32:8 33:13 37:15 38:2,9

base 14:15

based 5:15 13:12 26:4 30:15 31:13 41:5 42:17

basically 11:25 23:10

bay 17:16,17 40:13 41:8,10

Bayfront 15:18 17:17 34:20

Beach 26:24

bear 6:25 52:25

begin 6:6 24:16 44:2

beginning 24:23 27:17

behold 43:24

Belle 11:8 17:17 27:20

benefit 40:19 45:2 46:23

benefits 46:21

benefitting 40:25

between-size 40:1

Beverly 26:25

big 18:23 20:24 30:12 48:2,5

biggest 26:16

bio 22:16

bit 22:11 30:25 50:9

blue 16:18 17:8

BMI 35:7

BMR 13:22 15:3 31:3 41:24

bodies 34:10

body 34:12

bonus 14:16

booting 18:25

bottom 12:6 22:2

bring 10:2 28:16

broad 22:1 37:10

broken 12:3 13:11 43:17

budget 34:13

budgets 34:13,14,15

buffer 8:21,23 9:4,8 13:1,9 30:16,24

build 25:25 26:18 44:17,18 45:3 48:21 49:8

building 25:19

buildings 25:25 26:8, 13 39:13,14

built 11:18 25:8 26:7 30:5 33:12 39:22,23,24 48:1,6,22

bumping 48:15

burden 39:9

burdened 10:18 11:6

burdens 10:20

by-right 14:4,5

C

C-2 15:9

C-2-A 15:9

C-2-B 15:10

C-2-S 15:10

C-4 15:10

Calenviroscreen 11:2,7

California 4:14 5:18 8:22 10:18 11:3

call 6:21 7:6 14:24 46:25

called 7:18 10:16

calling 24:14 32:18

Camino 5:1 12:8 14:21 16:15

canopies 43:13

cap 14:18 17:2

capacity 36:2,16

capital 34:13,14

capitalist 26:9

capture 29:21

car 44:22

carbon 44:20

carefully 52:7

carry 44:22

cars 38:15 44:16 45:4, 13

case 29:9,18 30:1 36:21 39:4 40:15 41:5 42:21

47:12 48:8,20,22 52:17

cases 49:15,22

categories 12:4 13:8

category 12:5

caution 30:11

cement 44:21

census 11:4

center 16:10

central 16:14

CEQA 4:15 20:13 21:14,16 35:23,25 36:12,18,21 46:17,21, 24

certification 23:2

cetera 26:3,17 37:8 46:14 47:24 48:17 52:12

Chair 4:5 6:3 18:15 23:24 24:9,17,19 27:10 28:7,10,15 31:21 38:25 41:14 45:16 52:24

Chairman 23:20

challenged 40:16

challenges 13:13

change 6:18 9:22 25:22 26:17 29:13 42:12

charge 41:7

chart 11:25 12:2,6

checked 42:3

chime 30:20

circulation 33:22

cities 26:24 40:12

city 4:8 5:10,14 6:23 8:14 9:7,13,14,24 10:11 11:15,17,20,23 12:11, 15 14:8 15:16,18,20 16:14 18:22 21:19 22:22 23:1 33:23 35:11 40:2,14 48:1,4 52:15

City's 4:12,16 7:15 8:4, 20 10:10 13:18 15:3 18:11

City-owned 14:22

citywide 4:22 16:4

civic 11:14

clarification 6:19

clarifying 18:9,14,18 23:25 24:4 28:21,24 31:24 32:2

clear 18:16 24:6 36:22

Clearinghouse 4:17

climate 6:18 9:21 10:6, 7 25:22 26:17 42:12

close 28:9,15 38:10 53:6

closer 17:16

closes 22:12

closing 38:14

coherent 33:17

collecting 10:24

collectively 4:12

color 17:8

color-coded 16:8

combination 22:24

combines 11:4

comment 7:11 18:19 22:9,12,19,20 23:12,21 24:2,7,15 25:2,4,10 26:4 27:6,14 28:6,9,16, 22 29:14 30:3 42:23 44:10

commenter 24:21 27:10

commenters 24:16

comments 6:17 7:5,25 19:19,23 22:10,22,25 23:13,14 24:3 27:17 28:3,17 39:4 41:25 45:21 50:2,3 52:25 53:4

commercial 15:5 16:23 39:12

commercial-only 16:11,24 17:9

commission 6:4 11:20,21,23 14:8 23:25 24:3 28:16,17 41:15 45:21

commissioner 18:1 28:19,20 29:24 31:5,18, 21,23 32:8 33:13 37:15 38:2,9 39:3,17 41:18 44:9 45:22,23 46:1 47:9,18 48:19 49:3 50:1 51:21 52:20

commissioners 38:25

communities 10:16, 17,21,25 11:5

community 5:17 8:23 9:21 11:19 23:16 28:2 30:6 34:1,2 35:14 43:12 44:4 51:13,15

commute 25:20

companies 26:11

compare 12:24

comparing 25:5

complete 5:19

compliance 4:13 10:2

component 10:9 37:25

components 18:12

compounded 10:15

concept 34:24,25

concern 20:9

concerned 25:18 35:25 36:5 45:25 50:9

concerns 6:10,13

concludes 18:8

conforming 4:24

confusing 36:21

Connectmenlo 12:10 21:6

consideration 21:20 43:20,22

considered 11:8

consistency 4:25

construct 9:15 36:11

constructed 48:4 49:18

constructing 36:13

construction 28:1 39:14 40:2

consultant 8:4 18:11

contact 50:13 51:4,24 52:6,18

contemplate 33:1

content 7:5 8:1 37:24

context 36:6

continually 43:18

continue 25:25 40:13 42:1 45:18,19 52:5

continuing 39:22 40:24

controlling 32:6

convert 26:13

cool 43:13

correct 28:13

correction 35:9

corrections 6:1

correctly 30:23

correspondence 6:8

Council 11:15,20,23 14:9 15:16,18 17:21 23:2 40:2

count 12:15

country 25:15

couple 13:23 17:24 21:18 22:10 28:20 50:2

cover 8:8 20:25

covers 20:24

created 11:2 44:1

creates 43:9 45:11

creating 34:17 37:18

credits 12:6,18,24 13:7

criteria 52:8,13

Cruz 16:16 32:10,12

crystal 47:21
current 14:2
cursor 18:2
Cutlass 38:16
Cycle 4:6,10 6:11 8:10, 20 11:17 12:2,9,16,21, 25 13:3 14:2 25:6,9

D

DAC 11:8
DACS 10:16
data 42:17
Davis 26:25
days 22:18 42:22
deadline 22:3 23:4
Decardy 28:19,20 29:24 31:5,18 41:17,18 46:1 47:18 49:3
December 11:15 17:21
decisionmaking 11:14
decisions 7:16
defined 10:16
delete 39:11
densities 5:5 8:25 14:9,12,16 15:2,7,18,19 16:4,22 17:2 33:19 37:8
density 9:5 14:13 15:15 33:6,11 40:25 42:5,6,7 44:10,14 45:3, 4
Department 5:17 8:22
depend 9:16
derived 21:14
description 48:20
designated 28:2
details 6:10 18:11
determine 11:5 19:24 49:9 50:20
develop 6:14 8:25 9:15 46:12
developed 13:16
developers 44:18 47:22 50:14
developing 10:6
development 5:3,8,13, 17 6:12 7:17 8:16,23 9:16 10:4 13:20,21 14:4,6,15,17,22 15:7 16:3 17:5,10 31:1,2,16 32:14,18,21 33:3,8 34:18 35:7 39:10,18 40:9
developments 12:13 13:14,21 15:1,2 34:16
develops 9:5
difference 20:22
differently 37:22
digging 8:1 43:9
directed 49:20
direction 34:3
disadvantaged 10:16, 17 11:6
disagree 44:8
disagreed 29:25
disappointed 35:23
disaster 44:19,20,21
discussed 25:23
discussing 46:5
discussion 15:22 28:25
distinction 38:6,7
district 5:5 15:5,19 27:23 34:11,12,21,22 35:3 36:10,11
districts 5:4 6:20
document 19:25
Doran 4:5 6:3 18:15 23:24 24:9,18,19 27:10 28:7,10,15 31:21 38:25 41:14 45:16 52:24
dove-tailing 46:1
downtown 5:1 6:23 12:9 14:20 15:14 16:15, 20,25 32:3,12,17 33:2,9 39:17,25 40:4,6 42:8
draft 5:16 22:7,14,17, 20,24
draw 22:2
drilling 25:6 50:7
drive 38:16 40:13
driven 49:14
driving 26:2
drop 29:17
due 9:21 34:7 39:5
duration 42:11
dwelling 14:10,14,15, 25 15:8,15

E

e-mail 23:13 25:4
earlier 10:9 19:22 21:12 22:10 23:17 25:4, 23 32:7 37:3 51:3
early 7:10
earthquakes 9:22
easier 46:12,13
easy 38:13,15
economic 10:18
edge 30:1
education 34:8,9 38:13,18,19
educational 6:21 34:25 35:18 37:19 38:11
effect 37:18
effects 7:7,14
eight-year 8:8 9:2 47:20
EIR 4:9,16,17,18 5:20 6:19 7:6,7,12,13 8:1,2 13:17,25 18:12 19:11, 13 20:3,18,21,23 21:5, 6,10,13,24 22:14,17,20, 23 23:1 29:1,3 33:20 37:17,22,25 38:3 39:4,6 40:9,11 41:4,9,21 42:9, 19 43:15,17 44:25 45:8, 25 49:17 50:23 52:22, 25 53:1,3
EIRS 43:18
EJL 42:25
El 5:1 12:8 14:20 16:15
elaborate 37:13
element 4:7,8,10,11,13 5:7,16 6:11,13 7:20,22, 23 8:2,6,7,11,15 9:6,8, 9,12,18,19,20 10:2,10, 12,14 11:10 12:22 14:3 20:15 21:21 22:4 25:6 27:2 28:4 29:15,22 30:18 33:22 35:20 37:21,23 38:23 41:8 43:1 44:15 45:6 53:3
elements 4:24 7:18 8:5 26:24
embedded 44:20
emergency 36:4
emissions 7:9 26:3 43:10
emphasis 46:21
enabled 12:10
encourage 15:6 39:13 46:9
end 13:9 22:8,21 43:24 47:24 48:11
ended 53:10
endorses 6:22
engagement 11:14
enhancing 11:11
ensure 4:25 11:17 28:3
ensuring 11:13
entertain 23:25
envelope 29:6,18 47:15
environment 7:8 36:1, 7 39:12 43:25
environmental 4:6,8,

11,14,21 7:6,14,22 8:4 10:10,12,14,19 11:3,9 18:11,22 19:5,12,15,25 20:9 25:11 28:1 29:16 35:11 36:17,19,23 37:9 46:3,20 48:24 49:2

equation 33:10

equivalent 15:19

ESA 8:4 18:10,21

essentially 42:24

estimate 30:12

evacuation 10:5

evaluate 7:14

evaluated 10:3

evaluating 15:20 17:23 33:7 52:3

Evans 18:10,20,21 29:4 30:10 33:15 35:22 38:1, 5,14 46:5 47:14 49:14

evening 6:3 25:2 37:3

events 51:12

everybody's 22:2

evidence 26:6,11

examples 10:4 11:10

exceedance 36:15

exception 5:21

excuse 18:1 34:23

existing 5:12 7:20,22 8:11 36:14

exists 14:19 37:24

expand 36:11

expanding 11:12

expect 22:10 25:8 27:1 39:23

expectation 40:6

expected 9:1

expensive 46:13

experienced 10:21

explain 48:18

exposure 10:22 11:11

extent 21:8 46:17

extrapolate 41:24 44:4

F

fabulous 42:25

Facebook 25:23

facilities 11:12 34:13 36:14

facility 34:14 36:2

fact 44:15,22 46:23

faintly 16:7

familiar 11:21

families 25:19

fan 42:6

fast 42:22

feasible 6:12 33:11

February 23:16 51:14

federal 46:19,20

feedback 45:13 51:8

feel 25:14 30:20 39:6 50:22

feeling 25:20

feels 30:2 48:23

feet 16:21

fellow 39:17 44:9

FIA 34:19

figure 33:18 45:5

figured 39:21

figuring 32:19

final 15:12 17:15 23:1 42:19 53:7

find 29:15 48:12,14 49:15

finding 30:13

fires 9:22

firms 26:9

fits 53:1

flood 17:23

floods 9:22

focus 47:2

focused 16:14 36:23

focuses 9:20

folks 23:11 43:2

follow 8:4 18:5

food 11:12

forces 9:17

forestry 5:21 21:22

formulate 33:17

forward 40:3,5 41:2 45:15

fossil 43:9

found 49:24

fourth 44:11

free 30:20

friend 39:5

friends 25:19

front 45:19

frustrated 38:7

frustrating 42:15

fuel 43:9

full 5:20 21:23

fully 27:1 50:8

fund 35:15 38:13,21

funding 38:19

funds 35:13

future 7:16 15:21 37:5 40:20,23 41:11 42:21

G

gas 7:9 16:9 26:3

gave 32:7

general 4:9,12,17,19, 23,24 7:15 8:8 9:20 10:11,12 12:10 34:1 35:13 37:10

generally 49:17

geographically 30:7

give 6:6 13:23 28:10 40:17

goals 4:20 8:12

God-given 38:15

Goldilocks' 43:18

good 6:3 25:1 30:3 39:16 40:17 43:10

great 19:1 24:24 34:2, 21

green 16:18

greenhouse 7:9 26:3

guardrails 49:10

guess 23:20 29:24 30:11 47:9 48:19 50:11 52:21

guide 7:15

guidelines 21:14,16

guys 24:6

H

H2 53:10

half 12:2,6 52:11

halfway 39:20

hand 24:10,13

handled 30:22

hands 24:8 28:7,12,14 31:22

happen 22:5 23:6 42:22 47:2 48:10 50:24

happened 11:19 33:25

happening 46:16 53:2

happy 18:9,23 23:18,19

hard 35:5 37:9

Harris 45:22,23 47:9 48:19 50:1 51:21 52:20

Haven 11:8 17:18 27:20

hazard 10:5
hazardous 10:22
hazards 9:23,25 10:6
HCD 22:4 26:23 52:8,16
health 10:15,19
hear 18:15 20:5,6,15
heard 37:2
heat 43:13
height 33:3
Heights 16:6
Heights' 16:10
helpful 31:5 43:15
Hey 34:2
high 10:22 21:4
higher 5:5 14:10
Hill 16:6 26:8
Hills 26:25
hired 18:22
historic 13:12
history 41:22
holes 43:8
home 37:16,17,20,23 38:23
homelessness 26:17
hoops 46:13 48:17
hope 27:6 37:13 40:14 43:14
hopeful 49:4
hour 38:17
hours 25:13
houses 26:7
housing 4:7,10,13,21 5:4,6,7,9,14,16,17 6:11, 14,23 7:20 8:2,6,7,11, 12,13,15,16,18,22,24 9:1,6,8,9,12,14,15 11:13,20 12:1,11,13,22 13:14,15,20 14:1,2,5, 20,24 15:1 16:3,5,13,17 17:12,15 20:15 21:20 22:4 25:8,14,16,19 26:1,14,18,24 27:2 28:4 29:12,15,16,22 30:17 31:9 35:4,19 37:21,23 38:22 39:7,11 40:6,13 41:6,7,12,23 42:2,25 44:10,20 45:3,12 46:3, 9,12,15 47:10,11,23,25 48:21,23 49:2,4,8 50:16 51:10 52:10 53:3
housing-opportunity 16:2
huge 42:6 45:6

I

icon 24:13
idea 34:4 43:10
ideas 20:16
identified 9:4 13:15 17:16,22 36:7 49:18,22
identifies 10:24
identify 5:7 8:25 9:7 52:14
impact 4:6 7:6 18:22 25:11,22 33:19 34:12, 18 35:12 36:7,17,19,23 42:17
impacts 6:19,21 20:11 29:16,22 30:5,13 34:20 35:10,14,25 36:12 37:9 42:13 43:2 44:6 46:3 47:1 49:15,21
implement 31:7
implementation 4:20 8:13
implications 25:17
important 9:8 25:14 29:2 30:2 38:10,12 42:4 43:5 44:24 45:6,10
improving 11:10
inability 38:12
incentive 50:18
incentives 13:13 50:19
include 4:19,23 8:15, 21 9:8,12 10:21 13:19, 22 14:4
included 6:11 11:9
includes 5:14 41:11
including 13:9 16:14
inclusion 6:17
income 8:14 12:3,25 13:7,11,21
income-affordability 13:6
incorporated 31:12,16
increase 14:11 15:1 40:24
increased 16:3,22 33:19
increases 14:16 15:19 17:2
increasing 6:22 40:18
individual 6:20
individuals 51:8
indoor 43:3,4
inevitable 41:2
infill 46:3,6,9,12,15 47:11 49:4
information 8:2 10:25 11:5 20:6,8 23:11 51:11
informational 53:8
informs 7:16
infrastructure 11:12
input 5:16 19:4,5,8 42:23
inquiries 51:5
instance 32:10 33:2 34:11 35:2 36:4,8,16 46:11
integral 40:4
interaction 29:13
interested 27:24 36:2, 12 51:23
interests 9:16
interface 24:14
internal 4:25
intersection 34:5 43:15
introduce 27:11 36:9
inventory 8:15 9:12
islands 43:13
issue 25:12,15 36:19 40:10,11 50:4
issues 10:19 19:12 20:1,2,9 36:1,6 43:7
item 4:5 6:16 15:16 53:7,8,10
items 6:7

J

Jacqueline 6:16
January 4:1 22:3
Jones 27:12,19 39:5 50:4
jump 46:13 48:17
jurisdiction 24:23 27:17
justice 4:8,11,22 7:23 10:10,12,14 11:10 28:2 38:11,12

K

key 20:9 33:6
kind 17:6 19:8,12 22:8, 25 23:7 25:6,11 27:22 29:5,18,20 30:7,14 33:21 36:25 43:13 46:1, 20,24 47:2,4,15 48:8,24 49:15,16 50:18,20 52:25
kinds 37:10
knowing 48:1

L

lack 19:16 38:19

land 7:17 11:16
landed 31:3
landlords 50:13
large 20:24 26:13 32:22
larger 17:12
largest 25:7
law 5:11 9:11 10:3 31:16 36:21 39:23
laws 46:7,10
layout 23:11
lead 26:7 28:18
leading 25:19
learn 44:5
leaves 39:11
legislature 46:8,14
lesser 48:14
letter 30:4
letting 27:15
level 14:7,16,17 21:4 25:18 26:23 27:1 34:4, 9,24,25 35:17,19 48:14, 16
levels 8:14 12:25 13:6, 11 35:7
life 38:3
lift 33:13
lifted 17:3
lighter 16:19 17:8
likelihood 50:17
limits 48:9
list 5:12 19:12 20:1,2 21:12 26:5,19,21 50:5, 16 52:1
listen 27:5
live 40:23
lo 43:23
loading 6:6
local 7:16 10:5 25:17, 18 36:10
located 5:14 17:25
locations 39:6
lock 42:13
locked-in 42:16
long 19:25 20:2 23:5 25:4 28:23 42:10
longer 28:8 34:6
loosely 37:1
LOS 33:25
lot 15:13 21:7 22:21 23:6 25:13 26:7,10,23 46:10 50:7 52:21,22
lots 6:24 23:13 25:25 32:9 39:17,19,25 40:1 46:7
love 42:19,24
low 12:4 13:6 41:20
lower 8:25 48:10
lucrative 26:12
Luke 18:10,20 30:23 31:25

M

M-GROUP 50:12
made 31:10 39:16
mailer 51:22
mailings 51:2 52:4
main 25:12 26:4 43:16
maintain 52:16
major 12:12
make 13:8 15:19 26:19 27:3,4 28:3 30:12,17 33:8,10,16 42:12 43:3 51:25 52:6,18
makes 44:11
making 46:11,12,13 51:10,18
malnourishment 38:20
Manager 18:21
mandates 31:8
manifest 46:18
map 16:5,13 17:5,15
maps 15:23 18:7 30:5 51:3
market 9:17 13:21 31:3 41:23
Marsh 17:18
massively 45:1
massively-reduced 45:9
material 30:8,10
maximum 43:23
means 14:6 39:12
meant 47:14
measures 9:23 11:9 20:10
meet 5:10 8:16 9:2 11:17 12:1 13:18 41:8 49:10
meet all 13:2
meeting 7:4,24 17:21 23:16 39:9 51:13,16
meetings 11:19,20 51:13
melded 22:25
members 6:4 19:8,20 20:6 22:19 24:12
Menlo 4:8,9 11:7 12:3, 16,19 13:12 25:15 27:20 34:4,11,22 40:12, 19,22,23 41:9,10
Menloport 34:19
mentioned 7:25 10:9 22:10
metric 35:2
metrics 36:3
middle 43:24
Middlefield 17:6,13 26:8
miles 38:17
mind 41:3 44:8 52:25
mine 8:4
mineral 5:22 21:22
minimize 49:21
minimum 14:13 15:8, 13
minute 20:2 34:2
minutes 24:24 27:14
Misha 6:9 24:21 25:1 50:4
mitigation 20:10 43:8
mix 31:11 42:8 43:15 45:6,10,13
mixed 13:20 31:2
mixed-income 15:2
mixed-use 15:6 17:10
moderate 12:4,5 13:6
modifications 6:15 15:11 33:7
modified 17:10
modify 4:20 5:3 14:23 15:4 33:14
moment 7:1 17:20 28:8
Monday 4:1
money 26:10
months 19:18 22:13
move 7:2 26:12 40:3 53:7
moved 40:5
multifamily 5:9,13 9:14
multiple 11:16

N

National 46:19
nationwide 25:17
necessarily 20:25 37:7 39:15 50:5
needed 13:5,10

needle 43:25
negative 46:25 47:1,5 49:24
neighborhood 11:8 17:18 27:20 28:3
NEPA 46:19
net 13:10,17
nexus 34:17 37:18
noise 22:16
non-housing 9:5
NOP 6:21 22:12 25:5
north 17:7
note 6:7 9:11 18:2,10
notes 51:10
Notice 22:9
noticing 51:5
nuance 36:20
number 4:17 8:17 16:17,20 17:8,11 25:7 27:25 28:25 29:2,20 30:12,16 36:9 41:20 43:20,22 48:2,5 51:4,14

O

objectives 4:20 8:13
occupied 26:9
offer 15:2
office 17:19,21 25:25 26:8,13 32:20 39:12,14 50:8
offices 26:1
offset 35:13
ongoing 51:7,17
Oop 51:23
open 14:19 23:21 24:1, 7
operating 34:13,15
opinion 29:14 39:21
opportunities 13:19 14:20 30:6 31:8 52:15
opportunity 7:11 13:15 14:2 16:5,13,18 17:12,16 18:24 21:2,19 27:13 28:21 44:25 45:11
oppose 40:8
opposed 45:12
ordinance 5:2 7:21
orient 16:7
outdoor 43:4
outer 29:25
outreach 27:22 50:25 51:12,17 52:5,16
overemphasize 43:14
overlay 5:4 14:24
overreact 38:15
overview 11:25 13:24 23:2
owner 51:22 52:18
owners 9:17 26:13 50:13 51:1,2,19

P

P-DISTRICTS 15:10
p.m. 4:1
packet 6:9
padding 30:25
Pam 27:11 39:5
Pamela 27:19
paraphrasing 37:16
parcel 16:10
parcels 16:4 17:13,24 32:16 33:1
Park 4:8,9 11:7 12:3,19 13:12 25:15 27:20 34:4, 11 40:12,19,22,23 41:9, 10
Park's 12:16
parking 6:24 14:22 40:3 44:12,18,19 45:1, 4,10 49:3
parks 50:8
part 13:10 21:15 22:3 29:5 33:10
participate 27:24
path 41:2
patience 7:3
Paz 24:1
pending 12:13
peninsula 40:13
people 18:17 19:23 22:19 23:13 26:1 28:22 38:6 40:22 44:13,14 45:3,4,12 48:3 51:6
percent 8:21 13:1,16, 20 14:5 15:1 31:2
perfect 30:13
period 8:9 9:3 12:22 22:9,12 29:14
permissible 32:1
permit 8:16 13:24
permitted 14:12
personally 40:8
perspective 26:22 35:24
phone 24:14
phrase 48:25
physical 7:8 36:1
piece 32:17,21,22
pieces 35:4 45:2
Pierce 17:25
piggyback 21:8
pink 16:18,19 32:25
pipeline 12:12,17
place 35:17 42:9,10 46:8
places 47:12 50:8
plan 4:12,17,19,23,25 5:2 7:15 8:8 9:20 10:11, 13 12:9,10 14:12,13,17, 19 17:1 21:6 32:18 33:2,9,14 34:1 40:4
Plan/city 4:9
planning 8:9 9:2 11:20, 22 12:22 14:8
plans 37:4
play 19:17 46:17,22
plazas 14:22
point 23:20,21 37:5 39:16 50:12 51:23 52:4, 22
policies 4:20 8:12 10:7
Policy 46:20
political 38:3
pollution 10:23 11:11
portion 39:11
position 9:15
positive 45:13 46:2,6, 15
possibility 29:7
potential 7:14 9:24 14:16 15:17,21 17:1,11, 22 20:11 31:16 45:2
potentially 12:15 33:20
potentials 31:1
poverty 10:21
precise 29:9
preclude 35:7
predict 42:23
predominantly 17:13
prefer 18:14
preliminary 5:12 11:16
Preparation 4:9 22:9
prepare 18:22
prepared 7:13 21:6
present 43:18
presentation 6:5,25 8:3 18:8,16 19:1,3 23:18 32:7 41:19 45:24
presentations 11:22 32:6 45:24

presented 42:19
press 24:14
pretty 19:3 21:4 38:8
previous 11:19,22 25:6
priced 25:20
primarily 17:5,19 32:3
prior 8:1
problem 36:25
problematic 32:14
problems 26:16 36:7
process 18:12 19:16 23:3 26:22 33:25 35:1, 17 38:23 43:17 45:15 46:13 50:12,21 51:7,17 52:5
produce 13:14
produced 12:19
production 5:6
program 20:21,23,24 42:9 44:25 47:20
program-level 37:11
programs 4:21 8:13 43:13
progress 52:5
project 4:13,18 5:19 6:8 7:7,19,24 8:3 9:5 13:1 18:21,23 20:23 21:2 25:24 36:8,25 37:1,2,9 42:16 44:1,7 46:19 49:19
project's 35:25
projected 41:6
projects 12:12,15,17 14:4,6 20:25 31:2 33:12 37:3,6,11
promoting 11:13
properties 15:14 16:20 17:1 52:3
property 9:17 26:13 45:2 51:1,2,19,22 52:18
proposed 5:12 6:15 7:7
prosperity 42:7
protected 8:12
protecting 43:25
protection 9:21 11:3
provide 12:14 24:15 27:14,16
provided 6:17 8:3 35:12
providers 36:4
providing 36:23 50:19
Pruter 24:8,9,20 27:9 28:6,13
public 5:15 11:11,14 18:18 19:4,9,20,23 20:7 22:20 23:21 24:2,7,12, 15 27:14 28:9,15,22 29:13,14 36:3
publish 22:17
pull 6:25
pulling 23:7
purpose 7:4 10:14 19:4,7,22 21:10
purposes 28:25 43:8
put 23:10 39:8 46:8,21

Q

quality 4:14 7:9 11:10 22:15 43:4
question 20:17 29:23, 25 30:13 31:6,24,25 32:2,9 33:15 37:12 42:4,5 47:7,19 50:11
questions 18:6,9,14, 17,18 23:19,22,25 24:3, 4 28:17,21,24 30:8 45:21 47:17 52:21,22, 24
quickly 11:24 15:24 19:15

R

R-3 15:14 16:20 32:25
raise 24:13
raised 24:8,10 28:8,12 31:22
ranging 25:17
rate 12:20 13:21 31:3 41:23
Ravenswood 16:16 34:21
re-use 14:1
re-zonings 16:2
reach 51:18
read 27:6
ready 33:24
real 5:1 12:8 14:21 16:15 19:3 37:3,6
realistic 26:20 27:4 33:12 50:15
realistically 48:7
realize 25:10 41:3,7 48:23
reason 10:1 25:12 52:19
reasonable 40:6
reasoning 27:1
reasons 39:9
receive 7:5,25
received 6:7 22:22 51:4
recent 10:2 39:22
recognize 29:12
recognized 46:15
rectify 35:3
red 22:3
Redondo 26:24
reduce 9:24 20:11 49:21,23
reduced 41:11
reducing 11:11 43:9 45:1
reduction 15:17
refer 8:17
referenced 8:5
referred 4:12 8:9
refinement 5:15
reflected 33:20
region 26:17
Regional 8:18
reinvent 21:9
rejected 27:3
rejecting 26:23
relate 31:6
related 4:21 7:20 25:10
relates 32:23
relationship 37:18
Relative 42:9
relentless 40:24
relevant 28:25 42:21
relied 52:3
reload 32:6
relooking 33:3
remain 52:7
remainder 16:25
remaining 9:1
remedying 36:6
Remember 47:20
reminder 24:12
remove 14:18 15:12
removed 40:7
reopen 9:9
report 4:6 5:24 6:2 7:6 18:23 34:16
reporting 35:1
represent 25:7
request 41:4
require 5:23 14:7 20:13 36:10
required 9:7 13:3

requirement 12:3 13:4 15:13 30:24 41:8

requirements 4:14 5:11 12:7,25 13:2,18 15:3

requires 9:11,13

resident 25:3 27:19

residential 5:5 6:23 10:4 12:12 14:12,21 15:6,17 16:22 17:3 32:20

residents 27:23 40:19, 20,21

resiliency 10:8

resources 5:21,22 21:22

respect 39:5 50:16

respectfully 44:8

respond 22:22 39:16

response 36:4 38:24

responses 22:25

rest 45:15

restraining 40:1

result 29:13

retail 15:5 32:19

return 24:2

review 5:16 14:8 19:15

revolve 46:11

rezone 5:10

rezoned 16:11 17:9

rezoning 7:21

RHNA 8:18,20,21 9:2 11:18 12:1,2,6,9,16,24 13:10,18 30:15,23 42:11 49:10

Riggs 18:1 39:2,3 44:9

risk 37:15

risks 9:21,24 10:15

Road 16:7 17:6,13,18, 25 26:8 40:9

roadblock 40:7

roof 43:13

rounds 14:7

routes 10:5

rule 39:6 43:8

run 33:16

running 16:7,16 17:6, 18

S

safe 11:13

safety 4:7,10,21 7:22 9:19 10:1

Sand 16:6 26:8

sanitary 11:13

Santa 16:16 32:10,12

SB 31:6,12,15

scale 32:23

scenario 11:16 29:9,19 30:1 43:19 47:13 48:8, 21,22 49:11,13

scenarios 11:24

schedule 19:16

school 6:20 17:24 34:10,12,21,22 35:2 36:2,10,11,12,13,16

schools 6:20 33:19

scope 7:5,25 19:24 29:21

scoped 5:20

scoping 4:6 7:4,10 19:7,22 22:8 39:4 53:4, 7

score 11:5

seconds 28:10

section 21:17

sense 27:3 30:17 44:11

separate 16:11

separately 37:24

Sequoia 34:23

series 15:24

serve 43:7

service 34:4,9,24,25 35:18,19 36:3,4,24

session 7:5,10 19:7 22:8,19 53:4,7

Session/6th 4:6

set 8:17 14:13 44:25 52:8

setbacks 33:4

Sharon 16:6,10 32:11

shopping 16:10

short 20:18

shortfalls 36:14

shortly 27:15 51:16

show 19:13 20:3 21:13

showing 12:2 15:23

shown 26:11

shows 12:6 16:5,13 17:5,15 34:20

side 37:22

significantly 40:18

significantly-reduced 41:5

Silin 6:9 24:21 25:1

sir 38:1

site 9:4 16:12,24 51:9

sites 5:8,10,13,14 6:10, 13 8:16,25 9:2,7,13,15 13:15 14:2,3,9 15:8,14 16:1,2,6,8,13,18 17:9, 12,16,22,24 21:2,19 25:5,7,11 26:5,6,7,19, 21 29:12,16 50:6,15 51:3,6 52:8,11,16

situation 34:9

size 15:13 16:9 32:16 40:19,25 52:11,12

slide 19:2,21 20:20 21:11,25 23:9,10 32:3

slides 13:23

small 51:4

smaller 12:15 17:24 32:15 39:17,19

Smith 5:24 6:3 18:4 30:22 31:12,20 32:5 33:5 50:25 52:2

sort 18:12 39:25 52:10

sorts 43:5

sounds 23:5 24:17 30:8

south 17:7

space 44:12

speak 24:22,24 27:13, 15 39:1 41:15 45:20 51:24

specific 5:2,8 11:4 12:9 14:12,13,17,19 17:1 19:5 20:6,25 21:2 29:2 32:17 33:2,9,14 40:4 42:16

specifically 6:21 15:9

specifies 9:23

spend 26:19

spent 25:13

spot 30:14

spread 30:7 42:5

square 16:21

square-foot 15:13

staff 5:24 6:2 14:6 50:11,12

stage 50:21

standard 19:12

standards 5:3 15:5 32:18 33:3,8

standards' 32:22

standpoint 48:24

stands 8:18 27:2

star 24:14

start 8:6

started 24:11
startups 26:10
starving 38:20
state 4:17 5:11,18 8:17 9:11 10:2,17,24 11:1 24:22 26:23 31:8,15,16 33:23 39:23 41:6,10 52:9
state-mandated 8:7 9:20 34:3
station 16:10
step 32:20
stepping 25:12
steps 35:9
stop 43:8 45:18
strategies 11:17 13:24 14:23 15:7 16:1 23:17 31:13
strategy 14:1,11 15:4, 12 31:17
streamlining 46:11
street 22:18 38:15,16
stressed 25:20
structure 40:3
students 36:9
studied 6:18 13:25
study 15:17 17:22 22:15,16
stuff 43:3,4,14
subject 5:15
submit 22:4 23:13
submitted 27:7
subsequent 4:16 21:5, 10
subsidies 47:23
substantial 36:9
suggesting 49:11
suggestion 41:12
sunshine 44:5
super 32:14
supply 9:1
supported 11:16
susceptible 43:12
sweet 30:14
system 37:20
systemic 38:12,19

T

table 37:4
tackling 26:15
tail 22:8
takes 44:25
taking 23:12 25:2 27:5 35:9 43:24
talk 19:10,11 32:25 33:18 35:21 44:18 51:6 52:23
talked 23:17
talking 35:3,4 38:13 40:20,21 46:18
target 8:16,17 16:1
teal 16:25
teasing 37:17
ten 46:8
term 19:16 29:9 37:1
theoretical 40:20
thing 19:4 23:8 34:7 40:1 43:24 44:23 46:15 49:16
things 10:3,23 20:8 22:5,16 23:6 33:4 36:2, 5 43:5,16,19 46:10 49:18,24
thinking 43:6 44:13
thinks 6:20
thoughts 33:17
threads 43:25
thriving 42:8
thrust 34:1
time 10:11 22:18 23:5,8 24:5,10 26:19 27:5,11 28:23 33:23 35:8 41:16, 18 42:10,13 44:17 45:14 53:5
timeline 22:1
times 36:4
today 6:8 25:4 51:5
Tom 18:1,25 22:10 23:10,17 30:19
Tom's 23:19
tonight 5:25 23:12
tool 11:2
top 12:2 21:16,23
topic 5:20,22 7:17,18 15:21
topics 7:9,11 19:5 21:13,15
total 12:5,17,22 13:9,19 15:25
town 40:25
toxic 9:22
tract 11:4
traffic 7:8 22:15 25:23 35:18 38:17
trailing 44:15
transition 33:24
transitioning 33:24
transportation 6:18
transportation-impacted 39:15
treatment 21:23
trends 13:12
tuned 52:10
turn 18:9
turning 51:15
type 19:10 32:16,23 34:7 35:1
types 9:23 10:20 11:4 38:11
typical 21:12
typically 13:13 19:13

U

Uh-huh 31:20
ultimate 20:17
ultimately 42:4
unclear 49:6
uncomfortable 48:20, 24
undergo 32:22
understand 34:5 35:10 42:20 45:1 50:5,14
understanding 31:7 42:13
unemployment 10:22
unevenly 30:7
unhelpful 44:3
Union 34:23
unique 10:15
units 5:9 8:21,22,24 12:5,11,14,21 13:2,4,5, 10,16,18,22,25 14:10, 14,15,18,25 15:3,8,15 17:3 25:8 30:25 31:3 41:24 44:13 47:16,25 48:2,3
unrealistic 26:25
upcoming 23:15 51:13
update 4:13 7:20,21 8:2,7,12 12:10 20:15 21:21 28:7 29:15,22 30:18
updated 6:9 9:18 42:18
updates 4:7,11 51:10
updating 10:1
uphill 41:4
upper 48:9
Upzoning 33:1
utilized 50:8

V

variety 13:19
vehicular 35:18
venture 26:9
verbal 23:12
version 46:21
versus 29:1
viable 51:9 52:9,17
vision 7:16
VMT 33:24 34:2
vote 45:8,18
vulnerability 10:6

W

wait 28:8 34:2,6
waiting 28:22
walk 11:23 15:25 18:6 33:21
walked 31:13
walking 18:13
wanted 6:19
wanting 51:6
waste 9:22 10:22
water 10:22
ways 20:14 23:14
wealthy 26:9
week 22:11
Wender 6:16
wheel 21:9
Willow 17:6,14 40:9
wondering 50:24 51:21
word 41:21 47:12
words 37:17 47:10,15
work 9:17 21:7 26:1 44:23 46:4 50:23,24 52:1
working 22:14
works 41:21
worst 29:9,18 30:1 47:12 48:8,20,22
wrapped 23:8
write 49:17
written 23:13 27:6
wrote 25:13

X

X-DEVELOPMENT 37:19
X-MUCH 34:6

Y

Y-IMPACT 37:19
year 11:15 12:20 23:6 39:21,22
years 27:21 40:3 42:18 46:8 47:24 48:4,12,15
yellow 16:18
Yup 32:13

Z

Z-DEVELOPMENT 34:7
zone 9:13
zoned 15:14 17:20
Zones 33:1
zoning 5:2,4 7:21 15:5 32:21 39:8 50:19
Zoom 24:13

From: Misha Silin
To: _Planning Commission
Cc: Andrew Barnes; Chris DeCardy; Michael Doran; Cynthia Harris; Kennedy, Camille G.; Riggs, Henry; Michele Tate
Subject: Comment on item H2
Date: Monday, January 24, 2022 12:45:06 PM

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Planning Commision Members

I am a resident of Allied Arts writing in comment to item H2 on the agenda for the meeting on Jan 24th, 2022. I am affiliated with

Since the housing element is asking us to plan ahead for 8 years, this is an opportunity to plan for the Menlo Park that many of us envision. Residents imagine our city as inclusive, vibrant, with opportunities for folks of all income levels and backgrounds to be housed in a dignified manner. We want local families and workers to be able to be housed such that they can live, work, and enjoy all that Menlo Park and our surroundings have to offer.

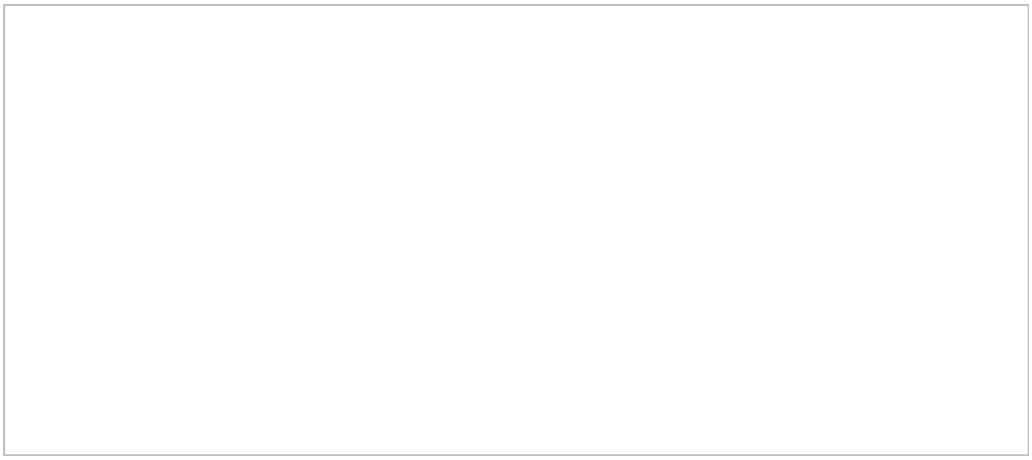
I have been digging into the proposed sites in our 6th cycle element and I am extremely concerned that this list is unrealistic and is not going to produce the housing we are claiming it will. Not even close. Specifically, I am concerned that our current plan is going to continue the status quo. Very little housing will get built, neighbors and families will continue to get priced out of the area, which will lead to more inequality, congestion due to local workers not being able to live here, and homelessness.

My comments below are mostly based on the City Council's 12/8 agenda staff report since, on page 20, staff noted the potential housing units expected from each site. The Notice of Preparation (NOP) does not include this number and thus is hard to evaluate.

1. First, it would be great to have the potential housing numbers for each site in the NOP so that we can all understand exactly what is being planned. There are a number of sites included in the NOP that were not included in the 12/8 staff report.

2. Below is a graph I made that shows how the % of new units breaks down by "existing use", based on the 12/8 staff report, assuming only the "carved out" portions get developed on the bigger sites.

    a.



b. The highlight is that **45% of the new housing units are expected to come from current office sites**. This is alarming and concerning because most real estate analysis firms put the SF Bay Area in the 2nd or 3rd most expensive office market (by asking rent or purchase price) in the United States. And given that we are very close to Facebook, Google, Apple, etc. this is further magnified in our specific city. Office space is very lucrative here, and thus I am extremely skeptical that it will be redeveloped into housing.

3. Here are some examples of sites included in our NOP in the “Office” categories

a. 85 Willow represents the largest number of units in the entire element. This is currently home to RobinHood’s headquarters, the financial company that went public last year for over $60bn dollars in market value. They are unlikely to move anytime soon from this location; instead they have been expanding and leasing other office space in the area.

b. There are numerous multi-story office buildings identified on Middlefield and Sand Hill Rd., currently occupied by large venture capitalist firms who manage billions of dollars in assets, and local startups funded by said VC firms. Why would these companies want to vacate their space, and why would the owners of the building want them to, given the extremely high office rents in the area (often 2-3x higher per square foot than residential)?

c. Multiple buildings on Bohannon Dr. and Campbell Ave. **These were not included in the 12/8 staff report so it’s not clear what assumptions are being made there.** One of the sites is the US Post Office (3875 Bohannon) while others are large office buildings with big biotech companies currently residing there such Abbott (current market cap: $222bn on NYSE). Would I like to have these sites turn into housing? Perhaps. It’s right next to the freeway, which doesn’t seem ideal for health. But even if I did, **what evidence do we have that these property owners will want to take their extremely valuable office space and turn it into housing?**

d. Note that in many cases, the 12/8 report’s “carve out” strategy expects that only the parking lot of these office buildings will be converted to affordable housing. This term/concept is not mentioned anywhere in the NOP.

e. On top of this, the NOP states (on page 5) that for existing retail and commercial use parcels, housing will only be added as an option to the zoning. So **the current use will still be allowed**, again reducing the incentive for the property owners to make any changes. This issue applies to most of the office sites in the NOP (like the ones on Sand Hill and Middlefield), but not the parcels from item c above, the properties on Bohannon/Campbell, which are zoned "office". The NOP does not state whether those uses will be allowed to continue since those sites were added after the 12/8 council meeting.

4. Other questionable categories:

   a. "Shopping Center" – this assumes that both the Safeway shopping centers, on Middle and in Sharon Heights, will convert their parking lots to housing. **No substantial evidence (as required by HCD) has been presented by staff or otherwise that this strategy has any likelihood of bearing fruit.** Why would the owners of these retail lots want to turn their parking lots into housing?

   b. "Churches" – this assumes that our local churches want to build housing on their parking lots, recently made possible by AB 1851 in the CA legislature. Again, I believe **no evidence has been provided that any of our churches actually want / plan to do this**.

   c. Another new group of sites added to the NOP is sites from the Downtown Specific Plan. The idea now is to remove the 680 unit cap from that plan and increase the allowable density. **No evidence has been presented that this is going to work. Have developers said that this change would incentivize new housing when it didn't before?** All of these sites were included in our 5th element already.

5. Some of the sites that I *do* think have potential are our downtown parking lots, USGS, and a few older office buildings near Caltrain. Perhaps we can do more to increase the density on those parcels.

CONCLUSION

1. **A majority of the housing planned in the sites listed in the NOP seems to be coming from sites that are unlikely to be developed since they are currently extremely valuable office buildings.**

2. **To my knowledge, little to no evidence has been given that ANY of the larger sites in the NOP are likely to become housing.**

3. **Little to no evidence has been given that the other strategies outlined in the NOP, such as increasing density for the downtown Specific plan, will lead to large numbers of affordable housing being built**

4. **HCD requires "substantial evidence" that an infill site will be redeveloped as housing, and has**

been rejecting housing elements that don't provide it (ex: Beverly Hills, Davis, Redondo Beach of recent).

a. **Because the residents of Menlo Park want to live in a city that welcomes new residents, and because the city will suffer numerous bad consequences if the housing element is rejected, these sites must be justified, or must be replaced with more plausible sites**

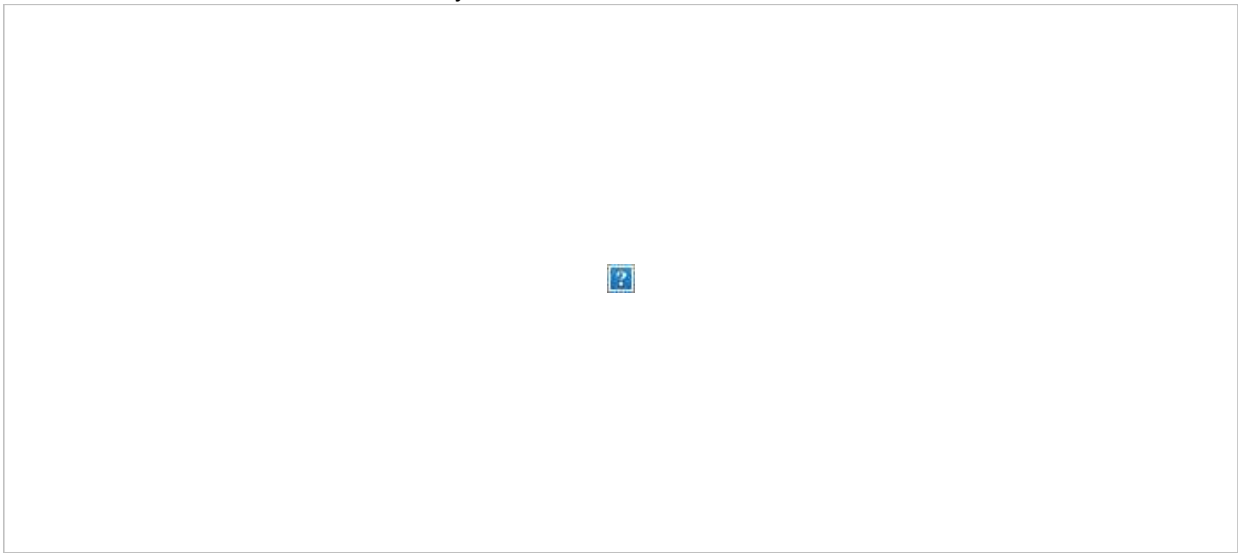
What would I like to see at this point, and what do I encourage you to ask for from staff?

1. **More evidence of feasibility for the sites listed in the NOP**
2. **Additional feasible sites identified and added to the list**
3. **More aggressive strategies and policies to make sure there is an overwhelming amount of incentive and lack of barriers for housing to get built on the selected sites.**

One last point. One thing HCD will consider when reviewing the element (and we should consider) is past history. I took a look at our last cycle's approved element to see what we said was going to happen and what actually happened.

a. First obvious point - there were ZERO large office parcels or shopping center parking lots in the previous element. And no such parcels have been turned into housing in the past 8 years that were not in the site list either. So previous history tells us this is, at best, unlikely to happen.

b. See below for the summary of what was in the 5th element



Source: p. 111 of 5th cycle adopted housing element

c. All "high density" opportunity sites – located east of 101 in Belle Haven (Table 1, p. 164 of 5th cycle element)

i. Many of the lots were vacant, storage, warehouse, or light manufacturing use. And indeed, some of them became housing. However, besides all of those lots being in D1, **no lots of that type are included in the 6th cycle plan**

d. El Camino / Downtown Specific Plan (Table 2, p. 165 of 5th cycle element)

i. 430 BMR units total are shown in the table above. The specific plan only allowed 680 total residential units so we know this is wishful thinking from the get go.

ii. Here are some of the larger sites included in the site list:

1. 217 affordable units were expected from 1300 El Camino and Derry Ln (2 parcels). That is now the Springline project, bringing in only 20 BMR units total across both parcels (8% of expected)

2. 118 affordable units were expected from 700 El Camino - CVS/BevMo/Big5 retail center. That parcel was not developed and is being included AGAIN in the 6th cycle. (0% of expected)

e. Given our track record from the last element, **I submit that we either need a lot more evidence that the sites in the 6th element will actually be developed, or we need to add a lot more sites to the new element knowing that very few will actually result in housing being built.**

Thank you for taking the time to read my long comment. I hope we can have a productive discussion this evening and make the housing element more aligned with our vision for Menlo Park.

Best,

Misha Silin

WEST BAY
SANITARY DISTRICT

Serving Our Community Since 1902

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SERGIO RAMIREZ
District Manager

In reply, please refer to our File No.

RECEIVED
FEB 03 2022
CITY OF MENLO PARK
BUILDING DIVISION

Mr. Tom Smith
Acting Principal Planner
City of Menlo Park
701 Laurel Street
Menlo Park, CA 94025

January 27, 2022

Re: City of Menlo Park Housing, Safety, and Environmental Justice Elements Project Comments on Notice of Preparation

Dear Mr. Smith,

The West Bay Sanitary District (WBSD or District) appreciates the opportunity to review this Notice of Preparation (NOP) and to provide input on the scope and content of the EIR that will be prepared for this project. We understand, as a jurisdictional agency, that we may need to use the EIR prepared by the City when considering our own approval action and should comment on information relevant to the District's statutory responsibilities. We further understand that this project will impact Utilities and Service Systems, therefore our comments focus on that category.

We understand that the EIR would analyze up to 4,000 net new housing units to meet the City's Regional Housing Needs Allocation (RHNA) during the planning period. The housing sites could be produced through a combination of rezoning, increased densities, and/or updates to the Zoning Ordinance and based on the following general strategies:

• "Re-use" sites for RHNA from the City's current Housing Element and allow "by right" development for projects that include at least 20 percent affordable units. Densities would allow at least 30 dwelling units per acre (du/ac) on these sites, and the maximum potential density may increase beyond 30 du/ac as part of additional site refinement.

• Increase the permitted densities for sites within the El Camino Real/Downtown Specific Plan area to allow at least 30 du/ac at the base level density and potential increases to the maximum bonus level density. The intent is to remove the existing residential cap of 680 units to allow for greater development potential in the Specific Plan area. These actions would require amendments to the Specific Plan and modifications to the Specific Plan development standards.

• Modify the affordable housing overlay (AHO; Menlo Park Municipal Code Chapter 16.98) to allow up to 100 du/ac for 100 percent affordable housing developments (meaning 100 percent of units would be available to low and very low-income residents) and potential increase in densities for

mixed-income developments where the percentage of affordable housing exceeds the City's Below Market Rate requirement.

• Modifications to the retail/commercial zoning districts to allow for residential uses and other potential development standards to encourage the production of mixed-use developments (C-2, C-2-A, C-2-B, C-2-S, C-4, P districts).

• Remove the 10,000 square-foot minimum lot size requirement for R-3 zoned properties located around downtown, which would allow all sites a density of up to 30 du/ac.

We have the following comments/input:

1) Using the District's current wastewater generation rate of 200 gpd/unit, this project will generate 0.8 million gallons a day (MGD) of flow. This will impact the District's conveyance system. If specific areas are targeted for these units, the conveyance system would need to be analyzed and if piping/pump stations are deemed to be upsized, we request the EIR note these upsizes and can be used as the CEQA document required for future construction projects.

2) Additional capacity at the regional wastewater treatment plant, Silicon Valley Clean Water, may need to be obtained for treatment. This is to be determined through discussions with the District when preparing the EIR.

3) If domestic water demand is found to be a concern when studying utility impacts, the District is implementing a Recycled Water Program and would like this to be considered as an alternate source of water and possibility including this in the EIR.

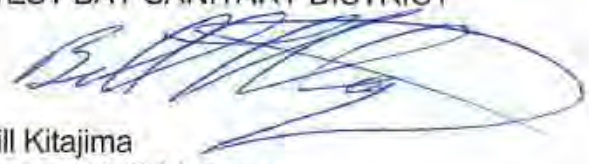
4) The East Palo Alto Sanitary District (EPASD) has jurisdiction of portions of the City of Menlo Park. EPASD should provide comment as well. If during the EIR preparation an alternative to redirect sewer flow from EPASD to WBSD is contemplated, these impacts should be included in the EIR.

Again, thank you for the opportunity to provide input. We look forward to discussing the project more as the Draft EIR is being developed.

If you have any questions, please feel free to call me at (650) 321-0384.

Very truly yours,

WEST BAY SANITARY DISTRICT



Bill Kitajima
Projects & IT Manager

Cc: SXR, TMR

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From:	Smith, Tom A
To:	Sung Kwon; Chow, Deanna M; Chan, Calvin; Doherty, Nira F; Luke Evans; Hillary Gitelman
Subject:	FW: MP"s Seismically Weak Buildings Part of Housing Element EIR
Date:	Friday, January 28, 2022 2:44:18 PM
Attachments:	CMP_Email_Logo_100dpi_05d92d5b-e8e3-498f-93a6-d0da509bd602111111111.png

Hi Everyone,

Another comment has been received on the Housing Element Update project NOP.

Thanks,
Tom

Tom A. Smith
Acting Principal Planner
City Hall - 1st Floor
701 Laurel St.
tel 650-330-6730
menlopark.org

From: Lynne Bramlett [mailto:lynne.e.bramlett@gmail.com]
Sent: Friday, January 28, 2022 2:30 PM
To: Smith, Tom A <tasmith@menlopark.org>
Cc: Naomi Goodman <nlgoodman@hotmail.com>; Wolosin, Jen <JWolosin@menlopark.org>; Lynne Bramlett <lynne.e.bramlett@gmail.com>
Subject: MP's Seismically Weak Buildings Part of Housing Element EIR

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Hi Mr. Smith,

You will likely separately receive an email from resident Naomi Goodman on the topic of soft-story buildings in Menlo Park. Menlo Park has many and soft-story structures are known for failure following an earthquake of certain magnitudes. When these buildings fail, the residents are typically displaced and most are renters. When residents are displaced, rebuilding takes longer later. This has a negative impact on the local economy due to fewer people living in a jurisdiction who support the local economy. I think the topic of Menlo Park's seismically weak structures should be explicitly reviewed as part of the Housing Element (and later Safety) EIR.

I started conducting a "field count" of the number of units within a soft-story structure, but I did not finish before I left town on a long trip. However, I did start with District 3 and District 1. In general, most of the buildings likely have between 4-8 units. I can continue the field

count upon my return, hopefully with some other volunteers to help me. That would give a better estimate of the total number of people potentially displaced following a major earthquake. Naturally, a professional count would be better but that could help jump-start action.

The City of Palo Alto conducted an outside study of their seismically at risk buildings which has very helpful information. I will separately send a link to that report and some others. I'm on a trip with limited time to do this today. Meanwhile, I will link to a website that focuses on ordinances related to getting seismically at risk buildings retrofitted. My impression is that "carrots" are the preferred approach in contrast with the (stick) ordinances. However, eventually ordinances might be necessary to prompt needed action. Residents living in soft-story buildings likely also do not know the potential risk to their housing. While loss of life is typically not a consequence of soft-story failure, displaced residents are typical as the buildings are not safe to reenter.

I met Ms. Goodman after reading her online comment sent to the Council in connection with the Housing Element. Fires following an earthquake are a typical secondary consequence of the earthquake. She suggests an incentive approach related to rebuilding to allow for higher density housing on the parcel. Along with Ms. Goodman's excellent suggestion, we will need other incentives to get our soft-story buildings retrofitted BEFORE the next earthquake. Building failure also leads to fires following an earthquake (due to someone cooking, etc.) Leadership is needed, especially to better protect the most vulnerable amongst us including renters.

Retrofitting seismically weak buildings is a project listed in Menlo Park's 2021 Local Hazard Mitigation Plan: Please see the below. .

MP-1—Where appropriate, support retro-fitting, purchase or relocation of structures located in high hazard areas and prioritize those structures that have experienced repetitive losses. ü **MPK-1 Comment: Menlo Park has a Planning Commission that oversees future building development which takes into consideration high risk hazards. Homeowners in high risk areas are required to take out home insurance associated with potential risks that expose their properties. No city facilities have been vulnerable to recurring losses, so relocation is no longer feasible. On the other hand, the City will continue to support retro-fitting of other structures, but the city's role in this for private property is limited.**

I also have more background information on what other jurisdictions have done, so could supply pointers to elsewhere.

Lynne Bramlett
650-380-3028

From: Chow, Deanna M
To: Smith, Tom A; Chan, Calvin; Turner, Christopher R; Sung Kwon
Subject: FW: NOP Comments: EIR Analysis related to Housing
Date: Tuesday, February 1, 2022 9:43:01 AM
Attachments: CMP_Email_Logo_100dpi_05d92d5b-e8e3-498f-93a6-d0da509bd602111111111.png

Deanna M. Chow
Assistant Community Development Director
City Hall - 1st Floor
701 Laurel St.
tel 650-330-6733
menlopark.org

From: Patti Fry [mailto:Patti.L.Fry@gmail.com]
Sent: Saturday, January 29, 2022 10:57 AM
To: Smith, Tom A <tasmith@menlopark.org>
Cc: _CCIN <city.council@menlopark.org>
Subject: NOP Comments: EIR Analysis related to Housing

CAUTION: This email originated from outside of the organization. Unless you recognize the sender's email address and know the content is safe, DO NOT click links, open attachments or reply.

Dear City,
The project definition related to the Housing and Safety Elements and new Environmental Justice Element appears to be limited to addressing the RHNA allocations and on modifying residential zoning to encourage housing. Menlo Park will be chasing its tail forever on addressing the demand for more housing if it doesn't also modify downwards the potential amount of non-residential development (particularly office space) that could be developed throughout Menlo Park. Thus, the project should also address potential modifications to non-residential zoning, particularly in District 1 where office growth seems to be driving most of the demand for more housing in our city. In other words, the EIR's scope should update the Housing Element based on what is happening in Menlo Park (excessive office growth relative to housing) and proposed measures to create a better balance, not just focus on RHNA and not just on residential zoning but also on non-residential zoning.

The project should examine a reduction in the amount of office allowed generally, and particularly in District 1. The 2015 ConnectMenlo General Plan modified zoning in District 1 but never analyzed the full potential of what could be built. This needs to be done as part of the No Project Alternative. Simple arithmetic based on all parcels in that district and the respective zoning would show that the potential office development and typical worker density (approx. 150 SF/worker) could create a housing demand far beyond RHNA. That potential should be analyzed as part of No Project and the proposed project should incorporate measures

to bring about a better jobs:housing balance.

Additionally, the project scope should evaluate the appropriate levels of mixed use at the Bonus level of zoning. Currently, no mixed use zoning results in a balance of jobs: housing when office is maximized at the Bonus level -- not even in District 1. Simple arithmetic would demonstrate the problem of the current zoning when a project seeks to maximize Office. Using the Willow Village example: that proposal includes 1,730 housing units. A jobs:housing ratio of 1:1 would suggest this project alone should not add more than 259,000 SF of office [calculation 259,000 SF/150 SF per worker = 1,730 workers). Yet the office portion of this project alone is up to 1,600,000 SF of office [calculation 1,600,000/150 SF per worker = 10,667 workers!] -- plus a hotel, retail space, and accessory buildings. This one massive project will worsen the jobs:housing balance even with recent modifications to it to reduce the amount of office and maximize the amount of housing. Note that only a portion of the land for this project is zoned mixed use. If the rest were zoned mixed use, that project could be in much better balance.

Given all the housing and office construction in District 1 in recent years, we do need to be sensitive when considering modifications to the housing potential there in the short-term. Lowering the potential amount of office development would moderate future demand for housing and help pull Menlo Park's jobs:housing balance more into a healthy ratio. The Project definition for the EIR analysis should address a more full picture than a focus solely on RHNA.

Respectfully submitted,
Patti Fry, former Menlo Park Planning Commissioner

California Department of Transportation

DISTRICT 4
OFFICE OF TRANSIT AND COMMUNITY PLANNING
P.O. BOX 23660, MS–10D | OAKLAND, CA 94623-0660
www.dot.ca.gov

January 31, 2022

SCH #: 2015062054
GTS #: 04-SM-2021-00409
GTS ID: 25122
Co/Rt/Pm: SM/82/0.66

Tom Smith, Acting Principal Planner
City of Menlo Park
701 Laurel Street
Menlo Park, CA 94025

Re: City of Menlo Park Housing, Safety, and Environmental Justice Elements Project Notice of Preparation (NOP)

Dear Tom Smith:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the City of Menlo Park Housing, Safety, and Environmental Justice Elements Project. We are committed to ensuring that impacts to the State's multimodal transportation system and to our natural environment are identified and mitigated to support a safe, sustainable, integrated and efficient transportation system. The following comments are based on our review of the December 2021 NOP.

Project Understanding

The project consists of updating the City's required Housing Element and Safety Element, and preparation of a new Environmental Justice Element. The purpose of the Housing Element update is to comply with the requirements of State law by analyzing existing and projected housing needs, and updating goals, policies, objectives, and implementation programs for the preservation, improvement, and development of housing for all income categories. The purpose of the Safety Element update is to focus on the protection of the community from risks associated with climate change, earthquakes, floods, fires, toxic waste, and other hazards. The purpose of the Environmental Justice Element is to address the unique or compounded health risks in "Disadvantaged Communities" within a jurisdiction. The project encompasses the entire City and is located along segments of State Route (SR)-82 (El Camino Real), SR-84, SR-109, SR-114, United States Route (US)-101, and Interstate (I)-280. The City is also served by Caltrain.

Travel Demand Analysis
With the enactment of Senate Bill (SB) 743, Caltrans is focused on maximizing efficient development patterns, innovative travel demand reduction strategies, and multimodal improvements. For more information on how Caltrans assesses Transportation Impact Studies, please review Caltrans' Transportation Impact Study Guide.

If the project meets the screening criteria established in the City's adopted Vehicle Miles Traveled (VMT) policy to be presumed to have a less-than-significant VMT impact and exempt from detailed VMT analysis, please provide justification to support the exempt status in align with the City's VMT policy. Projects that do not meet the screening criteria should include a detailed VMT analysis in the Draft Environmental Impact Report (DEIR), which should include the following:

- VMT analysis pursuant to the City's guidelines. Projects that result in automobile VMT per capita above the threshold of significance for existing (i.e. baseline) city-wide or regional values for similar land use types may indicate a significant impact. If necessary, mitigation for increasing VMT should be identified. Mitigation should support the use of transit and active transportation modes. Potential mitigation measures that include the requirements of other agencies such as Caltrans are fully enforceable through permit conditions, agreements, or other legally-binding instruments under the control of the City.

- A schematic illustration of walking, biking and auto conditions at the study area roadways.

- The project's primary and secondary effects on pedestrians, bicycles, travelers with disabilities and transit performance should be evaluated, including countermeasures and trade-offs resulting from mitigating VMT increases. Access to pedestrians, bicycle, and transit facilities must be maintained.

In addition, Caltrans requests the City include transportation impact analyses with applicable mitigation for any additional or re-zoning of improvements adjacent to Caltrans' Right-of-Way (ROW).

Mitigation Strategies
Location efficiency factors, including community design and regional accessibility, influence a project's impact on the environment. Using Caltrans' *Smart Mobility 2010: A Call to Action for the New Decade*, the proposed project site is identified as a Close-in Compact Community where community design is moderate and regional accessibility is strong.

Given the place, type and size of the project, the DEIR should include a robust Transportation Demand Management (TDM) Program to reduce VMT and greenhouse gas emissions from future development in this area. The measures listed below have been quantified by California Air Pollution Control Officers Association (CAPCOA) and shown to have different efficiencies reducing regional VMT:

- Project design to encourage mode shift like walking, bicycling and transit access;
- Transit and trip planning resources such as a commute information kiosk;
- Real-time transit information systems;
- Transit access supporting infrastructure (including bus shelter improvements and sidewalk/ crosswalk safety facilities);
- New development vehicle parking reductions;
- Implementation of a neighborhood electric vehicle (EV) network, including designated parking spaces for EVs;
- Designated parking spaces for a car share program;
- Unbundled parking;
- Wayfinding and bicycle route mapping resources;
- Participation/Formation in/of a Transportation Management Association (TMA) in partnership with other developments in the area;
- Aggressive trip reduction targets with Lead Agency monitoring and enforcement;
- VMT Banking and/or Exchange program; and
- Area or cordon pricing.

Using a combination of strategies appropriate to the project and the site can reduce VMT, along with related impacts on the environment and State facilities. TDM programs should be documented with annual monitoring reports by a TDM coordinator to demonstrate effectiveness. If the project does not achieve the VMT reduction goals, the reports should also include next steps to take in order to achieve those targets.

Please reach out to Caltrans for further information about TDM measures and a toolbox for implementing these measures in land use projects. Additionally, Federal Highway Administration's Integrating Demand Management into the Transportation Planning Process: A Desk Reference (Chapter 8). The reference is available online at: http://www.ops.fhwa.dot.gov/publications/fhwahop12035/fhwahop12035.pdf.

Transportation Impact Fees

We encourage a sufficient allocation of fair share contributions toward multimodal and regional transit improvements to fully mitigate cumulative impacts to regional transportation. We also strongly support measures to increase sustainable mode shares, thereby reducing VMT. Caltrans welcomes the opportunity to work with the

City and local partners to secure the funding for needed mitigation. Traffic mitigation- or cooperative agreements are examples of such measures.

Please identify in text and graphics existing and proposed improvements for the pedestrian, bicycle, and transit networks. The City should estimate the cost of needed improvements, expansion, and maintenance for the Plan area, as well as identify viable sources of funding, correlated with the pace of improvements, and a scheduled plan for implementation along with the DEIR.

Lead Agency
As the Lead Agency, the City of Menlo Park is responsible for all project mitigation, including any needed improvements to the State Transportation Network (STN). The project's fair share contribution, financing, scheduling, implementation responsibilities and lead agency monitoring should be fully discussed for all proposed mitigation measures.

Equitable Access
If any Caltrans facilities are impacted by the project, those facilities must meet American Disabilities Act (ADA) Standards after project completion. As well, the project must maintain bicycle and pedestrian access during construction. These access considerations support Caltrans' equity mission to provide a safe, sustainable, and equitable transportation network for all users.

Thank you again for including Caltrans in the environmental review process. Should you have any questions regarding this letter, or for future notifications and requests for review of new projects, please email LDR-D4@dot.ca.gov.

Sincerely,

Mark Leong

MARK LEONG
District Branch Chief
Local Development Review

c: State Clearinghouse

From: Sandmeier, Corinna D
To: Smith, Tom A; Chan, Calvin; Turner, Christopher R
Cc: Chow, Deanna M
Subject: FW: [Sent to Planning]comment on the NOP for the Housing Element EIR
Date: Monday, January 31, 2022 6:57:34 PM
Attachments: CMP_Email_Logo_100dpi_05d92d5b-e8e3-498f-93a6-d0da509bd602111111111.png

FYI

Corinna D. Sandmeier
Acting Principal Planner
City Hall - 1st Floor
701 Laurel St.
tel 650-330-6726
menlopark.org

From: Karen Grove [mailto:karenfgrove@gmail.com]
Sent: Monday, January 31, 2022 4:44 PM
To: PlanningDept <PlanningDept@menlopark.org>
Subject: [Sent to Planning]comment on the NOP for the Housing Element EIR

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Dear Mr. Smith,

I write to echo Planning Commissioner DeCardy's comment (at the Planning Commission meeting on Jan 24th) that the EIR for the Housing Element should include a scenario with massively reduced parking. The degree of VMT and air quality impacts found by the study will be affected by assumptions about parking, so scenarios with different parking assumptions should be compared.

Thank you for your consideration.

Karen Grove (she/her)
Menlo Park Housing Commissioner, writing only for myself
650-868-2732

January 31, 2022

Tom Smith, Acting Principal Planner
City of Menlo Park
701 Laurel St.
Menlo Park, CA 94025

RE: Comments on Notice of Preparation for 2023+ Housing Element

As a local citizen I wish to be kept up to date on the progress of the Housing Element and opportunities for public outreach.

I have several comments on the Notice of Preparation (NOP).

In determining the potential impacts of new Housing Opportunity sites, The EIR should be thorough in addressing mitigation measures to reduce potential impacts from changes in zones that affect established land uses and neighborhoods. Transitions and compatibility with existing land use goals in the General Plan should be required. Traffic impacts should also be addressed.

Also, in discussions of alternatives, while recognizing the need for affordable units, the range of housing types should be considered. The EIR should look at the possibility of prioritizing affordable housing ownership opportunities. In order to prioritize social equity, the best determinant for establishing long-term wealth is through home ownership.

The City of Menlo Park, as a less dense metropolitan area, has the potential for providing affordable home ownership opportunities on larger undeveloped sites outside the downtown area.
This alternative should definitely be addressed in the Housing Element. Just providing more rental units does not meet this important goal.

I look forward to reviewing the Draft Environmental Impact Report.

Yours truly,

Lisa Cope
Lisa_m_cope@hotmail.com

Smith, Tom A

From: Misha Silin <mdsilin@gmail.com>
Sent: Monday, January 31, 2022 2:03 PM
To: Smith, Tom A; _CCIN
Subject: Comment on Notice of Preparation

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Hi - the below is a comment regarding the city's NOP for our next housing element cycle.

My name is Mikhail Silin, I'm a resident of Menlo Park and I live in the allied arts neighborhood (D4).

Since the housing element is asking us to plan ahead for eight years, this is an opportunity to plan for the Menlo Park that many of us envision. Residents imagine our city as inclusive, vibrant, with opportunities for folks of all income levels and backgrounds to be housed in a dignified manner. We want local families and workers to be able to be housed such that they can live, work, and enjoy all that Menlo Park and our surroundings have to offer.

I have been digging into the proposed sites in the NOP and I am extremely concerned that this list is unrealistic and is not going to produce the housing we are claiming it will. Not even close. Specifically, I am concerned that our current plan is going to continue the status quo. Very little housing will get built, neighbors and families will continue to get priced out of the area, which will lead to more inequality, congestion due to local workers not being able to live here, and homelessness.

In addition to analyzing the sites listed in the NOP (my comment on that was submitted to the Planning Commission last week, I've taken some time to meet with numerous housing developers, who have ongoing or already-built projects in Menlo Park.

These are my conclusions:

1. **The draft list of sites is unlikely to lead to us hitting our RHNA goals and/or building a significant amount of housing in Menlo Park**
2. **This will continue to perpetuate housing un-affordability in Menlo Park**
3. **It will also likely be rejected by HCD, as other cities like Beverly Hills and Davis have, due to a lack of evidence that these sites will be redeveloped.**

<u>Evidence/backing for my conclusions</u>:

A. A majority of the larger sites in the element are mixed use/office. All of the developers I spoke with wouldn't get out of bed for a (potential) 30du/ac housing project on those office sites unless it's an old building that has low vacancy. Most of the sites clearly do not seem to be in that bucket, they are occupied by wealthy VC firms and startups/companies with deep pockets (ex: RobinHood). Staff has not produced evidence indicating those occupants plan to vacate or that the building owners are considering selling.

If we want to really incentivize those properties to be sold, we should increase the density significantly such that it becomes lucrative for a developer to buy the property and renovate the office space + add housing. 30du/ac is nowhere close to that number - those are essentially townhomes at best.

B. For 100% affordable projects, putting one in the parking lot of our Safeway sites or a large office site also seems unrealistic. No evidence has been presented how this would actually happen. Do the current owners of the sites plan to add affordable housing in the parking lot? Who? Or are they planning on selling? And if so, do we have evidence that the parking lot could turn into affordable housing? We have no history to go off of, since this was not something that happened in the previous element.

C. For our parking lots downtown, that are city owned -- this is a once in a lifetime opportunity to use our valuable land to create affordable housing for the community. Based on what I heard from affordable housing developers, we should be increasing the density to the max level that affordable develeopers can get funding for. My understanding is that that is 150-200du/ac.

Suggestions for next steps to fix the above issues, get our element approved by HCD, and actually build housing

1. Support 100% affordable housing development to the fullest extent

- Get in the weeds on any city owned sites to maximize 100% affordable housing.
    - Work very closely with developers and community to come up with good uses for those sites.
    - Don't squander it with low density or unrealistic requirements.
- Push staff to find more sites that can realistically support 100% affordable housing
- Add clarity / certainty
    - Remove as much discretionary approval as we can stomach for 100% affordable projects
    - Lower parking requirements. This has been mentioned in just about every community meeting and yet still isn't on the incentive list in the NOP.
- Get funding to help buy land and/or help subsidize 100% affordable housing
    - Given the large amount of wealth in Menlo Park, can we not get more funding from local large businesses who I'm sure also want to support the community?
- Add density / height for 100% affordable projects
- Waive fees for 100% affordable projects

2. Support more BMR development by incentivizing market rate projects that will come with a required % of BMR, as is already required in Menlo Park

- Get more serious about assessing feasibility of current sites / find more sites
    - My understanding is that so far staff has only sent out mailers to the property owners. At least for the larger sites, we can do better.
- Increase density significantly such that buying a site with an existing use and adding housing pencils out. My impression from speaking with developers is that it should be at least 100-150du/ac but admittedly I think more research should/could be done here.
- Add density / height in exchange for higher BMR rate.
- Add clarity / certainty in exchange for higher BMR rate
    - Remove as much discretionary approval as we can stomach. Especially for smaller sites, to attract more mom & pop landlords.
    - Lower parking requirements. This has been mentioned in just about every community meeting and yet still isn't on the incentive list in the NOP.

Thank you for taking the time to read my long comment. I hope you understand that continuing to proceed with the EIR and keeping the list of sites and incentives as currently written in the NOP is extremely likely to result in a rejection from HCD, which will allow a lot more freedom on what can be built in Menlo Park. By taking

the planning process seriously, we can get our element approved and maintain community control over the growth of our city, which I'm sure is what we all want.

Thank you
Mikhail Silin

--
Misha Silin
M: (925) 323-7727

From: aebi@pacbell.net
To: Smith, Tom A
Cc: Chan, Calvin
Subject: Comments / Input to Housing Element Update - NOP
Date: Monday, January 31, 2022 4:57:59 PM

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Dear Mr. Smith,

I have reviewed the NOP and previously listened to the presentation to Council in October. I have two inputs for consideration in the Housing Element Update:

1. I understand that the property with the Cornerstone Research building located at 1000 El Camino Real in Menlo Park is owned by the City of Menlo Park. I do not see this parcel identified in the NOP as a Housing Opportunity Site. It is in an ideal location in the Downtown Specific Plan Area very close to the Caltrain station. This would seem to be low hanging fruit to add to the Housing Opportunity Site list. I expect that Cornerstone has a long term lease on the property, but it may be possible to buy out the lease and redevelop the site as affordable housing in cooperation with one of the non-profit partner organizations that have been doing this in the eastern part of Menlo Park off of Willow Road.

2. I saw in the NOP that only 10.5 ADUs per year are expected to be added to the housing stock over the course of the Housing Element Update. This is disappointing as ADUs represent a good source of additional affordable housing units for the city. I do understand why this is the case however as Menlo Park does not encourage construction of new ADUs. I know this from personal experience with a new house with a detached ADU that my wife and I are planning in the R3 district. Initially the city would not allow an ADU in R3 and only allowed us to go ahead with the project after the State of California changed the laws governing ADUs forcing towns like Menlo Park to allow them more widely. Unfortunately we are now in the process of obtaining a building permit for our project and Menlo Park requires a separate building permit for the ADU in addition to the house building permit even though both are to be built simultaneously. The ADU building permit is almost the same cost as the building permit for the house which is 4 times the square footage and a much more complicated structure. Separate building permit submittals also increases the cost with our architect and throughout the building process. I strongly recommend that the City consider simplifying the process to build an approved ADU and reduce permitting costs to encourage construction of more ADUs throughout Menlo Park.

Best Regards,
Verle and Carol Aebi
220 Laurel St.
Menlo Park

Appendix B
Biological Resources

ESA

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Palo Alto (3712242))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Acanthomintha duttonii San Mateo thorn-mint	PDLAM01040	Endangered	Endangered	G1	S1	1B.1
Allium peninsulare var. franciscanum Franciscan onion	PMLIL021R1	None	None	G5T2	S2	1B.2
Ambystoma californiense pop. 1 California tiger salamander - central California DPS	AAAAA01181	Threatened	Threatened	G2G3T3	S3	WL
Amsinckia lunaris bent-flowered fiddleneck	PDBOR01070	None	None	G3	S3	1B.2
Aneides niger Santa Cruz black salamander	AAAAD01070	None	None	G3	S3	SSC
Antrozous pallidus pallid bat	AMACC10010	None	None	G4	S3	SSC
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G2G3	S1S2	
Bombus crotchii Crotch bumble bee	IIHYM24480	None	None	G2	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	None	G2G3	S1	
Centromadia parryi ssp. congdonii Congdon's tarplant	PDAST4R0P1	None	None	G3T1T2	S1S2	1B.1
Charadrius nivosus nivosus western snowy plover	ABNNB03031	Threatened	None	G3T3	S2	SSC
Cirsium fontinale var. fontinale fountain thistle	PDAST2E161	Endangered	Endangered	G2T1	S1	1B.1
Cirsium praeteriens lost thistle	PDAST2E2B0	None	None	GX	SX	1A
Collinsia corymbosa round-headed Chinese-houses	PDSCR0H060	None	None	G1	S1	1B.2
Collinsia multicolor San Francisco collinsia	PDSCR0H0B0	None	None	G2	S2	1B.2
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G4	S2	SSC
Coturnicops noveboracensis yellow rail	ABNME01010	None	None	G4	S1S2	SSC
Dicamptodon ensatus California giant salamander	AAAAH01020	None	None	G3	S2S3	SSC
Dipodomys venustus venustus Santa Cruz kangaroo rat	AMAFD03042	None	None	G4T1	S1	
Dirca occidentalis western leatherwood	PDTHY03010	None	None	G2	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Eryngium aristulatum var. hooveri Hoover's button-celery	PDAPI0Z043	None	None	G5T1	S1	1B.1
Eryngium jepsonii Jepson's coyote-thistle	PDAPI0Z130	None	None	G2	S2	1B.2
Euphydryas editha bayensis Bay checkerspot butterfly	IILEPK4055	Threatened	None	G5T1	S1	
Fritillaria liliacea fragrant fritillary	PMLIL0V0C0	None	None	G2	S2	1B.2
Geothlypis trichas sinuosa saltmarsh common yellowthroat	ABPBX1201A	None	None	G5T3	S3	SSC
Haliaeetus leucocephalus bald eagle	ABNKC10010	Delisted	Endangered	G5	S3	FP
Hesperolinon congestum Marin western flax	PDLIN01060	Threatened	Threatened	G1	S1	1B.1
Lasiurus cinereus hoary bat	AMACC05030	None	None	G3G4	S4	
Laterallus jamaicensis coturniculus California black rail	ABNME03041	None	Threatened	G3T1	S1	FP
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G2G3	S2S3	
Malacothamnus arcuatus arcuate bush-mallow	PDMAL0Q0E0	None	None	G2Q	S2	1B.2
Melospiza melodia pusillula Alameda song sparrow	ABPBXA301S	None	None	G5T2?	S2S3	SSC
Monolopia gracilens woodland woollythreads	PDAST6G010	None	None	G3	S3	1B.2
Neotoma fuscipes annectens San Francisco dusky-footed woodrat	AMAFF08082	None	None	G5T2T3	S2S3	SSC
Northern Coastal Salt Marsh Northern Coastal Salt Marsh	CTT52110CA	None	None	G3	S3.2	
Plagiobothrys chorisianus var. chorisianus Choris' popcornflower	PDBOR0V061	None	None	G3T1Q	S1	1B.2
Rallus obsoletus obsoletus California Ridgway's rail	ABNME05011	Endangered	Endangered	G3T1	S1	FP
Rana boylii foothill yellow-legged frog	AAABH01050	None	Endangered	G3	S3	SSC
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC
Reithrodontomys raviventris salt-marsh harvest mouse	AMAFF02040	Endangered	Endangered	G1G2	S1S2	FP

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Sagittaria sanfordii Sanford's arrowhead	PMALI040Q0	None	None	G3	S3	1B.2
Serpentine Bunchgrass Serpentine Bunchgrass	CTT42130CA	None	None	G2	S2.2	
Sorex vagrans halicoetes salt-marsh wandering shrew	AMABA01071	None	None	G5T1	S1	SSC
Spirinchus thaleichthys longfin smelt	AFCHB03010	Candidate	Threatened	G5	S1	
Sternula antillarum browni California least tern	ABNNM08103	Endangered	Endangered	G4T2T3Q	S2	FP
Stuckenia filiformis ssp. alpina northern slender pondweed	PMPOT03091	None	None	G5T5	S2S3	2B.2
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Thamnophis sirtalis tetrataenia San Francisco gartersnake	ARADB3613B	Endangered	Endangered	G5T2Q	S2	FP
Trifolium amoenum two-fork clover	PDFAB40040	Endangered	None	G1	S1	1B.1
Valley Oak Woodland Valley Oak Woodland	CTT71130CA	None	None	G3	S2.1	

Record Count: 51

CNPS Rare Plant Inventory

California Native Plant Society

Search Results

29 matches found. Click on scientific name for details

Search Criteria: Quad is one of [**3712242**]

▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK
Acanthomintha duttonii	San Mateo thorn-mint	Lamiaceae	annual herb	Apr-Jun	FE	CE	G1	S1	1B.1
Allium peninsulare var. *franciscanum*	Franciscan onion	Alliaceae	perennial bulbiferous herb	(Apr)May-Jun	None	None	G5T2	S2	1B.2
Amsinckia lunaris	bent-flowered fiddleneck	Boraginaceae	annual herb	Mar-Jun	None	None	G3	S3	1B.2
Androsace elongata ssp. *acuta*	California androsace	Primulaceae	annual herb	Mar-Jun	None	None	G5?T3T4	S3S4	4.2
Calandrinia breweri	Brewer's calandrinia	Montiaceae	annual herb	(Jan)Mar-Jun	None	None	G4	S4	4.2
Centromadia parryi ssp. *congdonii*	Congdon's tarplant	Asteraceae	annual herb	May-Oct(Nov)	None	None	G3T1T2	S1S2	1B.1
Cirsium fontinale var. *fontinale*	fountain thistle	Asteraceae	perennial herb	(Apr)May-Oct	FE	CE	G2T1	S1	1B.1
Cirsium praeteriens	lost thistle	Asteraceae	perennial herb	Jun-Jul	None	None	GX	SX	1A
Collinsia corymbosa	round-headed Chinese-houses	Plantaginaceae	annual herb	Apr-Jun	None	None	G1	S1	1B.2
Collinsia multicolor	San Francisco collinsia	Plantaginaceae	annual herb	(Feb)Mar-May	None	None	G2	S2	1B.2
Dirca occidentalis	western leatherwood	Thymelaeaceae	perennial deciduous shrub	Jan-Mar(Apr)	None	None	G2	S2	1B.2
Eryngium aristulatum var. *hooveri*	Hoover's button-celery	Apiaceae	annual/perennial herb	(Jun)Jul(Aug)	None	None	G5T1	S1	1B.1
Eryngium jepsonii	Jepson's coyote-thistle	Apiaceae	perennial herb	Apr-Aug	None	None	G2	S2	1B.2
Fritillaria liliacea	fragrant fritillary	Liliaceae	perennial bulbiferous herb	Feb-Apr	None	None	G2	S2	1B.2
Hesperolinon congestum	Marin western flax	Linaceae	annual herb	Apr-Jul	FT	CT	G1	S1	1B.1
Iris longipetala	coast iris	Iridaceae	perennial rhizomatous herb	Mar-May(Jun)	None	None	G3	S3	4.2
Leptosiphon acicularis	bristly leptosiphon	Polemoniaceae	annual herb	Apr-Jul	None	None	G4?	S4?	4.2
Leptosiphon ambiguus	serpentine leptosiphon	Polemoniaceae	annual herb	Mar-Jun	None	None	G4	S4	4.2
Leptosiphon	broad-lobed	Polemoniaceae	annual herb	Apr-Jun	None	None	G4	S4	4.3

latisectus	leptosiphon								
Lessingia hololeuca	woolly-headed lessingia	Asteraceae	annual herb	Jun-Oct	None	None	G2G3	S2S3	3
Lessingia tenuis	spring lessingia	Asteraceae	annual herb	May-Jul	None	None	G4	S4	4.3
Malacothamnus arcuatus	arcuate bush-mallow	Malvaceae	perennial deciduous shrub	Apr-Sep	None	None	G2Q	S2	1B.2
Monolopia gracilens	woodland woollythreads	Asteraceae	annual herb	(Feb)Mar-Jul	None	None	G3	S3	1B.2
Piperia michaelii	Michael's rein orchid	Orchidaceae	perennial herb	Apr-Aug	None	None	G3	S3	4.2
Plagiobothrys chorisianus var. *chorisianus*	Choris' popcornflower	Boraginaceae	annual herb	Mar-Jun	None	None	G3T1Q	S1	1B.2
Plagiobothrys chorisianus var. *hickmanii*	Hickman's popcornflower	Boraginaceae	annual herb	Apr-Jun	None	None	G3T3Q	S3	4.2
Sagittaria sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb (emergent)	May-Oct(Nov)	None	None	G3	S3	1B.2
Stuckenia filiformis ssp. *alpina*	northern slender pondweed	Potamogetonaceae	perennial rhizomatous herb (aquatic)	May-Jul	None	None	G5T5	S2S3	2B.2
Trifolium amoenum	two-fork clover	Fabaceae	annual herb	Apr-Jun	FE	None	G1	S1	1B.1

Showing 1 to 29 of 29 entries

Suggested Citation:

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Appendix C
Noise

ESA

AM Peak Hour														PM Peak Hour														
NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Name	Int	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR		
771	0	920	0	0	0	0	1581	0	0	858	0	Marsh & 101 NB	1	570	0	601	0	0	0	0	1850	0	0	954	0	4130	3975
0	0	0	1223	0	511	0	936	0	0	1462	0	Marsh & 101 SB	2	0	0	0	1234	0	350	0	959	0	0	1000	0	4132	3543
13	4	58	225	19	0	24	1095	7	448	1226	303	Marsh & Scott	3	15	5	389	262	6	4	35	1326	7	55	840	193	3422	3137
35	16	25	533	47	143	114	811	80	29	1025	428	Marsh & Bohannon	4	109	50	40	445	19	159	180	675	38	13	773	361	3286	2862
39	19	202	147	63	2	0	822	85	287	758	48	Marsh & Bay	5	65	11	267	45	14	2	2	752	50	167	699	56	2472	2130
1174	2217	72	349	451	172	207	438	277	37	79	72	Willow & Bayfront	6	559	731	34	82	1957	118	132	95	1112	159	238	134	5545	5351
260	79	71	23	133	349	143	1596	255	40	1318	7	Willow & Newbridge	7	191	270	96	28	170	240	317	1310	243	78	1214	26	4274	4183
529	0	789	0	0	0	0	1140	513	1	1748	424	Willow & 101 NB	8	265	0	859	0	0	0	0	1163	323	0	1308	495	5144	4413
0	0	0	578	0	391	0	1093	623	0	1378	826	Willow & 101 SB	9	0	0	0	556	0	352	0	927	199	0	919	660	4889	3613
0	0	0	397	0	60	65	1233	0	0	1217	581	Willow & Bay	10	0	0	0	282	0	49	20	1355	0	1	685	167	3553	2559
59	11	127	67	7	32	22	898	7	36	928	108	Willow & Durham	11	21	7	38	132	1	31	9	1029	4	29	533	18	2302	1852
1	2	6	206	6	59	28	783	7	4	878	112	Willow & Coleman	12	15	4	6	98	2	37	13	693	5	2	699	100	2092	1674
92	94	93	20	82	11	7	707	75	52	919	0	Willow & Gilbert	13	75	50	58	21	88	5	3	656	80	54	675	10	2152	1775
106	344	177	335	365	21	27	271	116	374	104	426	Willow & Middlefield	14	101	439	203	277	460	14	30	213	209	372	86	289	2666	2693
0	0	0	177	0	20	25	244	2	3	52	233	Willow & Laurel	15	0	0	0	304	0	3	23	306	0	0	68	224	756	928
21	567	114	233	656	56	6	11	9	157	28	293	Ringwood & Middlefield	17	2	662	107	292	586	2	34	32	32	69	0	208	2151	2026
185	71	20	99	163	43	11	489	68	17	527	11	Ravenswood & Laurel	18	240	124	38	42	109	24	103	528	102	38	457	31	1704	1836
16	789	145	199	1694	85	8	54	12	73	15	146	Encinal & El Camino Real	19	31	1728	95	125	1242	10	22	11	15	99	3	247	3236	3628
105	702	56	39	1128	549	242	144	112	85	218	25	Valparaiso & El Camino Real	20	97	1464	59	41	983	223	299	149	78	59	183	49	3405	3684
112	733	70	88	1215	51	83	193	72	113	220	40	Oak Grove & El Camino Real	21	89	1467	64	86	1019	60	120	174	134	95	210	80	2990	3598
0	802	89	0	1362	79	80	77	163	77	40	31	Santa Cruz & El Camino Real	22	0	1446	54	0	1156	89	146	43	141	61	46	37	2800	3219
96	773	460	135	1406	24	30	322	49	418	204	61	Ravenswood & El Camino Real	23	68	1131	337	187	1046	63	47	272	71	407	255	69	3978	3953
178	1221	0	0	1760	89	213	0	300	0	0	0	Middle & El Camino Real	24	383	1851	0	0	1489	87	176	0	230	0	0	0	3761	4216
90	99	37	69	52	63	157	403	114	47	500	63	Valparaiso & University	25	221	31	64	33	31	68	36	380	86	51	427	36	1694	1464
241	0	101	0	0	0	0	420	417	73	276	0	Santa Cruz & University	26	313	0	143	0	0	0	0	330	306	93	371	0	1528	1556
62	54	32	77	47	90	8	332	40	18	220	80	Middle & University	27	36	77	21	110	73	111	54	260	36	13	268	150	1060	1209
98	593	411	221	659	216	284	1182	227	258	506	52	Sand Hill & Santa Cruz	28	195	821	164	97	605	147	359	564	176	309	895	186	4707	4518
0	1	2	179	1	174	186	1467	5	10	673	145	Sand Hill & Sharon Park	29	8	1	15	166	1	149	143	892	6	11	1007	240	2843	2639
0	79	540	57	0	0	89	1750	0	0	0	0	Sand Hill & I-280 NB Off	30	0	26	153	67	0	0	10	630	0	0	0	0	2515	886
1	167	0	0	55	40	0	0	0	2	839	27	Sand Hill & I-280 NB On	31	4	32	0	0	62	168	0	0	0	5	1824	8	1131	2103
0	905	592	613	550	0	0	0	0	78	0	210	Juniperos Serra & Alpine	32	0	594	146	304	782	0	0	0	0	382	0	555	2948	2763

Baseline

ROAD SEGMENT			TOTAL # VEHICLES	VEHICLE TYPE %						Auto	k/h
				Auto		MT		HT			
Calveno Peak	from:	to:		%	Auto	%	MT	%	HT		
Marsh	Scott	Bohannon	2307	97	2237.79	2	46.14	1	23.07	35	56
Marsh	Bohannon	Bay	1986	97	1926.42	2	39.72	1	19.86	35	56
Willow	Hamilton	Newbridge	2752	97	2669.44	2	55.04	1	27.52	35	56
Willow	Newbridge	U.S. 101	3825	97	3710.25	2	76.5	1	38.25	35	56
Willow	U.S. 101	Durham	1779	97	1725.63	2	35.58	1	17.79	25	40
Willow	Durham	Coleman	1598	97	1550.06	2	31.96	1	15.98	25	40
Willow	Gilbert	Middlefield	1440	97	1396.8	2	28.8	1	14.4	25	40
Willow	Middlefield	Laurel	902	97	874.94	2	18.04	1	9.02	25	40
Middlefield	Willow	Ringwood	1509	97	1463.73	2	30.18	1	15.09	35	56
Middlefield	Ringwood	Oak Grove	1784	97	1730.48	2	35.68	1	17.84	35	56
Ravenswood	Middlefield	Laurel	1134	97	1099.98	2	22.68	1	11.34	25	40
Ravenswood	Laurel	Alma	1454	97	1410.38	2	29.08	1	14.54	25	40
ECR	Allejandra	Encinal	3374	97	3272.78	2	67.48	1	33.74	35	56
ECR	Encinal	Valparaiso	3059	97	2967.23	2	61.18	1	30.59	35	56
ECR	Valparaiso	Oak Grove	2832	97	2747.04	2	56.64	1	28.32	35	56
ECR	Oak Grove	Santa Cruz	2874	97	2787.78	2	57.48	1	28.74	35	56
ECR	Santa Cruz	Ravenswood	2543	97	2466.71	2	50.86	1	25.43	35	56
ECR	Ravenswood	Middle	3603	97	3494.91	2	72.06	1	36.03	35	56
Encinal	ECR	Laurel	580	97	562.6	2	11.6	1	5.8	25	40
Valparaiso	ECR	University	1029	97	998.13	2	20.58	1	10.29	30	48
Glenwood	ECR	Middlefield	540	97	523.8	2	10.8	1	5.4	25	40
Oak Grove	ECR	University	787	97	763.39	2	15.74	1	7.87	25	40
Oak Grove	ECR	Middlefield	709	97	687.73	2	14.18	1	7.09	25	40
Ravenswood	ECR	Laurel	1527	97	1481.19	2	30.54	1	15.27	25	40
Menlo	ECR	Chestnut	776	97	752.72	2	15.52	1	7.76	25	40
Middle	ECR	University	876	97	849.72	2	17.52	1	8.76	25	40
Sand Hill	Oak	Santa Cruz	2215	97	2148.55	2	44.3	1	22.15	35	56
Sand Hill	Santa Cruz	Sharon Park	2331	97	2261.07	2	46.62	1	23.31	35	56
Sand Hill	Sharon Park	I-280	2205	97	2138.85	2	44.1	1	22.05	40	64
Santa Cruz	Sand Hill	Alameda	2215	97	2148.55	2	44.3	1	22.15	25	40
Alpine	JSB	Bishop	1122	97	1088.34	2	22.44	1	11.22	35	56

Assumptions: PM peak hour traffic data from Hexagon

VEHICLE SPEED MT	k/h	HT	k/h	NOISE LEVEL (dBA) Auto	MT	HT	CALCULATED NOISE LEVEL (15 meters from roadway center)	Receptor Dist. from Roadway Center (m.)	Adjusted Noise Level (dBA)	Distance from Roadway to 65 dBA (m.)	Distance from Roadway to 65 dBA (ft)
35	56	35	56	67.8	60.7	64.4	70.0	40	65.7	47.2	154.7
35	56	35	56	67.2	60.0	63.7	69.3	40	65.1	40.6	133.2
35	56	35	56	68.6	61.4	65.1	70.7	40	66.5	56.3	184.6
35	56	35	56	70.0	62.9	66.6	72.2	40	67.9	78.2	256.5
25	40	25	40	62.5	57.3	61.9	65.9	40	61.6	18.3	59.9
25	40	25	40	62.0	56.8	61.4	65.4	40	61.1	16.4	53.8
25	40	25	40	61.6	56.3	61.0	64.9	40	60.7	14.8	48.5
25	40	25	40	59.5	54.3	59.0	62.9	40	58.6	9.3	30.4
35	56	35	56	66.0	58.8	62.5	68.1	40	63.9	30.8	101.2
35	56	35	56	66.7	59.6	63.3	68.9	40	64.6	36.5	119.6
25	40	25	40	60.5	55.3	59.9	63.9	40	59.6	11.6	38.2
25	40	25	40	61.6	56.4	61.0	65.0	40	60.7	14.9	48.9
35	56	35	56	69.5	62.3	66.0	71.6	40	67.4	69.0	226.3
35	56	35	56	69.0	61.9	65.6	71.2	40	66.9	62.5	205.1
35	56	35	56	68.7	61.6	65.3	70.9	40	66.6	57.9	189.9
35	56	35	56	68.8	61.6	65.3	70.9	40	66.7	58.7	192.7
35	56	35	56	68.2	61.1	64.8	70.4	40	66.1	52.0	170.5
35	56	35	56	69.7	62.6	66.3	71.9	40	67.7	73.6	241.6
25	40	25	40	57.6	52.4	57.0	61.0	40	56.7	6.0	19.5
30	48	30	48	62.4	56.1	60.3	65.0	40	60.8	15.2	49.7
25	40	25	40	57.3	52.1	56.7	60.7	40	56.4	5.5	18.2
25	40	25	40	58.9	53.7	58.4	62.3	40	58.1	8.1	26.5
25	40	25	40	58.5	53.3	57.9	61.9	40	57.6	7.3	23.9
25	40	25	40	61.8	56.6	61.2	65.2	40	60.9	15.7	51.4
25	40	25	40	58.9	53.7	58.3	62.2	40	58.0	8.0	26.1
25	40	25	40	59.4	54.2	58.8	62.8	40	58.5	9.0	29.5
35	56	35	56	67.6	60.5	64.2	69.8	40	65.5	45.3	148.5
35	56	35	56	67.9	60.7	64.4	70.0	40	65.8	47.6	156.3
40	64	40	64	69.3	61.4	64.7	71.1	40	66.8	60.8	199.3
25	40	25	40	63.4	58.2	62.9	66.8	40	62.5	22.7	74.6
35	56	35	56	64.7	57.5	61.2	66.8	40	62.6	22.9	75.2

Baseline + HEU

ROAD SEGMENT			TOTAL # VEHICLES	VEHICLE TYPE %						VEHICLE SPEED						NOISE LEVEL (d	
				Auto		MT		HT		Auto	k/h	MT	k/h	HT	k/h	Auto	MT
Calveno Peak	from:	to:		%	Auto	%	MT	%	HT								
Marsh	Scott	Bohannon	2427	97	2354.19	2	48.54	1	24.27	35	56	35	56	35	56	68.0	60.9
Marsh	Bohannon	Bay	2072	97	2009.84	2	41.44	1	20.72	35	56	35	56	35	56	67.3	60.2
Willow	Hamilton	Newbridge	2838	97	2752.86	2	56.76	1	28.38	35	56	35	56	35	56	68.7	61.6
Willow	Newbridge	U.S. 101	3953	97	3834.41	2	79.06	1	39.53	35	56	35	56	35	56	70.1	63.0
Willow	U.S. 101	Durham	1991	97	1931.27	2	39.82	1	19.91	25	40	25	40	25	40	63.0	57.8
Willow	Durham	Coleman	1810	97	1755.7	2	36.2	1	18.1	25	40	25	40	25	40	62.5	57.3
Willow	Gilbert	Middlefield	1658	97	1608.26	2	33.16	1	16.58	25	40	25	40	25	40	62.2	57.0
Willow	Middlefield	Laurel	958	97	929.26	2	19.16	1	9.58	25	40	25	40	25	40	59.8	54.6
Middlefield	Willow	Ringwood	1793	97	1739.21	2	35.86	1	17.93	35	56	35	56	35	56	66.7	59.6
Middlefield	Ringwood	Oak Grove	1937	97	1878.89	2	38.74	1	19.37	35	56	35	56	35	56	67.0	59.9
Ravenswood	Middlefield	Laurel	1233	97	1196.01	2	24.66	1	12.33	25	40	25	40	25	40	60.9	55.7
Ravenswood	Laurel	Alma	1591	97	1543.27	2	31.82	1	15.91	25	40	25	40	25	40	62.0	56.8
ECR	Allejandra	Encinal	3613	97	3504.61	2	72.26	1	36.13	35	56	35	56	35	56	69.8	62.6
ECR	Encinal	Valparaiso	3368	97	3266.96	2	67.36	1	33.68	35	56	35	56	35	56	69.5	62.3
ECR	Valparaiso	Oak Grove	3064	97	2972.08	2	61.28	1	30.64	35	56	35	56	35	56	69.0	61.9
ECR	Oak Grove	Santa Cruz	3086	97	2993.42	2	61.72	1	30.86	35	56	35	56	35	56	69.1	61.9
ECR	Santa Cruz	Ravenswood	2798	97	2714.06	2	55.96	1	27.98	35	56	35	56	35	56	68.6	61.5
ECR	Ravenswood	Middle	3859	97	3743.23	2	77.18	1	38.59	35	56	35	56	35	56	70.0	62.9
Encinal	ECR	Laurel	582	97	564.54	2	11.64	1	5.82	25	40	25	40	25	40	57.6	52.4
Valparaiso	ECR	University	1088	97	1055.36	2	21.76	1	10.88	30	48	30	48	30	48	62.6	56.4
Glenwood	ECR	Middlefield	629	97	610.13	2	12.58	1	6.29	25	40	25	40	25	40	58.0	52.7
Oak Grove	ECR	University	939	97	910.83	2	18.78	1	9.39	25	40	25	40	25	40	59.7	54.5
Oak Grove	ECR	Middlefield	843	97	817.71	2	16.86	1	8.43	25	40	25	40	25	40	59.2	54.0
Ravenswood	ECR	Laurel	1719	97	1667.43	2	34.38	1	17.19	25	40	25	40	25	40	62.3	57.1
Menlo	ECR	Chestnut	953	97	924.41	2	19.06	1	9.53	25	40	25	40	25	40	59.8	54.6
Middle	ECR	University	928	97	900.16	2	18.56	1	9.28	25	40	25	40	25	40	59.6	54.4
Sand Hill	Oak	Santa Cruz	2273	97	2204.81	2	45.46	1	22.73	35	56	35	56	35	56	67.7	60.6
Sand Hill	Santa Cruz	Sharon Park	2473	97	2398.81	2	49.46	1	24.73	35	56	35	56	35	56	68.1	61.0
Sand Hill	Sharon Park	I-280	2395	97	2323.15	2	47.9	1	23.95	40	64	40	64	40	64	69.6	61.7
Santa Cruz	Sand Hill	Alameda	2315	97	2245.55	2	46.3	1	23.15	25	40	25	40	25	40	63.6	58.4
Alpine	JSB	Bishop	1140	97	1105.8	2	22.8	1	11.4	35	56	35	56	35	56	64.7	57.6

Assumptions: PM peak hour traffic data from Hexagon

BA) HT	CALCULATED NOISE LEVEL (15 meters from roadway center)	Receptor Dist. from Roadway Center (m.)	Adjusted Noise Level (dBA)	Distance from Roadway t 65 dBA (m.)	Distance from Roadway to 65 dBA (ft)
64.6	70.2	40	65.9	49.6	162.8
63.9	69.5	40	65.2	42.4	139.0
65.3	70.9	40	66.6	58.0	190.3
66.7	72.3	40	68.1	80.8	265.1
62.4	66.3	40	62.1	20.4	67.0
62.0	65.9	40	61.7	18.6	60.9
61.6	65.5	40	61.3	17.0	55.8
59.2	63.2	40	58.9	9.8	32.2
63.3	68.9	40	64.6	36.6	120.2
63.6	69.2	40	65.0	39.6	129.9
60.3	64.3	40	60.0	12.7	41.5
61.4	65.4	40	61.1	16.3	53.6
66.3	71.9	40	67.7	73.8	242.3
66.0	71.6	40	67.4	68.8	225.9
65.6	71.2	40	66.9	62.6	205.5
65.6	71.2	40	67.0	63.1	207.0
65.2	70.8	40	66.6	57.2	187.6
66.6	72.2	40	67.9	78.9	258.8
57.0	61.0	40	56.7	6.0	19.6
60.5	65.3	40	61.0	16.0	52.6
57.4	61.3	40	57.1	6.5	21.2
59.1	63.1	40	58.8	9.6	31.6
58.7	62.6	40	58.3	8.6	28.4
61.8	65.7	40	61.4	17.6	57.9
59.2	63.1	40	58.9	9.8	32.1
59.1	63.0	40	58.8	9.5	31.2
64.3	69.9	40	65.7	46.5	152.4
64.7	70.3	40	66.0	50.5	165.8
65.1	71.4	40	67.2	66.0	216.5
63.0	67.0	40	62.7	23.8	77.9
61.3	66.9	40	62.7	23.3	76.5

AM Peak Hour

Int	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Name	Int	NBL	NBT	NBR	SBL	SBT	
1	777	0	1015	0	0	0	0	1593	0	0	897	0	Marsh & 101 NB	1	587	0	718	0	0	
2	0	0	0	1223	0	530	0	998	0	0	1471	0	Marsh & 101 SB	2	0	0	0	1273	0	
3	13	9	206	225	19	1	27	1175	7	470	1254	306	Marsh & Scott	3	15	7	423	268	8	
4	80	59	84	538	56	144	126	835	105	46	1037	428	Marsh & Bohannon	4	128	66	71	448	39	
5	40	19	236	147	64	2	0	849	86	312	781	53	Marsh & Bay	5	65	11	288	45	14	
6	1195	2217	72	349	458	175	214	490	306	37	83	72	Willow & Bayfront	6	583	737	34	82	2055	
7	264	79	94	30	167	465	149	1647	260	40	1355	7	Willow & Newbridge	7	196	311	96	28	171	
8	546	0	789	0	0	0	0	1238	544	1	1869	424	Willow & 101 NB	8	295	0	859	0	0	
9	0	0	0	621	0	401	0	1204	659	0	1446	884	Willow & 101 SB	9	0	0	0	630	0	
10	0	0	0	436	0	68	67	1359	0	0	1288	626	Willow & Bay	10	0	0	0	293	0	
11	59	11	148	68	9	32	22	1026	7	36	1006	108	Willow & Durham	11	21	7	43	132	1	
12	1	2	6	271	6	61	29	911	7	4	956	112	Willow & Coleman	12	15	4	6	103	2	
13	99	95	93	20	88	11	7	835	134	74	997	0	Willow & Gilbert	13	89	50	58	26	88	
14	113	430	179	434	438	25	35	283	130	379	131	493	Willow & Middlefield	14	107	501	208	355	511	
15	0	0	0	190	0	20	25	274	2	3	62	260	Willow & Laurel	15	0	0	0	318	0	
17	69	611	114	274	691	68	37	11	112	157	28	313	Ringwood & Middlefield	17	89	693	111	292	627	
18	237	122	20	103	182	43	13	523	84	18	557	21	Ravenswood & Laurel	18	268	124	46	65	158	
19	16	922	146	199	1810	85	8	54	12	74	15	146	Encinal & El Camino Real	19	31	1849	96	126	1358	
20	105	824	56	44	1223	573	261	149	112	85	268	38	Valparaiso & El Camino Real	20	97	1566	71	92	1089	
21	139	831	124	95	1280	74	101	211	93	117	242	46	Oak Grove & El Camino Real	21	108	1541	86	91	1104	
22	56	899	97	0	1428	104	113	77	215	154	40	31	Santa Cruz & El Camino Real	22	46	1515	55	0	1242	
23	120	879	472	146	1491	44	95	377	68	445	262	93	Ravenswood & El Camino Real	23	85	1210	361	214	1145	
24	210	1348	0	0	1886	94	229	0	322	0	0	0	Middle & El Camino Real	24	402	1961	0	0	1614	
25	134	99	39	69	52	63	157	404	117	47	529	63	Valparaiso & University	25	242	31	64	33	31	
26	305	0	150	0	0	0	0	467	436	73	299	0	Santa Cruz & University	26	331	0	143	0	0	
27	64	56	32	87	47	102	8	346	40	44	241	105	Middle & University	27	59	119	21	115	74	
28	108	609	414	229	688	229	321	1212	255	269	515	52	Sand Hill & Santa Cruz	28	219	849	174	101	621	
29	0	1	2	203	1	199	207	1562	5	10	705	149	Sand Hill & Sharon Park	29	8	1	15	174	1	
30	0	79	546	57	0	0	89	1761	0	0	0	0	Sand Hill & I-280 NB Off	30	0	26	190	67	0	

31	1	167	0	0	55	40	0	0	0	2	889	27	Sand Hill & I-280 NB On	31	4	32	0	0	62
32	0	925	594	640	595	0	0	0	0	78	0	218	Juniperos Serra & Alpine	32	0	610	147	319	802

PM Peak Hour

SBR	EBL	EBT	EBR	WBL	WBT	WBR
0	0	1924	0	0	1010	0
409	0	994	0	0	1026	0
6	37	1372	7	160	908	193
170	180	691	83	62	794	361
2	2	777	55	180	726	56
123	197	99	1136	159	242	134
265	362	1351	247	78	1258	27
0	0	1223	388	0	1376	495
378	0	1003	223	0	1018	670
53	26	1443	0	1	793	204
31	9	1124	4	29	645	18
37	15	788	5	2	811	100
5	3	751	94	54	787	10
18	33	234	215	375	111	375
3	23	321	0	0	82	237
28	53	32	99	71	0	244
28	103	559	146	38	487	38
11	22	11	15	99	3	247
250	321	155	78	74	187	50
100	141	195	159	148	236	87
118	174	47	195	69	48	37
77	65	316	93	424	317	87
100	184	0	242	0	0	0
68	36	387	104	63	428	36
0	0	358	342	111	412	0
125	68	262	37	13	269	159
179	379	580	192	312	920	186
169	179	945	6	11	1088	240
0	10	655	0	0	0	0

168	0	0	0	5	1852	8
0	0	0	0	383	0	580

AM Peak Hour

Int	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Name	Int	NBL	NBT	NBR	SBL	SBT	
1	772	0	1243	0	0	0	0	1861	0	0	940	0	Marsh & 101 NB	1	571	0	863	0	0	
2	0	0	0	1357	0	528	0	1051	0	0	1483	0	Marsh & 101 SB	2	0	0	0	1328	0	
3	13	4	68	373	19	0	41	1309	7	449	1249	340	Marsh & Scott	3	15	6	417	307	6	
4	38	22	25	634	74	228	234	955	126	29	1009	416	Marsh & Bohannon	4	127	82	40	488	34	
5	46	47	425	283	69	2	0	811	82	410	756	47	Marsh & Bay	5	65	75	297	71	22	
6	1186	2431	72	345	451	198	243	568	277	35	75	72	Willow & Bayfront	6	560	843	34	76	2209	
7	260	104	325	17	99	445	143	1877	403	40	1344	7	Willow & Newbridge	7	274	295	72	27	206	
8	406	0	790	0	0	0	0	1818	717	1	1811	425	Willow & 101 NB	8	363	0	860	0	0	
9	0	0	0	1158	0	397	0	1360	624	0	1287	849	Willow & 101 SB	9	0	0	0	796	0	
10	0	0	0	476	0	60	65	1391	0	0	1218	630	Willow & Bay	10	0	0	0	368	0	
11	59	12	349	68	14	33	23	914	7	36	925	108	Willow & Durham	11	21	7	30	141	27	
12	1	2	6	282	6	62	35	784	7	4	879	169	Willow & Coleman	12	15	4	6	158	2	
13	137	95	93	20	114	11	7	687	149	52	937	0	Willow & Gilbert	13	80	53	58	37	113	
14	131	387	170	325	330	20	27	281	157	375	143	427	Willow & Middlefield	14	138	463	184	277	643	
15	0	0	0	192	0	20	25	293	2	3	88	268	Willow & Laurel	15	0	0	0	347	0	
17	21	645	208	338	736	56	6	11	9	138	28	345	Ringwood & Middlefield	17	2	748	123	319	706	
18	185	102	20	169	195	38	12	450	68	25	528	31	Ravenswood & Laurel	18	240	169	36	73	204	
19	16	953	133	368	1734	85	8	54	12	73	15	146	Encinal & El Camino Real	19	31	1794	80	286	1404	
20	108	773	69	39	1150	580	241	158	112	85	282	25	Valparaiso & El Camino Real	20	96	1454	96	41	1144	
21	112	846	70	70	1224	61	79	181	72	113	263	47	Oak Grove & El Camino Real	21	82	1474	64	81	1198	
22	0	903	105	0	1364	79	80	72	193	60	43	31	Santa Cruz & El Camino Real	22	0	1450	63	0	1307	
23	96	891	460	133	1409	24	28	343	69	419	206	62	Ravenswood & El Camino Real	23	68	1148	336	182	1296	
24	298	1235	0	0	1743	95	227	0	319	0	0	0	Middle & El Camino Real	24	417	1842	0	0	1704	
25	276	99	44	69	52	63	157	403	161	47	549	63	Valparaiso & University	25	298	31	64	33	31	
26	328	0	171	0	0	0	0	409	537	73	264	0	Santa Cruz & University	26	331	0	157	0	0	
27	62	75	32	77	48	89	8	328	41	18	220	207	Middle & University	27	69	143	21	110	329	
28	133	777	412	207	673	216	289	1199	244	271	536	52	Sand Hill & Santa Cruz	28	195	879	180	117	813	
29	0	1	2	187	1	174	194	1501	5	10	725	155	Sand Hill & Sharon Park	29	8	1	15	170	1	
30	0	214	541	57	0	0	89	1787	0	0	0	0	Sand Hill & I-280 NB Off	30	0	28	138	67	0	

31	136	167	0	0	55	40	0	0	0	2	862	27	Sand Hill & I-280 NB On	31	6	32	0	0	62
32	0	949	593	645	565	0	0	0	0	78	0	388	Juniperos Serra & Alpine	32	0	630	146	423	845

PM Peak Hour

SBR	EBL	EBT	EBR	WBL	WBT	WBR
0	0	1934	0	0	1517	0
417	0	960	0	0	1195	0
4	49	1328	7	76	1032	266
226	287	676	53	13	998	355
2	2	746	59	401	726	66
353	203	95	1154	159	313	133
649	268	1398	324	78	1357	26
0	0	1360	434	0	1623	785
353	0	1005	199	0	1139	846
40	43	1293	0	1	798	280
38	9	1037	4	29	539	18
46	16	694	5	2	693	115
5	3	657	112	54	713	10
19	30	272	254	373	113	294
3	23	372	0	0	100	254
2	34	32	32	191	0	286
26	103	514	102	29	443	70
7	22	11	15	99	3	248
223	298	167	78	60	222	50
54	121	175	112	84	215	78
92	146	49	148	129	50	37
69	47	298	71	408	305	68
87	186	0	230	0	0	0
68	36	392	363	51	428	36
0	0	331	303	315	361	0
129	41	260	121	13	311	144
166	372	637	176	309	954	183
161	134	971	6	11	1087	240
0	10	675	0	0	0	0

168	0	0	0	5	1897	8
0	0	0	0	383	0	600

AM Peak Hour

Int	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Name	Int	NBL	NBT	NBR	SBL	SBT	
1	778	0	1243	0	0	0	0	1873	0	0	943	0	Marsh & 101 NB	1	588	0	863	0	0	
2	0	0	0	1357	0	547	0	1111	0	0	1492	0	Marsh & 101 SB	2	0	0	0	1328	0	
3	13	4	68	373	19	1	43	1389	7	449	1277	340	Marsh & Scott	3	15	6	417	307	6	
4	73	45	84	634	81	228	234	979	136	46	1021	416	Marsh & Bohannon	4	146	94	71	488	54	
5	46	47	432	283	69	2	0	838	82	435	779	47	Marsh & Bay	5	65	75	318	71	22	
6	1207	2431	72	345	451	201	249	573	306	35	79	72	Willow & Bayfront	6	584	843	34	76	2209	
7	264	104	325	18	100	452	149	1928	408	40	1381	7	Willow & Newbridge	7	279	296	72	27	207	
8	423	0	790	0	0	0	0	1898	748	1	1862	425	Willow & 101 NB	8	393	0	860	0	0	
9	0	0	0	1158	0	407	0	1471	660	0	1355	849	Willow & 101 SB	9	0	0	0	796	0	
10	0	0	0	496	0	68	67	1517	0	0	1289	637	Willow & Bay	10	0	0	0	379	0	
11	59	12	349	68	14	33	23	1042	7	36	1003	108	Willow & Durham	11	21	7	30	141	27	
12	1	2	6	282	6	62	35	912	7	4	957	169	Willow & Coleman	12	15	4	6	158	2	
13	137	95	93	20	114	11	7	815	149	52	1015	0	Willow & Gilbert	13	80	53	58	37	113	
14	131	427	172	424	403	22	28	293	157	380	149	494	Willow & Middlefield	14	138	524	189	355	694	
15	0	0	0	205	0	20	25	293	2	3	88	276	Willow & Laurel	15	0	0	0	358	0	
17	69	689	208	338	771	68	37	11	112	138	28	345	Ringwood & Middlefield	17	89	779	123	319	747	
18	237	102	20	169	195	38	12	484	84	25	558	31	Ravenswood & Laurel	18	268	169	36	73	204	
19	16	1086	134	368	1850	85	8	54	12	74	15	146	Encinal & El Camino Real	19	31	1915	81	286	1520	
20	108	895	69	40	1245	604	260	163	112	85	288	26	Valparaiso & El Camino Real	20	96	1556	96	42	1250	
21	139	944	75	77	1289	84	97	199	93	117	285	53	Oak Grove & El Camino Real	21	101	1548	68	86	1283	
22	56	1000	105	0	1430	104	113	72	245	60	43	31	Santa Cruz & El Camino Real	22	46	1519	63	0	1393	
23	120	997	472	144	1494	44	44	369	88	446	231	94	Ravenswood & El Camino Real	23	85	1227	360	209	1395	
24	305	1362	0	0	1869	100	243	0	341	0	0	0	Middle & El Camino Real	24	436	1952	0	0	1829	
25	278	99	45	69	52	63	157	404	164	47	550	63	Valparaiso & University	25	301	31	64	33	31	
26	334	0	171	0	0	0	0	456	556	73	287	0	Santa Cruz & University	26	347	0	157	0	0	
27	62	75	32	87	48	89	8	329	41	18	222	210	Middle & University	27	69	143	21	115	329	
28	143	793	415	207	687	229	326	1229	272	273	545	52	Sand Hill & Santa Cruz	28	219	892	183	117	829	
29	0	1	2	187	1	174	194	1596	5	10	757	155	Sand Hill & Sharon Park	29	8	1	15	170	1	
30	0	214	547	57	0	0	89	1798	0	0	0	0	Sand Hill & I-280 NB Off	30	0	28	155	67	0	

31	136	167	0	0	55	40	0	0	0	2	912	27	Sand Hill & I-280 NB On	31	6	32	0	0	62
32	0	969	595	672	581	0	0	0	0	78	0	396	Juniperos Serra & Alpine	32	0	646	147	438	865

PM Peak Hour

SBR	EBL	EBT	EBR	WBL	WBT	WBR
0	0	1940	0	0	1527	0
459	0	995	0	0	1221	0
6	50	1374	7	76	1100	266
226	287	692	82	62	1019	355
2	2	771	59	414	753	66
358	207	99	1178	159	317	133
656	275	1439	328	78	1401	27
0	0	1420	450	0	1691	785
379	0	1081	223	0	1238	846
44	49	1381	0	1	906	298
38	9	1132	4	29	651	18
46	16	789	5	2	805	115
5	3	752	112	54	825	10
20	32	281	254	376	125	380
3	23	372	0	0	100	267
28	53	32	99	191	0	286
26	103	545	146	29	473	70
7	22	11	15	99	3	248
240	320	172	78	60	226	51
70	142	196	137	89	231	85
121	174	49	202	129	50	37
83	65	323	93	425	328	86
100	194	0	242	0	0	0
68	36	393	365	52	429	36
0	0	359	313	315	402	0
129	41	262	121	13	312	153
198	392	653	192	312	979	183
161	134	1024	6	11	1168	240
0	10	700	0	0	0	0

168	0	0	0	5	1925	8
0	0	0	0	384	0	623

AM Peak Hour

Int	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Name	Int	NBL	NBT	NBR	SBL	SBT	
1	771	0	1241	0	0	0	0	1858	0	0	939	0	Marsh & 101 NB	1	570	0	862	0	0	
2	0	0	0	1355	0	527	0	1049	0	0	1481	0	Marsh & 101 SB	2	0	0	0	1326	0	
3	13	4	68	372	19	0	41	1307	7	448	1247	339	Marsh & Scott	3	15	6	416	307	6	
4	38	22	25	633	74	228	234	954	126	29	1007	415	Marsh & Bohannon	4	127	82	40	487	34	
5	46	47	424	283	69	2	0	810	82	409	755	47	Marsh & Bay	5	65	75	297	71	22	
6	1184	2427	72	344	450	198	243	567	277	35	75	72	Willow & Bayfront	6	559	842	34	76	2206	
7	260	104	325	17	99	444	143	1874	402	40	1342	7	Willow & Newbridge	7	274	295	72	27	206	
8	405	0	789	0	0	0	0	1815	716	1	1808	424	Willow & 101 NB	8	362	0	859	0	0	
9	0	0	0	1156	0	396	0	1358	623	0	1285	848	Willow & 101 SB	9	0	0	0	795	0	
10	0	0	0	475	0	60	65	1389	0	0	1216	629	Willow & Bay	10	0	0	0	367	0	
11	59	12	348	68	14	33	23	913	7	36	924	108	Willow & Durham	11	21	7	30	141	27	
12	1	2	6	282	6	62	35	783	7	4	878	169	Willow & Coleman	12	15	4	6	158	2	
13	137	95	93	20	114	11	7	686	149	52	936	0	Willow & Gilbert	13	80	53	58	37	113	
14	131	386	170	325	330	20	27	281	157	374	143	426	Willow & Middlefield	14	138	462	184	277	642	
15	0	0	0	192	0	20	25	293	2	3	88	268	Willow & Laurel	15	0	0	0	346	0	
17	21	644	208	337	735	56	6	11	9	138	28	344	Ringwood & Middlefield	17	2	747	123	319	705	
18	185	102	20	169	195	38	12	449	68	25	527	31	Ravenswood & Laurel	18	240	169	36	73	204	
19	16	952	133	367	1731	85	8	54	12	73	15	146	Encinal & El Camino Real	19	31	1791	80	286	1402	
20	108	772	69	39	1148	579	241	158	112	85	282	25	Valparaiso & El Camino Real	20	96	1452	96	41	1142	
21	112	845	70	70	1222	61	79	181	72	113	263	47	Oak Grove & El Camino Real	21	82	1472	64	81	1196	
22	0	902	105	0	1362	79	80	72	193	60	43	31	Santa Cruz & El Camino Real	22	0	1448	63	0	1305	
23	96	890	459	133	1407	24	28	342	69	418	206	62	Ravenswood & El Camino Real	23	68	1146	335	182	1294	
24	298	1233	0	0	1740	95	227	0	319	0	0	0	Middle & El Camino Real	24	416	1839	0	0	1701	
25	276	99	44	69	52	63	157	402	161	47	548	63	Valparaiso & University	25	298	31	64	33	31	
26	328	0	171	0	0	0	0	408	536	73	264	0	Santa Cruz & University	26	331	0	157	0	0	
27	62	75	32	77	48	89	8	328	41	18	220	207	Middle & University	27	69	143	21	110	329	
28	133	776	411	207	672	216	289	1197	244	271	535	52	Sand Hill & Santa Cruz	28	195	878	180	117	812	
29	0	1	2	187	1	174	194	1499	5	10	724	155	Sand Hill & Sharon Park	29	8	1	15	170	1	
30	0	214	540	57	0	0	89	1784	0	0	0	0	Sand Hill & I-280 NB Off	30	0	28	138	67	0	

31	136	167	0	0	55	40	0	0	0	2	861	27	Sand Hill & I-280 NB On	31	6	32	0	0	62
32	0	948	592	644	564	0	0	0	0	78	0	387	Juniperos Serra & Alpine	32	0	629	146	422	844

PM Peak Hour

SBR	EBL	EBT	EBR	WBL	WBT	WBR
0	0	1931	0	0	1515	0
416	0	959	0	0	1193	0
4	49	1326	7	76	1030	266
226	287	675	53	13	997	354
2	2	745	59	400	725	66
352	203	95	1152	159	313	133
648	268	1396	324	78	1355	26
0	0	1358	433	0	1621	784
352	0	1003	199	0	1137	845
40	43	1291	0	1	797	280
38	9	1035	4	29	538	18
46	16	693	5	2	692	115
5	3	656	112	54	712	10
19	30	272	254	372	113	294
3	23	371	0	0	100	254
2	34	32	32	191	0	286
26	103	513	102	29	442	70
7	22	11	15	99	3	248
223	298	167	78	60	222	50
54	121	175	112	84	215	78
92	146	49	148	129	50	37
69	47	298	71	407	305	68
87	186	0	230	0	0	0
68	36	391	362	51	427	36
0	0	331	303	315	360	0
129	41	260	121	13	311	144
166	371	636	176	309	953	183
161	134	970	6	11	1085	240
0	10	674	0	0	0	0

168	0	0	0	5	1894	8
0	0	0	0	382	0	599

	AM Peak Hour													PM Peak Hour												
Int	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Name	Int	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	777	0	1241	0	0	0	0	1870	0	0	942	0	Marsh & 101 NB	1	587	0	862	0	0	0	0	1937	0	0	1525	0
2	0	0	0	1355	0	547	0	1110	0	0	1490	0	Marsh & 101 SB	2	0	0	0	1326	0	459	0	995	0	0	1219	0
3	13	4	68	372	19	1	43	1388	7	448	1276	339	Marsh & Scott	3	15	6	416	307	6	6	50	1373	7	76	1099	266
4	73	45	84	633	81	228	234	979	136	46	1020	415	Marsh & Bohannon	4	146	94	71	487	54	226	287	692	82	62	1019	354
5	46	47	431	283	69	2	0	838	82	434	779	47	Marsh & Bay	5	65	75	318	71	22	2	2	771	59	413	753	66
6	1208	2427	72	344	450	201	249	572	308	35	79	72	Willow & Bayfront	6	585	842	34	76	2206	357	207	99	1179	159	317	133
7	264	104	325	18	100	451	149	1929	407	40	1383	7	Willow & Newbridge	7	279	296	72	27	207	655	275	1441	328	78	1402	27
8	424	0	789	0	0	0	0	1900	749	1	1864	424	Willow & 101 NB	8	394	0	859	0	0	0	0	1423	450	0	1694	784
9	0	0	0	1156	0	406	0	1476	661	0	1360	848	Willow & 101 SB	9	0	0	0	795	0	379	0	1085	225	0	1243	845
10	0	0	0	495	0	68	67	1525	0	0	1295	636	Willow & Bay	10	0	0	0	378	0	44	49	1387	0	1	913	298
11	59	12	348	68	14	33	23	1051	7	36	1010	108	Willow & Durham	11	21	7	30	141	27	38	9	1138	4	29	658	18
12	1	2	6	282	6	62	35	921	7	4	964	169	Willow & Coleman	12	15	4	6	158	2	46	16	796	5	2	812	115
13	137	95	93	20	114	11	7	824	149	52	1022	0	Willow & Gilbert	13	80	53	58	37	113	5	3	759	112	54	832	10
14	131	430	172	430	407	22	28	293	157	380	149	501	Willow & Middlefield	14	138	527	189	362	697	20	32	281	254	375	125	385
15	0	0	0	205	0	20	25	293	2	3	88	276	Willow & Laurel	15	0	0	0	357	0	3	23	371	0	0	100	267
17	70	697	208	337	778	68	37	11	114	138	28	344	Ringwood & Middlefield	17	90	785	123	319	755	28	53	32	101	191	0	286
18	237	102	20	169	195	38	12	485	84	25	558	31	Ravenswood & Laurel	18	268	169	36	73	204	26	103	546	146	29	473	70
19	16	1097	135	367	1862	85	8	54	12	75	15	146	Encinal & El Camino Real	19	31	1926	82	286	1529	7	22	11	15	99	3	248
20	108	910	69	41	1256	607	264	164	112	85	289	27	Valparaiso & El Camino Real	20	96	1566	96	43	1263	243	324	173	78	60	227	52
21	143	954	76	79	1295	87	99	201	96	118	288	55	Oak Grove & El Camino Real	21	103	1554	69	88	1292	72	145	199	140	90	233	87
22	60	1014	105	0	1440	104	114	72	248	60	43	31	Santa Cruz & El Camino Real	22	49	1527	63	0	1405	122	175	49	206	129	50	37
23	120	1013	471	145	1506	44	44	369	88	445	231	95	Ravenswood & El Camino Real	23	85	1237	359	210	1410	83	65	323	93	424	329	87
24	305	1377	0	0	1880	100	243	0	342	0	0	0	Middle & El Camino Real	24	436	1961	0	0	1843	100	194	0	242	0	0	0
25	278	99	45	69	52	63	157	404	164	47	550	63	Valparaiso & University	25	301	31	64	33	31	68	36	393	364	52	429	36
26	334	0	171	0	0	0	0	458	556	73	288	0	Santa Cruz & University	26	348	0	157	0	0	0	0	361	314	315	404	0
27	62	75	32	88	48	89	8	329	41	18	222	210	Middle & University	27	69	143	21	115	329	129	41	262	121	13	312	154
28	143	794	415	207	687	229	326	1227	272	273	544	52	Sand Hill & Santa Cruz	28	219	892	183	117	829	198	391	652	192	313	978	183
29	0	1	2	187	1	174	194	1594	5	10	756	155	Sand Hill & Sharon Park	29	8	1	15	170	1	161	134	1023	6	11	1166	240
30	0	214	546	57	0	0	89	1795	0	0	0	0	Sand Hill & I-280 NB Off	30	0	28	155	67	0	0	10	699	0	0	0	0
31	136	167	0	0	55	40	0	0	0	2	911	27	Sand Hill & I-280 NB On	31	6	32	0	0	62	168	0	0	0	5	1922	8
32	0	970	594	671	582	0	0	0	0	78	0	395	Juniperos Serra & Alpine	32	0	647	147	437	866	0	0	0	0	383	0	622

	AM Peak Hour													PM Peak Hour												
Int	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Name	Int	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
1	771	0	1241	0	0	0	0	1858	0	0	939	0	Marsh & 1(	1	570	0	862	0	0	0	0	1931	0	0	1515	0
2	0	0	0	1355	0	527	0	1049	0	0	1481	0	Marsh & 1(	2	0	0	0	1326	0	416	0	959	0	0	1193	0
3	13	4	68	372	19	0	41	1307	7	448	1247	339	Marsh & Sc	3	15	6	416	307	6	4	49	1326	7	76	1030	266
4	38	22	25	633	74	228	234	954	126	29	1007	415	Marsh & Bo	4	127	82	40	487	34	226	287	675	53	13	997	354
5	46	47	424	283	69	2	0	810	82	409	755	47	Marsh & Ba	5	65	75	297	71	22	2	2	745	59	400	725	66
6	1184	2427	72	344	450	198	243	567	277	35	75	72	Willow & B	6	559	842	34	76	2206	352	203	95	1152	159	313	133
7	260	104	325	17	99	444	143	1874	402	40	1342	7	Willow & N	7	274	295	72	27	206	648	268	1396	324	78	1355	26
8	405	0	789	0	0	0	0	1815	716	1	1808	424	Willow & 1	8	362	0	859	0	0	0	0	1358	433	0	1621	784
9	0	0	0	1156	0	396	0	1358	623	0	1285	848	Willow & 1	9	0	0	0	795	0	352	0	1003	199	0	1137	845
10	0	0	0	475	0	60	65	1389	0	0	1216	629	Willow & B	10	0	0	0	367	0	40	43	1291	0	1	797	280
11	59	12	348	68	14	33	23	913	7	36	924	108	Willow & D	11	21	7	30	141	27	38	9	1035	4	29	538	18
12	1	2	6	282	6	62	35	783	7	4	878	169	Willow & C	12	15	4	6	158	2	46	16	693	5	2	692	115
13	137	95	93	20	114	11	7	686	149	52	936	0	Willow & G	13	80	53	58	37	113	5	3	656	112	54	712	10
14	131	386	170	325	330	20	27	281	157	374	143	426	Willow & N	14	138	462	184	277	642	19	30	272	254	372	113	294
15	0	0	0	192	0	20	25	293	2	3	88	268	Willow & L	15	0	0	0	346	0	3	23	371	0	0	100	254
17	21	644	208	337	735	56	6	11	9	138	28	344	Ringwood	17	2	747	123	319	705	2	34	32	32	191	0	286
18	185	102	20	169	195	38	12	449	68	25	527	31	Ravenswoc	18	240	169	36	73	204	26	103	513	102	29	442	70
19	16	952	133	367	1731	85	8	54	12	73	15	146	Encinal & E	19	31	1791	80	286	1402	7	22	11	15	99	3	248
20	108	772	69	39	1148	579	241	158	112	85	282	25	Valparaiso	20	96	1452	96	41	1142	223	298	167	78	60	222	50
21	112	845	70	70	1222	61	79	181	72	113	263	47	Oak Grove	21	82	1472	64	81	1196	54	121	175	112	84	215	78
22	0	902	105	0	1362	79	80	72	193	60	43	31	Santa Cruz	22	0	1448	63	0	1305	92	146	49	148	129	50	37
23	96	890	459	133	1407	24	28	342	69	418	206	62	Ravenswoc	23	68	1146	335	182	1294	69	47	298	71	407	305	68
24	298	1233	0	0	1740	95	227	0	319	0	0	0	Middle & E	24	416	1839	0	0	1701	87	186	0	230	0	0	0
25	276	99	44	69	52	63	157	402	161	47	548	63	Valparaiso	25	298	31	64	33	31	68	36	391	362	51	427	36
26	328	0	171	0	0	0	0	408	536	73	264	0	Santa Cruz	26	331	0	157	0	0	0	0	331	303	315	360	0
27	62	75	32	77	48	89	8	328	41	18	220	207	Middle & L	27	69	143	21	110	329	129	41	260	121	13	311	144
28	133	776	411	207	672	216	289	1197	244	271	535	52	Sand Hill &	28	195	878	180	117	812	166	371	636	176	309	953	183
29	0	1	2	187	1	174	194	1499	5	10	724	155	Sand Hill &	29	8	1	15	170	1	161	134	970	6	11	1085	240
30	0	214	540	57	0	0	89	1784	0	0	0	0	Sand Hill &	30	0	28	138	67	0	0	10	674	0	0	0	0
31	136	167	0	0	55	40	0	0	0	2	861	27	Sand Hill &	31	6	32	0	0	62	168	0	0	0	5	1894	8
32	0	948	592	644	564	0	0	0	0	78	0	387	Juniperos S	32	0	629	146	422	844	0	0	0	0	382	0	599

2040 Baseline

ROAD SEGMENT			TOTAL # VEHICLES	VEHICLE TYPE %						VEHICLE SPEED						NOISE LEVEL (d	
				Auto		MT		HT		Auto	k/h	MT	k/h	HT	k/h	Auto	MT
Calveno Peak	from:	to:		%	Auto	%	MT	%	HT								
Marsh	Scott	Bohannon	2566	97	2489.02	2	51.32	1	25.66	35	56	35	56	35	56	68.3	61.1
Marsh	Bohannon	Bay	2304	97	2234.88	2	46.08	1	23.04	35	56	35	56	35	56	67.8	60.7
Willow	Hamilton	Newbridge	2954	97	2865.38	2	59.08	1	29.54	35	56	35	56	35	56	68.9	61.7
Willow	Newbridge	U.S. 101	4622	97	4483.34	2	92.44	1	46.22	35	56	35	56	35	56	70.8	63.7
Willow	U.S. 101	Durham	1791	97	1737.27	2	35.82	1	17.91	25	40	25	40	25	40	62.5	57.3
Willow	Durham	Coleman	1666	97	1616.02	2	33.32	1	16.66	25	40	25	40	25	40	62.2	57.0
Willow	Gilbert	Middlefield	1512	97	1466.64	2	30.24	1	15.12	25	40	25	40	25	40	61.8	56.6
Willow	Middlefield	Laurel	1071	97	1038.87	2	21.42	1	10.71	25	40	25	40	25	40	60.3	55.1
Middlefield	Willow	Ringwood	1724	97	1672.28	2	34.48	1	17.24	35	56	35	56	35	56	66.5	59.4
Middlefield	Ringwood	Oak Grove	2093	97	2030.21	2	41.86	1	20.93	35	56	35	56	35	56	67.4	60.3
Ravenswood	Middlefield	Laurel	1163	97	1128.11	2	23.26	1	11.63	25	40	25	40	25	40	60.6	55.4
Ravenswood	Laurel	Alma	1426	97	1383.22	2	28.52	1	14.26	25	40	25	40	25	40	61.5	56.3
ECR	Allejandra	Encinal	3756	97	3643.32	2	75.12	1	37.56	35	56	35	56	35	56	69.9	62.8
ECR	Encinal	Valparaiso	3206	97	3109.82	2	64.12	1	32.06	35	56	35	56	35	56	69.2	62.1
ECR	Valparaiso	Oak Grove	3002	97	2911.94	2	60.04	1	30.02	35	56	35	56	35	56	69.0	61.8
ECR	Oak Grove	Santa Cruz	3028	97	2937.16	2	60.56	1	30.28	35	56	35	56	35	56	69.0	61.9
ECR	Santa Cruz	Ravenswood	2806	97	2721.82	2	56.12	1	28.06	35	56	35	56	35	56	68.7	61.5
ECR	Ravenswood	Middle	3813	97	3698.61	2	76.26	1	38.13	35	56	35	56	35	56	70.0	62.9
Encinal	ECR	Laurel	727	97	705.19	2	14.54	1	7.27	25	40	25	40	25	40	58.6	53.4
Valparaiso	ECR	University	1084	97	1051.48	2	21.68	1	10.84	30	48	30	48	30	48	62.6	56.3
Glenwood	ECR	Middlefield	636	97	616.92	2	12.72	1	6.36	25	40	25	40	25	40	58.0	52.8
Oak Grove	ECR	University	759	97	736.23	2	15.18	1	7.59	25	40	25	40	25	40	58.8	53.6
Oak Grove	ECR	Middlefield	697	97	676.09	2	13.94	1	6.97	25	40	25	40	25	40	58.4	53.2
Ravenswood	ECR	Laurel	1595	97	1547.15	2	31.9	1	15.95	25	40	25	40	25	40	62.0	56.8
Menlo	ECR	Chestnut	858	97	832.26	2	17.16	1	8.58	25	40	25	40	25	40	59.3	54.1
Middle	ECR	University	919	97	891.43	2	18.38	1	9.19	25	40	25	40	25	40	59.6	54.4
Sand Hill	Oak	Santa Cruz	2378	97	2306.66	2	47.56	1	23.78	35	56	35	56	35	56	67.9	60.8
Sand Hill	Santa Cruz	Sharon Park	2491	97	2416.27	2	49.82	1	24.91	35	56	35	56	35	56	68.1	61.0
Sand Hill	Sharon Park	I-280	2364	97	2293.08	2	47.28	1	23.64	40	64	40	64	40	64	69.6	61.7
Santa Cruz	Sand Hill	Alameda	2527	97	2451.19	2	50.54	1	25.27	25	40	25	40	25	40	64.0	58.8
Alpine	JSB	Bishop	1157	97	1122.29	2	23.14	1	11.57	35	56	35	56	35	56	64.8	57.7

BA) HT	CALCULATED NOISE LEVEL (15 meters from roadway center)	Receptor Dist. from Roadway Center (m.)	Adjusted Noise Level (dBA)	Distance from Roadway t 65 dBA (m.)	Distance from Roadway to 65 dBA (ft)
64.8	70.4	40	66.2	52.4	172.1
64.4	70.0	40	65.7	47.1	154.5
65.4	71.0	40	66.8	60.4	198.1
67.4	73.0	40	68.7	94.5	310.0
61.9	65.9	40	61.6	18.4	60.3
61.6	65.6	40	61.3	17.1	56.1
61.2	65.1	40	60.9	15.5	50.9
59.7	63.6	40	59.4	11.0	36.1
63.1	68.7	40	64.4	35.2	115.6
64.0	69.6	40	65.3	42.8	140.4
60.1	64.0	40	59.7	11.9	39.2
60.9	64.9	40	60.6	14.6	48.0
66.5	72.1	40	67.8	76.8	251.9
65.8	71.4	40	67.1	65.5	215.0
65.5	71.1	40	66.9	61.4	201.3
65.6	71.2	40	66.9	61.9	203.1
65.2	70.8	40	66.6	57.4	188.2
66.6	72.2	40	67.9	77.9	255.7
58.0	62.0	40	57.7	7.5	24.5
60.5	65.3	40	61.0	16.0	52.4
57.4	61.4	40	57.1	6.5	21.4
58.2	62.2	40	57.9	7.8	25.6
57.8	61.8	40	57.5	7.2	23.5
61.4	65.4	40	61.1	16.4	53.7
58.7	62.7	40	58.4	8.8	28.9
59.0	63.0	40	58.7	9.4	30.9
64.5	70.1	40	65.8	48.6	159.5
64.7	70.3	40	66.0	50.9	167.1
65.0	71.4	40	67.1	65.1	213.7
63.4	67.4	40	63.1	25.9	85.1
61.4	67.0	40	62.7	23.6	77.6

2040 Baseline + HEU

ROAD SEGMENT			TOTAL # VEHICLES	VEHICLE TYPE %						VEHICLE SPEED						NOISE LEVEL (d	
				Auto		MT		HT		Auto	k/h	MT	k/h	HT	k/h	Auto	MT
Calveno Peak	from:	to:		%	Auto	%	MT	%	HT								
Marsh	Scott	Bohannon	2685	97	2604.45	2	53.7	1	26.85	35	56	35	56	35	56	68.5	61.3
Marsh	Bohannon	Bay	2392	97	2320.24	2	47.84	1	23.92	35	56	35	56	35	56	68.0	60.8
Willow	Hamilton	Newbridge	3047	97	2955.59	2	60.94	1	30.47	35	56	35	56	35	56	69.0	61.9
Willow	Newbridge	U.S. 101	4760	97	4617.2	2	95.2	1	47.6	35	56	35	56	35	56	71.0	63.8
Willow	U.S. 101	Durham	2014	97	1953.58	2	40.28	1	20.14	25	40	25	40	25	40	63.0	57.8
Willow	Durham	Coleman	1889	97	1832.33	2	37.78	1	18.89	25	40	25	40	25	40	62.7	57.5
Willow	Gilbert	Middlefield	1717	97	1665.49	2	34.34	1	17.17	25	40	25	40	25	40	62.3	57.1
Willow	Middlefield	Laurel	1095	97	1062.15	2	21.9	1	10.95	25	40	25	40	25	40	60.4	55.2
Middlefield	Willow	Ringwood	2023	97	1962.31	2	40.46	1	20.23	35	56	35	56	35	56	67.2	60.1
Middlefield	Ringwood	Oak Grove	2226	97	2159.22	2	44.52	1	22.26	35	56	35	56	35	56	67.7	60.5
Ravenswood	Middlefield	Laurel	1227	97	1190.19	2	24.54	1	12.27	25	40	25	40	25	40	60.9	55.7
Ravenswood	Laurel	Alma	1562	97	1515.14	2	31.24	1	15.62	25	40	25	40	25	40	61.9	56.7
ECR	Allejandra	Encinal	4018	97	3897.46	2	80.36	1	40.18	35	56	35	56	35	56	70.2	63.1
ECR	Encinal	Valparaiso	3491	97	3386.27	2	69.82	1	34.91	35	56	35	56	35	56	69.6	62.5
ECR	Valparaiso	Oak Grove	3238	97	3140.86	2	64.76	1	32.38	35	56	35	56	35	56	69.3	62.1
ECR	Oak Grove	Santa Cruz	3266	97	3168.02	2	65.32	1	32.66	35	56	35	56	35	56	69.3	62.2
ECR	Santa Cruz	Ravenswood	3092	97	2999.24	2	61.84	1	30.92	35	56	35	56	35	56	69.1	61.9
ECR	Ravenswood	Middle	4098	97	3975.06	2	81.96	1	40.98	35	56	35	56	35	56	70.3	63.2
Encinal	ECR	Laurel	729	97	707.13	2	14.58	1	7.29	25	40	25	40	25	40	58.6	53.4
Valparaiso	ECR	University	1141	97	1106.77	2	22.82	1	11.41	30	48	30	48	30	48	62.8	56.6
Glenwood	ECR	Middlefield	651	97	631.47	2	13.02	1	6.51	25	40	25	40	25	40	58.1	52.9
Oak Grove	ECR	University	892	97	865.24	2	17.84	1	8.92	25	40	25	40	25	40	59.5	54.3
Oak Grove	ECR	Middlefield	766	97	743.02	2	15.32	1	7.66	25	40	25	40	25	40	58.8	53.6
Ravenswood	ECR	Laurel	1732	97	1680.04	2	34.64	1	17.32	25	40	25	40	25	40	62.4	57.1
Menlo	ECR	Chestnut	978	97	948.66	2	19.56	1	9.78	25	40	25	40	25	40	59.9	54.7
Middle	ECR	University	972	97	942.84	2	19.44	1	9.72	25	40	25	40	25	40	59.8	54.6
Sand Hill	Oak	Santa Cruz	2426	97	2353.22	2	48.52	1	24.26	35	56	35	56	35	56	68.0	60.9
Sand Hill	Santa Cruz	Sharon Park	2625	97	2546.25	2	52.5	1	26.25	35	56	35	56	35	56	68.4	61.2
Sand Hill	Sharon Park	I-280	2498	97	2423.06	2	49.96	1	24.98	40	64	40	64	40	64	69.8	61.9
Santa Cruz	Sand Hill	Alameda	2610	97	2531.7	2	52.2	1	26.1	25	40	25	40	25	40	64.1	58.9
Alpine	JSB	Bishop	1177	97	1141.69	2	23.54	1	11.77	35	56	35	56	35	56	64.9	57.8

Assumptions: PM peak hour traffic data from Hexagon

BA) HT	CALCULATED NOISE LEVEL (15 meters from roadway center)	Receptor Dist. from Roadway Center (m.)	Adjusted Noise Level (dBA)	Distance from Roadway t 65 dBA (m.)	Distance from Roadway to 65 dBA (ft)
65.0	70.6	40	66.4	54.9	180.1
64.5	70.1	40	65.9	48.9	160.4
65.6	71.2	40	66.9	62.3	204.3
67.5	73.1	40	68.9	97.3	319.2
62.4	66.4	40	62.1	20.7	67.8
62.2	66.1	40	61.9	19.4	63.6
61.7	65.7	40	61.4	17.6	57.8
59.8	63.7	40	59.5	11.2	36.9
63.8	69.4	40	65.1	41.4	135.7
64.2	69.8	40	65.6	45.5	149.3
60.3	64.2	40	60.0	12.6	41.3
61.3	65.3	40	61.0	16.0	52.6
66.8	72.4	40	68.1	82.1	269.5
66.2	71.8	40	67.5	71.4	234.1
65.8	71.4	40	67.2	66.2	217.2
65.9	71.5	40	67.2	66.8	219.0
65.6	71.2	40	67.0	63.2	207.4
66.9	72.5	40	68.2	83.8	274.8
58.0	62.0	40	57.7	7.5	24.5
60.7	65.5	40	61.2	16.8	55.2
57.5	61.5	40	57.2	6.7	21.9
58.9	62.9	40	58.6	9.2	30.0
58.2	62.2	40	57.9	7.9	25.8
61.8	65.7	40	61.5	17.8	58.3
59.3	63.3	40	59.0	10.0	32.9
59.3	63.2	40	59.0	10.0	32.7
64.6	70.2	40	65.9	49.6	162.7
64.9	70.5	40	66.3	53.7	176.0
65.3	71.6	40	67.4	68.8	225.8
63.6	67.5	40	63.3	26.8	87.9
61.5	67.1	40	62.8	24.1	78.9

AM Peak Hour

Int	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Name	Int	NBL	NBT	NBR	SBL	SBT	
1	777	0	1241	0	0	0	0	1870	0	0	942	0	Marsh & 101 NB	1	587	0	862	0	0	
2	0	0	0	1355	0	547	0	1110	0	0	1490	0	Marsh & 101 SB	2	0	0	0	1326	0	
3	13	4	68	372	19	1	43	1388	7	448	1276	339	Marsh & Scott	3	15	6	416	307	6	
4	73	45	84	633	81	228	234	979	136	46	1020	415	Marsh & Bohannon	4	146	94	71	487	54	
5	46	47	431	283	69	2	0	838	82	434	779	47	Marsh & Bay	5	65	75	318	71	22	
6	1208	2427	72	344	450	201	249	572	308	35	79	72	Willow & Bayfront	6	585	842	34	76	2206	
7	264	104	325	18	100	451	149	1929	407	40	1383	7	Willow & Newbridge	7	279	296	72	27	207	
8	424	0	789	0	0	0	0	1900	749	1	1864	424	Willow & 101 NB	8	394	0	859	0	0	
9	0	0	0	1156	0	406	0	1476	661	0	1360	848	Willow & 101 SB	9	0	0	0	795	0	
10	0	0	0	495	0	68	67	1525	0	0	1295	636	Willow & Bay	10	0	0	0	378	0	
11	59	12	348	68	14	33	23	1051	7	36	1010	108	Willow & Durham	11	21	7	30	141	27	
12	1	2	6	282	6	62	35	921	7	4	964	169	Willow & Coleman	12	15	4	6	158	2	
13	137	95	93	20	114	11	7	824	149	52	1022	0	Willow & Gilbert	13	80	53	58	37	113	
14	131	430	172	430	407	22	28	293	157	380	149	501	Willow & Middlefield	14	138	527	189	362	697	
15	0	0	0	205	0	20	25	293	2	3	88	276	Willow & Laurel	15	0	0	0	357	0	
17	70	697	208	337	778	68	37	11	114	138	28	344	Ringwood & Middlefield	17	90	785	123	319	755	
18	237	102	20	169	195	38	12	485	84	25	558	31	Ravenswood & Laurel	18	268	169	36	73	204	
19	16	1097	135	367	1862	85	8	54	12	75	15	146	Encinal & El Camino Real	19	31	1926	82	286	1529	
20	108	910	69	41	1256	607	264	164	112	85	289	27	Valparaiso & El Camino Real	20	96	1566	96	43	1263	
21	143	954	76	79	1295	87	99	201	96	118	288	55	Oak Grove & El Camino Real	21	103	1554	69	88	1292	
22	60	1014	105	0	1440	104	114	72	248	60	43	31	Santa Cruz & El Camino Real	22	49	1527	63	0	1405	
23	120	1013	471	145	1506	44	44	369	88	445	231	95	Ravenswood & El Camino Real	23	85	1237	359	210	1410	
24	305	1377	0	0	1880	100	243	0	342	0	0	0	Middle & El Camino Real	24	436	1961	0	0	1843	
25	278	99	45	69	52	63	157	404	164	47	550	63	Valparaiso & University	25	301	31	64	33	31	
26	334	0	171	0	0	0	0	458	556	73	288	0	Santa Cruz & University	26	348	0	157	0	0	
27	62	75	32	88	48	89	8	329	41	18	222	210	Middle & University	27	69	143	21	115	329	
28	143	794	415	207	687	229	326	1227	272	273	544	52	Sand Hill & Santa Cruz	28	219	892	183	117	829	
29	0	1	2	187	1	174	194	1594	5	10	756	155	Sand Hill & Sharon Park	29	8	1	15	170	1	
30	0	214	546	57	0	0	89	1795	0	0	0	0	Sand Hill & I-280 NB Off	30	0	28	155	67	0	

31	136	167	0	0	55	40	0	0	0	2	911	27	Sand Hill & I-280 NB On	31	6	32	0	0	62
32	0	970	594	671	582	0	0	0	0	78	0	395	Juniperos Serra & Alpine	32	0	647	147	437	866

PM Peak Hour

SBR	EBL	EBT	EBR	WBL	WBT	WBR
0	0	1937	0	0	1525	0
459	0	995	0	0	1219	0
6	50	1373	7	76	1099	266
226	287	692	82	62	1019	354
2	2	771	59	413	753	66
357	207	99	1179	159	317	133
655	275	1441	328	78	1402	27
0	0	1423	450	0	1694	784
379	0	1085	225	0	1243	845
44	49	1387	0	1	913	298
38	9	1138	4	29	658	18
46	16	796	5	2	812	115
5	3	759	112	54	832	10
20	32	281	254	375	125	385
3	23	371	0	0	100	267
28	53	32	101	191	0	286
26	103	546	146	29	473	70
7	22	11	15	99	3	248
243	324	173	78	60	227	52
72	145	199	140	90	233	87
122	175	49	206	129	50	37
83	65	323	93	424	329	87
100	194	0	242	0	0	0
68	36	393	364	52	429	36
0	0	361	314	315	404	0
129	41	262	121	13	312	154
198	391	652	192	313	978	183
161	134	1023	6	11	1166	240
0	10	699	0	0	0	0

168	0	0	0	5	1922	8
0	0	0	0	383	0	622

AM Peak Hour

Int	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Name	Int	NBL	NBT	NBR	SBL	SBT	
1	772	0	1243	0	0	0	0	1861	0	0	940	0	Marsh & 101 NB	1	571	0	863	0	0	
2	0	0	0	1357	0	528	0	1051	0	0	1483	0	Marsh & 101 SB	2	0	0	0	1328	0	
3	13	4	68	373	19	0	41	1309	7	449	1249	340	Marsh & Scott	3	15	6	417	307	6	
4	38	22	25	634	74	228	234	955	126	29	1009	416	Marsh & Bohannon	4	127	82	40	488	34	
5	46	47	425	283	69	2	0	811	82	410	756	47	Marsh & Bay	5	65	75	297	71	22	
6	1186	2431	72	345	451	198	243	568	277	35	75	72	Willow & Bayfront	6	560	843	34	76	2209	
7	260	104	325	17	99	445	143	1877	403	40	1344	7	Willow & Newbridge	7	274	295	72	27	206	
8	406	0	790	0	0	0	0	1818	717	1	1811	425	Willow & 101 NB	8	363	0	860	0	0	
9	0	0	0	1158	0	397	0	1360	624	0	1287	849	Willow & 101 SB	9	0	0	0	796	0	
10	0	0	0	476	0	60	65	1391	0	0	1218	630	Willow & Bay	10	0	0	0	368	0	
11	59	12	349	68	14	33	23	914	7	36	925	108	Willow & Durham	11	21	7	30	141	27	
12	1	2	6	282	6	62	35	784	7	4	879	169	Willow & Coleman	12	15	4	6	158	2	
13	137	95	93	20	114	11	7	687	149	52	937	0	Willow & Gilbert	13	80	53	58	37	113	
14	131	387	170	325	330	20	27	281	157	375	143	427	Willow & Middlefield	14	138	463	184	277	643	
15	0	0	0	192	0	20	25	293	2	3	88	268	Willow & Laurel	15	0	0	0	347	0	
17	21	645	208	338	736	56	6	11	9	138	28	345	Ringwood & Middlefield	17	2	748	123	319	706	
18	185	102	20	169	195	38	12	450	68	25	528	31	Ravenswood & Laurel	18	240	169	36	73	204	
19	16	953	133	368	1734	85	8	54	12	73	15	146	Encinal & El Camino Real	19	31	1794	80	286	1404	
20	108	773	69	39	1150	580	241	158	112	85	282	25	Valparaiso & El Camino Real	20	96	1454	96	41	1144	
21	112	846	70	70	1224	61	79	181	72	113	263	47	Oak Grove & El Camino Real	21	82	1474	64	81	1198	
22	0	903	105	0	1364	79	80	72	193	60	43	31	Santa Cruz & El Camino Real	22	0	1450	63	0	1307	
23	96	891	460	133	1409	24	28	343	69	419	206	62	Ravenswood & El Camino Real	23	68	1148	336	182	1296	
24	298	1235	0	0	1743	95	227	0	319	0	0	0	Middle & El Camino Real	24	417	1842	0	0	1704	
25	276	99	44	69	52	63	157	403	161	47	549	63	Valparaiso & University	25	298	31	64	33	31	
26	328	0	171	0	0	0	0	409	537	73	264	0	Santa Cruz & University	26	331	0	157	0	0	
27	62	75	32	77	48	89	8	328	41	18	220	207	Middle & University	27	69	143	21	110	329	
28	133	777	412	207	673	216	289	1199	244	271	536	52	Sand Hill & Santa Cruz	28	195	879	180	117	813	
29	0	1	2	187	1	174	194	1501	5	10	725	155	Sand Hill & Sharon Park	29	8	1	15	170	1	
30	0	214	541	57	0	0	89	1787	0	0	0	0	Sand Hill & I-280 NB Off	30	0	28	138	67	0	
31	136	167	0	0	55	40	0	0	0	2	862	27	Sand Hill & I-280 NB On	31	6	32	0	0	62	
32	0	949	593	645	565	0	0	0	0	78	0	388	Juniperos Serra & Alpine	32	0	630	146	423	845	

PM Peak Hour

SBR	EBL	EBT	EBR	WBL	WBT	WBR
0	0	1934	0	0	1517	0
417	0	960	0	0	1195	0
4	49	1328	7	76	1032	266
226	287	676	53	13	998	355
2	2	746	59	401	726	66
353	203	95	1154	159	313	133
649	268	1398	324	78	1357	26
0	0	1360	434	0	1623	785
353	0	1005	199	0	1139	846
40	43	1293	0	1	798	280
38	9	1037	4	29	539	18
46	16	694	5	2	693	115
5	3	657	112	54	713	10
19	30	272	254	373	113	294
3	23	372	0	0	100	254
2	34	32	32	191	0	286
26	103	514	102	29	443	70
7	22	11	15	99	3	248
223	298	167	78	60	222	50
54	121	175	112	84	215	78
92	146	49	148	129	50	37
69	47	298	71	408	305	68
87	186	0	230	0	0	0
68	36	392	363	51	428	36
0	0	331	303	315	361	0
129	41	260	121	13	311	144
166	372	637	176	309	954	183
161	134	971	6	11	1087	240
0	10	675	0	0	0	0
168	0	0	0	5	1897	8
0	0	0	0	383	0	600

AM Peak Hour

Int	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	Name	Int	NBL	NBT	NBR	SBL	SBT	
1	778	0	1243	0	0	0	0	1873	0	0	943	0	Marsh & 101 NB	1	588	0	863	0	0	
2	0	0	0	1357	0	547	0	1111	0	0	1492	0	Marsh & 101 SB	2	0	0	0	1328	0	
3	13	4	68	373	19	1	43	1389	7	449	1277	340	Marsh & Scott	3	15	6	417	307	6	
4	73	45	84	634	81	228	234	979	136	46	1021	416	Marsh & Bohannon	4	146	94	71	488	54	
5	46	47	432	283	69	2	0	838	82	435	779	47	Marsh & Bay	5	65	75	318	71	22	
6	1207	2431	72	345	451	201	249	573	306	35	79	72	Willow & Bayfront	6	584	843	34	76	2209	
7	264	104	325	18	100	452	149	1928	408	40	1381	7	Willow & Newbridge	7	279	296	72	27	207	
8	423	0	790	0	0	0	0	1898	748	1	1862	425	Willow & 101 NB	8	393	0	860	0	0	
9	0	0	0	1158	0	407	0	1471	660	0	1355	849	Willow & 101 SB	9	0	0	0	796	0	
10	0	0	0	496	0	68	67	1517	0	0	1289	637	Willow & Bay	10	0	0	0	379	0	
11	59	12	349	68	14	33	23	1042	7	36	1003	108	Willow & Durham	11	21	7	30	141	27	
12	1	2	6	282	6	62	35	912	7	4	957	169	Willow & Coleman	12	15	4	6	158	2	
13	137	95	93	20	114	11	7	815	149	52	1015	0	Willow & Gilbert	13	80	53	58	37	113	
14	131	427	172	424	403	22	28	293	157	380	149	494	Willow & Middlefield	14	138	524	189	355	694	
15	0	0	0	205	0	20	25	293	2	3	88	276	Willow & Laurel	15	0	0	0	358	0	
17	69	689	208	338	771	68	37	11	112	138	28	345	Ringwood & Middlefield	17	89	779	123	319	747	
18	237	102	20	169	195	38	12	484	84	25	558	31	Ravenswood & Laurel	18	268	169	36	73	204	
19	16	1086	134	368	1850	85	8	54	12	74	15	146	Encinal & El Camino Real	19	31	1915	81	286	1520	
20	108	895	69	40	1245	604	260	163	112	85	288	26	Valparaiso & El Camino Real	20	96	1556	96	42	1250	
21	139	944	75	77	1289	84	97	199	93	117	285	53	Oak Grove & El Camino Real	21	101	1548	68	86	1283	
22	56	1000	105	0	1430	104	113	72	245	60	43	31	Santa Cruz & El Camino Real	22	46	1519	63	0	1393	
23	120	997	472	144	1494	44	44	369	88	446	231	94	Ravenswood & El Camino Real	23	85	1227	360	209	1395	
24	305	1362	0	0	1869	100	243	0	341	0	0	0	Middle & El Camino Real	24	436	1952	0	0	1829	
25	278	99	45	69	52	63	157	404	164	47	550	63	Valparaiso & University	25	301	31	64	33	31	
26	334	0	171	0	0	0	0	456	556	73	287	0	Santa Cruz & University	26	347	0	157	0	0	
27	62	75	32	87	48	89	8	329	41	18	222	210	Middle & University	27	69	143	21	115	329	
28	143	793	415	207	687	229	326	1229	272	273	545	52	Sand Hill & Santa Cruz	28	219	892	183	117	829	
29	0	1	2	187	1	174	194	1596	5	10	757	155	Sand Hill & Sharon Park	29	8	1	15	170	1	
30	0	214	547	57	0	0	89	1798	0	0	0	0	Sand Hill & I-280 NB Off	30	0	28	155	67	0	

31	136	167	0	0	55	40	0	0	0	2	912	27	Sand Hill & I-280 NB On	31	6	32	0	0	62
32	0	969	595	672	581	0	0	0	0	78	0	396	Juniperos Serra & Alpine	32	0	646	147	438	865

PM Peak Hour

SBR	EBL	EBT	EBR	WBL	WBT	WBR
0	0	1940	0	0	1527	0
459	0	995	0	0	1221	0
6	50	1374	7	76	1100	266
226	287	692	82	62	1019	355
2	2	771	59	414	753	66
358	207	99	1178	159	317	133
656	275	1439	328	78	1401	27
0	0	1420	450	0	1691	785
379	0	1081	223	0	1238	846
44	49	1381	0	1	906	298
38	9	1132	4	29	651	18
46	16	789	5	2	805	115
5	3	752	112	54	825	10
20	32	281	254	376	125	380
3	23	372	0	0	100	267
28	53	32	99	191	0	286
26	103	545	146	29	473	70
7	22	11	15	99	3	248
240	320	172	78	60	226	51
70	142	196	137	89	231	85
121	174	49	202	129	50	37
83	65	323	93	425	328	86
100	194	0	242	0	0	0
68	36	393	365	52	429	36
0	0	359	313	315	402	0
129	41	262	121	13	312	153
198	392	653	192	312	979	183
161	134	1024	6	11	1168	240
0	10	700	0	0	0	0

168	0	0	0	5	1925	8
0	0	0	0	384	0	623

Appendix D
Utilities & Service Systems

ESA

RESOLUTION NO. 6783

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MENLO PARK APPROVING THE WATER SUPPLY ASSESSMENT BY MENLO PARK MUNICIPAL WATER FOR THE HOUSING ELEMENT UPDATE

WHEREAS, the City of Menlo Park ("City") through Menlo Park Municipal Water is a public water supplier; and

WHEREAS, the City Council of the City is the governing body of Menlo Park Municipal Water; and

WHEREAS, the City approved and adopted the Menlo Park 2020 Urban Water Management Plan on May 25, 2021; and

WHEREAS, in 2001 the State of California enacted Senate Bill 610 adding Section 10910 et seq. to the California Water Code that became effective January 1, 2002; and

WHEREAS, the Guidelines for the Implementation of the California Environmental Quality Act ("CEQA Guidelines") were subsequently modified to incorporate similar provisions in Section 15155; and

WHEREAS, California Water Code Section 10910 and Section 15155 of the CEQA Guidelines require a water utility to prepare a water supply assessment for development applications for "water-demand projects" which include, but are not limited to, any proposed project that is subject to CEQA and would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project; and

WHEREAS, Section 10910(g) of the California Water Code and Section 15155(b) of the CEQA Guidelines require the governing body of a public water system that will serve a "water-demand project" to approve a water supply assessment for the project at a regular or special meeting; and

WHEREAS, the City is updating its required General Plan Housing Element and Safety Element, and preparing a new Environmental Justice Element, collectively referred to as the "Housing Element Update") (the "Project"); and

WHEREAS, the proposed Project is subject to CEQA and would allow up to 4,000 new dwelling units through rezoning and proposed land use strategies that would be implemented as part of the Project; and

WHEREAS, Menlo Park Municipal Water would provide water service to an estimated 1,790 new residential units included in the Project at full build-out; and

WHEREAS, the Project qualifies as a water-demand project, and therefore the City prepared a Water Supply Assessment for the Project addressing service of the Project by Menlo Park Municipal Water; and

WHEREAS, the Water Supply Assessment for the Project units within the MPMW service area was finalized in October 2022; and

WHEREAS, the Water Supply Assessment for the Project was provided to the City Council for consideration at a regularly scheduled meeting on October 18, 2022.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Menlo Park finds the foregoing recitals are true and correct, and they are hereby incorporated by reference into this Resolution.

BE IT FURTHER RESOLVED that the City Council of the City of Menlo Park as governing body of Menlo Park Municipal Water hereby resolves as follows:

1. The Water Supply Assessment for the Housing Element Update project (Project WSA) identified in this resolution is incorporated as if fully set forth herein as Exhibit A of this resolution.

2. The City Council hereby approves the Project WSA as Menlo Park Municipal Water's water supply assessment for the Project in compliance with Water Code section 10910 *et seq.* and CEQA Guidelines section 15155, and directs City staff to include the Project WSA in CEQA environmental review of the Project.

3. The City Council's action on the Project WSA is limited to approving the Water Supply Assessment. Nothing in this resolution or the Council's approval of the Project WSA shall be construed as requiring the City or its Council to consider, act on, approve, conditionally approve, deny, or take any other action on the Project.

SEVERABILITY
If any term, provision, or portion of these findings or the application of these findings to a particular situation is held by a court to be invalid, void or unenforceable, the remaining provisions of these findings, or their application to other actions related to the Project or the Project WSA, shall continue in full force and effect unless amended or modified by the City.

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I, Judi A. Herren, City Clerk of Menlo Park, do hereby certify that the above and foregoing City Council Resolution was duly and regularly passed and adopted at a meeting by said City Council on the eighteenth day of October, 2022, by the following votes:

AYES:

NOES:

ABSENT:

ABSTAIN:

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the Official Seal of said City on this third day of November, 2022.

Judi A. Herren, City Clerk

Exhibits
A. Project water supply assessment

EXHIBIT A

CITY OF MENLO PARK HOUSING ELEMENT UPDATE

Water Supply Assessment for the Water Service Provided by California Water Service (Bear Gulch District) and Menlo Park Municipal Water

Prepared for
City of Menlo Park

October 2022

ESA

Draft

CITY OF MENLO PARK HOUSING ELEMENT UPDATE

Water Supply Assessment for the Water Service Provided by California Water Service (Bear Gulch District) and Menlo Park Municipal Water

Prepared for
City of Menlo Park

October 2022

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CONTENTS

City of Menlo Park Housing Element Update Water Supply Assessment for the Water Service Provided by California Water Service (Bear Gulch District), and Menlo Park Municipal Water

Page

Acronyms and Abbreviations v

Section 1, Introduction 2-1
1.1 Project Overview 2-2
1.2 Project Location 2-2
1.3 Project Summary 2-2
1.4 Document Structure 2-4

Section 2, Background Information and Land Use Planning 2-1
2.1 ConnectMenlo and Land Use and Circulation Elements 2-1
2.2 Land Use, Zoning and Project Elements and Characteristics 2-2
2.3 Growth Projections 2-3

Section 3, Water Supply Planning 3-1
3.1 Water Supply Planning Under SB 610 and SB 221 3-2

Section 4, Water Supply Setting 4-1
4.1 Climate 4-1
4.2 Water Supply Entitlements, Water Rights and Contracts 4-2
4.3 Water Contracts and Agreements 4-6
4.4 Individual Supply Guarantees 4-8
4.5 Cal Water Bear Gulch District's Surface Water Supply (Local Watershed) 4-10
4.6 Total Water Supplies 4-11

Section 5, Water Demand Analysis 5-1
5.1 Proposed Project Water Demand 5-1
5.2 Historical and Existing Demand 5-4
5.3 Projected System Demand Forecasts 5-5

Section 6, Comparison of Available Water Supplies versus Demand 6-1
6.1 Bear Gulch District Supply and Demand Considerations 6-1
6.2 Cal Water Bear Gulch District Supply and Demand in a Normal Year 6-1
6.3 Cal Water Bear Gulch District Water Service Reliability – Single Dry and Multiple Dry Years with Bay-Delta Plan Amendment 6-2

Page

6.4 [PLACEHOLDER] Cal Water Bear Gulch District Water Service Reliability – Normal, Single Dry and Multiple Dry Years without the Bay-Delta Plan Amendment 6-5
6.5 MPMW Supply and Demand in a Normal Year 6-5
6.6 MPMW Water Service Reliability – Single Dry and Multiple Dry Years with Bay-Delta Plan Amendment 6-6
6.7 MPMW Water Service Reliability – Normal, Single Dry and Multiple Dry Years without the Bay-Delta Plan Amendment 6-8
6.8 Uncertainties in Dry Year Water Supply Projections 6-10
6.9 Alternative Supplies 6-12
6.10 Strategies and Actions to Address Dry Year Supply Shortfalls 6-12
6.11 Alternative Water Supply Program 6-13
6.12 Local Strategies and Actions 6-16
6.13 Water Demand Reductions and Conservation Savings 6-16
6.14 Demand Management Measures 6-17
6.15 Demand Management Measures Implementation over the Past Five Years 6-17
6.16 Dry-Year Shortage and Demand Reduction 6-18

Section 7, Conclusion 7-1
7.1 WSA Findings 7-2

Section 8, References 8-1

Appendices

A. California Water Service, Bear Gulch District, 2020 Urban Water Management Plan
B. Menlo Park Municipal Water, 2020 Urban Water Management Plan
C. SFPUC 2020 Urban Water Management Plan

List of Tables

Table 2-1 Major Pipeline Projects 2-3
Table 2-2 Updated Project Baseline and Projections 2-5
Table 4-1 City of Menlo Park Climate Summary 4-1
Table 4-2 Supply Sources and System-wide Reductions 4-2
Table 4-3 Cal Water Bear Gulch District Projected Future Water Supplies – Normal Years 4-12
Table 4-4 MPMW Current and Projected Future Water Supplies – Normal Years (MG) . 4-13
Table 5-1 Water Demand - Housing Element Update and Additional 2040 Growth Projections 5-2
Table 5-2 HEU Residential Units, Distribution in Water Service Areas and Demand 5-3
Table 5-3 Bear Gulch District Historical and Current Water Use (AFY) 5-4
Table 5-4 MPMW Historical and Current Water Use 5-5
Table 5-5 Bear Gulch District Service Area Projected Growth in Water Demand (AFY) 5-6
Table 5-6 MPMW Service Area Projected Growth in Water Demand (MG and AFY) 5-7
Table 6-1 Bear Gulch District Normal Year Supply and Demand Projections (AFY) 6-2
Table 6-2 Bear Gulch District Single Dry Year Potable Water Supply and Demand Projections (AFY) with Bay-Delta Plan Amendment 6-3
Table 6-3 Bear Gulch District Multiple Dry Years Potable Water Supply and Demand Comparison (AFY) with Bay-Delta Plan Amendment 6-4

Page

Table 6-4 MPMW Normal Year Water Supply and Demand Comparison (AFY) 6-5
Table 6-5 MPMW Single-Dry-Year Potable Water Supply and Demand Comparison (AFY) with Bay-Delta Plan Amendment 6-6
Table 6-6 MPMW Multiple Dry Years Supply and Demand Comparison (AFY) with Bay-Delta Plan Amendment 6-7
Table 6-7 MPMW Normal, Single Dry and Multiple Dry Years Supply and Demand Comparison (AFY) without the Bay-Delta Plan Amendment 6-8

List of Figures

Figure A Housing Sites and Water Service Areas 2-3
Figure B Water Suppliers in Menlo Park 3-5
Figure C Cal Water Bear Gulch District Service Area 3-7
Figure D Menlo Park Municipal Water Service Area 3-8
Figure E Regional Water Supply System 4-4
Figure F BAWSCA Member Agencies Service Area 4-7

Table 2-1 Major Pipeline Projects 2-3
Table 2-2 Updated Project Baseline and Projections 2-5
Table 4-1 City of Menlo Park Climate Summary 4-1
Table 4-2 Supply Sources and System-wide Reductions 4-2
Table 4-3 Cal Water Bear Gulch District Projected Future Water Supplies – Normal Years 4-12
Table 4-4 MPMW Current and Projected Future Water Supplies – Normal Years (MG) . 4-13
Table 5-1 Water Demand - Housing Element Update and Additional 2040 Growth Projections 5-2
Table 5-2 HEU Residential Units, Distribution in Water Service Areas and Demand 5-3
Table 5-3 Bear Gulch District Historical and Current Water Use (AFY) 5-4
Table 5-4 MPMW Historical and Current Water Use 5-5
Table 5-5 Bear Gulch District Service Area Projected Growth in Water Demand (AFY) 5-6
Table 5-6 MPMW Service Area Projected Growth in Water Demand (MG and AFY) 5-7
Table 6-1 Bear Gulch District Normal Year Supply and Demand Projections (AFY) 6-2
Table 6-2 Bear Gulch District Single Dry Year Potable Water Supply and Demand Projections (AFY) with Bay-Delta Plan Amendment 6-3
Table 6-3 Bear Gulch District Multiple Dry Years Potable Water Supply and Demand Comparison (AFY) with Bay-Delta Plan Amendment 6-4
Table 6-4 MPMW Normal Year Water Supply and Demand Comparison (AFY) 6-5
Table 6-5 MPMW Single-Dry-Year Potable Water Supply and Demand Comparison (AFY) with Bay-Delta Plan Amendment 6-6
Table 6-6 MPMW Multiple Dry Years Supply and Demand Comparison (AFY) with Bay-Delta Plan Amendment 6-7
Table 6-7 MPMW Normal, Single Dry and Multiple Dry Years Supply and Demand Comparison (AFY) without the Bay-Delta Plan Amendment 6-8

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
ABAG	Association of Bay Area Governments
ADU	accessory dwelling unit
AF	acre-feet
AFY	acre-feet per year
Agreement	Water Supply Agreement
BAWSCA	Bay Area Water Supply and Conservation Agency
BMP	best management practice
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CIP	Capital Improvement Program
CPUC	California Public Utilities Commission
CUWCC	California Urban Water Conservation Council
Cal Water	California Water Service
Demand Study	SFPUC 2004 Wholesale Customer Water Demand Projections study
DWR	Department of Water Resources
EIR	environmental impact report
GMP	groundwater management plan
gpd	gallons per day
HEU	Housing Element Update
ILTWSP	integrated long-term water supply plan
IRWMP	integrated regional water management plan
ISG	Individual Supply Guarantee
LAFCO	Local Area Formation Commission
MPMW	Menlo Park Municipal Water
MG	million gallons
mgd	million gallons per day
MID	Modesto Irrigation District

Acronym/Abbreviation	Definition
MOU	memorandum of understanding
MSA	Settlement Agreement and Master Water Sales Contract
MSR	Municipal Service Review
PEIR	program environmental impact report
RHNA	Regional Housing Needs Allocation
RWS	Regional Water System
SAA	Supply Assurance Allocation
San Francisco	City and County of San Francisco
SB	Senate Bill
SEIR	Subsequent Environmental Impact Report
SFPUC	San Francisco Public Utilities Commission
SR	State Route
Strategy	Long-Term Reliable Water Supply Strategy
SVWTP	Sunol Valley Water Treatment Plant
SWRCB	State Water Resources Control Board
TID	Turlock Irrigation District
UWMP	urban water management plan
Water Code	California Water Code
WSA	water supply assessment
WSAP	water supply allocation plan
WSIP	Water System Improvement Program
WSV	Water Supply Verification

SECTION 1
Introduction

In 2001, California adopted Senate Bill (SB) 610 and SB 221, thereby amending the California Water Code (Water Code). Under these laws, certain types of development projects are required to provide detailed water supply assessments to planning agencies. The requirements for a water supply assessment (WSA) are set forth in the California Water Code (Water Code) Sections 10910 et seq. A WSA connects water supply and land use planning with the environmental review process. The law also reflects the growing awareness of the need to incorporate water supply and demand analysis at the earliest possible stage in the land use planning process. Any proposed project that is subject to the California Environmental Quality Act (CEQA) and would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project, is subject to SB 610 and is required to prepare a WSA.

The primary purpose of a WSA is to determine whether the identified water supply or water supplier will be able to meet projected demands for the Project, in addition to existing and planned future uses, over a 20-year planning period in normal, single-dry, and multiple-dry water years. Secondarily, a WSA provides decision-makers a regional framework on which to base a decision about the sufficiency of water supplies for the proposed Project.

The proposed Project is subject to CEQA and would allow for residential and mixed-use developments that may include more than 500 units. In fact, the proposed Project would allow up to 4,000 new dwelling units as a result of proposed land use strategies and rezoning, and assumes an additional 85 accessory dwelling units (ADUs), within City Council Districts 2, 3, 4 and 5. Therefore, this WSA was prepared in accordance with SB 610 and the Water Code. The SB 610 requirements and their applicability to the proposed Project are addressed in detail in Section 3, Water Supply Planning.

This WSA assesses the availability of identified water supplies under normal-, single-dry-, and multiple-dry-year conditions, accounting for the projected water demand of the proposed Project in addition to other existing and planned future uses of the identified water supply. This WSA examines the regional water providers and their supplies (Section 4.2), the reliability of these sources (Section 4.4), the projected short-term and long-term water demand of the proposed Project (Section 5), and a comparison of supply and demand as required in a WSA (Section 6) and Conclusion (Section 7).

The Project Site is located in the City of Menlo Park (City), within the service areas of Menlo Park Municipal Water (MPMW) and the California Water Service (Cal Water) Bear Gulch District. Therefore, with respect to the proposed Project, Cal Water's Bear Gulch District and MPMW are the water suppliers responsible for preparing WSAs.

1.1 Project Overview

The City is conducting an environmental review under the requirements of CEQA for its Housing Element Update (HEU). This WSA will provide information for use in the CEQA analysis for the proposed project. The City is preparing a Subsequent Environmental Impact Report (SEIR) regarding the HEU, which relies on and supplements information and analyses contained in the Environmental Impact Report (EIR) the City certified in 2016 as part of adopting the ConnectMenlo General Plan Update.

1.2 Project Location

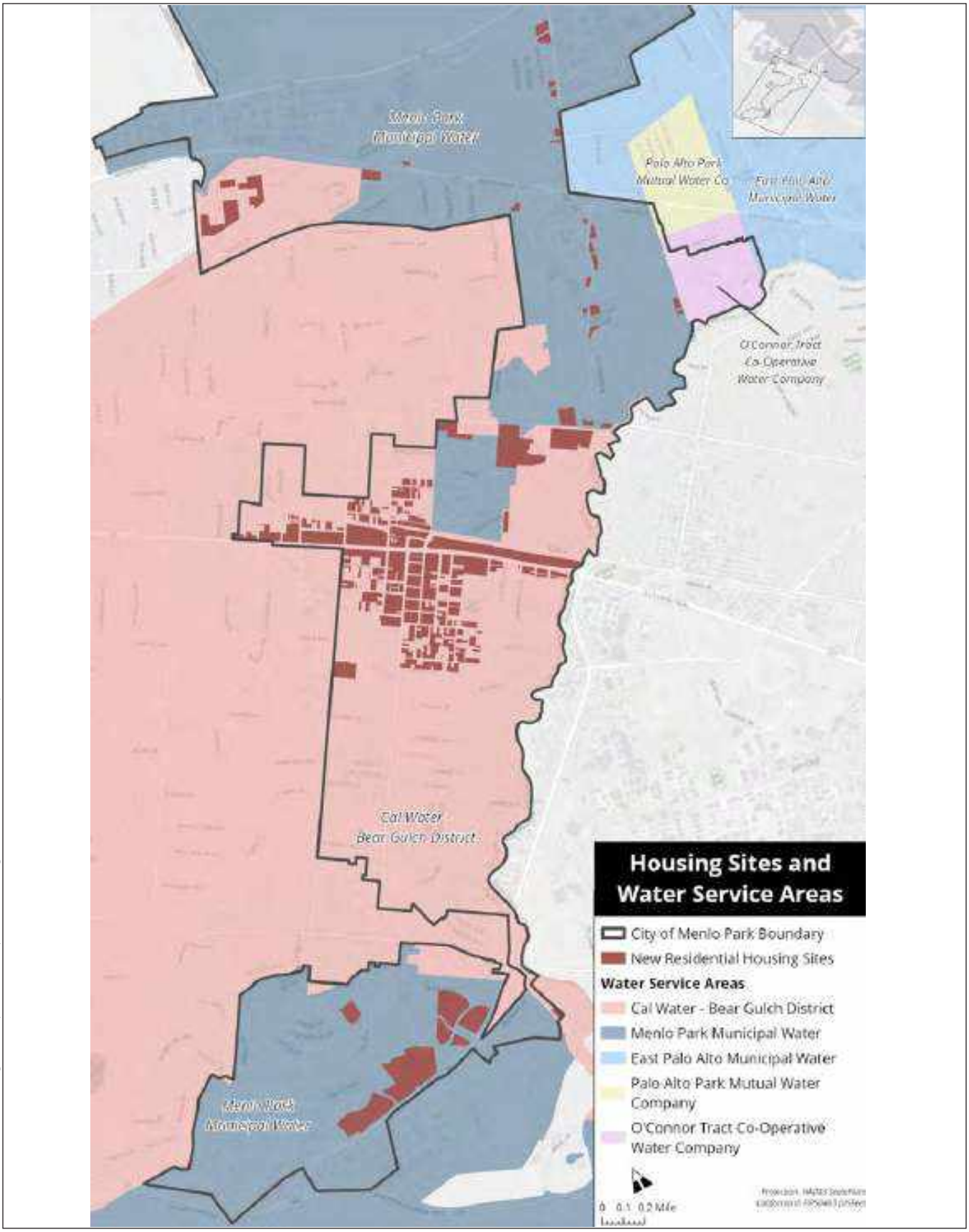
The City is located approximately 30 miles south of San Francisco on the San Francisco Peninsula about 20 miles northwest of San Jose. The City is located at the southern edge of San Mateo County. The City encompasses approximately 17 square miles (approximately seven square miles of which is water) with a population of approximately 35,000 people. The City boundaries and its regional location are shown in **Figure A**.

The City is generally bounded by San Francisco Bay to the north and east; the cities of East Palo Alto and Palo Alto and Stanford University to the southeast; and Atherton, unincorporated North Fair Oaks, and Redwood City to the northwest. The City is accessed by Interstate 280 (I-280), U.S. Highway 101 (US-101), Caltrain, State Route 84 (SR-84, or Bayfront Expressway) via the Dumbarton Bridge, and a variety of arterial roadways, as well as regional and local pedestrian and bicycles routes. The City has a Caltrain station located near the downtown area and is less than one hour from downtown San Francisco via train. The City has a range of urban and suburban land uses, including residential neighborhoods of varied densities, its downtown, parks, established business centers, and an emerging center for innovation and technology.

1.3 Project Summary

The City's current General Plan was last updated in 2016, when ConnectMenlo, an update of the Land Use and Circulation Elements, was adopted. The City's Housing Element was last adopted on April 1, 2014, and in accordance with State law, addresses the planning period from January 31, 2015, through January 31, 2023. As the end of this period is near, State law [Government Code Section 65588] requires the City to update its Housing Element with a due date of January 31, 2023. In accordance with State law, the planning period for the updated "6th Cycle" Housing Element will extend from January 31, 2023 through January 31, 2031.

Concurrent with updating the Housing Element, the City proposes to update the General Plan's Safety Element, prepare and adopt a new Environmental Justice Element, and make conforming amendments to other elements of the General Plan, as needed, to maintain internal consistency. The City also proposes to undertake changes to the City's Zoning Ordinance (Menlo Park Municipal Code Title 16) and the El Camino Real/Downtown Specific Plan (adopted June 12, 2012) that are needed to reflect the updated Housing Element and to maintain consistency with the General Plan, and proposes to rezone housing opportunity sites identified in the Housing Element.



D202100009.00 - Menlo Park Housing Element Update EIR\05 Graphics-GIS-Modeling-USE AZURE\Illustrator\Technical Report

Menlo Park Housing Element Update

Figure A
Housing Sites and Water Service Areas

1.4 Document Structure

This WSA is organized following a basic hierarchy to describe each issue: regional context (San Francisco Public Utilities Commission (SFPUC) service area); local context (Cal Water Bear Gulch District and MPMW service areas), Project-level analysis for the proposed Project; the assessment as a comparison of water supply and demand for the Project; and existing and future demand in all water year types. The report organization is as follows:

1. Introduction; project overview, location, and description; and document structure
2. City background information and land use planning
3. General information on water supply planning under SB 610
4. Water supply setting including local climate, water supplies, capacities, and reliability
5. Regional, city, and project water demands, including historical, projected, and projected dry-year demands
6. Supply-demand comparisons on a regional, city, and project-level basis
7. Conclusions

SECTION 2
Background Information and Land Use Planning

The City is proposing to update the Housing Element of its General Plan, update the Safety Element, and add a new Environmental Justice Element. These actions would build upon changes to the City's General Plan Update adopted in 2016 and would ensure the City's compliance with state law. The 2016 ConnectMenlo General Plan Update is briefly described below, along with relevant requirements of state law.

2.1 ConnectMenlo and Land Use and Circulation Elements

The purpose of ConnectMenlo was to update the Land Use and Circulation Elements of the City's General Plan, with a particular geographical focus on the Bayfront Area, and to update the zoning provisions to reflect the proposed land use changes within the Bayfront Area. The updated Land Use Element included goals, policies, and programs to guide local decisions regarding land use, and framed the type and scope of potential development that may occur in the City. The updated Circulation Element addressed transportation throughout the City and aimed to improve mobility connections citywide for all modes of travel. The General Plan amendments were accompanied by Zoning Ordinance amendments to foster a new live/work/play environment in the Bayfront Area. The City Council adopted three new zoning districts: Office (O), Life Sciences (LS), and Residential Mixed Use (R-MU) to set the framework for creating the live/work/play concept.

A primary focus of ConnectMenlo was to balance the potential for development impacts with providing community amenities, especially for the Belle Haven neighborhood. Bayfront Area projects may propose development at the bonus level, which allows additional height, floor area ratio (FAR), and/or density above the base level of zoning regulations in exchange for community amenities. Highlighted community amenities included improved transportation alternatives, affordable housing to support both the adjacent neighborhood and the growing workforce, and expanded service and community-serving retail uses.

The new development potential created in the Bayfront Area was analyzed in the ConnectMenlo EIR, along with remaining development potential under the General Plan. The ConnectMenlo EIR was adopted in 2016.

2.2 Land Use, Zoning and Project Elements and Characteristics

2.2.1 Housing Element Update Project Components

The Housing Element Update (HEU) would include adoption of General Plan amendments that would add or modify goals, objectives, policies, and implementation programs related to housing, safety, and environmental justice. General Plan amendments would also include conforming amendments to other elements of the General Plan, as needed, to ensure internal consistency. Amendments to the Housing Element would address among other things, the maintenance, preservation, improvement, and development of housing in the city. In addition, the HEU would include a housing sites inventory with sufficient existing and new housing sites at appropriate densities to meet the City's Regional Housing Needs Allocation (RHNA) requirement plus an ample buffer, and the City would modify provisions of its zoning ordinance, zoning map, and El Camino Real/Downtown Specific Plan as necessary to reflect the housing sites inventory and strategies to meet the City's RHNA.

2.2.2 Housing Sites Inventory

The HEU identifies specific sites appropriate for development of housing (especially affordable units), and the City would rezone those sites as necessary to meet the requirements of State law. The final housing sites inventory will be refined based on additional community input and analysis. The HEU SEIR evaluates the environmental effects of adding up to 4,000 new residential units in the City within the eight-year planning period via a variety of strategies in addition to possible pipeline projects and an additional 85 ADUs, as described below.

2.2.3 Pipeline Projects

Pipeline projects are new housing projects that have been recently approved but not yet occupied or are pending (in review). At the time the Notice of Preparation (NOP) for the HEU SEIR was published (December 23, 2021), there were seven major residential projects in the "pipeline" as either approved or pending housing developments that would provide approximately 3,642 new units. These units, as well as smaller projects in the City, could potentially count towards Menlo Park's RHNA requirement if the residential units were not completed and occupied prior to June 30, 2022. Major pipeline projects are listed in **Table 2-1** and are identified as either "approved" or "pending." Approved projects are considered part of the baseline, and pending projects are considered part of the Project being analyzed. (See the discussion of Growth Projections below.)

2.2.4 Accessory Dwelling Units

California Department of Housing and Community Development allows the City to develop a projection of ADUs that will be built within the planning period based on average annual production between 2018 and 2020. Because the City permitted an average of 10.6 ADUs per year between 2018 and 2020, the City can anticipate development of 85 units during the 6th Cycle Housing Element planning period. These units could potentially count towards Menlo Park's RHNA requirement.

TABLE 2-1
MAJOR PIPELINE PROJECTS

Project	Status	Net New Units
Approved Projects		
111 Independence Dr.	Approved	105
115 Independence Dr. (Menlo Portal)	Approved	335
141 Jefferson Dr. (Menlo Uptown)	Approved	483
Subtotal Approved Projects		*923*
Pending Projects		
123 Independence Dr.	Pending	432
165 Jefferson Dr. (Menlo Flats)	Pending	158
Willow Village	Pending	1,729
333 Ravenswood Ave. (Parkline)	Pending	400
Subtotal Pending Projects		*2,719*
Total		***3,642***

SOURCE: City Council Staff Report #21-210-CC (October 26, 2021), Table 3, Major Pipeline Projects.

NOTE: This table shows major pipeline projects yielding greater than 10 units.

2.3 Growth Projections

Changes to the City's General Plan proposed as part of the HEU would build on the changes adopted in November 2016, when the Land Use and Circulation Elements were comprehensively updated as part of the ConnectMenlo General Plan Update. To assess the increase in residential development planned with the proposed Project, the SEIR will use an updated baseline and updated projections for 2040. The updated baseline and projections are shown in **Table 2-2** and are explained briefly here:

- 2015 Existing Conditions from the ConnectMenlo EIR column is included for informational purposes. Comparison with the 2021 Baseline Conditions allows readers to understand changes since the ConnectMenlo EIR was prepared.
- 2021 Baseline Conditions column reflects conditions on the ground in the City when the NOP for the HEU SEIR was published in December 2021 and also includes development projects that have been approved and are either under construction or expected to commence construction shortly.
- The HEU columns reflect pending (proposed but not yet approved) projects and ADUs that would count towards the City's RHNA along with the 4,000 additional units anticipated as a result of proposed land use strategies and rezoning. Taken together, these represent the Project being analyzed in the HEU SEIR.
- The 2040 Cumulative (Maximum Buildout) Projections from the ConnectMenlo EIR are included for informational purposes and allows readers to understand the maximum buildout of the General Plan that was anticipated in the ConnectMenlo EIR.

- The Updated 2040 Cumulative (Maximum Buildout) Projections with the HEU column provides a summary of the maximum buildout of the General Plan as a result of the proposed Project plus other past, present, and reasonably foreseeable development projects that were not reflected in the ConnectMenlo 2040 projections. The data reflects the ConnectMenlo 2040 projections plus the 85 ADUs and the 4,000 additional units anticipated as a result of the HEU between 2023 and 2031, plus the 123 Independence Drive pipeline project, as well as an increment of additional growth that may occur between 2031 and 2040, in part due to the zoning and specific plan changes that would accompany the HEU. The additional increment of 299 units over nine years is relatively modest because the housing inventory sites included in the HEU represent those parcels most likely to develop by 2031, leaving smaller sites that are less likely to develop in later years.

TABLE 2-2
UPDATED PROJECT BASELINE AND PROJECTIONS

	2015 Baseline (Existing) Conditions from ConnectMenlo EIR	2021 Baseline Conditions[a]		Housing Element Update			2040 Cumulative (Maximum Buildout) Projections from ConnectMenlo EIR	Updated 2040 Cumulative (Maximum Buildout) Projections with Housing Element Update[d]
		Existing	Approved Projects[a]	Pending Projects[b]	ADUs[c]	Additional Units		
Bayfront Areae								
Residential Units	0	735	923	2,319		0	5,430	5,581
Population[f]	0	1,874	2,373	5,960		0	13,960	14,343
Non-Residential SF	8.7 million	9.74 million				0	13.4 million	13.4 million
Hotel Rooms	0	250				0	850	850
Jobs	19,800	32,275[g]	(213)			0	39,950	39,950
Remainder of City								
Residential Units	13,100	13,281	525	414	85	4,000	14,450	19,248
Population[f]	32,900	34,841	1,350	1,064	218	10,280	36,390	49,467
Non-Residential SF	5.9 million	5.93 million				0	6.8 million	6.8 million
Hotel Rooms	570	631				0	640	640
Jobs	11,100	11,416[h]	1,470			0	13,300	13,300
Citywide Totals								
Residential Units	13,100	14,016	1,448	2,733	85	4,000	19,880	24,829
Population[f]	32,900	36,715	3,723	7,024	218	10,280	50,350	63,810
Non-Residential SF	14.6 million	15.7 million				0	20.6 million	20.6 million
Hotel Rooms	570	881				0	1,490	1,490
Jobs	30,900	43,691	1,257			0	53,250	53,250

SOURCE: City of Menlo Park, March 2022.

NOTES:

a. 2021 Baseline conditions reflect existing conditions plus approved projects that are in construction or likely to commence construction in the near term. The approved projects include 111 Independence Drive; Menlo Uptown (141 Jefferson Drive, 180-186 Constitution Drive); and Menlo Portal (104-110 Constitution Drive, 115 Independence Drive) in the Bayfront Area. In the remainder of the City, approved projects include 1275 El Camino Real, 500 El Camino Real, Springline (1300 El Camino Real), 1021 Evelyn Street, 1540 El Camino Real, 115 El Camino Real, 409 Glenwood Avenue, 706-716 Santa Cruz Avenue, 1300 Block of Willow Road, 201 El Camino Real, 1162 El Camino Real, 975 Florence Lane, and 661-687 Partridge Avenue.
b. Pending projects reflect residential development applications that are currently on file for residential development in the City. These projects include Willow Village, Menlo Flats (165 Jefferson Drive), and 123 Independence Drive in the Bayfront Area. In the remainder of the City, pending projects include 1550 El Camino Real, Parkline (333 Ravenswood Avenue), and 1220 Hoover Street.
c. Because the location of future ADUs is unknown, the units are not distributed between the Bayfront Area and the Remainder of the City, and are instead included in the Citywide Totals.
d. The Updated 2040 Cumulative represents the *ConnectMenlo* 2040 Cumulative plus approved and pipeline projects that were not anticipated in the *ConnectMenlo* EIR, plus the 85 ADUs and 4,000 units being zoned for in the Housing Element Update, plus an estimated 299 units that may result from development on small sites affected by zoning and Specific Plan changes as part of the HEU after the end of the planning period in 2031. The estimate of 299 units is based on the assumption that the best sites are those included in the Housing Sites Inventory that are assumed to be built-out by 2031, and the smaller sites remaining may see modest development in later years. Projects that were not anticipated in *ConnectMenlo* include 123 Independence Drive in the Bayfront Area. The 2040 "No Project" condition would include the housing unit and population values in this column, less the 4,000 units from the HEU (10,280 persons), and the 299 additional units noted above (768 persons). Thus the Citywide unit count for the "No Project" condition would be 20,530 units, with a resultant Citywide population of 52,762 persons.
e. The Bayfront Area as defined in the *ConnectMenlo* EIR refers to areas on the Bay side of US-101 with the exception of the Belle Haven neighborhood.
f. Population estimates presented for the *ConnectMenlo* existing baseline and 2040 Cumulative are based on the assumption of 2.57 persons per household used in the *ConnectMenlo* EIR which aligns with the City's transportation model.
g. This number represents the 19,800 jobs from *ConnectMenlo* EIR Table 3-2 plus 5,412 from the occupied portion of Facebook Campus Expansion Project and 7,063 from space occupied from 2015 through 2021.
h. This number represents the 11,100 jobs from *ConnectMenlo* EIR Table 3-2 plus 316 jobs in space occupied from 2015 through 2021.

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SECTION 3
Water Supply Planning

California has many different processes through which the development and/or maintenance of water supplies are planned on a local and regional level. Urban Water Management Plans (UWMPs), Groundwater Management Plans (GMPs), Integrated Regional Water Management Plans (IRWMPs), Municipal Service Reviews (MSRs) and water resources components of General Plans all integrate a degree of regional planning of water supply and demand. The following are brief descriptions of the plans mentioned above:

- Urban Water Management Plans (UWMP), pursuant to Water Code sections 10610 et seq. are long-range water supply and demand planning documents that provide a connection between land use planning and available water supplies. The UWMPs should make every effort to ensure the appropriate level of reliability in a water service area sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry years.
- Groundwater Management Plans (GMPs) are adaptive management tools and represent a critical step in establishing a framework for maintaining a sustainable groundwater resource for the various users overlying the basins. The GMPs are consistent with the provisions of California Water Code sections 10750 et seq. GMPs are developed in a consensus-based process, and include stakeholders throughout the overlying basins.
- Integrated Regional Water Management Plans (IRWMPs) are collaborative efforts to manage all aspects of water resources in a region. IRWMPs cross jurisdictional, watershed, and political boundaries; involve multiple agencies, stakeholders, individuals, and groups; and attempt to address the issues and differing perspectives of all the entities involved through mutually beneficial solutions.
- Municipal Service Reviews (MSR) are comprehensive studies designed to better inform Local Area Formation Commissions (LAFCO), local agencies, and the community about the provision of municipal services. Service reviews capture and analyze information about the governance structures and efficiencies of service providers and identify opportunities for greater coordination and cooperation between providers. The MSR is a prerequisite to a Sphere of Influence determination and may also lead a LAFCO to take other actions under its authority.
- General Plans are required by California law. The General Plan is designed to guide the long-term physical development and conservation of a city or county's land and environment through a framework of goals, policies, and implementation programs. The General Plan also provides a foundation for more detailed plans and implementation programs to be conducted, such as area or community plans, zoning ordinances, and specific plans.

To complement these large-scale planning processes, California enacted Senate Bill (SB) 610 and 221 in 2002, both of which emphasize the interrelationships between land use and water supply planning, and require the incorporation of water supply and demand analysis at the earliest possible stage in the planning process for sizeable land use projects. These statutes primarily

apply to the planning of water supplies and identification of sources for defined "projects" (Water Code, Section 10912) in the case of SB 610 and for individual residential subdivision projects of more than 500 units in the case of SB 221. SB 610 amended portions of the Water Code, including Section 10631, which contains the Urban Water Management Planning Act, and added Sections 10910, 10911, 10912, 10913, and 10915, which describe the required elements of a WSA to be prepared and relied upon during the CEQA process. WSAs are prepared in connection with the environmental review process for defined "projects" (generally very similar to "projects of statewide, regional, or area wide significance," as defined in "CEQA Guidelines" Section 15206), and provide information (along with EIR analysis) to be considered by agency decision-makers at the time of project approval. Nothing in SB 610 prevents a city or county from approving a proposed project even in the face of information concluding that there is not sufficient water supply for build-out of the project.

Under both laws, agencies are required to consider water demands over a 20-year planning horizon, considering normal, single dry, and multiple dry year scenarios in light of the water provider's existing and planned future uses, including agricultural and manufacturing uses.

3.1 Water Supply Planning Under SB 610 and SB 221

As the "public water system" that supplies water to portions of the City including the proposed Project housing sites, Cal Water Bear Gulch District and MPMW are required to prepare WSAs and water supply verifications (WSVs), under the requirements of Senate Bills 610 and 221, and the Government Code (Sections 65867.5, 66455.3 and 66473.7). There are three primary areas to be addressed in a WSA:

(1) A description of all relevant water supply entitlements, water rights, and/or water contracts;

(2) A description of the available water supplies and the infrastructure, either existing or proposed, to deliver the water; and

(3) An analysis of the demand placed on those supplies, by the project, and relevant existing and planned future uses in the area.

Where the description of existing water supply entitlements, water rights, and/or water contracts shows insufficient water supplies to serve the proposed project as well as existing and planned uses over the 20-year planning horizon, additional information is required to describe how and where sufficient supplies may be obtained. Such information must include the estimated costs, financing methods, and regulatory approvals needed to obtain new supplies, as well as a projected time frame for obtaining them. WSVs must also contain information regarding existing supplies, as well as more detailed confirmation that the appropriate infrastructure planning and funding is in place to fully commit water supplies to a project. Senate Bill 610, which is applicable to certain large projects subject to CEQA or considered a "project" under Water Code Section 10912(a) or (b), builds on the information that is typically contained in an UWMP. The amendments to Water Code Section 10631 were designed to make WSAs and UWMPs consistent. A key difference between the WSAs and UWMPs is that pursuant to Water Code Section 10621, UWMPs are required to be updated every five years on or before July 1, in years ending in one and six, while WSAs are required as part of the environmental review process for each individually qualifying

project. As a result, the 20-year planning horizons for each type of document may cover slightly different planning periods. Additionally, not all water providers who must prepare a WSA under SB 610 are required to prepare an UWMP because these water systems do not meet the requirements in Water Code section 10631. As stated above, only public water systems providing water for municipal purposes to more than 3,000 customers, or supplying more than 3,000 acre-feet (AF) annually must prepare UWMPs.

3.1.1 SB 610 Water Supply Assessment

The SB 610 water supply assessment process involves answering the following questions:

- Is the project subject to CEQA?
- Is it a project under SB 610?
- Is there a public water system?
- Is there a current UWMP that accounts for the project demand?
- Is groundwater a component of the supplies for the project?
- Are there sufficient supplies available to serve the project over the next 20 years?

"Is the Project Subject to CEQA?"

The first step in the SB 610 process is determining whether the project is subject to CEQA. SB 610 amended Public Resources Code Section 21151.9 to read: "Whenever a City or county determines that a project, as defined in Section 10912 of the Water Code, is subject to this division [i.e., CEQA], it shall comply with part 2.10 (commencing with Section 10910) of Division 6 of the Water Code." The City has determined that the proposed Project is a project subject to CEQA. The information contained in this assessment will be used to inform and support the SEIR for the HEU, and will be appended thereto.

"Is It a Project Under SB 610?"

The second step in the SB 610 process is to determine if a project meets the definition of a "Project" under Water Code Section 10912(a). Under this section, a "Project" is defined as meeting any of the following criteria:

- A proposed residential development of more than 500 dwelling units;
- A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet (ft2) of floor space;
- A commercial building employing more than 1,000 persons or having more than 250,000 ft2 of floor space;
- A hotel or motel with more than 500 rooms;
- A proposed industrial, manufacturing, or processing plant, or industrial park, planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 ft2 of floor area;

- A mixed-use project that includes one or more of these elements; or
- A project creating the equivalent demand of 500 residential units.

Alternately, if a public water system has less than 5,000 service connections, the definition of a "Project" also includes any proposed residential, business, commercial, hotel or motel, or industrial development that would account for an increase of 10 percent or more in the number of service connections for the public water system.

As previously stated, the proposed Project would allow for residential and mixed-use developments that may include more than 500 units. In fact, the proposed Project would allow up to 4,000 new dwelling units through zoning modifications, and for that reason, it meets the requirements as a "Project" under the Water Code. As a result, a WSA pursuant to Water Code Section 10912 (a) will need to be prepared prior to completion of the HEU SEIR. (It should be noted that there is some question whether adoption or amendment of a general plan fits the definition of a "project" for purposes of requiring a WSA, as it does not directly create demand for water but instead authorizes the use of land that may be proposed for development requiring water. Notwithstanding this question, the City has determined that a WSA is required as part of the CEQA analysis of the Housing Element Update.)

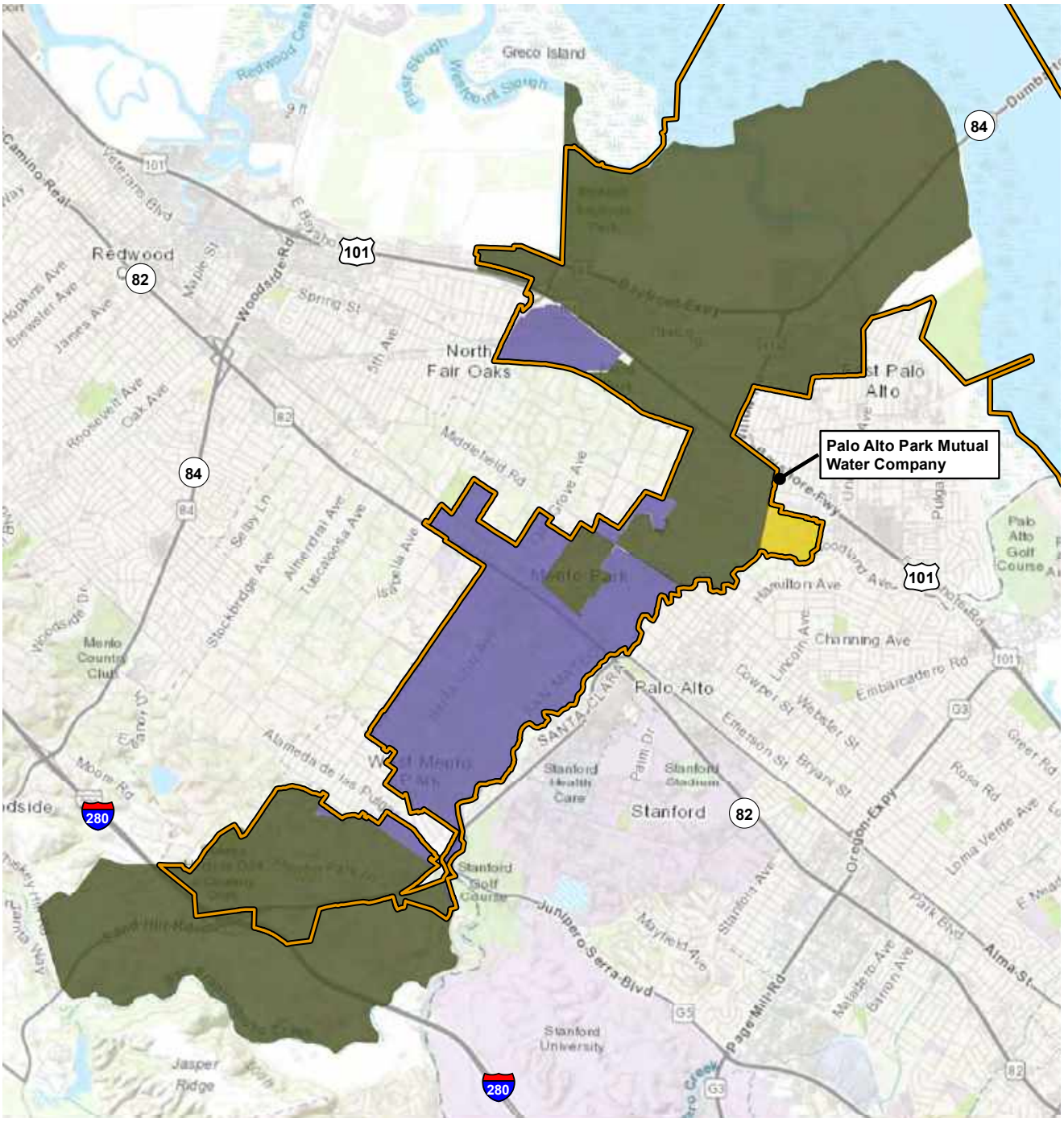
"Is There a Public Water System?"

The third step in the SB 610 process is determining if there is a "public water system" to serve the project. Section 10912(c) of the California Water Code states: "[A] public water system means a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections."

The City is served by four water systems: Cal Water Bear Gulch District, MPMW, O'Connor Tract Co-operative Water Company, and Palo Alto Park Mutual Water Company. The City has determined that two (Cal Water's Bear Gulch District and MPMW, as described in detail below) qualify as public water systems pursuant to Water Code section 10912(c) that would serve the proposed Project's additional housing and therefore require preparation of a WSA. The City does not require WSA's by O'Connor Tract Co-operative Water Company or Palo Alto Park Mutual Water Company, because the new residential development proposed under the Housing Element Update all is outside their service areas. **Figure B** provides an overview of all water suppliers within the City and their service area boundaries.

Cal Water Bear Gulch District

California Water Service Company is an investor-owned private utility supplying water service to 1.7 million Californians through over 440,000 connections. Its twenty-five separate water districts serve over fifty communities from Chico in the north to the Palos Verdes Peninsula in Southern California. Cal Water's operations for individual service districts are regulated by the California Public Utilities Commission (CPUC). CPUC sets different tariff rates for each of Cal Water's individual districts. Cal Water incorporated in 1926, and has provided water service to the Bear Gulch District since 1936.



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Menlo Park Housing Element Update EIR

Figure B
Water Suppliers in Menlo Park

Cal Water's Bear Gulch District is located in San Mateo County approximately 30 miles south-southeast of the City of San Francisco. The area served by Cal Water Bear Gulch District includes the communities of Atherton; Portola Valley; Woodside; portions of Menlo Park including the HEU plan area; and adjacent unincorporated portions of San Mateo County including West Menlo Park, Ladera, North Fair Oaks, and Menlo Oaks. Cal Water's Bear Gulch District's system is bordered on the north by Redwood City; on the east by Palo Alto, Stanford University, and unincorporated Santa Clara County; and on the south and west by unincorporated San Mateo County. Current land uses within the Cal Water's Bear Gulch District are a mixture of low, medium, and high density residential, mixed use, commercial, public facilities, and parks/open space.

Cal Water expanded its Bear Gulch District service area by acquiring three neighboring water service providers (Los Trancos County Water District, Skyline County Water District, and Woodside Mutual Water Company), and in 2020 it served more than 18,000 connections. Residential customers account for most of Bear Gulch District's service connections and 84 percent of its total water use. Non-residential water uses account for 11 percent of total demand while distribution system losses account for 5 percent.

Cal Water's Bear Gulch District serves approximately one-half of the City, with **[X#X]** connections in the City in 2020. **Figure C** illustrates Cal Water's Bear Gulch District's service area, its relationship to the City, and the locations within its service area where implementation of the HEU would support additional housing development.

Menlo Park Municipal Water

MPMW provides water service to approximately half of the City, serving an area of approximately 9 square miles. In 2020, MPMW served 4,296 connections. Land uses in the MPMW service area consist of residential, commercial, industrial and institutional. Customer service connections include residential users, industrial connections, commercial service connections, irrigation accounts, institutional and governmental accounts and other connections (including temporary services, private fire services, and hydrant services). **Figure D** illustrates MPMW's service area and its relationship to the City, and the locations within its service area where implementation of the HEU would authorize additional housing development.

"Is There a Current Urban Water Management Plan That Accounts for the Project Demand?"

Step four in the SB 610 process involves determining if there is a current UWMP that considers the projected water demand for the project area. The Water Code requires that all public water systems providing water for municipal purposes to more than 3,000 customers, or supplying more than 3,000 AF annually must prepare an UWMP. Pursuant to Water Code Section 10621, UWMPs are required to be updated every five years on or before July 1, in years ending in one and six.

Cal Water Bear Gulch District prepared an UWMP in 2020 (**Appendix A**), which was adopted in June 2021. MPMW's most recently adopted UWMP is the 2020 UWMP, which was adopted in May 2021 (**Appendix B**). Both of the aforementioned 2020 UWMP's are incorporated by reference into this WSA.

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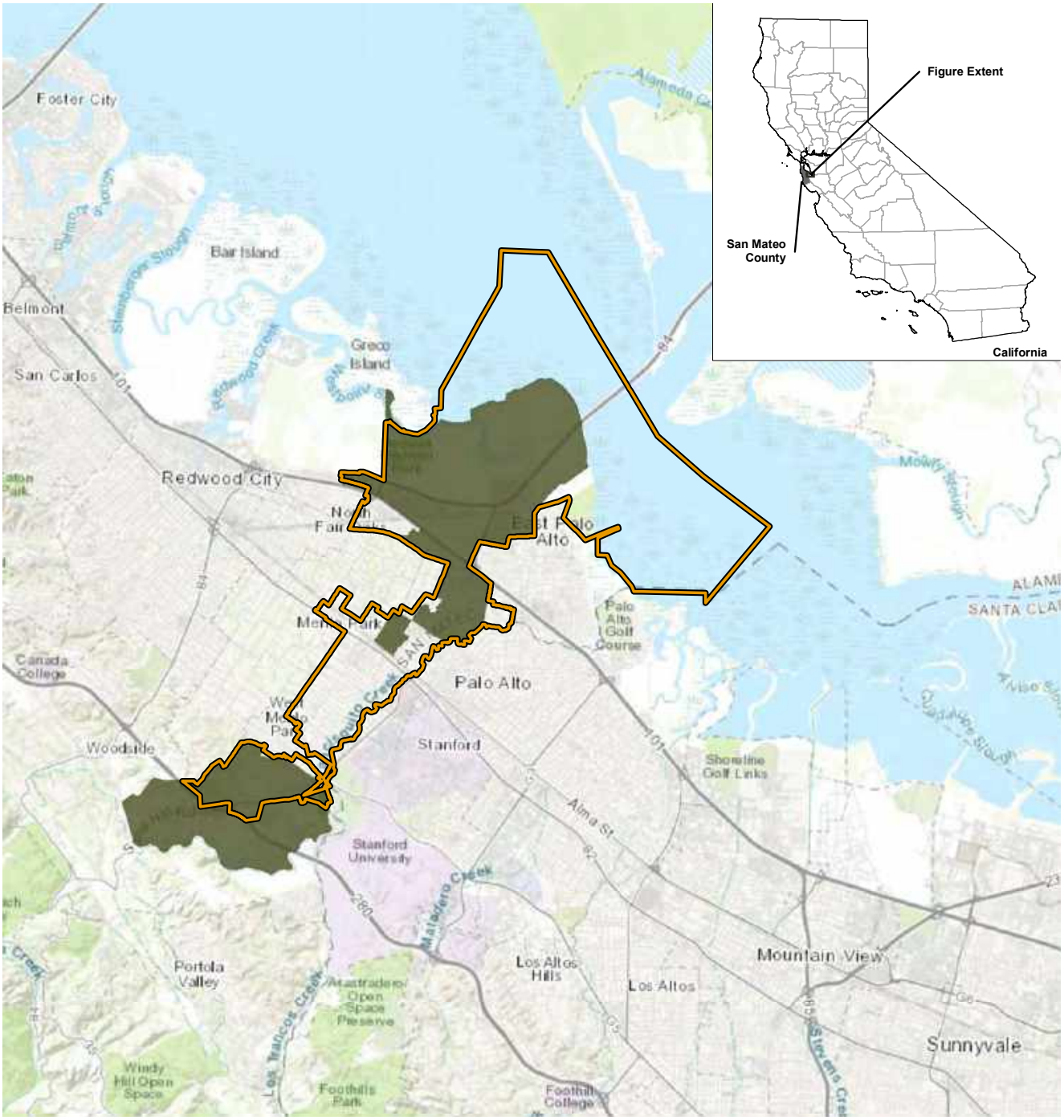
SOURCE: M-Group, 2022

Menlo Park Housing Element Update EIR

Figure C
Bear Gulch District Service Area



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Menlo Park Housing Element Update EIR

Figure D
Menlo Park Municipal Water

ESA

Water Code Section 10910(c)(2) states: “If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f), and (g) [i.e., the WSA].” If projected water demand associated with the proposed project was not accounted for in the most recently adopted urban management plan, Water Code Section 10910(c)(3) states: “the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses.”

The Cal Water Bear Gulch District’s 2020 UWMP is currently available online at the Department of Water Resources (DWR) website and MPMW’s 2020 UWMP is available at the City’s website. As shown in Figure C and Figure D, portions of proposed growth associated with implementation of the HEU and additional projected cumulative growth would occur within each of the water suppliers’ service areas. Therefore, new water demand associated with projected growth and implementation of the HEU is also expected to occur within each of the water suppliers’ service areas. Both water suppliers’ 2020 UWMPs accounted for proportional future growth in demand above the average water demand in each service area over a five-year period (from 2016 through 2020), however, implementation of the HEU and other projected growth forecasted by respective planning agencies was not accounted for in the growth forecasts when Cal Water Bear Gulch District was preparing its 2020 UWMP. Furthermore, additional growth in demand in the MPMW 2020 UWMP did not account for implementation of the HEU, and this WSA, consistent with Water Code Section 10910(c)(3) provides an assessment of supply and demand including new demand associated with implementation of the HEU and other projected growth. Projected growth in residential development in each of the respective water service areas is provided in greater detail below.

It is estimated that Cal Water Bear Gulch District’s service area population was 60,814 in 2020. Cal Water Bear Gulch District estimates its service area population using census block population counts from decadal Census data. The decadal Census estimates are converted to average population per single- and multi-family service, which are applied to service counts for years between the decadal Censuses. This method is similar to the approach used by the California DWR Population Tool and population estimates generated by the two methods have been shown to differ by less than one percent in most cases.

Cal Water Bear Gulch District’s population and service growth projections are tied to Association of Bay Area Governments (ABAG) census tract level projections of population, housing, and employment. These projections, in turn, are developed by ABAG through detailed land use modeling of the Bay Area. Parcels, or individual units of land ownership, provide the fundamental building block for the ABAG land use model. The land use database includes information linking the parcels to zones they are within, buildings within each parcel, their size, their monetary value, and their current planning constraints. The base year database contains 1.9 million buildings categorized into different land use types, ranging from detached single-

family housing to heavy industrial. The ABAG land use model relies on current zoning for all parcels in the region as a representation of the land use controls in place in the base year. Zoning codes, general plans, and specific plans were processed by ABAG to obtain a consistent indication of each jurisdiction's long-term vision for land use type, residential dwelling units per acre, and commercial floor area ratio. However, as previously discussed, the water demand for the proposed Project was not accounted for within projected growth in water demand described in Cal Water Bear Gulch District's 2020 UWMP. Therefore, this WSA, consistent with the City's HEU conducted an analysis of water demand associated with implementation of the HEU and additional growth anticipated in the Updated 2040 Cumulative Growth (Section 5) and evaluated the current and future water supply and demand scenarios in Section 6.

The MPMW 2020 UWMP incorporated the future population, employment and water demand projections for buildout of the General Plan, including the additional allowable development associated with ConnectMenlo and other major development projects within the MPMW service area. As previously described in this WSA, ConnectMenlo identifies the maximum development potential that could occur within the ConnectMenlo study area, including potential bonus-level increased development, and the associated program-level EIR further defines the maximum development that can occur by specific land uses. MPMW and the City's Planning Division are actively tracking projects within the ConnectMenlo study area on a cumulative basis to ensure that developed projects remain within the maximum development permitted in ConnectMenlo and would be consistent with the program-level EIR. The potential units located within the MPMW service area for the proposed Project, if approved, would be in addition to the remaining unallocated total residential development potential for ConnectMenlo, and are being evaluated within the program-level SEIR being prepared for the HEU. Water demand for the proposed Project is described in Section 5.3 and Table 5-5 of this WSA.

Additional discussion on the Cal Water Bear Gulch District and MPMW's existing and projected water demands is provided in Section 5 of this WSA.

"Is Groundwater a Component of the Supplies for the Project?"

According to the requirements of SB 610, if groundwater is identified as a possible source, Section 10910(f) of the Water Code also applies and a description of the groundwater basin or basins from which the proposed project will be supplied must be included in the WSA. Groundwater is a small component of the SFPUC's Retail supply but is not used to provide water to any of the Suburban wholesale customers including the Cal Water Bear Gulch District and MPMW. As recipients of treated water through the SFPUC Regional Water System (RWS), neither the Cal Water Bear Gulch District nor the MPMW use groundwater to meet customer demand within their respective service areas. However, MPMW may use groundwater for emergency purposes and has undertaken a multi-year Emergency Water Storage/Supply Project to construct groundwater wells and storage. As such, this WSA evaluates groundwater basin conditions pursuant to Section 10910(f).

Groundwater Basin Description

The MPMW service area overlies the southern end of the Santa Clara Valley Groundwater Basin's San Mateo Plain Groundwater Subbasin (DWR basin number 2-9.03; DWR, 2004; or "subbasin"). The subbasin is not adjudicated, nor has it been found by DWR to be in a condition of overdraft. As part of the implementation of the Sustainable Groundwater Management Act (SGMA), the subbasin was ranked as a "very low priority" basin under the California Statewide Groundwater Elevation Monitoring basin prioritization process. As such, the subbasin is not subject to the requirements of SGMA.

Located within the 45-square mile San Francisquito Creek Watershed, the MPMW service area contains both mountainous bedrock terrain and comparatively flat alluvial deposits. Coarse- and fine-grained alluvial deposits from the San Francisquito Creek can be found in the MPMW service area. There is a shallow aquifer and a deep aquifer that has an upper and a lower zone in the MPMW service area. Both aquifers lie beneath a laterally extensive confining layer. The shallow aquifer is unconfined while the deep aquifer is semi-confined. Pump tests and empirical transmissivity data show that it is feasible to develop a municipal supply from the groundwater subbasin. It is estimated that the groundwater subbasin can be as thick as 1,000 feet in some locations.

Groundwater in the Santa Clara Valley Groundwater Basin naturally flows toward the San Francisco Bay from the uplands in the southwest. Reverse groundwater gradients, from the San Francisco Bay toward the uplands, have been seen when pumping has exceeded the rate of recharge. The estimated annual recharge rate of the San Francisquito Creek watershed ranges from 4,000 to 8,000 acre-feet per year, equivalent to 3.6 to 7.2 mgd.

Additional discussion of the groundwater conditions and groundwater management is provided in MPMW's 2020 UWMP.

MPMW Emergency Water Storage/Supply Project

The MPMW Emergency Water Storage/Supply Project intends to provide a backup water supply to MPMW's Lower Zone, which lacks emergency storage, in the event water from the SFPUC RWS is reduced or unavailable. The MPMW Emergency Water Storage/Supply Project goal is to provide a total capacity of up to 3,000 gpm, or approximately 4.32 mgd, between two to three wells at separate locations. MPMW initiated this project in 2010 and completed site screening, site ranking, and detailed engineering and hydrologic evaluation in 2013, including extensive community engagement. The City selected the Corporation Yard at 333 Burgess Drive for the first well, completed the CEQA evaluation in 2016, and drilled the well in 2017. Construction of the well facility (e.g., generator, disinfection equipment, associated piping) was completed in late 2020, and MPMW is working with the SWRCB to permit the well.

The MPMW Emergency Water Storage/Supply Project also consists of constructing an underground reservoir and pump station. The wells, underground reservoir, and pump station are identified in the 2018 Water System Master Plan as priority projects and funding has been included in the current five-year capital improvement program. MPMW is currently in the process of identifying locations for the two other wells, the underground reservoir, and pump station.

In addition, MPMW's 2020 UWMP includes utilizing well water for drought stage 5 (up to 50% reduction) and drought stage 6 (greater than 50% reduction) to augment supplies if necessary as part of its Water Shortage Contingency Plan.

The SWRCB Division of Drinking Water classifies wells as "active" or "standby." Active wells require regular, frequent testing to meet Safe Drinking Water Standards; standby wells are tested less frequently. Additionally, standby wells, must meet all primary standards (but not secondary standards) and have restrictions that the well cannot be used for more than 14 days per year or more than five consecutive days. To provide flexibility, the City plans to permit its emergency wells as "active" wells as long as primary and secondary standards can be met. The City's plan is to use the wells for emergency purposes only, but have the flexibility to provide well water during emergencies that last more than 14 days per year or more than five consecutive days.

"Are There Sufficient Supplies to Serve the Project over the Next 20 Years?"

The final step in the SB 610 process is to illustrate the available water supplies, including the availability of these supplies in all water-year conditions (normal year, single dry year, and multiple dry years) over a 20-year planning horizon, and an assessment of how these supplies relate to project-specific and cumulative demands over 20- and 25-year planning periods as compared to the Cal Water Bear Gulch District and MPMW 2020 UWMPs. In this case, the period is projected to 2045 for Cal Water's Bear Gulch District and to 2040 for MPMW. The water supply and demand comparisons are presented and discussed in Section 6. Section 7 of this WSA provides a conclusion. For convenience, the WSA findings are also presented below.

WSA Findings

Regarding the availability of water supplies to serve the HEU, consistent with the two water districts' 2020 UWMPs, this WSA presents water supply scenarios with and without implementation of the Bay-Delta Plan Amendment (as described in section 4.2.3 SFPUC Regional Water System).

Water supply scenario **without implementation** of the Bay-Delta Plan Amendment:

- In years of normal and above-normal precipitation and including local water supply sources, the Cal Water Bear Gulch District and MPMW have adequate supplies to serve 100 percent of normal demand beginning in 2025 and through each of their respective planning horizons.
- SFPUC would be able to meet 100 percent of its water supply guarantees during all water year types through 2045 except during the fourth and fifth consecutive dry years for base year 2045 when 15 percent shortages are projected within the Regional Water System (RWS). In these years, Cal Water Bear Gulch District and MPMW would not have sufficient supplies to meet demand and would need to activate their water shortage contingency plans to balance demand against reduced supplies.
- As discussed in Section 6.7 and presented in Table 6-7, MPMW through its ISG with SFPUC will meet the projected water demand associated with the Updated 2040 Cumulative Demand. If and when supply shortfalls occur in single dry and multiple dry years as soon as 2025,

MPMW expects to meet these supply shortfalls through water demand reductions through implementation of its Demand Management Measures.

Water supply scenario **with implementation** of the Bay-Delta Plan Amendment:

- SFPUC will be able to meet its contractual obligations to its wholesale customers in normal years but would experience significant supply shortages in all dry years. In these years, Cal Water Bear Gulch District and MPMW along would not have sufficient supplies to meet demand and would need to activate their water shortage contingency plans to balance demand against reduced supplies.
- In single dry years, supply shortages in the SFPUC's Regional Water System would range from 36 to 46 percent. In multiple dry years, supply shortages would range from 36 to 54 percent. Notably, implementation of the Bay-Delta Plan Amendment will reduce SFPUC's primary supply source and require rationing in all single dry and multiple dry years through 2040 and 2045. In these years, Cal Water Bear Gulch District and MPMW would not have sufficient supplies to meet demand and would need to activate their water shortage contingency plans to balance demand against reduced supplies.
- As discussed in sections 6.9 through 6.12, SFPUC, BAWSCA, Cal Water and MPMW are working to develop regional and local projects to shore up local supplies and reduce the projected shortfall. If conditions for substantial drought cutbacks to the RWS persist, Cal Water Bear Gulch District and MPMW will need to implement additional demand management practices and prohibitions on potable water use and accelerate efforts to develop alternative supplies of water.

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SECTION 4
Water Supply Setting

This section presents local climate conditions and reviews water supply sources, entitlements, water rights and contracts.

4.1 Climate

The City has a Mediterranean climate with cool, wet winters and warm, dry summers. Climatic statistics are shown in **Table 4-1**. Rainfall in the area averages 15.28 inches per year and is generally confined to the "wet" season from late October to early May. The average reference evapotranspiration (ETo) for the region is 44 inches per year. The ETo is a standard measurement related to the water demand by plants in a specific region. Because the average annual ETo is approximately 30 inches more than the average annual precipitation, and because 90 percent of the annual precipitation occurs between the months of November and April, growing turf or other plantings in this region requires a significant amount of irrigation during the dry season. This irrigation demand contributes to the overall and observed seasonal variation in water demand throughout Cal Water Bear Gulch District's and MPMW's service areas.

TABLE 4-1
CITY OF MENLO PARK CLIMATE SUMMARY

Month	Maximum Average Temperature (°F)	Minimum Average Temperature (°F)	Standard Average ETo (inches)	Average Monthly Rainfall (inches)
January	57.5	39.0	1.4	3.23
February	61.3	41.3	2	2.88
March	64.1	43.2	3.3	2.22
April	68.4	44.8	4.4	0.99
May	72.8	48.5	5.4	0.37
June	77.4	52.5	6	0.08
July	78.2	54.8	6.2	0.02
August	78.5	55.0	5.4	0.05
September	78.2	52.8	4.4	0.18
October	73.1	48.0	3.1	0.71
November	64.5	42.5	1.7	1.86
December	58.0	38.2	1.2	2.69
Annual Average	**69.3**	**46.7**	**44**	**15.28**

SOURCE: City of Menlo Park, *Urban Water Management Plan* (2020)

a. Temperature and precipitation data are from the Western Regional Climate Center for Station #046646 PALO ALTO from September 1, 1953 to June 4, 2016. https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca6646. Accessed July 2022.
b. Reference evapotranspiration data for Union City station #171 are from the Department of Water Resources, California Irrigation Management Information System.

4.2 Water Supply Entitlements, Water Rights and Contracts

Water Code Section 10910(d)(1) states: "The assessment required by this section shall include an identification of any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and a description of the quantities of water received in prior years by the public water system, or the City or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights or water service contracts."

4.2.1 Water Supply Sources

All of MPMW's potable water and the majority of potable water for Cal Water Bear Gulch District is provided through the SFPUC of the City and County of San Francisco. The SFPUC, through its Regional Water System (RWS) currently delivers an annual average of approximately 265 million gallons per day (mgd) to retail and wholesale customers primarily within the San Francisco Bay Area. Approximately 85 percent of that water supply is provided by the Hetch Hetchy system, which diverts water from the Tuolumne River in the Sierra Nevada. The balance (approximately 15 percent) comes from runoff in the Alameda Creek watershed, which is stored in the Calaveras and San Antonio reservoirs, and runoff from the San Francisco Peninsula, which is stored in the Crystal Springs, San Andreas, and Pilarcitos reservoirs (which also provide storage for water delivered from the Hetch Hetchy Project).

Table 4-2 shows the quantities and volumes of supply and the respective percentages. The table also shows the approximate volume of supply when a 20 percent system-wide reduction is imposed by the SFPUC on the retail and wholesale customers within the regional Bay Area conveyance system over multiple dry years.

TABLE 4-2
SUPPLY SOURCES AND SYSTEM-WIDE REDUCTIONS

SFPUC Water Sources	Normal-Year Supply Source		Approximate Multiple-Dry-Year Supply Source (20% System-wide Reduction)		
	Origin/System	mgd	Approximate Percent of Supply	mgd	Approximate % of Supply
Local Source	Alameda System[a]	39.75	15	14.84	7
	Peninsula System[b]				
Imported Source	Hetch Hetchy System[c]	225.25	85	197.16	93
	Total	***265.00***	***100***	***212.00***	***100***

SOURCE: San Francisco Public Utilities Commission. 2020 Urban Water Management Plan.

a. Calaveras Reservoir, San Antonio Reservoir.
b. Crystal Springs Reservoirs, San Andreas Reservoir, Pilarcitos Reservoir.
c. Hetch Hetchy Reservoir, Lake Lloyd, Lake Eleanor, New Don Pedro Reservoir, Tuolumne River System.

4.2.2 Surface Water

Appropriative water rights allow the holder to divert water from a source to a place of use not connected to the water source. These rights are based on seniority and use of water must be reasonable, beneficial, and not wasteful. In 1914, California established a formal water rights permit system, which is administered by the SWRCB. The SWRCB has sole authority to issue new appropriative water rights (i.e., permits and licenses) but cannot alter property rights created under a pre-1914 appropriative water right.

The City and County of San Francisco (San Francisco) hold pre-1914 appropriative water rights to store and deliver water from the Tuolumne River in the Sierra Nevada and locally from the Alameda and Peninsula watersheds. San Francisco also diverts and stores water in the San Antonio Reservoir under an appropriative water right license granted by the SWRCB in 1959. The 1912 Freeman Report identified the ultimate diversion rate from the Tuolumne River to the Bay Area as 400 mgd (448,220 acre-feet per year (AFY)) and San Francisco used this as the basis for designing the export capacity of the Hetch Hetchy project for water supply deliveries to San Francisco. San Francisco has sufficient water rights for current diversions and the ultimate planned diversion rate of the Hetch Hetchy Project.[1]

The federal Raker Act, enacted on December 19, 1913, grants to San Francisco rights-of-way and public land use on federal property in the Sierra Nevada Mountains to construct, operate, and maintain reservoirs, dams, conduits, and other structures necessary or incidental to developing and using water and power. It also imposes restrictions, and specific terms and conditions on use of the Hetch Hetchy Reservoir. In terms of water rights, the requirement that San Francisco recognizes the senior water rights of the Turlock and Modesto Irrigation Districts (TID and MID) to divert water from the Tuolumne River. Specifically, the Raker Act requires San Francisco to bypass certain flows through its Tuolumne River reservoirs to TID and MID for beneficial use. By agreement, San Francisco, TID, and MID have supplemented these Raker Act obligations to increase the TID and MID entitlements to account for other senior Tuolumne River water rights and to allow San Francisco to “pre-pay” TID and MID their entitlement by storing water in the Don Pedro water bank. San Francisco is required to bypass inflow to TID and MID sufficient to allow these districts to divert 2,416 cubic feet per second (cfs) or natural daily flow, whichever is less, at all times (as measured at La Grange), except for April 15 to June 13, when the requirement is 4,066 cfs or natural daily flow as measured at La Grange, whichever is less. Other terms and conditions specific to SFPUC’s Settlement Agreement and Master Water Sales Contract (MSA) with the 26 member agencies of the BAWSCA are described in section 4.2.1.1 of SFPUC’s 2020 UWMP (**Appendix C**).

[1] San Francisco made numerous water-rights filings on the Tuolumne River between 1901 and 1911. The Tuolumne River water-rights filings support a *prima facie* diversion rate well over 400 mgd. The 1912 Freeman Report, which provided the basis for San Francisco’s proposals to Congress to develop the Hetch Hetchy Project, identified 400 mgd as the ultimate diversion from the Tuolumne River. SF Planning Department, pg. 2-39, SFPUC Water System Improvement Program PEIR

4.2.3 SFPUC Regional Water System

In 1934, in order to create the RWS, San Francisco combined its newly operational Hetch Hetchy water conveyance system and the existing Spring Valley system, which it had recently acquired with the purchase of the Spring Valley Water Company. With this acquisition, San Francisco also gained water rights to local diversions off existing streams on the San Francisco Peninsula that were originally held by the Spring Valley Water Company.

The RWS currently delivers water to 2.5 million users in Tuolumne, Alameda, Santa Clara, San Mateo, and San Francisco counties. As introduced above, the RWS delivers an annual average of approximately 265 mgd—of this, 81 mgd serves the retail customers within the City and County boundaries of San Francisco, and the other 184 mgd is delivered to the Wholesale customers based primarily on the San Francisco Bay Peninsula, and then the Wholesale customers sell water to its consumers within the individual service areas.

The RWS is a complex system, shown in **Figure E**, and supplies water from two primary sources:

- Tuolumne River through the Hetch Hetchy Reservoir, and
- Local runoff into reservoirs in Bay Area reservoirs in the Alameda and Peninsula watersheds.

Figure E
Regional Water Supply System

Water from Hetch Hetchy Reservoir, through the Hetch Hetchy facilities, represents the majority of the water supply available to the SFPUC. During drought periods of low precipitation in the San Francisco Bay Area, water from the Hetch Hetchy system can amount to over 93 percent of the total water delivered through the RWS.

Bay Area reservoirs provide on average approximately 15 percent of the water delivered by the SFPUC RWS. The local watershed facilities are operated to conserve local runoff for delivery. On the San Francisco Peninsula, the SFPUC utilizes Crystal Springs Reservoir, San Andreas

Reservoir, and Pilarcitos Reservoir to capture local watershed runoff. In the Alameda Creek watershed, the SFPUC constructed the Calaveras Reservoir and San Antonio Reservoir. In addition to capturing runoff, San Antonio, Crystal Springs, and San Andreas reservoirs also provide storage for Hetch Hetchy diversions. The local watershed facilities also serve as an emergency water supply in the event of an interruption to Hetch Hetchy diversions.

Bay-Delta Plan Amendment and Uncertainty in Tuolumne River Water Supply

In December 2018, the SWRCB adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento San Joaquin Delta Estuary (Bay-Delta Plan Amendment) to establish water quality objectives to maintain the health of the Bay-Delta ecosystem. The SWRCB is required by law to regularly review this plan. The adopted Bay-Delta Plan Amendment was developed with the stated goal of increasing salmon populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay-Delta. The Bay-Delta Plan Amendment requires the release of 30-50 percent of the "unimpaired flow"[2] on the three tributaries from February through June in every water year type including below normal, dry and critical dry years. In SFPUC modeling of the new flow standard, it is assumed that the required release is 40 percent of unimpaired flow.

The SWRCB has stated that it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, assuming all required approvals are obtained by that time. However, implementation of the Bay-Delta Plan Amendment is uncertain for multiple reasons.

First, since adoption of the Bay-Delta Plan Amendment, over a dozen lawsuits have been filed in both state and federal courts, challenging the SWRCB's adoption of the Bay-Delta Plan Amendment, including a legal challenge filed by the federal government, at the request of the U.S. Department of Interior, Bureau of Reclamation. This litigation is in the early stages and there have been no dispositive court rulings as of this date.

Second, the Bay-Delta Plan Amendment is not self-implementing and does not automatically allocate responsibility for meeting its new flow requirements to the SFPUC or any other water rights holders. Rather, the Bay-Delta Plan Amendment merely provides a regulatory framework for flow allocation, which must be accomplished by other regulatory and/or adjudicatory proceedings, such as a comprehensive water rights adjudication or, in the case of the Tuolumne River, may be implemented through the water quality certification process set forth in section 401 of the Clean Water Act as part of the Federal Energy Regulatory Commission's licensing proceedings for the Don Pedro and La Grange hydroelectric projects. It is currently unclear when the license amendment process is expected to be completed. This process and the other regulatory and/or adjudicatory proceedings would likely face legal challenges and have lengthy timelines, and quite possibly could result in a different assignment of flow responsibility (and therefore a different water supply impact on the SFPUC).

[2] "Unimpaired flow represents the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds." (Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Dec. 12, 2018) p.17, fn. 14, available at https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf.)

Third, in recognition of the obstacles to implementation of the Bay-Delta Plan Amendment, the SWRCB Resolution No. 2018-0059 adopting the Bay-Delta Plan Amendment directed staff to help complete a "Delta watershed-wide agreement, including potential flow measures for the Tuolumne River" by March 1, 2019, and to incorporate such agreements as an "alternative" for a future amendment to the Bay-Delta Plan to be presented to the SWRCB "as early as possible after December 1, 2019." In accordance with the SWRCB's instruction, on March 1, 2019, SFPUC, in partnership with other key stakeholders, submitted a proposed project description for the Tuolumne River that could be the basis for a voluntary substitute agreement with the SWRCB ("March 1st Proposed Voluntary Agreement"). On March 26, 2019, the Commission adopted Resolution No. 19-0057 to support the SFPUC's participation in the Voluntary Agreement negotiation process. To date, those negotiations are ongoing under the California Natural Resources Agency and the leadership of the Newsom administration.[3]

4.2.4 Water Supply Sources for Cal Water Bear Gulch District and Menlo Park Municipal Water

The potable water furnished to customers within the City is a combination of purchased water and treated surface water.

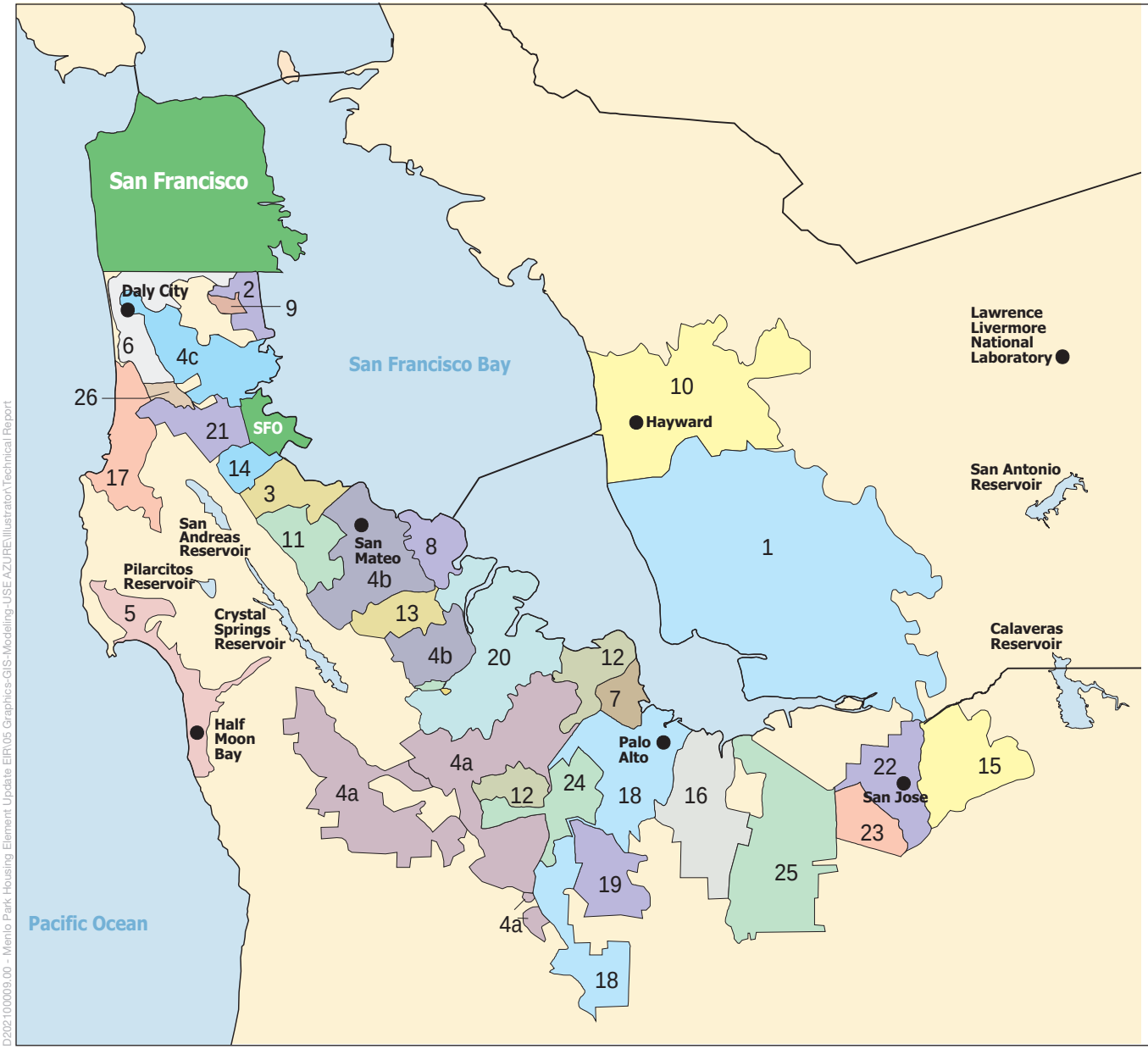
4.2.5 Imported Purchased Water from SFPUC

MPMW and Cal Water's Peninsula's districts including Bear Gulch District, Mid-Peninsula and South San Francisco all receive purchased treated water from SFPUC's RWS. SFPUC utilizes storage and conveyance systems within the RWS to serve all its retail and wholesale water demands with an integrated operation of imported water from Hetch Hetchy and/or locally produced Bay Area water collected and stored in several reservoirs some of which reside on the Peninsula. Notably, the federal Raker Act, as described above, imposes restrictions and specific terms and conditions on use of the Hetch Hetchy Reservoir, preventing privately-owned utilities, like Cal Water, from receiving water from the Hetch Hetchy system, but allows purchases of treated water from local supply sources and storage reservoirs such as Crystal Springs Reservoir, San Andreas Reservoir, and Pilarcitos Reservoir.

4.3 Water Contracts and Agreements

In 1984, the SFPUC executed the Settlement Agreement and Master Water Sales Contract (MSA) with the 26 member agencies of Bay Area Water Supply and Conservation Agency (BAWSA). The BAWSCA members purchase approximately two-thirds of the water delivered by the SFPUC system and the balance is delivered to the City and County of San Francisco and its retail customers. **Figure F** represents the BAWSCA member agencies and their locations and respective service areas. The MSA primarily addressed the rate-making methodology used by SFPUC in setting wholesale water rates for its wholesale customers, in addition to addressing water supply and water shortages within the regional water system. The MSA provides 184 mgd as an annual average of "Supply Assurance" to all BAWSCA wholesale customers, but is subject

[3] California Natural Resources Agency, "Voluntary Agreements to Improve Habitat and Flow in the Delta and its Watersheds," available at https://files.resources.ca.gov/voluntary-agreements/.



BAWSCA MEMBERS

Agency Name	Agency Number
Alameda County Water District	1
City of Brisbane	2
City of Burlingame	3
Cal Water Service Co. - Bear Gulch	4a
Cal Water Service Co. - Mid-Peninsula	4b
Cal Water Service Co. - SSF	4c
Coastside County Water District	5
City of Daly City	6
East Palo Alto	7
Estero Municipal Improvement District	8
Guadalupe Valley Municipal Improvement District	9
City of Hayward	10
Town of Hillsborough	11
City of Menlo Park	12
Mid-Peninsula Water District	13
City of Millbrae	14
City of Milpitas	15
City of Mountain View	16
North Coast County Water District	17
City of Palo Alto	18
Purissima Hills Water District	19
City of Redwood City	20
City of San Bruno	21
City of San Jose	22
City of Santa Clara	23
Stanford University	24
City of Sunnyvale	25
Westborough Water District	26

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Menlo Park Housing Element Update EIR

Figure F
BAWSCA Member Agencies

ESA

to reductions in the event of droughts, water shortages, earthquakes, other acts of God or system maintenance and rehabilitation. Almost all members hold an individual water supply contract and the MSA governs the contract. The original 25-year contract ended on June 30, 2009.

The SFPUC approved the new 25-year contract, now known as the Water Supply Agreement (Agreement), in June 2009 and the BAWSCA agencies completed their approval of the Agreement in October 2009. This Agreement was amended in 2018 (known as the 2018 Amended and Restated WSA) and expires on June 30, 2034. Section 7.01 of the 1984 MSA states "Supply Assurance continues in effect indefinitely, even after expiration of the MSA in 2009" and this is still the case in the new Agreement. The condition is a reflection of case law, which holds that a municipal utility acts in a trust capacity with respect to water supplied to outside communities (Durant v. City of Beverly Hills, 39 Cal. App. 2d 133, 102 P.2d 759 (1940); and Hansen v. City of San Buenaventura, 42 Cal. 3d 1172 (1986)). In other words, entire communities have developed in reliance on these water supplies. Consequently, the Supply Assurance of up to 184 mgd will survive the termination of the Agreement and the Individual Contracts.

4.4 Individual Supply Guarantees

SFPUC has a perpetual commitment (Supply Assurance) to deliver 184 mgd to the 24 permanent BAWSCA Wholesale Customers collectively. San Jose and Santa Clara are not included in the Supply Assurance commitment and each has temporary and interruptible water supply contracts with San Francisco. The Supply Assurance is allocated among the 24 permanent Wholesale Customers through Individual Supply Guarantees (ISG), which represent each Wholesale Customer's allocation of the 184 mgd Supply Assurance.

Cal Water's ISG is 35.68 mgd, or 39,993 acre-feet per year (AFY), which is shared among its Bear Gulch, Mid-Peninsula, and South San Francisco Districts (also referred to herein as the "Peninsula Districts").

MPMW's ISG is 4.456 mgd, or 5,002 AFY, which is the equivalent of roughly 1,630 million gallons per year (mgy). Between 2016 and 2020, MPMW purchased between 52 percent and 66 percent of its ISG. MPMW's 2020 UWMP presented its purchased supplies and demand in millions of gallons. For purposes of consistency between Cal Water Bear Gulch District and MPMW in describing water supply, water use, and HEU water demand, and for comparison purposes, in Section 6, this WSA converted million gallons to acre-feet (AF) or million gallons per year to AFY.

Additional agreements and plans have been developed over the last 25 years. In the early 1990s, for planning and reliability purposes, BAWSCA negotiated, and then formally adopted in 1993, the Supply Assurance Allocation (SAA), which is now referred to as the ISG under the current Agreement. The ISG, like the SAA, quantifies SFPUC's contract obligation to supply water to each of the BAWSCA members. The Agreement does not guarantee that SFPUC will meet peak or hourly demands if the individual wholesaler's annual usage exceeds the Supply Assurance Allocation. The ISG helps the wholesaler plan for future demands and growth within their service area; for that reason, the ISG transcends the Agreement expiration and continues indefinitely. The

ISG for Cal Water's Peninsula districts secures 35.68 mgd for normal year deliveries; MPMW's ISG secures 4.456 mgd for normal year deliveries. However, some Wholesale agencies (Hayward, the cities of Santa Clara and San Jose) have been guaranteed the ability to increase water demands at the potential expense of other communities. Hayward and San Francisco executed a contract in 1962. This contract does not place a limit on Hayward's original ISG and SFPUC is contractually bound to meet these increasing demands. The contract stipulates that if Hayward purchases 22.1 mgd for three consecutive years, then SFPUC will recalculate the supply deliveries to the other BAWSCA agencies with an appropriate reduction. This has the potential in the future to affect the ISG for other communities and their water suppliers, including Cal Water's Peninsula Districts and MPMW.

In addition, the cities of San Jose and Santa Clara are also included in the Suburban Wholesalers and receive portions of the 184.0 mgd from SFPUC allocated to wholesale customers. These cities have both been granted 4.5 mgd for a total of 9.0 mgd of the 184.0 mgd. This routinely creates issues with regard to allocating supply shortages and could potentially affect the supply deliveries to Cal Water's Peninsula Districts and MPMW and the other Wholesalers in times of RWS reductions.

In terms of water supply reliability, the SFPUC's UWMP assumes "firm" delivery as "the amount the system can be expected to deliver during historically experienced drought periods." The 1987 to 1992 drought is the basis for this plan, plus an additional period of limited water availability. The SFPUC plans its water deliveries assuming that the worst drought experience is likely to reoccur and then adds an additional period of limited water availability. An 8.5-year drought scenario is referred to as the "design drought" and is ultimately the basis for SFPUC water resource planning and modeling. The "design drought" is based on the 1986-1992 drought plus 2.5 years of "prospective drought", which includes a 6-month recovery period.

Water Shortage Allocation Plan

The SFPUC and the wholesale members developed a long-term strategy to accommodate or rectify the potential of future water shortages throughout its wholesale and retail operations. The methodology for determining water supply reliability during drought years is the Water Shortage Allocation Plan (WSAP). The SFPUC and BAWSCA members agreed upon and adopted the WSAP. Under this plan, the SFPUC will determine the available water supply in drought years for shortages up to 20 percent on an average, system-wide basis.

The WSAP has two components. The Tier One component of the WSAP allocates water between San Francisco and the wholesale customer agencies collectively. In a 20 percent reduction implemented by the SFPUC, the City and County of San Francisco will only face an 18 percent reduction. The Tier Two component of the WSAP allocates the collective wholesale customer share among each of the 26 wholesale customers. This allocation is based on a formula that considers three factors, the first two of which are fixed: (1) each agency's Supply Assurance from SFPUC, with certain exceptions, and (2) each agency's purchases from SFPUC during the three years preceding adoption of the Plan. The third factor is the agency's rolling average of purchases of water from SFPUC during the three years immediately preceding the onset of shortage. The WSAP, also known as the Tier One Plan, was amended in the 2018 Amended and Restated WSA.

The SFPUC 2004 Wholesale Customer Water Demand Projections study (Demand Study) analyzed water demands associated with each customer sector and then forecasted demands over a 25-year planning horizon. The Tier One (SFPUC to BAWSCA) and Tier Two (BAWSCA to wholesale customers) allocation plans were used to determine supply reductions in single and multiple dry year scenarios.

As amended in 2018, the Tier One Plan requires Retail Customers to conserve a minimum of 5 percent during droughts. If Retail Customer demands are lower than the Retail Customer allocation (resulting in a "positive allocation" to Retail) then the excess percentage would be re-allocated to the Wholesale Customers' share. The additional water conserved by Retail Customers up to the minimum 5 percent level is deemed to remain in storage for allocation in future successive dry years.

The Tier One Plan will expire at the end of the term of the WSA in 2034, unless mutually extended by San Francisco and the Wholesale Customers.

The Tier One Plan applies only when the SFPUC determines that a system-wide water shortage exists and issues a declaration of a water shortage emergency under California Water Code Section 350. Separate from a declaration of a water shortage emergency, the SFPUC may opt to request voluntary cutbacks from its Retail and Wholesale Customers to achieve necessary water use reductions during drought periods.

The Tier Two Plan, the second component of the WSAP, allocates the collective wholesale customer share among each of the 26 wholesale customers. It was last adopted in 2011 by the governing bodies of each wholesale customer and originally expired in 2018. However, use of the Tier Two Plan has been extended by the BAWSCA Board on an annual basis, most recently in November 2021 (which extended use of the Tier Two Plan through December 31, 2022). The BAWSCA wholesale customers are currently in discussions about jointly developing an alternative allocation method that would consider additional equity factors if SFPUC is unable to deliver its contractual supply volume and cutbacks to the RWS supply exceed 20 percent.

Because water use efficiency and conservation efforts are needed to accommodate new growth throughout the Bay Area and it is unknown how or if new supplies would be available in the RWS, the SFPUC assumes that the wholesale customers will purchase 184 mgd from the RWS through 2045. Therefore, this WSA assumes wholesale supplies remain at 184.0 mgd and each of the ISGs are subject to their existing agreements with SFPUC, with no increases: Cal Water's ISG is 35.68 mgd (39,993 AFY) for all its Peninsula districts and MPMW's ISG is 4.456 mgd (5,002 AFY).

4.5 Cal Water Bear Gulch District's Surface Water Supply (Local Watershed)

The Cal Water Bear Gulch District obtains a small fraction of its supplies (approximately 9 percent of annual deliveries during the 1980-2020 time period) from surface water diverted from Bear Gulch Creek, a perennial stream that flows from a watershed in the Coast Range Mountains northeast to its confluence with San Francisquito Creek and eventually into San Francisco Bay.

Cal Water Bear Gulch District diverts water from two points of diversion (PODs) along the creek – the Upper POD (with an upstream watershed area of 2.5 square miles) and the Lower POD (with an upstream watershed area of 9.4 square miles).

Diversions from the Upper and Lower PODs are each governed by separate SWRCB-administered water rights (i.e., pre-1914 claimed water rights and post-1914 SWRCB-issued diversion permits/licenses) that specify the volumes, rates, and timing of allowed diversions at each POD. In addition to these SWRCB-administered water rights, diversions are further constrained by certain diversion limitations and minimum instream flow requirements imposed by the California Department of Fish and Wildlife (CDFW) at the Upper POD and by the National Oceanic and Atmospheric Administration (NOAA) at the Lower POD. There also exists a 1936 agreement with Stanford University that prohibits Cal Water Bear Gulch District from diverting more than 50 percent of the flows that pass by (i.e., are not diverted at) the Upper POD.

Water diverted from the Upper POD flows through a gravity conveyance pipeline to a junction point where it is joined by water diverted from the Lower POD, at which point the water is pumped into the Cal Water Bear Gulch District-owned Bear Gulch Reservoir, a man-made storage facility impounded by an earthen dam. The Bear Gulch Reservoir is operated to have a minimum "dead pool" storage of 50 million gallons (MG), or approximately 153 acre-feet (AF). The maximum storage estimate of the reservoir has been reduced from 149 MG (547 AF) to 142.7 MG (438 AF), a limit imposed by the California Division of Safety of Dams (DSOD), based on a maximum storage elevation of 230 feet above mean sea level. Cal Water Bear Gulch District is undertaking capital improvements to Bear Gulch Reservoir to address DSOD's seismic safety concerns, and may also consider increasing the maximum storage capacity. Outflows from Bear Gulch Reservoir are currently limited by the DSOD to the rate that causes a water surface elevation decline of 0.3 feet per day.

Water stored in Bear Gulch Reservoir is released and sent through the Cal Water Bear Gulch District-owned Bear Gulch Water Treatment Plant (BGWTP) prior to addition to the distribution system. The Bear Gulch Water Treatment Plant, which was placed into operation in 1977, has a rated capacity of 6.0 MGD. There the water is clarified, filtered, and chloraminated[4] in compliance with the Surface Water Treatment Rule and the Safe Drinking Water Act.

4.6 Total Water Supplies

4.6.1 Normal-Year Supplies for Bear Gulch District and MPMW

Purchased supplies from the SFPUC RWS are delivered in millions of gallons per day. Cal Water's ISG of 35.68 mgd or 39,993 AFY is shared among all three of its Peninsula districts, which provides operational flexibility to distribute the supply as needed in each system depending on the availability of local supplies and conditions within each service area. Cal Water's

[4] Chloramination is the treatment of drinking water with a chloramine disinfectant. Both chlorine and small amounts of ammonia are added to the water one at a time which react together to form chloramine (also called combined chlorine), a long lasting disinfectant. Chloramine disinfection is used in both small and large water treatment plants.

collective total from the RWS for the three Peninsula districts is equal to its ISG. However, the "Reasonably Available Volume" shown in the Cal Water Bear Gulch District 2020 UWMP is only a portion of Cal Water's ISG to meet demand within its service area through 2045.

An estimate of projected SFPUC supply available to the Cal Water Bear Gulch District (i.e., the "Reasonably Available Volume") was calculated by subtracting the Cal Water Bear Gulch District's local surface water supply from the Cal Water Bear Gulch District's total demand over the planning horizon. The reasonably available volume of local surface water (840 AFY) is the projected long-term average diversion amount based on analysis conducted by Cal Water Bear Gulch District considering hydrology and all applicable constraints. The "Total Right or Safe Yield" (1,520 AFY) is based on the upper limit volume of diversion to storage under the Cal Water Bear Gulch District's SWRCB-administered surface water rights. The local surface water supply amounts in Cal Water Bear Gulch District's 2020 UWMP are presented in **Table 4-3**. Purchased supplies from the SFPUC RWS, along with local surface water supply to the Cal Water Bear Gulch District, will be sufficient to serve normal year demands through 2045. The availability and reliability of Cal Water Bear Gulch District's water supplies in dry years is discussed in Section 6 of this WSA.

TABLE 4-3
CAL WATER BEAR GULCH DISTRICT PROJECTED FUTURE WATER SUPPLIES – NORMAL YEARS

	2025	2030	2035	2040	2045
Potable Water – Purchased from SFPUC RWS	11,956	11,859	11,890	11,835	11,854
Bear Gulch Reservoir	840	840	840	840	840
Total	**12,796**	**12,699**	**12,730**	**12,675**	**12,694**

SOURCE: 2020 Cal Water Bear Gulch District 2020 UWMP. Table 6-9A. Water Supplies (Combined Peninsula Districts) – Projected

Table 4-4 provides a summary of MPMW's current and projected future normal year supplies as presented in MPMW's 2020 UWMP. Recycled water is estimated to be available at all times and in all water year types. MPMW expects to receive 120 MG (368 AF) of recycled water from the Sharon Heights and Bayfront recycled water facilities. As previously mentioned, MPMW's 2020 UWMP presented purchased supplies and demand in million gallons; for consistency between Cal Water Bear Gulch District and MPMW and for comparison purposes, this WSA converted million gallons to acre-feet or acre-feet per year. The availability and reliability of MPMW's water supplies in dry years is discussed in Section 6 of this WSA.

TABLE 4-4
MPMW CURRENT AND PROJECTED FUTURE WATER SUPPLIES – NORMAL YEARS (MG)

	2020	2025	2030	2035	2040
Potable Water - Purchased from SFPUC RWS	1,069	1,630	1,630	1,630	1,630
Recycled Water – Sharon Heights Recycled Water Facility[a]	20	48	48	48	48
Recycled Water – Bayfront Recycled Water Facility[a]	—	0	72	72	72
Total Recycled Water			**120**	**120**	**120**
Total	**1,089**	**1,678**	**1,750**	**1,750**	**1,750**
Total (AFY)	**3,342**	**5,150**	**5,371**	**5,371**	**5,371**

SOURCE: 2020 MPMW 2020 UWMP. Table 6-9 Water Supplies – Projected

NOTE:

a. MPMW expects to receive 120 MG (368 AF) of recycled water from the Sharon Heights and Bayfront recycled water facilities.

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SECTION 5
Water Demand Analysis

This section shows the calculated water demand for the proposed project as well as projected demand for Cal Water's Bear Gulch District and MPMW systems and then compares the demand to the supply.

5.1 Proposed Project Water Demand

The expected water use of the HEU was determined by analyzing similar land uses and assigning a demand factor for residential water use. For consistency with the ConnectMenlo Water Supply Evaluation (WSE), this WSA used the identical residential demand factor to evaluate the net demand at the project level within the HEU Plan area. For conservative water supply planning purposes, water demand associated with the HEU area is assumed to occur immediately and is added to existing demand to present the quantitative data needed to analyze current and future demand within Cal Water Bear Gulch District's and MPMW's service areas. It should be noted and recognized that actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment. This also aligns more closely with the State's goal for the City to achieve development of its RHNA housing allocation by 2031. As discussed in Section 5.3, projected demand from the HEU, existing demand, and planned future water demands are extended over a 25-year planning horizon for consistency with growth projections in population, household and jobs growth throughout the regional Bay Area.

As stated above, for consistency with the ConnectMenlo WSE, this WSA used identical residential demand factors of 127 gallons per day per residential dwelling unit, which is based on occupancy of 2.57 persons per household multiplied by 49.4 gallons per capita per day (gpcd).[5] Additional outdoor water demand is calculated to be 5.9 gallons per day per residential dwelling unit (2.57 persons per household multiplied by 2.3 gpcd[6]) and is consistent with the outdoor water demand calculated in the ConnectMenlo WSE. In addition to estimating demand associated with implementation of the HEU, the City anticipates population increases through 2040. For water supply planning purposes, HEU water demand per residential unit is calculated to be approximately 133 gallons per day (127 gallons indoor and 5.9 gallons outdoor).[7]

5 Calculated indoor water demand, 2016 ConnectMenlo WSE, page 10.
6 Calculated outdoor water use, 2016 ConnectMenlo WSE, page 11.
7 Calculated indoor and outdoor per residential unit, 2016 ConnectMenlo WSE, page 11.

At the time the ConnectMenlo WSE was prepared, based on the then-current land use assumptions, the per capita residential water use at Project buildout was estimated to be 52 gpcd.[8] As shown in **Table 5-1**, this WSA estimates water use per residential unit, which closely aligns with Executive Order B-37-16, Making Water Conservation a Way of Life of 50 gpcd. Notably, with installation of high-efficiency, low-water use fixtures throughout the new facilities, along with plumbing code changes and little to no outdoor water use or installation of drought-tolerant landscaping materials, water demands from the proposed development components of the HEU could be further reduced.

Table 5-1 shows the land uses, residential units, and population growth that could occur as a result of implementation of the HEU, which is also the City's anticipated buildout scenario. Table 5-1 was derived from Table 2-1 and shows the total residential units that could occur as a result of implementation of the HEU (4,000 dwelling units and 85 ADUs) plus 414 new residential dwelling units outside of the Bayfront that are already on file and pending review by the City. As shown in Table 5-1, an additional 299 residential dwelling units are also anticipated to be implemented under the City's 2040 buildout scenario. Table 5-1 demonstrates the new water demand that is anticipated to occur under the proposed HEU associated zoning and Specific Plan changes.

TABLE 5-1
WATER DEMAND - HOUSING ELEMENT UPDATE AND ADDITIONAL 2040 GROWTH PROJECTIONS

	New Residential Units			Demand Factor (GPD/DU)[d]	GPD[e]	AFY[e]
	Pending Projects[a]	ADUs[b]	Residential Units			
Housing Element Update (HEU) Demand	414	85	4,000	133	598,367	670
Additional 2040 Cumulative Demand	0	0	299[c]		39,767	45
New Residential Units			4,299			
Totals	**414**	**85**	**4,798**		**638,134**	**715**

SOURCE: Menlo Park Housing Element Update, Table 2-2

NOTES: ADU = accessory dwelling unit; GPD = gallons per day; AFY = acre-feet per year;

a. Pending projects (414) reflect applications that are currently on file for residential development. Water demand generated by these Pending Projects was not accounted for in the adopted 2020 UWMPs and would contribute to new water demand associated with implementation of the HEU.
b. Future locations of ADUs are currently unknown and contribute to the Citywide Totals. For water supply planning purposes, these ADUs would be assumed to be developed throughout MPMW's service area.
c. 299 units that may result from development on small sites between 2031 and 2040 affected by zoning and Specific Plan changes as part of the HEU.
d. The estimated annual indoor and outdoor water demand at buildout is based on and consistent with the Water Supply Evaluation Study, ConnectMenlo – General Plan and M-2 Area Zoning Update, pages 9-10.
e. The estimated total annual water demand for residential units is calculated in gallons per day and acre-feet per year and is the sum of indoor and outdoor water demands. Totals may not sum exactly due to rounding.

The land use changes proposed in the HEU would potentially create a net increase in water demand of 670 AFY or an average demand of 598,367 gallons per day (gpd) (0.598 MGD). The

[8] Calculated indoor and outdoor per residential unit, 2016 ConnectMenlo WSE, page 11.

zoning and Specific Plan changes proposed to occur by 2040 under the Cumulative (Maximum Buildout) scenario would potentially create an additional net increase in water demand of 45 AFY or an average demand of 39,767gpd (0.040 MGD). The calculated demand associated with implementation of the HEU is assumed to be new demand that would be served by either Cal Water Bear Gulch District or MPMW. However, the actual net change in water demand would be lower as some existing uses on the housing opportunity sites would be removed to accommodate new residential units. It is anticipated that actual demand increases at housing opportunity sites may be lower than calculated demand because of the net change from existing uses to new residential uses. This WSA is a program-level analysis of water supply and demand; therefore, at this time it is not feasible to accurately calculate the net change in demand from replacing existing uses with new residential uses. In addition, as previously mentioned, the HEU would be implemented over a 25-year planning horizon and the net change in demand would likely occur over time commensurate with new development proposals. Considering the net increase of 670 AFY generated from the HEU and 45 AFY from additional cumulative growth, the Updated 2040 Cumulative Growth Build Out scenario is calculated to be 715 AFY or 0.638 MGD.

As previously discussed in Section 2, Cal Water Bear Gulch District and MPMW would provide water service to the new developments proposed in the HEU and also to the additional 299 residential units of cumulative growth expected to be developed by 2040. As shown in Table 5-1, up to approximately 4,085 new units (4,000 residential units plus 85 ADUs) are proposed under the HEU, in addition to 414 pending projects already under review (the proposed distribution of new residential units is shown in Figure A). As shown in Table 5-1, a total of 4,798 new residential units are proposed (including the 299 units from additional cumulative growth) and could be constructed between 2024 and 2040 when the City reaches its proposed cumulative build out scenario.

As shown in **Table 5-2**, based on the proposed distribution of new residential dwelling units (see Figure A) Cal Water Bear Gulch District would serve approximately 63 percent or 3,008 new residential units and MPMW would serve approximately 37 percent or 1,790 new residential units.

TABLE 5-2
HEU RESIDENTIAL UNITS, DISTRIBUTION IN WATER SERVICE AREAS AND DEMAND

	New Residential Units	Percent of new Residential Units	GPD	MGD	AFY
Cal Water Bear Gulch District	3,008	63%	400,064	0.400	448
MPMW	1,790	37%	238,070	0.238	267
Totals	**4,798**	**100%**	**638,134**	**0.638**	**715**

SOURCE: Menlo Park Housing Element Update, Table 2-2; Menlo Park Water Supply Assessment Housing Element Update, ESA 2022

NOTES: ADU = accessory dwelling unit; GPD = gallons per day; AFY = acre-feet per year

Cal Water Bear Gulch District would provide water service to 3,008 new residential units (2,793 + 201 +14 = 3,008) and the MPMW would provide water service to 1,790 new residential units (1,207 + 85 + 98 + 400 = 1,790).

For water supply planning purposes, as shown in Table 5-2, this distribution of water service equates to 400,064 gallons per day (0.400 MGD) or 448 AFY within the Cal Water Bear Gulch District's service area and 238,070 gallons per day (0.238 MGD) or 267 AFY within MPMW's service area.

5.2 Historical and Existing Demand

5.2.1 Bear Gulch District

Table 5-3 presents water uses in the Cal Water Bear Gulch District's service area from 2016 to 2020 and shows the actual demand in each water use category over this same year period. The table shows growth in demand over the last five years with an average of approximately 11,600 AFY.

TABLE 5-3
BEAR GULCH DISTRICT HISTORICAL AND CURRENT WATER USE (AFY)

	2016	2017	2018	2019	2020
Single Family	8,001	9,000	9,742	9,361	10,598
Multi-Family	235	264	285	242	279
Commercial	980	1,048	1,111	1,152	1,038
Institutional/Government	218	292	323	299	303
Industrial	2	2	2	2	3
Other Potable	54	59	28	35	20
Landscape	24	26	29	27	21
Losses[a]	591	705	416	752	711
Total	**10,105**	**11,395**	**11,936**	**11,869**	**12,972**

SOURCE: 2020 Cal Water Bear Gulch District 2020 UWMP. Table 4-1. Demands for Potable and Non-Potable Water – Actual

NOTE:

a. Real and apparent losses

5.2.2 Menlo Park Municipal Water

Prior to 2020, all potable water demands within the MPMW service area were met with water purchased from the SFPUC RWS (**Table 5-4**). Starting in July 2020, recycled water became available and was used to meet a portion of the irrigation demand. The historical and current total water demands within the MPMW service area include the water consumed by metered accounts in the service area ("metered water consumption"), unmetered water used for fire services and flushing ("unmetered water consumption"), and the water that is lost within the distribution system ("losses"). The table shows growth in demand over the last five years with an average of approximately 3,134 AFY.

TABLE 5-4
MPMW HISTORICAL AND CURRENT WATER USE

	2016	2017	2018	2019	2020
Single Family	277	306	315	309	361
Multi-Family	95	106	101	97	113
Commercial	157	179	245	244	203
Industrial	222	240	140	143	140
Institutional/Governmental	42	58	58	67	98
Landscape[a]	97	116	125	122	139
Losses[b]	4	-4[c]	120	42	12
Other[d]	5	2	4	2	3
Total (MG)	**898**	**1,003**	**1,108**	**1,028**	**1,069**
Total (AFY)	**2,756**	**3,078**	**3,400**	**3,155**	**3,281**

SOURCE: 2020 MPMW 2020 UWMP. Table 4-1. Demands for Potable and Non-Potable Water - Actual

NOTES:

Demand data provided by MPMW. Demands did not include accounts that received water from East Palo Alto but were billed by MPMW.

a. Irrigation water use includes water use recorded at dedicated irrigation meters and does not represent all of the outdoor irrigation water use within MPMW.
b. Losses were obtained from the AWWA Water Audit Reports. 2020 water loss was estimated as the difference between production and consumption.
c. The high variability of water losses during this period and the negative value of water losses in 2017 were likely due to the quality of the billing data and differences in meter reading cycles between the SFPUC supply meters and MPMW's meters.
d. Other water uses include other billed metered consumption (e.g., temporary meters and hydrant), billed unmetered consumption and unbilled consumption which are obtained from the AWWA Water Audit Reports.

5.3 Projected System Demand Forecasts

5.3.1 Bear Gulch District Projected Demand

As shown in **Table 5-5**, the projected water demands to year 2030 are based on projected purchases from SFPUC as shown in the Cal Water Bear Gulch District's 2020 UWMP. Although the Cal Water Bear Gulch District's projected water demands delivered from SFPUC include growth beyond current demand, the projections did not include the water demands from specific projects but do include growth in demand from new employment centers, residential housing units and other projects. Notably, according to Cal Water Bear Gulch District's 2020 UWMP, average water use per service is adjusted over the forecast period to account for anticipated reductions in water use from the ongoing effects of domestic appliance standards and plumbing codes, conservation and customer assistance programs, and growth in the inflation-adjusted cost of water service and household income. These factors, in combination, are anticipated to attenuate the projected increase in water use associated with projected growth in Cal Water Bear Gulch District's service area.

Because the demand associated with implementation of the HEU was not included in Cal Water Bear Gulch District's 2020 UWMP, an additional 448 AFY of water demand (as calculated in Section 5.1 of this WSA) must be added to account for the proposed HEU units and additional cumulative residential growth in the Cal Water Bear Gulch District service area. The updated growth in water demand through 2040 is provided in Table 5-5 below. As discussed in

TABLE 5-5
BEAR GULCH DISTRICT SERVICE AREA PROJECTED GROWTH IN WATER DEMAND (AFY)

	2025	2030	2035	2040	2045
Single Family	10,591	10,595	10,629	10,605	10,647
Multi-Family	264	267	277	281	286
Commercial	957	913	897	864	836
Institutional/Government	286	278	279	274	270
Industrial	3	3	3	3	3
Other Potable	18	18	18	18	18
Landscape	21	21	21	21	21
Losses[a]	657	604	607	610	614
2020 UWMP Demand Total (AFY)	**12,796**	**12,699**	**12,730**	**12,675**	**12,694**
HEU Demand plus Cumulative 2040 Demand[b]	448	448	448	448	448
Updated 2040 Cumulative Demand	**13,244**	**13,147**	**13,178**	**13,123**	**13,142**

SOURCE: 2020 Cal Water Bear Gulch District 2020 UWMP. Table 4-2. Use for Potable and Non-Potable Water – Projected

NOTES:

a. Real and apparent losses
b. City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – Cal Water Bear Gulch District portion of 715 AFY of new demand generated by implementation of the HEU and Additional 2040 Growth. New water demand of 448 AFY associated with the HEU area is assumed to occur instantaneously. Actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.

Section 5.1, for conservative water resources planning purposes, water demand associated with the HEU (448 AFY) is assumed to occur instantaneously as shown in Tables 5-5, 6-1, 6-2 and 6-3. The additional 448 AFY is added to projected demand in five-year increments to present the quantitative data needed to analyze current and future demand within Cal Water Bear Gulch District's service area. It should be recognized that actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.

5.3.2 Menlo Park Municipal Water Projected Demand

In 2020, future water demands for MPMW's service area were projected by BAWSCA on behalf of MPMW. Future water demands were projected using the Demand Management Decision Support System Model (DSS Model) and were based on population and employment projections within MPMW's service area. The DSS Model and the associated water demand and conservation projection methodology is documented in detail in the Regional Water Demand and Conservation Projections Report (BAWSCA 2020b).

In 2021, as part of the 2020 UWMP update, MPMW's DSS Model was revised to account for several changes since the demand projections were estimated by BAWSCA. The baseline year for projections was updated to 2019, which was the most recent year with full data. Population and

employment inputs were revised by the City's Planning Division based on information related to the City's recently approved projects and the current General Plan.

Demands are projected through 2040 to be consistent with the General Plan's planning horizon. There is a significant increase in demand projected over the next five years (i.e., a 19 percent increase between 2020 and 2025) which reflects conservative assumptions regarding: (1) a potential rebound from the drought-suppressed water demands, and (2) the accelerated growth between 2020 and 2025 attributable to the City's approved and planned projects and implementation of new residential units like those contemplated in the HEU.

After accounting for the recycled water use of 48 MG applied at the Sharon Heights Golf and Country Club, the remaining demand is anticipated to be supplied by potable water from the SFPUC RWS. Potable water demand is anticipated to be approximately 1,363 MG in 2040, an increase of 28 percent compared to 2020. MPMW's projected potable water demand in five-year increments, as outlined in the 2020 UWMP, is summarized in **Table 5-6**.

TABLE 5-6
MPMW SERVICE AREA PROJECTED GROWTH IN WATER DEMAND (MG AND AFY)

	2025	2030	2035	2040
Single Family	306	299	293	288
Multi-Family	158	176	203	230
Commercial	346	345	373	401
Industrial	134	122	112	102
Institutional/Governmental	98	105	115	126
Landscape	95	61	71	85
Losses	110	116	122	128
Other Potable	1	1	1	2
Total (MG)	**1,248**	**1,225**	**1,290**	**1,363**
2020 UWMP Demand Total (AFY)	**3,830**	**3,759**	**3,959**	**4,183**
HEU Demand plus Cumulative 2040 Demand[a]	267	267	267	267
Updated 2040 Cumulative Demand	**4,097**	**4,026**	**4,226**	**4,450**

SOURCE: 2020 MPMW 2020 UWMP. Table 4-6. Use for Potable and Non-Potable Water – Projected

NOTE: Recycled water is not included in total projected water demand.

a. City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – MPMW portion of 715 AFY of new demand generated by implementation of the HEU and Additional 2040 Growth. New water demand of 267 AFY associated with the HEU area is assumed to occur instantaneously. Actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.

Because the demand associated with implementation of the HEU was not included in MPMW's 2020 UWMP, an additional 267 AFY of water demand (as calculated in Section 5.1 of this WSA) must be added to account for the proposed HEU units and additional cumulative residential growth in the MPMW service area. The updated growth in water demand through 2040 is provided in Table 5-6. As discussed in Section 5.1, for conservative water resources planning

purposes, water demand associated with the HEU (267 AFY) is assumed to occur instantaneously as shown in Tables 5-6, 6-4, 6-5, 6-6 and 6-7. The additional 267 AFY is added to projected demand in five-year increments to present the quantitative data needed to analyze current and future demand within Cal Water Bear Gulch District's service area. It should be recognized that actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.

SECTION 6
Comparison of Available Water Supplies versus Demand

Section 10910(c)(3) of the Water Code states, "the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available for normal, dry and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses."

6.1 Bear Gulch District Supply and Demand Considerations

In order to present a conservative water supply analysis, the supply and demand models in this section assume that the supplies from the SFPUC would be held to 11.18 mgd (12,523 AFY) and surface water from the Cal Water Bear Gulch District's Bear Gulch Reservoir is limited to 1.12 mgd (1,254 AFY) for a total supply of 12.30 mgd or 13,778 AFY. With this understanding, each growth in demand scenario is compared to the Cal Water Bear Gulch District's available supplies. Furthermore, this WSA recognizes that the Cal Water Bear Gulch District could use additional supplies within its ISG to meet demand and because the aggregated demand within the BAWSCA members has not reached its maximum of 184.0 mgd, no supply limitations are being enforced. Therefore, Cal Water could purchase supplemental supplies from the SFPUC and, in fact, Cal Water has purchased additional supplies in the past to meet demand.

6.2 Cal Water Bear Gulch District Supply and Demand in a Normal Year

Table 6-1 shows the projected supply and demand totals for a normal year. The supply and demand totals are consistent with those in Table 6-9B and Table 4-3 in the 2020 Cal Water Bear Gulch District UWMP. The Cal Water Bear Gulch District is expected to have adequate water supplies during normal years to meet its projected demands through 2045. It should be noted that supply reflects 12.30 mgd (13,778 AFY) of committed supplies (SFPUC and Bear Gulch Reservoir water) plus the quantity of potable water amount needed to meet demand that can be purchased from SFPUC or transferred within Cal Water's Peninsula Districts.

TABLE 6-1
BEAR GULCH DISTRICT NORMAL YEAR SUPPLY AND DEMAND PROJECTIONS (AFY)

	2025	2030	2035	2040
2020 UWMP Supply[a]	13,244	13,147	13,178	13,123
2020 UWMP Demand	12,796	12,699	12,730	12,675
HEU Demand plus Additional 2040 Demand	448	448	448	448
HEU Demand plus Cumulative 2040 Demand[a]	**13,244**	**13,147**	**13,178**	**13,123**
Difference [Surplus/(Deficit)]	**0**	**0**	**0**	**0**

SOURCE: Cal Water Bear Gulch District 2020 UWMP. Table 7-3. Normal Year Supply and Demand Comparison

NOTE:

a. City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – Cal Water Bear Gulch District portion of 715 AFY of new demand generated by implementation of the HEU and Additional 2040 Growth. New water demand of 448 AFY associated with the HEU area is assumed to occur instantaneously. Actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.
[NTR: Cal Water – is there surplus water supplies within the 39,993 AFYU to make this supply and demand assumption?]

6.3 Cal Water Bear Gulch District Water Service Reliability – Single Dry and Multiple Dry Years with Bay-Delta Plan Amendment

The reliability of the RWS is anticipated to vary greatly in different year types. Cal Water Bear Gulch District and MPMW have relied on the supply reliability estimates provided by the SFPUC for the RWS and the drought allocation structure provided by SFPUC and BAWSCA to estimate available RWS supplies in dry year types through 2045. For conservative water supply planning purposes, water demand of 448 AFY associated with the HEU area is assumed to occur instantaneously and is added to existing demand in five-year increments to present the quantitative data needed to analyze current and future demand within Cal Water Bear Gulch District's service area. As previously mentioned that actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment. These projections indicated that without implementation of the Bay-Delta Plan Amendment, SFPUC would be able to supply 100 percent of projected RWS demands in all year types through 2045, except for the 4th and 5th consecutive dry year in 2045, during which 90 percent of projected RWS demands (85 percent of the Wholesale demands) would be met.

As shown in the tables below, significant water supply shortfalls are currently projected in future single and multiple dry years if the Bay-Delta Plan Amendment is implemented. However, numerous uncertainties remain regarding implementation of the Bay Delta Plan Amendment. The water supply projections presented below likely represent a worst-case scenario in which the Bay-Delta Plan Amendment is implemented without the SFPUC and the SWRCB reaching a Voluntary Agreement, and do not account for implementation of SFPUC's AWSP, described further in Section 6.7 under Alternative Supplies. Under this supply scenario, as modeled, SFPUC would not be able to meet its contractual obligations (i.e., Level of Service Goals) and Cal Water Bear Gulch District's forecasted demands during droughts. **Table 6-2** shows the Cal Water Bear Gulch District projected supply and demand totals for the single dry year. As shown in Table 6-2,

demand exceeds supply by greater than 50 percent and Cal Water Bear Gulch District would not be able to meet demand within its service area under single dry years through 2045. Under this water supply and demand scenario as shown in Table 6-2, Cal Water Bear Gulch District would be in Stages 3 and 4 of its Water Shortage Contingency Plan (discussed in Section 6.16). Cal Water Bear Gulch District customers would need to reduce their demand by at least 38 percent in 2025 and up to 48 percent in 2045 to balance demand against significant supply reductions.

TABLE 6-2
BEAR GULCH DISTRICT SINGLE DRY YEAR POTABLE WATER SUPPLY AND DEMAND PROJECTIONS (AFY) WITH BAY-DELTA PLAN AMENDMENT

	2025	2030	2035	2040
2020 UWMP Supply[a]	8,546	8,482	8,503	8,334
2020 UWMP Demand	13,354	13,253	13,285	13,228
HEU Demand plus Cumulative 2040 Demand[b]	448	448	448	448
Updated 2040 Cumulative Demand	**13,802**	**13,701**	**13,733**	**13,676**
Difference [Surplus/(Deficit)]	(5,256)	(5,219)	(5,230)	(5,342)
Percent Demand Reduction to balance Supply	**(38%)**	**(38%)**	**(38%)**	**(39%)**

SOURCE: Cal Water Bear Gulch District 2020 UWMP. Table 7-4. Single Dry Year Supply and Demand Comparison

NOTES:

a. Dry year RWS supply availability is calculated in accordance as a percentage of projected RWS demands for each base year consistent with the revised BAWSCA Drought Methodology that assumes equal percent cutbacks across all Wholesale Agencies.
b. City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – Cal Water Bear Gulch District portion of 715 AFY of new demand generated by implementation of the HEU and Additional 2040 Growth. New water demand of 448 AFY associated with the HEU area is assumed to occur instantaneously. Actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.

As discussed in Cal Water Bear Gulch District's 2020 UWMP, SFPUC also provided water supply reliability projections without the Bay-Delta Plan Amendment (Cal Water Bear Gulch District, 2020 UWMP Appendix I), which represents a highly optimistic water supply reliability.[9] The large disparity in projected water supply reliability between these two scenarios demonstrates the current level of uncertainty. **Table 6-3** shows the Cal Water Bear Gulch District projected supply and demand totals for multiple dry year periods extending five years with the more conservative Bay-Delta Plan Amendment in effect. As shown in the table, demand exceeds supply by greater than 50 percent and Cal Water Bear Gulch District would not be able to meet demand within its service area under multiple dry years through 2045. Under this water supply and demand scenario as shown in Table 6-6, in the first dry year and identical to the single dry year scenario presented in Table 6-3, Cal Water Bear Gulch District would be in Stages 4 and 5 of its Water Shortage Contingency Plan (discussed Section 6.16). Cal Water Bear Gulch District customers would need to reduce their demand by up to 50 percent in the 3rd year of a multiple dry year and if dry conditions persist up to 55 percent in 2045 in the 5th year to balance demand against significant supply reductions. Under this multiple dry year scenario, Cal Water Bear Gulch District customers would need to reduce their demand significantly to balance city-wide demand against significant supply reductions throughout the RWS. In fact, Stage 6 is an "Emergency Shortage" condition that includes water use allocations and mandatory conservation measures.

9 City of Menlo Park, 2020 Urban Water Management Plan, page 104.

TABLE 6-3
BEAR GULCH DISTRICT MULTIPLE DRY YEARS POTABLE WATER SUPPLY AND DEMAND COMPARISON (AFY) WITH BAY-DELTA PLAN AMENDMENT

		2025	2030	2035	2040	2045
First Year	2020 UWMP Supply[a]	8,767	8,701	8,722	8,549	7,339
	2020 UWMP Demand[a]	13,699	13,595	13,629	13,570	13,591
	HEU Demand plus Cumulative 2040 Demand[b]	448	448	448	448	448
	Updated 2040 Cumulative Demand	14,147	14,043	14,077	14,018	14,039
	Difference [Surplus/(Deficit)]	(5,380)	(5,342)	(5,355)	(5,469)	(6,700)
Percent Demand Reduction to balance Supply		**(38%)**	**(38%)**	**(38%)**	**(39%)**	**(48%)**
Second Year	2020 UWMP Supply[a]	7,534	7,477	7,360	7,328	7,339
	2020 UWMP Demand[a]	13,699	13,595	13,629	13,570	13,591
	HEU Demand plus Cumulative 2040 Demand[b]	448	448	448	448	448
	Updated 2040 Cumulative Demand	14,147	14,043	14,077	14,018	14,039
	Difference [Surplus/(Deficit)]	(6,613)	(6,566)	(6,717)	(6,690)	(6,700)
Percent Demand Reduction to balance Supply		**(38%)**	**(38%)**	**(38%)**	**(39%)**	**(48%)**
Third Year	2020 UWMP Supply[a]	7,534	7,477	7,360	6,514	6,252
	2020 UWMP Demand[a]	13,699	13,595	13,629	13,570	13,591
	HEU Demand plus Cumulative 2040 Demand[b]	448	448	448	448	448
	Updated 2040 Cumulative Demand	14,147	14,043	14,077	14,018	14,039
	Difference [Surplus/(Deficit)]	(6,613)	(6,566)	(6,717)	(7,504)	(7,787)
Percent Demand Reduction to balance Supply		**(47%)**	**(47%)**	**(48%)**	**(54%)**	**(55%)**
Fourth Year	2020 UWMP Supply[a]	7,534	7,477	7,360	6,514	6,252
	2020 UWMP Demand[a]	13,699	13,595	13,629	13,570	13,591
	HEU Demand plus Cumulative 2040 Demand[b]	448	448	448	448	448
	Updated 2040 Cumulative Demand	14,147	14,043	14,077	14,018	14,039
	Difference [Surplus/(Deficit)]	(6,613)	(6,566)	(6,717)	(7,504)	(7,787)
Percent Demand Reduction to balance Supply		**(47%)**	**(47%)**	**(48%)**	**(54%)**	**(55%)**
Fifth Year	2020 UWMP Supply[a]	7,534	7,477	6,814	6,514	6,252
	2020 UWMP Demand[a]	13,699	13,595	13,629	13,570	13,591
	HEU Demand plus Cumulative 2040 Demand[b]	448	448	448	448	448
	Updated 2040 Cumulative Demand	14,147	14,043	14,077	14,018	14,039
	Difference [Surplus/(Deficit)]	(6,613)	(6,566)	(6,717)	(7,504)	(7,787)
Percent Demand Reduction to balance Supply		**(47%)**	**(47%)**	**(48%)**	**(54%)**	**(55%)**

SOURCE: Cal Water Bear Gulch District 2020 UWMP.

NOTES:

a. Table 7-5. Multiple Dry Years Supply and Demand Comparison
b. City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – Cal Water Bear Gulch District portion of 715 AFY of new demand generated by implementation of the HEU and Additional 2040 Growth. New water demand of 448 AFY associated with the HEU area is assumed to occur instantaneously. Actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.

6.4 [PLACEHOLDER] Cal Water Bear Gulch District Water Service Reliability – Normal, Single Dry and Multiple Dry Years without the Bay-Delta Plan Amendment

Table 6-X summarizes the water supply and demand scenario if the Bay-Delta Plan Amendment is not implemented as adopted by the SWRCB. Under these water supply and demand conditions, the total projected water supplies available to BGD through its ISG with SFPUC will meet the projected water demand associated with the HEU in addition to BGD projected uses through 2040 in normal, single dry and multiple dry years.

As described in Section XX, based on SFPUC's analysis, a 16.5 percent supply shortfall is projected during the 4th and 5th consecutive dry years after base year 2040. These projected supply shortfalls are significantly less than the projected supply shortfalls if the Bay-Delta Plan Amendment is implemented. If and when supply shortfalls do occur, BGD expects to meet these supply shortfalls through water demand reductions and other water shortage response actions by implementation of its WSCP.

6.5 MPMW Supply and Demand in a Normal Year

As presented in MPMW's 2020 UWMP, projected normal year potable water supplies are adequate to satisfy MPMW's projected normal year potable water demands as shown in **Table 6-4** through 2040. Recycled water is estimated to be available at all times at a volume that meets MPMW's projected recycled water demands.

TABLE 6-4
MPMW NORMAL YEAR WATER SUPPLY AND DEMAND COMPARISON (AFY)

	2025	2030	2035	2040
2020 UWMP Supply[a]	5,150	5,371	5,371	5,371
2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
Updated 2040 Cumulative Demand	**4,244**	**4,395**	**4,594**	**4,818**
Difference [Surplus/(Deficit)]	**906**	**976**	**777**	**553**

SOURCE: MPMW 2020 UWMP. Table 7-4 Normal Year Supply and Demand Comparison

NOTES:

a. Supply and demand include both potable water and recycled water. MPMW expects to receive 120 MG (368 AF) of recycled water from the Sharon Heights and Bayfront recycled water facilities.
b. City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – MPMW portion of 715 AFY of new demand generated by implementation of the HEU and Additional 2040 Growth. New water demand of 267 AFY associated with the HEU area is assumed to occur instantaneously. Actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.

6.6 MPMW Water Service Reliability – Single Dry and Multiple Dry Years with Bay-Delta Plan Amendment

The reliability of the SFPUC RWS supply is anticipated to vary greatly in different year types. MPMW has relied on SFPUC's RWS supply reliability estimates and the drought allocation structure provided by SFPUC and BAWSCA to estimate available RWS supplies in dry year types through 2040. This WSA is consistent with MPMW's 2020 UWMP, which recognizes that purchased supplies from the SFPUC RWS assume dry year supply reductions if the Bay-Delta Plan Amendment is implemented, which would significantly reduce dry year allocations for SFPUC wholesale customers. Recycled water supply is expected to be 100 percent reliable in all year types. **Table 6-5** shows the projected potable water supply and demand totals for the single dry year. Under this water supply and demand scenario as shown in Table 6-5, MPMW would be in a Stages 3 and 4 of its Water Shortage Contingency Plan (discussed in Section 6.16). MPMW customers would need to reduce their demand by almost 40 percent in 2025 and up to 32 percent in 2040 to balance demand against significant supply reductions.

TABLE 6-5
MPMW SINGLE-DRY-YEAR POTABLE WATER SUPPLY AND DEMAND COMPARISON (AFY) WITH BAY-DELTA PLAN AMENDMENT

	2025	2030	2035	2040
2020 UWMP Supply[a]	2,691	3,001	3,124	3,259
2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
Updated 2040 Cumulative Demand	**4,244**	**4,395**	**4,594**	**4,818**
Difference [Surplus/(Deficit)]	**(1,553)**	**(1,393)**	**(1,470)**	**(1,559)**
Percent Demand Reduction to balance Supply	**(37%)**	**(32%)**	**(32%)**	**(32%)**

SOURCE: MPMW 2020 UWMP; Menlo Park Housing Element WSA Table 5-5

NOTES:

a. Supply and demand include both potable water and recycled water. MPMW expects to receive 120 MG (368 AF) of recycled water from the Sharon Heights and Bayfront recycled water facilities.
b. City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – MPMW portion of 715 AFY of new demand generated by implementation of the HEU and Additional 2040 Growth. New water demand of 267 AFY associated with the HEU area is assumed to occur instantaneously. Actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.

Based on the supply reliability estimates and allocation structure provided by SFPUC and BAWSCA and the assumed 100 percent reliability for recycled water supply, **Table 6-6** shows the projected potable water supply and demand totals for multiple dry year periods extending in five year increments. Recycled water supply is expected to be 100 percent reliable in all year types.

Table 6-6 shows significant shortfalls under multiple dry years beginning in 2025 and through 2040 if the Bay-Delta Plan Amendment is implemented. Under this water supply and demand scenario as shown in Table 6-6, in the first dry year and identical to the single dry year scenario presented in Table 6-5, MPMW would be in a Stages 3 and 4 of its Water Shortage Contingency Plan (discussed Section 6.16). MPMW customers would need to reduce their demand by almost

TABLE 6-6
MPMW MULTIPLE DRY YEARS SUPPLY AND DEMAND COMPARISON (AFY) WITH BAY-DELTA PLAN AMENDMENT

		2025	2030	2035	2040
First Year	2020 UWMP Supply[a]	2,691	3,001	3,124	3,259
	2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
	HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
	Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
	Difference [Surplus/(Deficit)]	(1,553)	(1,393)	(1,470)	(1,559)
Demand Reduction needed to balance Supply		**(37%)**	**(32%)**	**(32%)**	**(32%)**
Second Year	2020 UWMP Supply[a]	2,332	2,621	2,722	2,845
	2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
	HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
	Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
	Difference [Surplus/(Deficit)]	(1,912)	(1,774)	(1,872)	(1,973)
Demand Reduction needed to balance Supply		**(45%)**	**(40%)**	**(41%)**	**(41%)**
Third Year	2020 UWMP Supply[a]	2,332	2,621	2,722	2,845
	2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
	HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
	Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
	Difference [Surplus/(Deficit)]	(1,912)	(1,774)	(1,872)	(1,973)
Demand Reduction needed to balance Supply		**(45%)**	**(40%)**	**(41%)**	**(41%)**
Fourth Year	2020 UWMP Supply[a]	2,332	2,621	2,722	2,553
	2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
	HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
	Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
	Difference [Surplus(Deficit)]	(1,912)	(1,774)	(1,872)	(2,265)
Demand Reduction needed to balance Supply		**(45%)**	**(40%)**	**(41%)**	**(47%)**
Fifth Year	2020 UWMP Supply[a]	2,332	2,621	2,529	2,553
	2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
	HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
	Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
	Difference [Surplus/(Deficit)]	(1,912)	(1,774)	(2,065)	(2,265)
Demand Reduction needed to balance Supply		**(45%)**	**(40%)**	**(45%)**	**(47%)**

SOURCE: MPMW 2020 UWMP, Tables 7-4 and 7-5 Single Dry Year Supply and Demand Comparison. Table 7-6 Multiple Dry Years Supply and Demand Comparison, Menlo Park Housing Element WSA Table 5-5

NOTES:

a. Supply and demand include both potable water and recycled water. MPMW expects to receive 120 MG (368 AF) of recycled water from the Sharon Heights and Bayfront recycled water facilities.
b. City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – MPMW portion of 715 AFY of new demand generated by implementation of the HEU and Additional 2040 Growth. New water demand of 267 AFY associated with the HEU area is assumed to occur instantaneously. Actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.

40 percent in 2025 and up to 32 percent in 2040 to balance demand against significant supply reductions. Over the next four years, if dry conditions persist, MPMW would need to move to Stages 4 and 5 of its WSCP. Under this multiple dry scenario MPMW customers would need to reduce their demand by 40 or 50 percent, respectively through 2040 to balance city-wide demand against significant supply reductions throughout the RWS.

6.7 MPMW Water Service Reliability – Normal, Single Dry and Multiple Dry Years without the Bay-Delta Plan Amendment

Table 6-7 summarizes the water supply and demand scenario if the Bay-Delta Plan Amendment is not implemented as adopted by the SWRCB. Under these water supply and demand conditions, the total projected water supplies available to MPMW through its ISG with SFPUC will meet the projected water demand associated with the Updated 2040 Cumulative Demand.

TABLE 6-7
MPMW NORMAL, SINGLE DRY AND MULTIPLE DRY YEARS SUPPLY AND DEMAND COMPARISON (AFY) WITHOUT THE BAY-DELTA PLAN AMENDMENT

	2025	2030	2035	2040
Normal Year				
2020 UWMP Supply[a]	5,150	5,371	5,371	5,371
2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
Difference [Surplus/(Deficit)]	905	976	776	552
Percent Shortfall of Demand	**0%**	**0%**	**0%**	**0%**
Single Dry Year				
2020 UWMP Supply[a]	4,125	4,496	4,695	4,919
2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
Difference [Surplus/(Deficit)]	(120)	101	101	101
Percent Shortfall of Demand	**(3%)**	**0%**	**0%**	**0%**
Multiple Dry Years				
First Year				
2020 UWMP Supply[a]	4,125	4,496	4,695	4,919
2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
Difference [Surplus/(Deficit)]	(120)	101	101	101
Percent Shortfall of Demand	**(3%)**	**0%**	**0%**	**0%**

TABLE 6-7
MPMW NORMAL, SINGLE DRY AND MULTIPLE DRY YEARS SUPPLY AND DEMAND COMPARISON (AFY)
WITHOUT THE BAY-DELTA PLAN AMENDMENT

	2025	2030	2035	2040
Second Year				
2020 UWMP Supply[a]	4,125	4,496	4,695	4,919
2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
Difference [Surplus/(Deficit)]	(120)	101	101	101
Percent Shortfall of Demand	**(3%)**	**0%**	**0%**	**0%**
Third Year				
2020 UWMP Supply[a]	4,125	4,496	4,695	4,919
2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
Difference [Surplus/(Deficit)]	(120)	101	101	101
Percent Shortfall of Demand	**(3%)**	**0%**	**0%**	**0%**
Fourth Year				
2020 UWMP Supply[a]	4,125	4,496	4,695	4,919
2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
Difference [Surplus/(Deficit)]	(120)	101	101	101
Percent Shortfall of Demand	**(3%)**	**0%**	**0%**	**0%**
Fifth Year				
2020 UWMP Supply[a]	4,125	4,496	4,695	4,919
2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
Difference [Surplus/(Deficit)]	(120)	101	101	101
Percent Shortfall of Demand	**(3%)**	**0%**	**0%**	**0%**

SOURCE: MPMW 2020 UWMP, Table 7-6 Multiple Dry Years Supply and Demand Comparison, Menlo Park Housing Element WSA Table 5-5

NOTES:

a. Tables 7-4 and 7-5 Single Dry Year Supply and Demand Comparison. Supply and demand include both potable water and recycled water. MPMW expects to receive 120 MG (368 AF) of recycled water from the Sharon Heights and Bayfront recycled water facilities.
b. City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – MPMW portion of 715 AFY of new demand generated by implementation of the HEU and Additional 2040 Growth. New water demand of 267 AFY associated with the HEU area is assumed to occur instantaneously. Actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.

As described in Section 6.8, based on SFPUC's analysis, a 16.5 percent supply shortfall is projected during the fourth and fifth consecutive dry years after base year 2040. These projected supply shortfalls are significantly less than the projected supply shortfalls if the Bay-Delta Plan Amendment is implemented. If and when supply shortfalls occur in single dry and multiple dry years as soon as 2025, MPMW expects to meet these supply shortfalls through water demand reductions of less than 5 percent pursuant to its Demand Management Measures.

6.8 Uncertainties in Dry Year Water Supply Projections

As shown in the above tables, if the Bay-Delta Plan Amendment is implemented, significant water supply shortfalls are currently projected in future single and multiple dry years. However, numerous uncertainties remain regarding implementation of the Bay-Delta Plan Amendment. The water supply projections presented above likely represent a worst-case scenario in which the Bay-Delta Plan Amendment is implemented without the SFPUC and the SWRCB reaching a Voluntary Agreement, and do not account for implementation of SFPUC's Alternative Water Supply Program (AWSP), described in more detail below. Under this supply scenario, SFPUC appears not to be able to meet its contractual obligations (i.e., Level of Service (LOS) Goals) and Bear Gulch and MPMW's forecasted demands during droughts.

As discussed in Cal Water Bear Gulch District and MPMW UWMP's, SFPUC also provided water supply reliability projections without the Bay-Delta Plan Amendment (refer to Appendix I of each of the 2020 UWMPs), which likely represents a highly optimistic water supply reliability outcome.[10] These projections indicated that without implementation of the Bay-Delta Plan Amendment SFPUC would be able to supply 100 percent of projected RWS demands in all year types through 2045, except for the 4th and 5th consecutive dry years in 2045, during which 90 percent of projected RWS demands (85 percent of the Wholesale demands) would be met.

In addition to these two water supply scenarios, in a March 26, 2021 Special Commission Meeting, SFPUC staff presented Hetch Hetchy and Local Simulation Model modeling results for 10 different scenarios, including scenarios with implementation of the Tuolumne River Voluntary Agreement (TRVA), implementation of the Bay-Delta Plan Amendment and the AWSP, and use of a modified rationing policy and a modified design drought. Results for the scenarios with the TRVA and with the AWSP (particularly with a modified rationing policy and design drought) showed significantly improved RWS supply availability compared to the Bay-Delta Plan Amendment scenario shown herein.

The current sources of uncertainty in the dry year water supply projections are summarized below:

- *Implementation of the Bay-Delta Plan Amendment is under negotiation.* The SFPUC is continuing negotiations with the SWRCB on implementation of the Bay-Delta Plan Amendment for water supply cutbacks, particularly during droughts. The SFPUC, in partnership with other key stakeholders, has proposed a voluntary substitute agreement to the Bay-Delta Plan Amendment, the TRVA, that provides a collaborative approach to protect the

[10] City of Menlo Park, 2020 Urban Water Management Plan, page 104

environment and plan for a reliable and high-quality future potable water supply. This is a dynamic situation and the projected drought cutback allocations may need to be revised before the next cycle of UWMPs (2025) depending on the outcome of ongoing negotiations.

- *Benefits of the AWSP are not accounted for in current supply projections.* SFPUC is exploring options to increase its supplies through the AWSP. Implementation of feasible projects developed under the AWSP is not yet reflected in the supply reliability scenarios presented herein and is anticipated to reduce the projected RWS supply shortfalls.

- *SFPUC is considering modifications to its design drought methodology and rationing policy.* Shortening the 8.5-year design drought or modifying the rationing policy to increase rationing in the early years of a drought are anticipated to reduce projected RWS supply shortfalls. On June 7, 2021, MPMW sent a letter to the SFPUC requesting the inclusion of a reduced duration drought scenario, if and when SFPUC's current climate change study merits doing so.

- *Methodology for Tier One and Tier Two Wholesale drought allocations have not been established for wholesale shortages greater than 20%.* As discussed in Cal Water Bear Gulch District's and MPMW 2020 UWMP's, the current Tier One and Tier Two Plans are not designed for RWS supply shortages greater than 20%. According to BAWSCA guidance, the Tier One Wholesale share for a 16 percent to 20 percent supply reduction (62.5 percent) has been applied for reductions greater than 20 percent and an equal percent reduction has been applied across all Wholesale agencies. BAWSCA member agencies have not formally agreed to adopt this shortage allocation methodology and are in discussions about jointly developing an alternative allocation method that would consider additional equity factors if SFPUC is unable to deliver its contractual supply volume and cutbacks to the RWS supply exceed 20 percent.

- *RWS demands are subject to change.* The RWS supply availability is dependent upon the system demands. The supply scenarios are based on the total projected Wholesale Customer purchases provided by BAWSCA to SFPUC in January 2021. During the UWMP process, many of the BASCWA agencies refined their projected demand estimates. It is notable that RWS demand projections are subject to change in the future based upon future housing needs, increased conservation, and development of additional local supplies.

- *Frequency and duration of cutbacks are also uncertain.* While the projected shortfalls presented in SFPUC's UWMP appear severe, the actual frequency and duration of such shortfalls are uncertain. Based on the HHLSM simulations provided by BAWSCA for the "with Bay-Delta Plan Amendment" scenario, rationing is anticipated to be required 20 percent of years for base year 2025 through 2035, 23 percent of years for base year 2040, and 25 percent of years for base year 2045. In addition to the supply volumes, the above listed uncertainties would also impact the projected frequency and duration of shortfalls.

To further evaluate local options to increase supply reliability, Cal Water and MPMW have placed high priority on working with BAWSCA and SFPUC in the upcoming years to better refine the estimates of RWS supply reliability and may need to amend their respective UWMPs when new information becomes available.

The above uncertainties notwithstanding, BAWSCA's current drought allocation cutbacks will require Cal Water Bear Gulch District and MPMW to apply their Water Shortage Contingency Plan (WSCP) Stage 5 for water use restrictions up to 50 percent and will affect Cal Water Bear Gulch District's and MPMW's short- and long-term water management decisions. As described

in their UWMPs, Cal Water Bear Gulch District and MPMW are working independently and with the other BAWSCA agencies to identify regional mitigation measures to improve reliability for regional and local water supplies and meet its customers' water needs. If conditions for large drought cutbacks to the RWS persist, Cal Water Bear Gulch District and MPMW will need to implement additional demand management practices to restrict potable water use and accelerate efforts to develop alternative supplies of water.

6.9 Alternative Supplies

According to the requirements of Water Code Section 10910(c)(3), the water supply assessment shall include a discussion of "whether the public water system's total projected water supplies available…will meet the projected water demand associated with proposed project, in addition to the public water system's existing and planned future uses." According to the requirements of Water Code Section 10911(a), if the results of the assessment conclude that the water supplies are, or will be, insufficient, the water supply assessment shall include plans for acquiring additional water supplies. Those plans may include, but are not limited to, information on costs, financing, permits, and timeframes.

In normal years and above-normal years, Cal Water Bear Gulch District and MPMW have sufficient supplies within their water supply portfolio to meet demand over the 25-year planning horizon. As discussed in the previous section, water supplies are insufficient to meet projected demands of the HEU, in addition to existing and planned uses within the Cal Water Bear Gulch District and the MPMW service area in single dry years and the 4th and 5th years in multiple-dry years. It should be noted that without implementation of the HEU or projected growth, water supplies are insufficient to meet current demands in the Cal Water Bear Gulch District and MPMW service area under these same dry year conditions.

Based on a determination of insufficient supplies, it is necessary to investigate the potential for acquiring additional supplies to serve the HEU and/or projected demand now and in the future. There are several alternative supply actions, which could be implemented by Cal Water Bear Gulch District and MPMW to assist water supply planning for the projected 25-year horizon.

6.10 Strategies and Actions to Address Dry Year Supply Shortfalls

Although there remains significant uncertainty in future supply availability, as discussed above, Cal Water Bear Gulch District, MPMW, SFPUC, and BAWSCA have developed strategies and actions to address the projected dry year supply shortfalls. Regional and local strategies, plans and programs are discussed below.

6.10.1 SFPUC and Other Regional Strategies and Actions

Dry Year Water Supply Projects

The Water Supply Improvement Program (WSIP) authorized the SFPUC to undertake a number of water supply projects to meet dry-year demands with no greater than 20 percent system-wide

rationing in any one year. Implementation of these projects is also expected to mitigate impacts of the implementation of the Bay-Delta Plan Amendment.

Those projects include the following:

- **Calaveras Dam Replacement Project.** The new dam replacement was completed in 2018, and began filling in 2019. In December 2020, the Calaveras Reservoir reached 67 percent of capacity but as a result of dry year conditions has subsequently lost water in the last few years. Fill inspections resumed in 2021.

- **Alameda Creek Recapture Project.** The Alameda Creek Recapture Project will recapture the water system yield that is either lost due to instream flow releases at Calaveras Reservoir or bypassed around the Alameda Creek Diversion Dam and return this yield to the RWS through facilities in the Sunol Valley. Construction of this project was scheduled from spring 2021 to spring 2023.

- **Lower Crystal Springs Dam Improvements.** The Lower Crystal Springs Dam (LCSD) Improvements Project was completed in May 2012 and associated projects in support of the LCSD were completed in 2019. While the main improvements to the dam have been completed, environmental permitting issues for reservoir operation remain significant, while the endangered Fountain Thistle is incrementally reinstated above reservoir capacity levels. As a result, it may be several years before pre-project water storage volumes can be realized.

- **Regional Groundwater Storage and Recovery Project.** The Regional Groundwater Storage and Recovery (GSR) Project is a partnership between the SFPUC and three San Mateo County agencies: California Water Service Company (serving South San Francisco and Colma), and the cities of Daly City and San Bruno. The GSR is a conjunctive use program to sustainably manage groundwater and surface water resources to provide the RWS with additional supplies during times of drought. In normal or wet years' supplemental surface water would be provided to the San Mateo County partners allowing them to reduce the amount of groundwater extractions. Over time, the groundwater pumping reductions would allow natural recharge to occur and increase groundwater in storage by up to 61,000 acre feet that would be available during dry years.

  Phase 1 of the GSR installed thirteen well sites and nearly complete. Final construction was completed in 2021. Phase 2 will complete construction the South San Francisco Main well station. Phase 2 design work began in early 2020 and the 100 percent design commenced in 2021. The new Regional Groundwater Treatment Improvements (RGTI) was approved in the 10-Year Water Enterprise Capital Improvement Program (2021 – 2030). The RGTI includes treatment facilities for several of the GSR wells to address groundwater quality issues. The RGTI commenced in 2021.

- **Dry-year Water Transfer**. The SFPUC pursued a long-term agreement to transfer 2 MGD from MID to the SFPUC in drought years. Unsuccessful negotiations with MID ended in 2012. The dry-year transfer project is now being included as part of the new SFPUC Alternative Water Supply Program, as discussed in the next section.

6.11 Alternative Water Supply Program

In early 2020, the SFPUC began implementation of the Alternative Water Supply Planning Program (AWSP), a program designed to investigate and plan for new water supplies to address

future long-term water supply reliability challenges and vulnerabilities on the RWS. Included in the AWSP is a suite of diverse, non-traditional supply projects that, to a great degree, leverage regional partnerships and are designed to meet the water supply needs of the SFPUC Retail and Wholesale Customers through 2045. As of the most recent Alternative Water Supply Planning Quarterly Update, SFPUC has budgeted $264 million over the next ten years to fund water supply projects. BAWSCA is heavily engaged with the SFPUC on its AWSP efforts.

6.11.1 SFPUC's Alternative Water Supply Program

The SFPUC is pursuing additional supplies to meet increasing demand and accelerating its efforts to acquire additional water supplies and explore other projects that would increase overall water supply resilience through the AWSP. The drivers for the program include:

1. The "potential" adoption of the Bay-Delta Plan Amendment and the resulting potential limitations to RWS supply during dry years,
2. The net supply shortfall following the implementation of WSIP,
3. San Francisco's perpetual obligation to supply 184 MGD to the Wholesale Customers,
4. Adopted Level of Service Goals (potable water service deliveries) to limit rationing to no more than 20 percent system-wide during droughts, and
5. The potential need to identify water supplies that would be required to offer permanent status to interruptible customers.

Developing additional supplies through this program would reduce water supply shortfalls and reduce rationing associated with such shortfalls.

The planning priorities guiding the framework of the AWSP are as follows:

1. Offset instream flow needs and meet regulatory requirements,
2. Meet existing obligations to existing permanent customers,
3. Make interruptible customers permanent, and
4. Meet increased demands of existing and interruptible customers.

In conjunction with these planning priorities, the SFPUC considers how the program fits within the Level of Service Goals and Objectives related to water supply and sustainability when considering new water supply opportunities. The key Level of Service Goals and Objectives relevant to this effort can be summarized as:

- Meet dry-year delivery needs while limiting rationing to a maximum of 20 percent system-wide reduction in water service during extended droughts;
- Diversify water supply options during non-drought and drought periods;
- Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers;
- Meet, at a minimum, all current and anticipated legal requirements for protection of fish and wildlife habitat;

- Maintain operational flexibility (although this Level of Service Goal was not intended explicitly for the addition of new supplies, it is applicable here).

Together, the planning priorities and Level of Service Goals and Objectives provide a lens through which the SFPUC considers water supply options and opportunities to meet all foreseeable water supply needs. The SFPUC has taken action to fund the study of potential additional water supply projects.

Following are capital projects under consideration to develop additional water supplies including surface water storage expansion, recycled water expansion, water transfers, desalination, and potable reuse.

- **Daly City Recycled Water Expansion** (Regional, Normal- and Dry-Year Supply): This project can produce up to 3 MGD of tertiary recycled water during the irrigation season (~7 months). On an average annual basis, this is equivalent to 1.25 MGD or 1,400 AFY. This potential project was identified in the SFPUC's 2015 UWMP and has since been approved by the City of Daly City.
- **Alameda County Water District -USD Purified Water Partnership** (Regional, Normal- and Dry-Year Supply). This project could provide a new purified water supply utilizing Union Sanitary District's (USD) treated wastewater. Purified water produced by advanced water treatment at USD could be transmitted to the Quarry Lakes Groundwater Recharge Area to supplement recharge into the Niles Cone Groundwater Basin or put to other uses in Alameda County Water District's service area. With the additional water supply to ACWD, an in-lieu exchange with the SFPUC would result in more water left in the RWS.
- **Crystal Springs Purified Water** (Regional, Normal- and Dry-Year Supply). The Crystal Springs Purified Water Project is a purified water project that could provide 6-12 MGD of water supply through reservoir water augmentation at Crystal Springs Reservoir, which is a facility of the RWS.
- **Los Vaqueros Reservoir Expansion** (Regional, Dry Year Supply). The Los Vaqueros Reservoir Expansion Project is a storage project that will enlarge the existing reservoir located in northeastern Contra Costa County from 160,000 acre-feet to 275,000 acre-feet. While the existing reservoir is owned and operated by the Contra Costa Water District (CCWD), the expansion will have regional benefits and will be managed by a Joint Powers Authority.
- **Bay Area Brackish Water Desalination** (Regional, Normal- and Dry-Year Supply). The Bay Area Brackish Water Desalination (Regional Desalination) Project is a partnership between CCWD, the SFPUC, Santa Clara Valley Water Agency, and Zone 7 Water Agency. The SFPUC is considering a water supply benefit of between 5 and 15 MGD during drought conditions when combined with storage at the LVE Project.
- **Calaveras Reservoir Expansion** (Regional, Dry Year Supply). Calaveras Reservoir would be expanded to create 289,000 acre-feet additional capacity to store excess Regional Water System supplies or other source water in wet and normal years.
- **Groundwater Banking.** Groundwater banking in the MID and TID service areas could be used to provide some additional water supply to meet instream releases in dry years reducing water supply impacts to the SFPUC service area.

- **Inter-Basin Collaborations.** Inter-Basin Collaborations could provide net water supply benefits in dry years by sharing responsibility for in-stream flows in the San Joaquin River and Delta more broadly among several tributary reservoir systems.

If all the projects identified through the current planning process can be implemented, there would still be a supply shortfall to meet projected needs. Furthermore, each of the supply options being considered has its own inherent challenges and uncertainties that may affect the SFPUC's ability to implement it.

Given the limited availability of water supply alternatives - unless the supply risks are significantly reduced or needs change significantly - the SFPUC will continue to plan, develop and implement all project opportunities that can help bridge the anticipated water supply gaps during droughts.

6.12 Local Strategies and Actions

Cal Water Bear Gulch District is currently in the process of developing multiple regional water supply reliability studies using integrated resource planning practices to create a long-term supply reliability strategy through 2050 for Cal Water Bear Gulch District districts throughout California. The studies will create long-term strategies to address a wide range of water supply challenges including climate change, new regulatory requirements (e.g., the Bay-Delta Plan Amendment), and potential growth in demands due to new development. These water supply reliability studies will be completed on a rolling basis over the next several years, with all studies anticipated to be complete by 2024.

Through its Emergency Water Storage/Supply Project, Menlo Park Municipal Water anticipates providing augmented supply in the event of significant water shortage due to severe drought conditions, loss of SFPUC supply, or other emergency. The project consists of constructing up to three wells, an underground reservoir, and pump station. The first well, located at the City's Corporation Yard, has been constructed and is awaiting final approval from the State. MPMW is currently in the process of identifying locations for the two other wells, the underground reservoir, and pump station. The wells, underground reservoir, and pump station are identified in the 2018 Water System Master Plan as priority projects and funding has been included in the current five-year capital improvement program. In addition, MPMW's 2020 UWMP includes utilizing well water for drought stage 5 (up to 50% reduction) and drought stage 6 (greater than 50% reduction) to augment supplies if necessary as part of its Water Shortage Contingency Plan.

6.13 Water Demand Reductions and Conservation Savings

Cal Water Bear Gulch District also has its own aggressive and comprehensive water conservation program that has and will continue to reduce per-capita usage and therefore demands on critical water sources. Cal Water Bear Gulch District is committed to helping its customers use water efficiently and has developed a range of water conservation programs to support this goal. To ensure that it is providing the right mix of programs in the most cost-effective manner possible,

Cal Water Bear Gulch District routinely conducts comprehensive conservation program analysis and planning. This is done on a five-year cycle in tandem with the UWMPs.

Cal Water Bear Gulch District's Conservation Master Plan provides the basis for the information on the implementation of and expected water savings from Demand Management Measures (DMMs).

6.14 Demand Management Measures

DMMs are codified in the California Water Code, Sections 10608.12 and 10608.20, and discussed in detail in the Cal Water Bear Gulch District and MPMW UWMPs. DMMs are used universally across California as the means to achieve water savings through demand reduction. Essentially, DMMs are used to provide education, assistance, and incentives to help customers use water efficiently. These programs have been grouped in accordance with the DMM categories in California Water Code, Section 10631(e). These categories are:

i. Water waste prevention ordinances,
ii. Metering,
iii. Conservation pricing,
iv. Public education and outreach,
v. Programs to assess and manage distribution system real loss,
vi. Water conservation program coordination and staffing support, and
vii. Other demand management measures.

A complete discussion of the Cal Water Bear Gulch District and MPMW DMMs can be found in Section 9 of their respective UWMPs.

6.15 Demand Management Measures Implementation over the Past Five Years

Through implementation of the DMMs, Cal Water Bear Gulch District and MPMW have been able to significantly reduce water demands in their service areas and help customers to achieve water conservation and cost savings. DMMs (e.g., water savings kits, education, rebates, high efficiency (HE) toilet replacements) implemented by Cal Water Bear Gulch District and MPMW over the last five years have proven to be successful to reduce demand within each of their service areas. Within Cal Water Bear Gulch District's service area, estimated reductions do not include savings from water waste prevention ordinances, conservation pricing, public information, or distribution system water loss management.

Ongoing programs and conservation measures are still currently in effect by Cal Water and MPMW. While it is not possible to quantify all the potential water savings associated with these programs, through implementation of DMMs over the five-year period from 2016 through 2020, Cal Water (all Peninsula districts combined) conservatively estimates water savings from its host of DMMs to be 480 AF or an average annual water saving of almost ~100 AF. MPWM has also implemented DMMs over the last five years. Water savings from the high-efficiency toilet (HET)

rebates and the Lawn Be Gone! Turf Replacement Program are conservatively estimated to be over 6 million gallons or 18.5 AF. Furthermore, over the 2013–2016 drought, many water service providers observed water-savings of up to 25 percent in their service areas.

6.16 Dry-Year Shortage and Demand Reduction

Pursuant to the Urban Water Management Planning Act (Water Code Section 10632), water suppliers with a water shortage contingency plan can implement subsequent stages of demand reduction measures listed in its UWMP as a strategy to balance supply and demand.

A water shortage contingency plan allows the Cal Water Bear Gulch District and MPMW to reduce water deliveries to customers and implement demand reductions during periods of water shortage. Therefore, to overcome the potential supply deficit expected to occur during critical dry years or over multiple dry years, both the Cal Water Bear Gulch District and MPMW will follow their adopted water shortage contingency plans (WSCPs) to implement drought-planning sequences and associated operating procedures that subsequently initiate different levels of demand management relative to regional water supply rationing imposed by the SFPUC. The WSCPs can be found in each of the UWMPs (Cal Water Bear Gulch District Appendix L and MPMW Appendix K)

The WSCP requires water suppliers to adopt six water shortage stages, which correspond to progressively severe water shortage conditions (up to 10%, 20%, 30%, 40%, 50%, and greater than 50% shortage) as compared to the normal reliability condition. The following six stages list the shortage response actions:

- **Stage 1 (Up to 10% shortage)** – Stage 1 is a “Water Alert” where voluntary conservation is encouraged.
- **Stage 2 (Up to 20% shortage)** – Stage 2 is a “Moderate Shortage” and will be implemented if the Stage 1 restrictions are deemed insufficient to achieve necessary demand reductions due to water supply shortages.
- **Stage 3 (Up to 30% shortage)** – Stage 3 is a “Severe Shortage” that requires water allocations and mandatory conservation.
- **Stage 4 (Up to 40% shortage)** – Stage 4 is a “Critical Shortage” that includes all steps taken in prior stages regarding allocations and mandatory conservation.
- **Stage 5 (Up to 50% shortage)** – Stage 5 is a “Shortage Crisis” that includes all steps taken in prior stages regarding allotments and mandatory conservation. This stage will be implemented in the event that the source of supply is severely curtailed to the level that requires each customer to restrict their water use for only human health and safety purposes.
- **Stage 6 (Greater than 50% shortage)** – Stage 6 is an “Emergency Shortage” condition that includes all steps taken in prior stages regarding allotments and mandatory conservation.

SECTION 7
Conclusion

According to the requirements of Water Code Section 10910(c)(3) “the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses.”

Implementation of the HEU would result in net increases in total average demand within each of the water supplier’s service areas. At buildout in 2040, new demand associated with the HEU and all other projected growth through 2040 shown in Table 5-1 would increase water demand by 715 AFY, or 0.638 MGD. The Cal Water Bear Gulch District could expect an increase of 448 AFY or 0.400 MGD within its service area, and MPMW is expected to see an increase of 267 AFY or 0.238 MGD in its service area. In years with normal or above-normal precipitation (years of normal supply), Cal Water Bear Gulch District and MPMW as shown in Tables 6.1 and 6.4, respectively, would have sufficient supplies available within its water supply portfolio (imported water, local surface water, and ISG) to serve development implemented under the HEU plus existing demand and planned future uses between 2020 and 2040. If the Bay-Delta Plan Amendment is implemented as adopted and under below-normal rainfall conditions, i.e. single dry years or multiple dry years as discussed in Section 6, Cal Water Bear Gulch District and MPMW would have insufficient water supplies to meet the projected water demands associated with implementation of the HEU, in addition to existing and planned future uses within Cal Water Bear Gulch District and MPMW service areas. In fact, both water supply agencies would be operating under their respective stage levels outlined in the WSCPs to balance water demand against significant water supply reductions throughout the RWS.

As noted in both UWMPs, significant challenges remain within the regional water supply and demand context as well as throughout California; growth in demand is projected while statewide supplies are waning and unreliable. Regionally, as growth continues within the BAWSCA member service areas, demand will incrementally reach BAWSCA’s 184.0 mgd maximum. If the water supplies currently available to the BAWSCA member agencies continue to be unreliable and subject to cutbacks, then all current and future water service connections will be affected. This is true under normal conditions, but as shown in the tables (Section 6) would be exacerbated during droughts and significantly worse with implementation of the Bay-Delta Plan Amendment. BAWSCA is actively planning and investigating numerous ways to improve supply reliability and reduce demand within its service areas. Although these efforts are in the early planning stages, it would appear, based on the projects and programs presented in the BAWSCA’s Long-

Term Reliable Water Supply Strategy document that even modest success in these efforts would improve water supply reliability to all BAWSCA members.

As described in this WSA, the sufficiency of supplies to meet the Updated 2040 Cumulative Demand depends on the assumed reliability of the SFPUC RWS supplies, which depends on whether or not the Bay-Delta Plan Amendment is implemented as adopted. If it is assumed the Bay-Delta Plan Amendment is implemented, projected supplies during normal years are sufficient to meet the Proposed Project demands, but significant supply shortfalls are projected in dry years for BAWSCA agencies including Cal Water Bear Gulch District and MPMW that receive water supplies from the SFPUC RWS, as well as other agencies whose water supplies would be affected by the Bay-Delta Plan Amendment. For Cal Water Bear Gulch District and MPMW, supply shortfalls are projected in single dry years (ranging from 30 to 40 percent) and in multiple dry years (ranging from 30 to 55 percent) through 2040, with similar findings through 2045 based on SFPUC's analysis.

Under the scenario shown in Section 6, which assumes the Bay-Delta Plan Amendment is implemented, the projected single dry year and multiple dry year shortfalls would require implementation of Stages 3, 4, and 5 of each water supplier's WSCP. Cal Water Bear Gulch District would be under Stage 6 in the 5th year of a multiple dry scenario. Units developed from implementation of the HEU would be subject to the same water conservation and water use restrictions as other water users within the Cal Water Bear Gulch District and MPMW systems.

As described in Section 6.6, if the Bay-Delta Plan Amendment is not implemented, projected supplies during normal years, single dry years and multiple dry years are sufficient to meet the demands associated with the Updated 2040 Cumulative Demand; based on SFPUC's analysis, a 16.5 percent supply shortfall is projected during the 4th and 5th consecutive dry years for base year 2045. If supply shortfalls occur, Cal Water Bear Gulch District and MPMW expect to meet these supply shortfalls through water demand reductions and other shortage response actions by implementation of its WSCP. Under the scenario which assumes the Bay-Delta Plan Amendment is not implemented, the projected multiple dry year shortfalls in 2045 would require implementation of Stage 2 of the Cal Water Bear Gulch District and MPMW WSCPs.

7.1 WSA Findings

Regarding the availability of water supplies to serve the HEU, consistent with the findings in their 2020 UWMPs, this WSA presents water supply scenarios with and without implementation of the Bay-Delta Plan Amendment. An explanation of the Bay-Delta Plan Amendment is found in section 4.2.3 and explained in detail in the SFPUC's 2020 UWMP and used to support the results found in the Cal Water Bear Gulch District's and MPMW's 2020 UWMPs.

Water supply scenario **without implementation** of the Bay-Delta Plan Amendment:

- In years of normal and above-normal precipitation and including local water supply sources, the Cal Water Bear Gulch District and MPMW have adequate supplies to serve 100 percent of normal demand beginning in 2025 and through each of their respective planning horizons.

- SFPUC would be able to meet 100 percent of its water supply guarantees during all water year types through 2045 except during the fourth and fifth consecutive dry years for base year 2045 when 15 percent shortages are projected within the RWS. In these years, Cal Water Bear Gulch District and MPMW would not have sufficient supplies to meet demand and would need to activate their water shortage contingency plans. The projected multiple dry year shortfalls in 2045 would require implementation of Stage 2 of the Cal Water Bear Gulch District and MPMW WSCPs.

- As discussed in Section 6.7 and presented in Table 6-7, MPMW through its ISG with SFPUC will meet the projected water demand associated with the Updated 2040 Cumulative Demand. If and when supply shortfalls occur in single dry and multiple dry years as soon as 2025, MPMW expects to meet these supply shortfalls through water demand reductions through implementation of its DMMs.

Water supply scenario **with implementation** of the Bay-Delta Plan Amendment:

- SFPUC will be able to meet its contractual obligations to its wholesale customers in normal years but would experience significant supply shortages in dry years. In these years, Cal Water Bear Gulch District and MPMW would not have sufficient supplies to meet demand and would need to activate their water shortage contingency plans. The projected single dry year and multiple dry year shortfalls would require implementation of Stages 3, 4, 5 and/or 6 of their WSCPs.

- In single dry years, supply shortages in the RWS would range from 36 to 46 percent. In multiple dry years, supply shortages would range from 36 to 54 percent. Notably, implementation of the Bay-Delta Plan Amendment would reduce SFPUC's primary supply source and require rationing in all single dry and multiple dry years through 2040 and 2045. In these years, Cal Water Bear Gulch District and MPMW would not have sufficient supplies to meet demand and would need to activate their water shortage contingency plans. The projected single dry year and multiple dry year shortfalls would require implementation of Stages 3, 4, 5 and/or 6 of their WSCPs.

As discussed in sections 6.9 through 6.12, SFPUC, BAWSCA, Cal Water and MPMW are working to develop regional and local projects to shore up local supplies and reduce the projected shortfall. If conditions for large drought cutbacks to the RWS persist, Cal Water Bear Gulch District and MPMW will need to implement additional demand management practices and prohibitions on potable water use and accelerate efforts to develop alternative supplies of water.

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SECTION 8
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Appendix A

California Water Service, Bear Gulch District, 2020 Urban Water Management Plan

2020 Urban Water Management Plan

Bear Gulch District

June 2021

Table of Contents

Table of Contents 1
List of Tables 6
List of Figures 9
List of Acronyms 10
Chapter 1 Introduction and Overview 13
1.1 Background and Purpose 13
1.2 Urban Water Management Planning and the California Water Code 14
1.3 Relationship to Other Planning Efforts 15
1.4 Plan Organization 15
1.5 Demonstration of Consistency with the Delta Plan for Participants in Covered Actions 16
1.6 Lay Description 16
Chapter 2 Plan Preparation 21
2.1 Public Water Systems 21
2.2 Regional Planning 22
2.3 Individual or Regional Planning and Compliance (Regional Alliance) 22
2.4 Plan Preparation, Standard Units, and Basis for Reporting 23
2.5 Coordination and Outreach 24
2.5.1 Wholesale and Retail Coordination 25
2.5.2 Coordination with and Notice to Other Agencies and the Community 26
2.5.3 Coordination with Land Use Authorities 26
Chapter 3 System Description 27
3.1 General Description 27
3.2 Service Area Boundary Map 28
3.3 Service Area Climate 29
3.4 Service Area Population and Demographics 30
3.5 Land Uses within Service Area 32
Chapter 4 Water Use Characterization 34
4.1 Non-Potable Versus Potable Water Use 34

4.2 Past, Current, and Projected Water Uses by Sector 35
4.2.1 Past and Current Water Use 35
4.2.2 Projected Water Use 36
4.2.3 Distribution System Water Loss 38
4.2.4 Future Water Savings in Projected Water Use 39
4.2.5 Water Use by Lower Income Households in Water Use Projections 42
4.2.6 Characteristic Five-Year Water Use 43
4.3 Climate Change Considerations 43
Chapter 5 SB X7-7 Baseline and Targets 45
5.1 Wholesale Suppliers 46
5.2 Updates to the 2015 UWMP Calculations 46
5.3 Service Area Population 46
5.4 Baseline Periods, Baseline GPCD, and Confirmed SB X7-7 2020 Target 47
5.5 Demonstration of Compliance with SB X7-7 2020 Target 47
5.6 Demonstration of Compliance with Regional Alliance SB X7-7 2020 Target 47
Chapter 6 Water Supply Characterization 49
6.1 Purchased Water 50
6.1.1 Description of SFPUC RWS 50
6.1.2 Water Distribution 51
6.1.3 Water Treatment 52
6.1.4 Water Storage 53
6.1.5 Individual Supply Guarantees 55
6.1.6 2028 SFPUC Decisions (formerly 2018 SFPUC Decisions) 56
6.2 Groundwater 57
6.3 Surface Water 58
6.4 Stormwater 59
6.5 Wastewater and Recycled Water 59
6.5.1 Recycled Water Coordination 59
6.5.2 Wastewater Collection, Treatment, and Disposal 60
6.5.3 Recycled Water System and Recycled Water Beneficial Uses 64
6.5.4 Actions to Encourage and Optimize Future Recycled Water Use 66

6.6 Desalinated Water Opportunities 67
6.7 Water Exchanges and Transfers 68
6.7.1 Exchanges 68
6.7.2 Transfers 68
6.7.3 Emergency Interties 68
6.8 Future Water Projects 68
6.9 Summary of Existing and Planned Sources of Water 70
6.10 Special Conditions 75
6.10.1 Climate Change Effects 75
6.10.2 Regulatory Conditions and Project Development 81
6.10.3 Other Locally Applicable Criteria 81
6.11 Energy Intensity 82
Chapter 7 Water Supply Reliability Assessment 84
7.1 Constraints on Water Sources 84
7.1.1 Regional Water System Supply Availability 85
7.1.2 Local Surface Water Supply Availability 93
7.1.3 Water Quality 93
7.1.4 Climate Change 94
7.2 Reliability by Type of Year 95
7.2.1 SFPUC Supply Modeled RWS Dry Year Supply Availability 96
7.2.2 Cal Water's Year Type Characterization 98
7.3 Supply and Demand Assessment 99
7.3.1 Normal Year Supply and Demand Assessment 99
7.3.2 Dry Year Supply and Demand Assessment (with Bay-Delta Plan) 100
7.3.3 Uncertainties in Dry Year Water Supply Projections 101
7.3.4 Strategies and Actions to Address Dry Year Supply Shortfalls 103
7.4 Water Supply Management Tools and Options 113
7.5 Drought Risk Assessment 114
7.5.1 Data, Methods, and Basis for Water Shortage Condition 114
7.5.2 Drought Risk Assessment Water Source Reliability 115
7.5.3 Drought Risk Assessment Total Water Supply and Use Comparison 116

Chapter 8 Water Shortage Contingency Planning 120
Chapter 9 Demand Management Measures 127
9.1 Demand Management Measures for Wholesale Agencies 128
9.2 Demand Management Measures for Retail Suppliers 128
9.2.1 Water Waste Prevention Ordinances 128
9.2.2 Metering 130
9.2.3 Conservation Pricing 130
9.2.4 Public Education and Outreach 130
9.2.5 Programs to Assess and Manage Distribution System Real Loss 131
9.2.6 Water Conservation Program Coordination and Staffing Support 132
9.2.7 Other Demand Management Measures 132
9.3 Implementation over the Past Five Years 134
9.4 Implementation to Achieve Water Use Targets 135
9.5 Water Use Objectives (Future Requirements) 135
Chapter 10 Plan Adoption, Submittal, and Implementation 138
10.1 Inclusion of All 2020 Data 138
10.2 Notice of Public Hearing 139
10.2.1 Notice to Cities and Counties 139
10.2.2 Notice to the Public 140
10.3 Public Hearing and Adoption 141
10.4 Plan Submittal 142
10.5 Public Availability 142
10.6 Notification of Public Utilities Commission 143
10.7 Amending an Adopted UWMP or Water Shortage Contingency Plan 143
Appendix A: UWMP Act Checklist A-1
Appendix B: Correspondence B-1
Appendix C: Public Meeting Notice C-1
Appendix D: Land Use Map D-1
Appendix E: Summary of Demand Projection Methodology and Assumptions E-1
Appendix F: DWR SB X7-7 Verification Forms F-1
Appendix G: Climate Change Studies – Executive Summaries G-1

Appendix H: SFPUC and BAWSCA Common Language H-1

Appendix I: Regional Water Supply Reliability and BAWSCA Tier 2 Drought Implementation Scenarios I-1

Appendix J: 26 March 2021 SFPUC Commission Special Meeting – Water Workshop Number 3 Water Supply Planning Scenarios SFPUC Staff Presentation Material J-1

Appendix K: Bay-Delta Plan Correspondence K-1

Appendix L: Water Shortage Contingency Plan L-1

Appendix M: Conservation Master Plan M-1

Appendix N: Resolution to Adopt UWMP N-1

List of Tables

Table 2-1. Public Water Systems (DWR Table 2-1) 21
Table 2-2. Plan Identification (DWR Table 2-2) 22
Table 2-3. Supplier Identification (DWR Table 2-3) 24
Table 2-4. Water Supplier Information Exchange (DWR Table 2-4) 25
Table 3-1. Population – Current and Projected (DWR Table 3-1) 31
Table 3-2. Demographic and Housing Characteristics 32
Table 4-1. Demands for Potable and Non-Potable Water - Actual (DWR Table 4-1) 36
Table 4-2. Use for Potable and Non-Potable Water – Projected (DWR Table 4-2) 37
Table 4-3. Total Gross Water Use (Potable and Non-Potable) (DWR Table 4-3) 37
Table 4-4. Last Five Years of Water Loss Audit Reporting (DWR Table 4-4) 38
Table 4-5. Inclusion in Water Use Projections (DWR Table 4-5) 39
Table 4-6. Future Conservation Savings (AF) 41
Table 4-7. Residential Demands of Lower Income Households (AF) 42
Table 4-8. Characteristic Five-Year Water Use (AF) 43
Table 4-9. Climate Change Effect on Demand 44
Table 5-1. SB X7-7 Baselines and Targets Summary (DWR Table 5-1) 47
Table 5-2. SB X7-7 2020 Compliance (DWR Table 5-2) 47
Table 5-3. SB X7-7 Regional Alliance – 2020 GPCD (DWR RA 2020 GPCD Table) 48
Table 5-4. SB X7-7 Regional Alliance – 2020 Compliance (DWR RA 2020 Compliance Table) 48
Table 6-A. Regional Water System Storage Capacity 55
Table 6-1. Groundwater Volume Pumped (DWR Table 6-1) 57

Table 6-2. Wastewater Collected Within Service Area in 2020 (DWR Table 6-2) 62

Table 6-3. Wastewater and Discharge Within Service Area in 2020 (DWR Table 6-3) 63

Table 6-4. Recycled Water Direct Beneficial Uses Within Service Area (DWR Table 6-4) 65

Table 6-5. 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual (DWR Table 6-5) 66

Table 6-6. Methods to Expand Future Recycled Water Use (DWR Table 6-6) 67

Table 6-7. Expected Future Water Supply Projects or Programs (DWR Table 6-7) 69

Table 6-8. Water Supplies – Actual (DWR Table 6-8) 71

Table 6-9A. Water Supplies (Combined Peninsula Districts) – Projected 72

Table 6-9B. Water Supplies – Projected (DWR Table 6-9) 74

Table 6-10. Recommended Energy Intensity – Total Utility Approach (DWR Table O-1B) 83

Table 7-1. Basis of Water Year Data (Reliability Assessment) (DWR Table 7-1) 96

Table 7-2. RWS Wholesale Supply Availability During Normal and Dry Years for Based Years 2025 through 2045 (Responds to DWR Table 7-1) 99

Table 7-3. Normal Year Supply and Demand Comparison (DWR Table 7-2) 99

Table 7-4. Single Dry Year Supply and Demand Comparison (DWR Table 7-3) 100

Table 7-5. Multiple Dry Years Supply and Demand Comparison (DWR Table 7-4) 101

Table 7-6. 2020 Base Year Multiple Dry Year Drought Allocations 116

Table 7-7. Five-Year Drought Risk Assessment Tables (DWR Table 7-5) 118

Table 8-1. Water Shortage Contingency Plan Levels (DWR Table 8-1) 121

Table 8-2. Demand Reduction Actions (DWR Table 8-2) 122

Table 8-3. Supply Augmentation and Other Actions (DWR Table 8-3) 126

Table 9-1. Cal Water DMMs Available to District Customers 134

Table 9-2. Implementation of Customer DMMs: 2016-2020 135

Table 10-1. Notification to Cities and Counties (DWR Table 10-1) 140

List of Figures

Figure 3-1. District Location and Service Boundaries 29

Figure 3-2. 30-Year Normals, Precipitation and Maximum Daily Air Temperature 30

Figure 6-1. Regional Water System 51

List of Acronyms

AB	Assembly Bill
ABAG	Association of Bay Area Governments
ACWD	Alameda County Water District
AF	Acre-Feet
AFY	Acre-Feet Per Year
AMI	Advanced Metering Infrastructure
AMR	Automatic Meter Reading
AWSP	Alternative Water Supply Planning Program
AWWA	American Water Works Association
BAIRWMP	Bay Area Integrated Regional Water Management Plan
BARR	Bay Area Regional Reliability
BAWSCA	Bay Area Water Supply and Conservation Agency
BDPL	Bay Division Pipeline
BG	Billions of Gallons
BGWTP	Bear Gulch Water Treatment Plant
CAP	Customer Assistance Program
CCR	California Code of Regulations
CCWD	Contra Costa Water District
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CII	Commercial, Industrial, and Institutional
CPUC	California Public Utilities Commission
CUWCC	California Urban Water Conservation Council
CWC	California Water Code
DBP	Disinfection By-Product
DDW	Division of Drinking Water
DMM	Demand Management Measure
DRA	Drought Risk Assessment
DSOD	Division of Safety of Dams
DWR	Department of Water Resources
EBMUD	East Bay Municipal Utilities District
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EO	Executive Order
FT	Feet
FY	Fiscal Year
GPCD	gallons per capita per day
GSRP	Groundwater Storage and Recovery Project
HHLSM	Hetch Hetchy and Local Simulation Model

HTWTP	Harry Tracy Water Treatment Plant
ILI	Infrastructure Leakage Index
IRWMP	Integrated Regional Water Management Plan
ISG	Individual Supply Guarantees
JPA	Joint Powers Authority
kWh	Kilowatt Hours
kWh/AF	Kilowatt Hours Per Acre-Foot
LCSD	Lower Crystal Springs Dam
LOS	Level of Service
LVE	Los Vaqueros Reservoir Expansion
MCLs	Maximum Contaminant Levels
MG	Million Gallons
MGD	Million Gallons Per Day
MID	Modesto Irrigation District
MMWD	Marin Municipal Water District
NOAA	National Oceanic and Atmospheric Administration
PODs	Points of Diversion
PREP	Crystal Springs Purified Water Project
PWS	Public Water SystemsPublic Water System
RA	Regional Alliance
RUWMP	Regional Urban Water Management Plan
RWS	Regional Water System
SB	Senate Bill
SFPUC	San Francisco Public Utilities Commission
SGMA	Sustainable Groundwater Management Act
SMP	Surface Mining Permit
SRES	Special Report Emissions Scenarios
SVCW	Silicon Valley Clean Water
SVWTP	Sunol Valley Water Treatment Plant
SWAP	Shared Water Access Program
SWRCB	State Water Resources Control Board
TAP	Technical Assistance Program
TDS	Total Dissolved Solids
TID	Turlock Irrigation District
TRVA	Tuolumne River Voluntary Agreement
USD	Union Sanitary District
USEPA	United States Environmental Protection Agency
UV	Ultraviolet
UWMP	Urban Water Management Plan
WQD	Water Quality Division
WSA	Water Supply Agreement
WSAP	Water Shortage Allocation Plan

WSCP	Water Shortage Contingency Plan
WSIP	Water System Improvement Program
WWTP	Wastewater Treatment Plant

Chapter 1
Introduction and Overview

This chapter discusses the importance and uses of this Urban Water Management Plan (UWMP or Plan), the relationship of this Plan to the California Water Code (CWC), the relationship of this Plan to other local and regional planning efforts, and how this Plan is organized and developed in general accordance with the UWMP Guidebook 2020.[1] Specifically, this chapter contains the following sections:

1.1 Background and Purpose

1.2 Urban Water Management Planning and the California Water Code

1.3 Relationship to Other Planning Efforts

1.4 Plan Organization

1.5 Demonstration of Consistency with the Delta Plan for Participants in Covered Actions

1.6 Lay Description

1.1 Background and Purpose

California Water Service Company (Cal Water) is an investor-owned public utility supplying water service to approximately 1.8 million Californians through over 481,000 connections. Its 25 districts serve 63 communities spanning from the Chico-Hamilton City District in the northern portion of the state to the Palos Verdes District in southern California. California Water Service Group, Cal Water's parent company, also provides water service to communities in Washington, New Mexico, and Hawaii.[2] While water rates are set separately for each of Cal Water's 25 districts, oversight of the water rate setting process and district operations is provided by the California Public Utilities Commission (CPUC).

Cal Water incorporated in 1926 and has provided water service to communities served by the Bear Gulch District since 1936. These communities include Portola Valley, Woodside, Atherton, and portions of Menlo Park, Redwood City, and San Mateo County. Skyline County's water system became part of the Bear Gulch district in 2009.

This UWMP is a foundational document and source of information about the Bear Gulch District's historical and projected water demands, water supplies, supply reliability and potential

[1] The UWMP Guidebook 2020 is available at: https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Urban-Water-Management-Plans
[2] In addition, Cal Water operates the City of Hawthorne's water system on behalf of the City.

vulnerabilities, water shortage contingency planning, and demand management programs. Among other things, it is used as:

- A long-range planning document by Cal Water for water supply and system planning; and
- A source for data on population, housing, water demands, water supplies, and capital improvement projects used in:
    - Regional water resource management plans prepared by wholesale water suppliers and other regional planning authorities (as applicable),
    - General Plans prepared by cities and counties, and
    - Statewide and broad regional water resource plans prepared by the California Department of Water Resources (DWR), the State Water Resources Control Board (SWRCB), or other state agencies.

The District's last UWMP was completed in 2016, referred to herein as the "2015 UWMP." This Plan is an update to the 2015 UWMP and carries forward information from that plan that remains current and relevant, and provides additional information as required by subsequent amendments to the UWMP Act (CWC §10610 – 10657). Although this Plan is an update to the 2015 UWMP, it was developed to be a self-contained, stand-alone document and does not require readers to reference information contained in previous UWMP updates.

1.2 Urban Water Management Planning and the California Water Code

The UWMP Act requires urban water suppliers to prepare an UWMP every five years and to submit this plan to the DWR, the California State Library, and any city or county within which the supplier provides water supplies. All urban water suppliers, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet annually are required to prepare an UWMP (CWC §10617).

The UWMP Act was enacted in 1983. Over the years it has been amended in response to water resource challenges and planning imperatives confronting California. A significant amendment was made in 2009 as a result of the governor's call for a statewide 20 percent reduction in urban water use by 2020, referred to as "20x2020," the Water Conservation Act of 2009, and "SB X7-7." This amendment required urban retail water suppliers to establish water use targets for 2015 and 2020 that would result in statewide water savings of 20 percent by 2020. Beginning in 2016, urban retail water suppliers were required to comply with the water conservation requirements in SB X7-7 in order to be eligible for state water grants or loans. Chapter 5 of this plan contains the data and calculations used to determine compliance with these requirements.

A subsequent substantial revision to the UWMP Act was made in 2018 through a pair of bills (i.e., Assembly Bill 1668 and Senate Bill 606), referred to as "Making Water Conservation a California

Way of Life" or the "2018 Water Conservation Legislation." These changes include, among other things, additional requirements for Water Shortage Contingency Plans (WSCPs), expansion of dry year supply reliability assessments to a five-year drought period, establishment of annual drought risk assessment procedures and reporting, and new conservation targets referred to as "annual water use objectives," which will require retailers to continue to reduce water use beyond the 2020 SB X7-7 targets. The UWMP Act contains numerous other requirements that an UWMP must satisfy. Appendix A to this Plan lists each of these requirements and where in the Plan they are addressed.

1.3 Relationship to Other Planning Efforts

This Plan provides information specific to water management and planning by the Bear Gulch District. However, water management does not happen in isolation; there are other planning processes that integrate with the UWMP to accomplish urban planning. Some of these relevant planning documents include relevant city and county General Plans, Water Master Plans, Recycled Water Master Plans, integrated resource plans, Integrated Regional Water Management Plans, Groundwater Management Plans, Groundwater Sustainability Plans, and others.

This Plan is informed by and helps to inform these other planning efforts. In particular, this Plan utilizes information contained in city and county General Plans and local and regional water resource plans to the extent data from these plans are applicable and available.

1.4 Plan Organization

The organization of this Plan follows the same sequence as outlined in the UWMP Guidebook 2020.[3]

Chapter 1 - Introduction and Overview

Chapter 2- Plan Preparation

Chapter 3 - System Description

Chapter 4 - Water Use Characterization

Chapter 5 - SB X7-7 Baseline and Targets

Chapter 6 - Water Supply Characterization

[3] The UWMP Guidebook 2020 is available at: https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Urban-Water-Management-Plans

Chapter 7 - Water Supply Reliability Assessment

Chapter 8 - Water Shortage Contingency Planning

Chapter 9 - Demand Management Measures

Chapter 10 - Plan Adoption, Submittal, and Implementation

In addition to these ten chapters, this Plan includes a number of appendices providing supporting documentation and supplemental information. Pursuant to CWC §10644(a)(2), this Plan utilizes the standardized forms, tables, and displays developed by DWR for the reporting of water use and supply information required by the UWMP Act. This Plan also includes additional tables, figures, and maps to augment the set developed by DWR, as appropriate. The table headers indicate if the table is part of DWR's standardized set of submittal tables.

1.5 Demonstration of Consistency with the Delta Plan for Participants in Covered Actions

Although not required by the UWMP Act, in the UWMP Guidebook 2020,[4] DWR recommends that all suppliers that are participating in, or may participate in, receiving water from a proposed project that is considered a "covered action" under the Delta Plan—such as a (1) multiyear water transfer; (2) conveyance facility; or (3) new diversion that involves transferring water through, exporting water from, or using water in the Sacramento-San Joaquin Delta (Delta)—provide information in their UWMP to demonstrate consistency with the Delta Plan policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (California Code of Regulations, Title 23, Section 5003). The San Francisco Public Utilities Commission (SFPUC), the District's wholesale agency, has made a legal determination that this requirement does not apply to their water sources.[5]

1.6 Lay Description

☑ ***CWC § 10630.5***

Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.

[4] The UWMP Guidebook 2020 is available at: https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Urban-Water-Management-Plans
[5] Email from BAWSCA, dated 9 February 2021.

This Urban Water Management Plan (UWMP or Plan) is prepared for the Cal Water Bear Gulch District (also referred to as "District"), which serves drinking water to a population of approximately 60,800 in San Mateo County, approximately 30 miles south of the City of San Francisco. This UWMP serves as a foundational planning document and includes descriptions of historical and projected water demands, water supplies, and the resulting reliability during a set of defined water supply conditions over a 20-year planning horizon. This document also describes the actions the District is taking to promote water conservation, both by the District itself and by its customers (referred to as "demand management measures"), and includes a plan to address potential water supply shortages such as drought or other impacts to supply availability (the "Water Shortage Contingency Plan"). This UWMP is updated every five years in accordance with state requirements under the Urban Water Management Planning Act and amendments (Division 6 Part 2.6 of the California Water Code [CWC] §10610 – 10656). Past plans developed for the District are available on the California Department of Water Resources (DWR) Water Use Efficiency Data Portal website: https://wuedata.water.ca.gov/. This document includes 10 chapters, which are summarized below.

Chapter 1- Introduction and Overview

This chapter presents the background and purpose of the UWMP, identifies the Plan organization, and provides this lay description overview of the document. For districts that rely on water from the Sacramento-San Joaquin Delta, this section also discusses and demonstrates consistency with the Delta Plan. Based on information provided by the San Francisco Public Utilities Commission (SFPUC) and the Bay Area Water Supply and Conservation Agency (BAWSCA), the adoption of the Delta Plan is anticipated to impact the reliability of the Regional Water System (RWS) supplies in the future. The San Francisco Public Utilities Commission (SFPUC), the District's wholesale agency, has made a legal determination that this requirement does not apply to their water sources.[6]

Chapter 2 - Plan Preparation

This chapter discusses key structural aspects related to the preparation of the UWMP, and describes the coordination and outreach conducted as part of the preparation of the Plan, including coordination with local agencies (i.e., Town of Atherton, Town of Portola Valley, Town of Woodside, City of Menlo Park, and San Mateo County), and the public.

Chapter 3 - System Description

This chapter provides a description of the Bear Gulch District's water system and the service area, including information related to the climate, population, and demographics. The District is located in San Mateo County. The District has a population of approximately 63,800 and has a

[6] Email from BAWSCA, dated 9 February 2021.

climate characterized by mild summers and cool wet winters. The majority of the 37 inches of average annual precipitation falls between October and May. Current land uses within the District is a mixture of low, medium, and high density residential, mixed use, commercial, public facilities, and parks/open space. All water customers are considered urban (i.e., non-agricultural water users).

Chapter 4 - Water Use Characterization

This chapter provides a description and quantifies the Bear Gulch District's current and projected demands through the year 2045. The District provides drinking water (also referred to as "potable water") to customers. Water demands refer not only to the water used by customers, but also includes the water used as part of the system maintenance and operation, as well as unavoidable losses inherent in the operation of a water distribution system. Water demand within the District was 11,655 acre-feet per year (AFY) on average between 2016 and 2020. Taking into account historical water use, expected population increase and other growth, climatic variability, and other assumptions, water demand within the District is projected to increase to a maximum of 12,796 AFY by 2025, a change of nine percent compared to the 2016-2020 average. In dry year periods, water demands are expected to be somewhat higher, potentially up to a maximum of 13,699 AFY by 2025 during an extended five-year drought.

Chapter 5 - SB X7-7 Baseline and Targets

In this chapter, the Bear Gulch District demonstrates compliance with its per capita water use target for the year 2020. The Water Conservation Act of 2009 (Senate Bill X7-7) was enacted in November 2009 and requires the state of California to achieve a 20 percent reduction in urban per capita water use by December 31, 2020. In order to achieve this, each urban retail water supplier was required to establish water use targets for 2015 and 2020 using methodologies established by DWR. Having reduced its water use in 2020 to 190 gallons per capita per day (GPCD), the Bear Gulch District did not meet its individual 2020 water use target of 187 GPCD. However, the District is a member of the California Water Service – San Francisco Bay Regional Alliance and complies with SB X7-7 requirements via this regional alliance. The Regional Alliance's 2020 water use is 130 GPCD, which is in below (i.e., in compliance with) its 2020 target of 150 GPCD.

Chapter 6 - Water Supply Characterization

This chapter presents an analysis of the Bear Gulch District's water supplies, as well as an estimate of water-related energy-consumption. The intent of this chapter is to present a comprehensive overview of the District's water supplies, estimate the volume of available supplies over the 20-year planning horizon, and assess the sufficiency of the District's supplies to meet projected demands under "normal" hydrologic conditions.

The Bear Gulch District derives its water supply from a combination of both local surface water and imported surface water supply purchased from the SFPUC RWS. California Water Service Company (Cal Water)'s annual allocation of SFPUC supply is shared among the Bear Gulch, Mid-Peninsula, and South San Francisco Districts. Local surface water comprises approximately nine percent of annual deliveries from 1980 to 2020.

Calculating and reporting of water system energy intensity is a new requirement for the 2020 UWMPs. Energy intensity is defined as the net energy used for water treatment, pumping, conveyance, and distribution for all water entering the distribution system, and does not include the energy used to treat wastewater. The energy intensity for the Bear Gulch District is estimated to be 345 kilowatt hours per acre-foot of water (kWh/AF).

Chapter 7 - Water Supply Reliability Assessment

This chapter assesses the reliability of the Bear Gulch District's water supplies, with a specific focus on potential constraints such as purchased water and surface water supply availability, water quality, and climate change. The intent of this chapter is to identify any potential constraints that could affect the reliability of the District's supply (such as drought conditions) to support the District's planning efforts to ensure that its customers are well served. Water service reliability is assessed during normal, single dry-year, and multiple dry-year hydrologic conditions.

The Bear Gulch District's local surface water supply is expected to be 100 percent reliable in normal year types. However, it is conservatively estimated that there will be no local surface water supply in dry year types.

The reliability of the RWS is anticipated to vary greatly in different year types. Cal Water has relied on the supply reliability estimates provided by the SFPUC for the RWS and the drought allocation structure provided by SFPUC and BAWSCA to estimate available RWS supplies in dry year types through 2045.

Based on this analysis, the District's supply is expected to be sufficient to meet demands in normal year conditions. However, the District is expected to experience significant shortfalls during single dry and multiple dry year conditions as a result of Bay-Delta Plan Amendment implementation. At this time numerous uncertainties remain in the implementation of the Bay-Delta Plan Amendment and the resultant allocation of the available supply to the District and the other SFPUC Wholesale Customers. Cal Water has developed a Water Shortage Contingency Plan to address potential water shortage conditions.

Potential water quality issues are not expected to affect the quality of water served to the District's customers, as water quality is routinely monitored and the District is able to make all appropriate adjustments to its treatment and distribution system to ensure only high quality drinking water is served.

Chapter 8 - Water Shortage Contingency Planning

This chapter describes the Water Shortage Contingency Plan (WSCP) for the Bear Gulch District. The WSCP serves as a standalone document to be engaged in the case of a water shortage event, such as a drought or supply interruption, and defines specific policies and actions that will be implemented at various shortage level scenarios. For example, implementing customer water budgets and surcharges, or restricting landscape irrigation to specific days and/or times. Consistent with DWR requirements, the WSCP includes six levels to address shortage conditions ranging from up to 10 percent to greater than 50 percent shortage.

Chapter 9 - Demand Management Measures

This chapter includes descriptions of past and planned conservation programs that Cal Water operates within each demand management measure (DMM) category outlined in the UWMP Act, specifically: (1) water waste prevention ordinances, (2) metering, (3) conservation pricing, (4) public education and outreach, (5) distribution system water loss management, (6) water conservation program coordination and staffing support, and (7) "other" DMMs. Cal Water has developed a suite of conservation programs and policies, which address each DMM category.

Chapter 10 - Plan Adoption, Submittal, and Implementation

This chapter provides information on a public hearing, the adoption process for the UWMP and WSCP, the adopted UWMP and WSCP submittal process, plan implementation, and the process for amending the adopted UWMP and WSCP. Prior to adopting the Plan, Cal Water held a formal public hearing to present information on its Bear Gulch District UWMP and WSCP on June 9, 2021, 5:00 PM. This UWMP and the corresponding WSCP were submitted to DWR within 30 days of adoption and by the July 1, 2021 deadline.

Cal Water recommends that users of its 2020 UWMP contact District staff for potential updates about its water supply reliability before using the 2020 UWMP drought cutback projections for their planning projects and referencing the drought allocations.

Chapter 2
Plan Preparation

This chapter discusses the type of Urban Water Management Plan (UWMP or Plan) the Bear Gulch District (also referred to herein as "District") has prepared and includes information that will apply throughout the Plan. Coordination and outreach during the development of the Plan is also discussed. Specifically, this chapter includes the following sections:

2.1 Public Water Systems

2.2 Regional Planning

2.3 Individual or Regional Planning and Compliance (Regional Alliance)

2.4 Plan Preparation, Standard Units, and Basis for Reporting

2.5 Coordination and Outreach

2.1 Public Water Systems

The Bear Gulch District operates the Public Water System (PWS) listed in Table 2-1. Public Water Systems are the systems that provide drinking water for human consumption and are regulated by the State Water Resources Control Board (SWRCB), Division of Drinking Water. The SWRCB requires that water agencies report water usage and other relevant PWS information via the electronic Annual Reports to the Drinking Water Program (eARDWP). These data are used by the state to determine, among other things, whether an urban retail water supplier has reached the threshold (3,000 or more connections or 3,000 acre-feet of water supplied) for submitting an UWMP.

Table 2-1. Public Water Systems (DWR Table 2-1)

Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020
CA4110006	Bear Gulch	18,561	12,972
	TOTAL	18,561	12,972

NOTES:
(a) Volumes are in units of AF.

2.2 Regional Planning

Regional planning can deliver mutually beneficial solutions to all agencies involved by reducing costs for the individual agency, assessing water resources at the appropriate geographic scale, and allowing for solutions that cross jurisdictional boundaries. California Water Service Company (Cal Water) participates in regional water resources planning initiatives throughout California in the regions in which its 25 water districts are located. In the region in which the Bear Gulch District is located, Cal Water participates in regional planning through the Bay Area Water Supply and Conservation Agency (BAWSCA). As a BAWSCA member, Cal Water assisted with development of the San Francisco Bay Area Integrated Regional Water Management Plan and BAWSCA's Long-Term Reliability Water Supply Strategy, discussed further in Section 7.1.1.

2.3 Individual or Regional Planning and Compliance (Regional Alliance)

Urban water suppliers may elect to prepare individual or regional UWMPs. The Bear Gulch District has elected to prepare an individual UWMP (see Table 2-2).

Urban retail water suppliers may report on the requirements of SB X7-7 (2009 California Conservation Act) individually or as a member of a "Regional Alliance." As described in Chapter 5, the Bear Gulch District is a member of a Regional Alliance and this UWMP provides information on the District's compliance with its SB X7-7 water conservation targets both as an individual urban retail water supplier and as a member of a Regional Alliance.

Table 2-2. Plan Identification (DWR Table 2-2)

Select Only One	Type of Plan		Name of RUWMP or Regional Alliance *if applicable*
X	Individual UWMP		
		Water Supplier is also a member of a RUWMP	
	X	Water Supplier is also a member of a Regional Alliance	California Water Service - San Francisco Bay Regional Alliance
	Regional Urban Water Management Plan (RUWMP)		
NOTES: The Bear Gulch District is a member of a Regional Alliance. Chapter 5 provides information on the District's progress towards meeting its water conservation targets under SB X7-7 both as an individual urban retail water supplier and as a member of its Regional Alliance.			

2.4 Plan Preparation, Standard Units, and Basis for Reporting

☑ ***CWC § 10608.12 (t)***

"Urban retail water supplier" means a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes.

☑ ***CWC § 10617***

"Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

☑ ***CWC § 10621 (a)***

Each urban water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update.

☑ ***CWC § 10621 (f)***

Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.

Per California Water Code (CWC) §10617, the Bear Gulch District is an urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. It is therefore obligated under CWC §10621(f) to develop and submit an UWMP to the California Department of Water Resources (DWR) by July 1, 2021. The Bear Gulch District is an urban retail water supplier, as defined by CWC §10608.12 (t) and §10617, and as identified in Table 2-3. The Bear Gulch District is not a wholesale water supplier.

Annual volumes of water reported in this UWMP are measured in acre-feet (AF) and are reported on a calendar year basis (Table 2-3). Water use and planning data reported in this UWMP for calendar year 2020 cover the full twelve months of the year, as required by the UWMP Guidelines.

Table 2-3. Supplier Identification (DWR Table 2-3)

Type of Supplier	
	Supplier is a wholesaler
X	Supplier is a retailer
Fiscal or Calendar Year	
X	UWMP Tables are in calendar years
	UWMP Tables are in fiscal years
If using fiscal years provide month and date that the fiscal year begins (mm/dd)	
Units of measure used in UWMP	
Unit	AF
NOTES:	

2.5 Coordination and Outreach

☑ ***CWC § 10620 (d) (3)***

Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

☑ ***CWC § 10631 (a)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

☑ ***CWC § 10642***

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. …

Coordination with other water suppliers, cities, counties, and other community organizations in the region is an important part of preparing a UWMP and Water Shortage Contingency Plan

(WSCP). This section identifies the agencies and organizations the Bear Gulch District sought to coordinate with during preparation of this Plan.

2.5.1 Wholesale and Retail Coordination

☑ ***CWC § 10631 (h)***

An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).

Urban retail water suppliers relying on one or more wholesalers for water supply are required to provide these wholesalers with information regarding projected water supply and demand. The Bear Gulch District coordinates with the wholesale supplier shown in Table 2-4.

Table 2-4. Water Supplier Information Exchange (DWR Table 2-4)

The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.
Wholesale Water Supplier Name
San Francisco Public Utilities Commission
NOTES:

2.5.2 Coordination with and Notice to Other Agencies and the Community

☑ ***CWC § 10620 (d) (3)***

Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

☑ ***CWC § 10642***

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

The Bear Gulch District coordinated with cities, counties, and other community organizations during preparation of this UWMP. Cal Water provided notice to these entities and the communities it serves 60 days prior to the public hearing it held on June 9, 2021, to present the draft of the UWMP, address questions, and receive comments. Cities and counties receiving the public hearing notification from Bear Gulch District as required per CWC §10621 (b) are listed in Table 10-1 in Chapter 10 of this Plan.

Copies of correspondence with other agencies and public notices are provided in Appendix B and Appendix C, respectively.

2.5.3 Coordination with Land Use Authorities

☑ ***CWC § 10631 (a)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

Cal Water coordinated with the Town of Atherton, Town of Portola Valley, Town of Woodside, City of Menlo Park, and San Mateo County staff to review and confirm that appropriate land use assumptions were used to develop the UWMP demand projections. Correspondence with land use authorities is included in Appendix B.

Chapter 3
System Description

☑ ***CWC § 10631 (a)***

A plan shall be adopted in accordance with this chapter that shall do all of the following:

Describe the service area of the supplier, including current and projected population, climate, and other social, economic, and demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available. The description shall include the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

This chapter provides a description of the Bear Gulch District (also referred to herein as the "District") water system and service area, including climate, population, demographics, and land uses to help in understanding various elements of water supply and demand. This chapter includes the following sections:

3.1 General Description

3.2 Service Area Boundary Map

3.3 Service Area Climate

3.4 Service Area Population and Demographics

3.5 Land Uses within Service Area

3.1 General Description

The District was formed in 1936 by California Water Service Company (Cal Water), an investor-owned water utility regulated by the California Public Utilities Commission (CPUC), and serves the communities of Portola Valley, Woodside, Atherton, and portions of Menlo Park, Redwood City, and San Mateo County. The District's water supply is comprised of local surface water (approximately nine percent of annual deliveries) and water purchased from the City and County of San Francisco's Hetch Hetchy system. The District delivers roughly 12 million gallons of water per day to more than 18,000 service connections. The District delivers water to residential, commercial, industrial, and governmental customers. Residential customers account for most of

the District's service connections and 84 percent of its water uses. Non-residential water uses account for 11 percent of total demand while distribution system losses account for 5 percent.

3.2 Service Area Boundary Map

Figure 3-1 shows the location of the District and its current service area boundaries. The District is located in San Mateo County approximately 30 miles south of the City of San Francisco. The District is bordered on the north by Redwood City; on the east by Palo Alto, Stanford University, and unincorporated Santa Clara County; and on the south and west by unincorporated San Mateo County. The major transportation links through the District are Interstate 280, U.S. Highway 101, El Camino Real, Woodside Road, and Alpine Road. The Dumbarton Bridge connects the area to the East Bay communities.

Elevations in the service area range from just over sea level on the eastern boundary to nearly 1,100 feet above sea level on the western boundary. This marked variation in elevation requires 33 separate pressure zones for effective system operation. Much of the terrain that bounds the service area on the west is too steep for any type of development.

The San Francisquito Creek and its tributaries provide the principal source of drainage to the area. Bear Gulch Creek, one of these tributaries, drains a 1,500-plus acre watershed of which Cal Water owns 1,306 acres. Storm runoff carried by this creek is captured by two separate diversion facilities on the creek providing the only local source of supply available to the District.

The San Andreas Fault rift zone forms the major geologic features of the area as it passes through the western portion of the service area along with the Monta Vista Fault Line. The Hayward Fault lies along the east side of San Francisco Bay. A major earthquake occurring on any of these faults may disrupt water service in the District.

Figure 3-1. District Location and Service Boundaries

3.3 Service Area Climate

The District's climate is characterized by mild summers and cool wet winters (see Figure 3-2).[7] Most rainfall occurs between October and May. Precipitation totals in the summer months are

[7] Precipitation and temperature data downloaded from: https://prism.oregonstate.edu/explorer/. These data represent a 30-year period from 1980 through 2010. The x-axis reflects the end of the 30-year time series.

negligible. On average, the District receives 37 inches of rainfall annually. Maximum daily air temperature averages 81 degrees Fahrenheit during the summer months. In the winter, it averages 56 degrees Fahrenheit.

Figure 3-2. 30-Year Normals, Precipitation and Maximum Daily Air Temperature

Based on a review of data downloaded from the Oregon State PRISM dataset for 1895 to 2019, rainfall varies significantly from year-to-year, as it does in most of California.[8] The standard deviation in annual rainfall is 11 inches, or approximately one-third of average annual rainfall.[9] Consecutive years of below average rainfall are fairly common. Since 1895, runs of below average rainfall lasting three or more years have occurred ten times and runs lasting five or more years have occurred once, running from 1987 through 1991. While rainfall in the region is highly variable, there has been no statistically significant trend in the mean or variance of annual rainfall since 1895.

The District's climate has been warming. Since 1895, average daily temperature has increased at an average rate of 0.014 degrees Fahrenheit per year. Mean annual temperature for 2010-2019 was 1.7 degrees Fahrenheit higher than for 1900-1909.

3.4 Service Area Population and Demographics

It is estimated that the District's service area population was 60,814 in 2020.

The District estimates its service area population using Census Block population counts from decadal Census data. The decadal Census estimates are converted to average population per single- and multi-family service, which are applied to service counts for years between the

[8] Downloaded from: https://prism.oregonstate.edu/explorer/. The x-axis reflects the end of the 30-year time series.
[9] Standard deviation measures the typical or average year-to-year variation in annual rainfall amount. Thus, it is typical for annual rainfall to fluctuate significantly in the District.

decadal Censuses. This method is similar to the approach used by the California Department of Water Resources (DWR) Population Tool and population estimates generated by the two methods have been shown to differ by less than a percent in most cases.[10]

Current and projected service area population are shown in Table 3-1. Projected population is based on population, housing, and employment projections developed by the Association of Bay Area Governments (ABAG).[11]

Table 3-1. Population – Current and Projected (DWR Table 3-1)

Population Served	2020	2025	2030	2035	2040	2045
	60,814	60,907	61,255	61,778	62,302	62,835
NOTES:						

Demographics for the Atherton, Menlo Park, North Fair Oaks, Portola Valley, West Menlo Park and Woodside are summarized in Table 3-2. These data are from the U.S. Census American Community Survey 2019 5-Year Estimates.[12] Relative to the rest of California, the District's population is older and more racially homogenous. Educational attainment is higher than for the state as a whole, as is median household income.

The District's stock of housing is older than for California as a whole. Only 14.8 percent of homes in the District were built after 1990 compared to 25.5 percent for all of California. Homes built after 1990 are more likely to have plumbing fixtures that are compliant with state and federal water and energy efficiency standards.

[10] California Water Service, 2016. 2015 Urban Water Management Plan: Bear Gulch District, dated June 2016.
[11] Association of Bay Area Governments Projections 2040. Accessed from: http://projections.planbayarea.org/
[12] U.S. Census Bureau, 2019. 2015-2019 American Community Survey 5-year Estimates, dated 2019. Retrieved from: https://data.census.gov/cedsci/.

Table 3-2. Demographic and Housing Characteristics

Demographics	Ather-ton	Menlo Park	North Fair Oaks	Portola Valley	West Menlo Park	Wood-side	Cali-fornia
Median Age (Years)	47.4	37.9	33.1	52.8	39.8	47.5	36.5
Racial Makeup (%)							
White	75.5	71.8	55.5	91.2	83.1	87.6	63.8
Black or African American	1.2	5.8	2.7	1.9	1.7	1.5	7.0
American Indian and Alaska Native	1.8	1.3	1.6	0.1	1.0	1.1	1.9
Asian	24.1	18.2	6.7	10.0	19.1	10.2	16.7
Native Hawaiian	1.2	2.4	0.2	0.0	0.0	0.1	0.8
Some other race	1.3	6.2	38.5	1.3	0.0	4.0	15.1
Hispanic or Latino (of any race) (%)	4.4	15.5	73.4	6.7	4.1	9.1	39.0
Educational Attainment (%)							
Bachelor's Degree or Higher	81.9	69.6	26.4	77.1	83.2	78.7	33.9
Primary Language Spoken at Home (%)							
English Only	77.0	67.2	26.0	87.3	87.9	82.8	82.2
Limited English-Speaking Households	1.2	4.4	16.2	0.0	2.5	0.6	8.9
Median Household Income ($)	250,000+	160,784	77,899	224,554	214,167	250,000+	75,235
Population below Federal Poverty Level (%)	3.7	7.6	15.1	1.8	3.9	4.5	13.4
Housing	**Ather-ton**	**Menlo Park**	**North Fair Oaks**	**Portola Valley**	**West Menlo Park**	**Wood-side**	**Cali-fornia**
Median Year Built	1959	1959	1959	1969	1959	1964	1975
Year Housing Built (%)							
2010 or Later	7.3	3.9	2.0	4.4	6.9	3.3	3.5
2000 to 2009	9.6	4.4	1.1	9.0	4.6	8.1	11.2
1990 to 1999	8.6	4.5	7.0	5.5	4.8	7.8	10.9
Before 1990	74.5	87.1	89.9	81.1	83.8	80.8	74.5

3.5 Land Uses within Service Area

Current land uses within the District is a mixture of low, medium, and high density residential, mixed use, commercial, public facilities, and parks/open space. Maps showing General Plan land use designations for communities served by the District are provided in Appendix D.

The District's population and service growth projections are tied to ABAG census tract level projections of population, housing, and employment. These projections, in turn, are developed by ABAG through detailed land use modeling of the Bay Area.[13] The areas included in the ABAG land use model include all incorporated and unincorporated areas of the nine-county Bay Area. ABAG's land use model application is comprised of ten sub models:

1. Employment Transition Model
2. Household Transition Model
3. Real Estate Development Model
4. Scheduled Development Events Model
5. Employment Relocation Model
6. Household Relocation Model
7. Government Growth Model
8. Employment Location Choice Model
9. Household Location Choice Model
10. Real Estate Price Model

Parcels, or individual units of land ownership, provide the fundamental building block for the ABAG land use model. The land use database includes information linking the parcels to zones they are within, buildings within each parcel, their size, their monetary value, and their current planning constraints. The base year database contains 1.9 million buildings categorized into 14 different land use types, ranging from detached single-family housing to heavy industrial.

The ABAG land use model relies on current zoning for all parcels in the region as a representation of the land use controls in place in the base year. Zoning codes, general plans, and specific plans were processed by ABAG to obtain a consistent indication of each jurisdiction's long-term vision for land use type, residential dwelling units per acre, and commercial floor-area-ratio.

[13] Association of Bay Area Governments and Metropolitan Transportation Commission (2017). Land Use Modeling Report, Plan Bay Area 2040 Final Supplemental Report, dated July 2017. Accessed from: http://2040.planbayarea.org/files/2020-02/Land_Use_Modeling_PBA2040_Supplemental%20Report_7-2017.pdf

Chapter 4
Water Use Characterization

☑ ***CWC § 10631 (d) (1)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(J) Distribution system water loss.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

This chapter provides a description and quantifies the Bear Gulch District's (also referred to herein as the "District") past, current, and projected water uses through 2045. For the purposes of the Urban Water Management Plan (UWMP or Plan), the terms "water use" and "water demand" are used interchangeably. This chapter is divided into the following subsections:

4.1 Non-Potable Versus Potable Water Use

4.2 Past, Current, and Projected Water Uses by Sector

4.3 Climate Change Considerations

Appendix E provides additional information and data related to the development of the water demand projections presented in this chapter.

4.1 Non-Potable Versus Potable Water Use

This Plan maintains a clear distinction between recycled, potable, and raw water uses and supplies. Recycled water is addressed comprehensively in Chapter 6, but a summary of recycled

water demand is included in Table 4-3 of this chapter. The primary focus of this chapter is the historical and projected potable water uses in the District.

4.2 Past, Current, and Projected Water Uses by Sector

☑ ***CWC § 10631 (d)***

For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(J) Distribution system water loss.

4.2.1 Past and Current Water Use

Table 4-1 shows water use in 2016-2020 by use type (referred to as "sector" in CWC §10631). Water use has been decreasing in the District since the mid-2000s. Several factors have contributed to this reduction. First, California Water Service Company (Cal Water) implemented conservation pricing starting in 2009, supplying stronger financial incentives to use water efficiently. Second, starting around 2012, Cal Water tripled the level of expenditure on conservation programs aimed at helping customers use water more efficiently. Third, appliance efficiency standards and plumbing codes have contributed to significant improvement over time in the average water use efficiency of the installed base of appliances and plumbing fixtures. For example, a new toilet uses roughly one-third the amount of water as a toilet manufactured in the 1980s while a new clothes washer uses about half the amount of water as an older washer.[14] Per capita water use in 2020 was 24 percent below its peak in the early 2000s.

[14] Water Research Foundation, 2016. Residential End Uses of Water, Version 2, prepared by DeOreo, William B., Peter Mayer, Benedykt Dziegielewski, and Jack Kiefer, dated April 2016.

Water use in 2020 was 12,972 acre-feet (AF). Residential customers accounted for most of the District's service connections and 84 percent of its water uses. Non-residential water uses accounted for 11 percent of total demand, while distribution system losses accounted for 5 percent.

Table 4-1. Demands for Potable and Non-Potable Water - Actual (DWR Table 4-1)

Use Type	Additional Description *(as needed)*	Level of Treatment When Delivered	Volume (a)				
			2016	2017	2018	2019	2020
Single Family		Drinking Water	8,001	9,000	9,742	9,361	10,598
Multi-Family		Drinking Water	235	264	285	242	279
Commercial		Drinking Water	980	1,048	1,111	1,152	1,038
Institutional/Gov't		Drinking Water	218	292	323	299	303
Industrial		Drinking Water	2	2	2	2	3
Other Potable		Drinking Water	54	59	28	35	20
Landscape		Drinking Water	24	26	29	27	21
Losses	(b)	Drinking Water	591	705	416	752	711
		TOTAL	10,105	11,395	11,936	11,869	12,972

NOTES:
(a) Volumes are in units of AF.
(b) Real and apparent losses.

4.2.2 Projected Water Use

Projected water use through 2045 is summarized in Table 4-2. Projected water use is estimated as a function of expected service growth and a forecast of average water use per service for each of the use types shown in the table. As discussed in Chapter 3, population and service growth projections are based on population, housing, and employment projections developed by the Association of Bay Area Governments (ABAG).[15]

As described later in the chapter, average water use per service is adjusted over the forecast period to account for anticipated reductions in water use due to the ongoing effects of appliance standards and plumbing codes, conservation and customer assistance programs, and growth in the inflation-adjusted cost of water service and household income. These factors, in combination, are projected to attenuate the projected increase in water use associated with projected service and population growth.

[15] Association of Bay Area Governments Projections 2040. Accessed from: http://projections.planbayarea.org/

Table 4-2. Use for Potable and Non-Potable Water – Projected (DWR Table 4-2)

Use Type	Additional Description *(as needed)*	Projected Water Use				
		2025	2030	2035	2040	2045
Single Family		10,591	10,595	10,629	10,605	10,647
Multi-Family		264	267	277	281	286
Commercial		957	913	897	864	836
Institutional/Gov't		286	278	279	274	270
Industrial		3	3	3	3	3
Other Potable		18	18	18	18	18
Landscape		21	21	21	21	21
Losses	(b)	657	604	607	610	614
TOTAL		12,796	12,699	12,730	12,675	12,694

NOTES:
(a) Volumes are in units of AF.
(b) Real and apparent losses.

Future water demands are expected to be comprised entirely of potable water use, as shown in Table 4-3. Potential opportunities for recycled water use in the District are discussed in Chapter 6.

Table 4-3. Total Gross Water Use (Potable and Non-Potable) (DWR Table 4-3)

	2020	2025	2030	2035	2040	2045
Potable Water, Raw, Other Non-potable *From DWR Tables 4-1 and 4-2*	12,972	12,796	12,699	12,730	12,675	12,694
Recycled Water Demand *From DWR Table 6-4*	0	0	0	0	0	0
Optional Deduction of Recycled Water Put Into Long-Term Storage						
TOTAL WATER USE	12,972	12,796	12,699	12,730	12,675	12,694

NOTES:
(a) Volumes are in units of AF.

4.2.3 Distribution System Water Loss

☑ ***CWC § 10631 (3)***

(A) The distribution system water loss shall be quantified for each of the five years preceding the plan update, in accordance with rules adopted pursuant to Section 10608.34.

(B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.

(C) In the plan due July 1, 2021, and in each update thereafter, data shall be included to show whether the urban retail water supplier met the distribution loss standards enacted by the board pursuant to Section 10608.34.

Table 4-4 shows distribution system water losses for the previous five years. Water loss is the sum of apparent and real losses. Apparent loss is associated with metering inaccuracies, billing and administrative errors, authorized unmetered uses (e.g., system flushing and firefighting), and unauthorized uses. Real loss is associated with physical water lost through line breaks, leaks and seeps, and overflows of storage tanks. Since 2016, urban retail water suppliers have been required under CWC §10608.34 and California Code of Regulations (CCR) §638.1 et seq to quantify distribution system water losses using the American Water Works Association (AWWA) Free Water Audit Software (referred to as "water loss audit reports"). The water loss audit reports the District submits to DWR provide the basis for the 2016-2019 estimates shown in Table 4-4 and are available through DWR's Water Use Efficiency Data Portal.[16] The District's 2020 water loss audit report had not been completed at the time this Plan was prepared.[17] The 2020 estimate shown in Table 4-4 is therefore drawn from the District's preliminary draft water loss audit results.

Table 4-4. Last Five Years of Water Loss Audit Reporting (DWR Table 4-4)

Reporting Period Start Date	Volume of Water Loss (a)
01/2016	591
01/2017	705
01/2018	416
01/2019	752
01/2020	711
NOTES: (a) Volumes are in units of AF.	

CWC §10631 (3)(c) requires that this UWMP demonstrate whether the distribution loss standards

[16] DWR's Water Use Efficiency Data Portal: https://wuedata.water.ca.gov/awwa_plans
[17] The District's regulatory deadline for filing its 2020 water loss audit report to the state is October 1, 2021.

enacted by the State Water resources Control Board (SWRCB) pursuant to §10608.34 have been met. However, the SWRCB has yet to establish these standards, and thus consistency with these standards cannot be demonstrated herein.

4.2.4 Future Water Savings in Projected Water Use

☑ ***CWC § 10631 (d) (4)***

(A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.

(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:

(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.

(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.

As affirmed in Table 4-5, both future water savings (discussed below) and lower income residential demands (discussed in Section 4.2.5) are included in the projections of future water use.

Table 4-5. Inclusion in Water Use Projections (DWR Table 4-5)

Are Future Water Savings Included in Projections?	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, or otherwise are utilized in demand projections are found.	Section 4.2.4
Are Lower Income Residential Demands Included In Projections?	Yes
NOTES:	

As noted above, the District has adjusted the forecast of average water use per service for the effects of appliance standards and plumbing codes, conservation programs, and increases in the real cost of water service and household income. These adjustments are described below.

The District uses forecasts of per capita water savings from appliance standards and plumbing codes prepared for DWR to adjust its projections of average water use per service.[18] These forecasts incorporate the effects of the following codes and regulations:

- Assembly Bill (AB) 715, enacted in 2007, requires that any toilet or urinal sold or installed in California on or after January 1, 2014 cannot have a flush rating exceeding 1.28 and 0.5 gallons per flush, respectively. AB 715 superseded the state's previous standards for toilet and urinal water use set in 1991 of 1.6 and 1.0 gallons per flush, respectively. On April 8, 2015, in response to the Governor's Emergency Drought Response Executive Order (EO B-29-15), the California Energy Commission approved new standards for urinals requiring that they not consume more than 0.125 gallons per flush, 75 percent less than the standard set by AB 715.
- Water use standards for residential and commercial clothes washers and dishwashers are established by the U.S. Department of Energy through its authority under the federal Energy Policy and Conservation Act. Water use efficiency is summarized by the water factor for the appliance which measures the gallons of water used per cycle per cubic foot of capacity. A typical top-loading residential clothes washer manufactured in the 1990s had a water factor of around 12. In 2015, the allowable water factor for top- and front-loading residential clothes was reduced to 8.4 and 4.7, respectively. In 2018, water factor standard for top-loading residential clothes washers will be reduced to 6.5. In 2010 the allowable water factor for top- and front-loading commercial clothes washers was reduced to 8.5 and 5.5, respectively. The maximum water factor for Energy Star compliant top- and front-loading washers is 3.7 and 4.3, respectively. The U.S. Environmental Protection Agency estimates that Energy Star washers made up at least 60 percent of the residential market and 30 percent of the commercial market in 2011.[19] An Energy Star compliant washer uses about two-thirds less water per cycle than washers manufactured in the 1990s. Federal dishwasher water use efficiency standards were last updated in 2013. The maximum water use for standard and compact sized dishwashers is 5.0 and 3.5 gallons per cycle, respectively.
- New construction and renovations in California are now subject to CalGreen Code requirements. CalGreen includes prescriptive indoor provisions for maximum water consumption of plumbing fixtures and fittings in new and renovated properties. CalGreen also allows for an optional performance path to compliance, which requires an overall aggregate 20 percent reduction in indoor water use from a calculated baseline using a set of worksheets provided with the CalGreen guidelines.
- Senate Bill (SB) 407, enacted in 2009, mandates that all buildings in California come up to current State plumbing fixture standards within this decade. This law establishes

[18] M.Cubed, 2016. Projected Statewide and County-Level Effects of Plumbing Codes and Appliance Standards on Indoor GPCD, technical memorandum prepared for the California Department of Water Resources, dated August 2016.
[19] EPA Energy Star Unit Shipment and Market Penetration Report Calendar Year 2011 Summary.

requirements that residential and commercial property built and available for use on or before January 1, 1994 replace plumbing fixtures that are not water conserving, defined as "noncompliant plumbing fixtures." This law also requires effective January 1, 2017 that a seller or transferor of single-family residential property show to the purchaser or transferee, in writing, the specified requirements for replacing plumbing fixtures and whether the real property includes noncompliant plumbing. Similar disclosure requirements went into effect for multi-family and commercial transactions January 1, 2019. SB 837, passed in 2011, reinforces the disclosure requirement by amending the statutorily required transfer disclosure statement to include disclosure about whether the property follows SB 407 requirements.

The District's 2015 Conservation Master Plan forms the basis for the forecast of water savings from conservation programs. Cal Water used the Alliance for Water Efficiency's Water Conservation Tracking Tool to estimate expected water savings from planned program implementation.[20]

Projected increases in water service costs and household income form the basis for the adjustments to average water use due to changes in the real cost of water service. The forecast uses the historical rate of increase in District water rates to project future water service costs. It uses Caltrans income projections for San Mateo County to estimate changes in household income. It uses empirically derived estimates of price and income demand elasticity to adjust future water demand for changes in these variables.[21]

Table 4-6 shows the total water savings from plumbing codes and appliance standards, conservation programs, and increases in the real cost of water service.

Table 4-6. Future Conservation Savings (AF)

2025	2030	2035	2040	2045
165	270	315	443	498

[20] Alliance for Water Efficiency Water Conservation Tracking Tool: https://www.allianceforwaterefficiency.org/resources/topic/water-conservation-tracking-tool

[21] M.Cubed, 2018. California Water Service 2020 Test Year Sales Forecast: 2018 General Rate Case, prepared for California Water Service by M.Cubed, dated January 2018.

4.2.5 Water Use by Lower Income Households in Water Use Projections

☑ ***CWC § 10631.1***

(a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirements under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

California Senate Bill No. 1087 (SB 1087), Chapter 727, passed in 2005, amended Government Code §65589.7 and CWC §10631.1. This law requires that local governments supply a copy of their adopted housing element to water and sewer providers. Additionally, it requires that water providers grant priority for service allocations to developments that include housing units for lower income families and workers. The UWMP Act requires that water providers estimate water demands by lower income single and multi-family households.

Cal Water must serve all development that occurs within its service area, regardless of the income level of the future residents. Cal Water does not keep records of the income level of its customers and does not discriminate when supplying water to any development. It is the responsibility of the city or county with land use authority over a given area to approve or not approve developments within Cal Water's service areas. Cal Water has a Customer Assistance Program (CAP) to help with water service affordability. CAP discounts the monthly service charge of qualifying lower income households.

Table 4-7 shows projected water use by lower income households. These demands are part of the projected residential water use in Table 4-2. Cal Water used the General Plan Housing Elements from the cities in Bear Gulch District to estimate the number of lower income households which is the basis for the estimates in Table 4-7.[22]

Table 4-7. Residential Demands of Lower Income Households (AF)

2025	2030	2035	2040	2045
3,691	3,693	3,708	3,701	3,717

[22] Town of Atherton Housing Element Update 2007-2014, Table HII-7; Town of Woodside General Plan 2012 Housing Element 2007-2014, page 273; City of Menlo Park Housing Element 2015-2023, Page 71; Town of Portola Valley General Plan Housing Element, Adopted January 14, 2015, page 23.

4.2.6 Characteristic Five-Year Water Use

☑ ***CWC § 10635(b)(3)***

(b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following…

(3) A comparison of the total water supply sources available to the water supplier with ***the total projected water use for the drought period.*** (Emphasis added).

CWC §10635(b) is a new requirement for 2020 UWMPs. A critical part of this new statutory language is the requirement to prepare a five-year Drought Risk Assessment (see Section 7.5). As a first step, DWR suggests that water suppliers estimate their unconstrained water demand for the next five years (2021-2025). Unconstrained water demand is water use in the absence of drought water use restrictions. Drought conditions cause unconstrained demands to increase. The Drought Risk Assessment presented in Section 7.5 accounts for this increase in unconstrained water demand. Cal Water's demand forecast model separately estimates water use for normal, wet, and dry weather conditions. Table 4-8 shows unconstrained demands for 2021-2025 for normal weather and multiple-dry-year scenarios.

Table 4-8. Characteristic Five-Year Water Use (AF)

Weather Scenario	2021	2022	2023	2024	2025
Multi-Year Dry	13,690	13,689	13,695	13,707	13,699
Normal	12,790	12,788	12,794	12,805	12,796
NOTES: The table shows unconstrained demand (i.e., demand in the absence of drought water use restrictions).					

4.3 Climate Change Considerations

☑ ***CWC § 10635(b)***

(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.

Climate strongly influences the level and seasonal pattern of District water demands. Cal Water has analyzed the effect of climate and weather variability on both aspects of demand.[23] Using

[23] A&N Technical Services, 2014. Cal Water Long-Term Water Demand Forecast Model. Report prepared for California Water Service Company. December 2014.

this information, Cal Water has estimated the effect of alternative climate warming scenarios on future water demand.[24] Table 4-9 summarizes the results of this analysis. It shows that for plausible emission scenarios and corresponding temperature increases, climate change may, on average, increase future District demands by 2 to 3 percent compared to current climate conditions. Two points are worth noting. First, this is the average effect. There is significant variation about the mean. Second, this is a ceteris paribus, or all else equal, result. It assumes existing levels and types of landscaping. However, landscaping choices are partly a function of climate and as the climate changes, so too may these choices. It is reasonable to think households and businesses will adapt their landscaping as the climate warms. This adaptation may mitigate some of the expected demand increase shown in the table.

Table 4-9. Climate Change Effect on Demand

Emissions Scenario	Change in Mean Temperature by 2040 (degree F)	Change from Current Mean Temperature (%)	Effect on Demand (%)
Lower Emissions Scenario (B1)	2.5	3.4%	2.0%
Higher Emissions Scenario (A2)	2.7	3.7%	2.1%
80%ile Temperature Scenario	3.6	4.9%	2.8%

NOTES:
(a) Predicted temperature increases for Southwest United States for alternative emission scenarios reported in Kunkel et al. (2013). Predicted effect on demand derived from weather response models estimated with historical monthly water use, temperature, and rainfall data.
(b) The physical climate framework for the 2013 National Climate Assessment is based on climate model simulations of the future using the high (A2) and low (B1) Special Report Emissions Scenarios (SRES). The A1B emission scenario reflects a middle case between the A2 and B1 scenarios. The 80%ile scenario is the 80th percentile temperature change across the family of emissions scenarios. Further description of emission scenarios can be found at https://www.ipcc.ch/site/assets/uploads/2018/03/sres-en.pdf

[24] Table 4-9 uses climate scenarios for the southwestern United States. These in turn rely on alternative greenhouse gas emission scenarios. Emissions under scenario A2 are higher than under scenario B2. The 80th percentile scenario is the 80th percentile temperature change for the full suite of emission scenarios. For further information, see Kunkel, K.E, L.E. Stevens, S.E. Stevens, L. Sun, E. Janssen, D. Wuebbles, K.T. Redmond, and J.G. Dobson, 2013. Regional Climate Trends and Scenarios for the U.S. National Climate Assessment. Part 5. Climate of the Southwest U.S., NOAA Technical Report NESDIS 142-5, dated 2013.

Chapter 5
SB X7-7 Baseline and Targets

☑ ***CWC § 10608.24 (b)***

Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

☑ ***CWC § 10608.28***

(a) An urban retail water supplier may meet its urban water use target within its retail service area, or through mutual agreement, by any of the following:

(1) Through an urban wholesale water supplier.

(2) Through a regional agency authorized to plan and implement water conservation, including, but not limited to, an agency established under the Bay Area Water Supply and Conservation Agency Act (Division 31 (commencing with Section 81300)).

(3) Through a regional water management group as defined in Section 10537.

(4) By an integrated regional water management funding area.

(5) By hydrologic region.

(6) Through other appropriate geographic scales for which computation methods have been developed by the department.

(b) A regional water management group, with the written consent of its member agencies, may undertake any or all planning, reporting, and implementation functions under this chapter for the member agencies that consent to those activities. Any data or reports shall provide information both for the regional water management group and separately for each consenting urban retail water supplier and urban wholesale water supplier.

The Water Conservation Act of 2009, also known as Senate Bill (SB) X7-7, requires that urban retail water suppliers reduce their per capita water use by 20 percent by 2020. SB X7-7 defines an urban retail water supplier as "a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes" (CWC §10608.12). The Bear Gulch District meets both criteria. The state will assess each urban retail water supplier's 2020 per capita water use against the target it established in its 2015 urban water management plan (UWMP).

This chapter demonstrates the District's compliance with its SB X7-7 per capita water use target and includes the following sections:

5.1 Wholesale Suppliers

5.2 Updates to the 2015 UWMP Calculations

5.3 Service Area Population

5.4 Baseline Periods, Baseline GPCD, and Confirmed SB X7-7 2020 Target

5.5 Demonstration of Compliance with SB X7-7 2020 Target

5.6 Demonstration of Compliance with Regional Alliance SB X7-7 2020 Target

5.1 Wholesale Suppliers

SB X7-7 does not directly apply to wholesale water suppliers. Wholesale suppliers may adopt programs and policies that support SB X7-7 compliance by the retail water suppliers they serve. They may also take part in a Regional Alliance (discussed below) set up to satisfy SB X7-7 requirements on a regional basis. As discussed in Chapter 2, the District is not a wholesale water supplier.

5.2 Updates to the 2015 UWMP Calculations

Urban retail water suppliers may update or correct the water use and population data they used to set their 2020 target in their 2015 UWMP. The District has not made any changes to these data.

5.3 Service Area Population

Service area population estimation must satisfy the requirements in Methodology 2 – Service Area Population – of DWR's *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use*. California Water Service Company (Cal Water)'s population estimation method is similar to the method used by DWR's Population Tool.[25] DWR reviewed and accepted Cal Water's population estimation method as part of the review of its 2015 UWMPs. Cal Water used this method to estimate the District's 2020 service area population. As reported in Chapter 3, the District's population was 60,814 in 2020.

[25] Cal Water estimates service area population using census block population data with the LandView 5 and MARPLOT software programs. In census years, the method estimates service area population using the population counts of census blocks with centroids falling within the District's service boundary. In off-census years, the method estimates population by adjusting the census year estimates for changes in the number of single- and multi-family service connections and dwelling units. As shown in the District's 2015 UWMP, estimates prepared using this method and DWR's Population Tool typically differ by less than a percent. Cal Water prefers using its method to be consistent with its other planning documents.

5.4 Baseline Periods, Baseline GPCD, and Confirmed SB X7-7 2020 Target

Table 5-1 shows the District's 5- and 10-year baseline periods, its baseline gallons per capita per day (GPCD) for these periods, and its confirmed SB X7-7 2020 target. The data used to calculate the baseline and target GPCD values are provided in Appendix F.

Table 5-1. SB X7-7 Baselines and Targets Summary (DWR Table 5-1)

Baseline Period	Start Year	End Year	Average Baseline GPCD	Confirmed 2020 Target GPCD
10-15 year	2000	2009	233	187
5 Year	2004	2008	237	
NOTES:				

5.5 Demonstration of Compliance with SB X7-7 2020 Target

Service area population and water use in 2020 were 60,814 and 12,972 AF, respectively, resulting in per capita water use of 190 GPCD. This is greater than the SB X7-7 target GPCD, as shown in Table 5-2. Supporting population and water use data are in Appendix F.

Table 5-2. SB X7-7 2020 Compliance (DWR Table 5-2)

2020 GPCD			2020 Confirmed Target GPCD	Did Supplier Achieve Targeted Reduction for 2020?
Actual 2020 GPCD	2020 TOTAL Adjustments	Adjusted 2020 GPCD *(Adjusted if applicable)*		
190			187	No
NOTES:				

Although District per capita water use in 2020 was greater than the SB X7-7 target GPCD, the District has complied with SB X7-7 via its membership in the California Water Service – San Francisco Bay Hydrologic Region, as demonstrated in the next section.

5.6 Demonstration of Compliance with Regional Alliance SB X7-7 2020 Target

An urban retail water supplier can satisfy SB X7-7 requirements either individually or as part of a Regional Alliance. The District formed a regional alliance with other Cal Water districts in the San Francisco Bay Hydrologic Region. The name of this Regional Alliance is California Water Service – San Francisco Bay Regional Alliance. Table 5-3 shows 2020 per capita water use for this Regional

Alliance. Table 5-4 demonstrates compliance with the Regional Alliance's SB X7-7 2020 target GPCD.[26]

Table 5-3. SB X7-7 Regional Alliance – 2020 GPCD (DWR RA 2020 GPCD Table)

Participating Member Agency Name	2020 Actual GPCD*	2020 Population	(2020 GPCD) X (2020 Population)	Regional Alliance 2020 GPCD (Actual)
Cal Water Bear Gulch District	190	60,814	11,554,660	
Cal Water Los Altos District	166	70,161	11,646,726	
Cal Water Livermore District	143	59,814	8,553,402	
Cal Water Mid Peninsula District	94	137,486	12,923,684	
Cal Water South San Francisco District	98	63,319	6,205,262	
Regional Alliance Totals	691	391,594	50,883,734	130

**All participating agencies must submit individual SB X7-7 Tables, as applicable, showing the individual agency's calculations. These tables are: SB X7-7 Tables 0 through 6, Table 7, any required supporting tables (as stated in SB X7-7 Table 7), and SB X7-7 Table 9, as applicable. These individual agency tables will be submitted with the individual or Regional Urban Water Management Plan.*

Table 5-4. SB X7-7 Regional Alliance – 2020 Compliance (DWR RA 2020 Compliance Table)

2020 Actual GPCD	Optional Adjustment for Economic Growth[1]	Adjusted 2020 Actual GPCD	2020 Target GPCD [2]	Did Alliance Achieve Targeted Reduction for 2020?
130			150	Yes

[1]Adjustments for economic growth can be applied to either the individual supplier's data or to the aggregate regional alliance data (but not both), depending upon availability of suitable data and methods. [2] 2020 Target GPCD will be taken from the Regional Alliance's SB X7-7 Verification Form, Weighted Target Table.

[26] The population and water use data used to establish the Regional Alliance's 2020 target GPCD are provided in the District's 2015 UWMP.

Chapter 6
Water Supply Characterization

☑ ***CWC § 10631 (b)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).

This chapter provides a description of the Bear Gulch District's (also referred to herein as "District") current water supplies, including local and imported surface water and other current and potential supply sources, such as groundwater, stormwater, and recycled water, as well as assessment of the energy intensity used to operate the District's treatment and distribution system. This chapter includes the following sections:

6.1 Purchased Water

6.2 Groundwater

6.3 Surface Water

6.4 Stormwater

6.5 Wastewater and Recycled Water

6.6 Desalinated Water Opportunities

6.7 Water Exchanges and Transfers

6.8 Future Water Projects

6.9 Summary of Existing and Planned Sources of Water

6.10 Special Conditions

6.11 Energy Intensity

To maintain consistency with the Urban Water Management Plans prepared by the San Francisco Public Utilities Commission (SFPUC) and the other Bay Area Water Supply and Conservation Agency (BAWSCA) member agencies, much of the language describing the SFPUC wholesale water supply in the following sections is common language provided by BAWSCA, in coordination with the SFPUC.

6.1 Purchased Water

☑ ***CWC § 10631 (h)*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

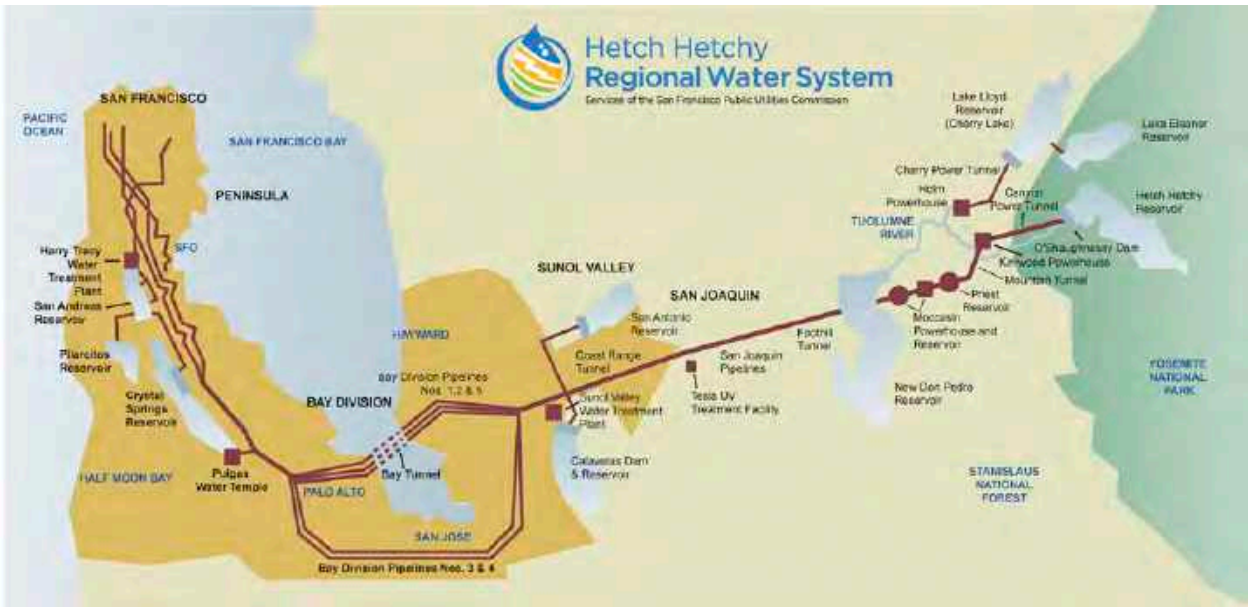
An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).

The majority of the water supply to the California Water Service Company (Cal Water) Bear Gulch District (i.e., approximately 91 percent over the 1980-2020 time period) is treated water purchased from the City and County of San Francisco's Regional Water System (RWS), which is operated by the SFPUC. Detailed information regarding the SFPUC RWS supply is provided below and in Section 7.1.1. Within the District, Cal Water takes delivery from eight turnouts (connections) from RWS transmission lines.

6.1.1 Description of SFPUC RWS

Approximately 85 percent of the water supply to the SFPUC RWS originates in the Hetch Hetchy watershed, located in Yosemite National Park, and flows down the Tuolumne River into the Hetch Hetchy Reservoir. Water from the Hetch Hetchy watershed is managed through the Hetch Hetchy Water and Power Project. The remaining 15 percent of the water supply to the SFPUC RWS originates locally in the Alameda and Peninsula watersheds and is stored in six different reservoirs in Alameda and San Mateo Counties. Details of the various components of the SFPUC RWS are provided below and are shown on Figure 6-1. Information regarding the Hetch Hetchy, Alameda, and Peninsula water systems is sourced from the SFPUC's 2020 UWMP and is provided verbatim below.

Figure 6-1. Regional Water System



6.1.2 Water Distribution

The RWS, shown in Figure 6-1, consists of more than 280 miles of pipelines, 60 miles of tunnels, 11 reservoirs, five pump stations, and two water treatment plants. It includes the Hetch Hetchy Project and the Bay Area water system facilities. The Hetch Hetchy Project is generally composed of the reservoirs, hydroelectric generation and transmission facilities, and water transmission facilities from the Hetch Hetchy Valley west to the Alameda East Portal of the Coast Range Tunnel in Sunol Valley. Water system components of the Hetch Hetchy Project are also referred to as the Hetch Hetchy System. The local Bay Area water system is comprised of two parts—the Alameda System and the Peninsula System—generally consisting of the facilities west of the Alameda East Portal of the Coast Range Tunnel, including the 63,000-acre Alameda and Peninsula watersheds, storage reservoirs, two water treatment plants, and the distribution system that delivers water to both retail and wholesale customers. The Hetch Hetchy, Alameda, and Peninsula Systems are described in more detail below.

Hetch Hetchy System: In the Hetch Hetchy System, water is diverted from Hetch Hetchy Reservoir into a series of tunnels and aqueducts from the Sierra Nevada to the San Joaquin Pipelines that cross the San Joaquin Valley to the Coast Range Tunnel, which connects to the Alameda System at the Alameda East Portal. Hetch Hetchy System water is disinfected at the Tesla Treatment Facility.

Alameda System: The Alameda System includes two reservoirs, San Antonio Reservoir and Calaveras Reservoir, which collect water from the San Antonio Creek, Upper Alameda Creek, and Arroyo Hondo watersheds in Alameda County. San Antonio Reservoir also receives water from the Hetch Hetchy System. Conveyance facilities in the Alameda System connect the Hetch Hetchy System and Alameda water sources to the Peninsula System. The BDPLs cross the South Bay to the Peninsula System delivering water to customers along the pipeline route. The Sunol Valley Water Treatment Plant (SVWTP) filters and disinfects water supplied from San Antonio Reservoir and Calaveras Reservoir.

Peninsula System: The Peninsula System includes conveyance facilities connecting the BDPLs to the in-City distribution system and to other customers on the Peninsula. Two reservoirs, Crystal Springs Reservoir and San Andreas Reservoir, collect runoff from the San Mateo Creek watershed. Crystal Springs Reservoir also receives water from the Hetch Hetchy System. A third reservoir, Pilarcitos Reservoir, collects runoff from the Pilarcitos Creek watershed and directly serves one of the Wholesale Customers, the Coastside County Water District (which includes the City of Half Moon Bay), along with delivering water to Crystal Springs and San Andreas Reservoirs. The Harry Tracy Water Treatment Plant (HTWTP) filters and disinfects water supplied from Crystal Springs Reservoir and San Andreas Reservoir before it is delivered to customers on the Peninsula and the in-City distribution system.

6.1.3 Water Treatment

The Hetch Hetchy Reservoir is the largest unfiltered water supply on the West Coast, and one of only a few large unfiltered municipal water supplies in the nation. The water originates from well-protected wilderness areas in Yosemite National Park, which flows down the Tuolumne River to Hetch Hetchy Reservoir. This water meets or exceeds all federal and State criteria for watershed protection. Water from Hetch Hetchy Reservoir is protected in pipes and tunnels as it is conveyed to the Bay Area, and requires pH adjustment to control pipeline corrosion and disinfection for bacteria control. Based on the SFPUC's disinfection treatment practice, extensive bacteriological quality monitoring, and high operational standards, the U.S. Environmental Protection Agency (USEPA) and the SWRCB Division of Drinking Water (DDW) determined that the Hetch Hetchy water source meets federal and State drinking water quality requirements without the need for filtration.

A new USEPA regulation took effect in 2012 requiring secondary disinfection for all unfiltered drinking water systems to control the waterborne parasite cryptosporidium. To comply with this regulation, the SFPUC completed construction of a new ultraviolet (UV) treatment facility in 2011. The Tesla Treatment Facility is a key component of the Water System Improvement Program (WSIP) and enhances the high-quality water from the

RWS. The facility has a capacity of 315 million gallons per day (mgd), making it the third largest UV drinking water disinfection facility in the U.S.

All water derived from sources other than Hetch Hetchy Reservoir is treated at one of two treatment plants: the SVWTP or the HTWTP. The SVWTP primarily treats water from the Alameda System reservoirs and has both a peak capacity and sustainable capacity of 160 mgd. Treatment processes include coagulation, flocculation, sedimentation, filtration, disinfection, fluoridation, corrosion control treatment, and chloramination. Fluoridation, chloramination, and corrosion control treatment can also be provided for the combined Hetch Hetchy System and SVWTP water at the Sunol Valley Chloramination Facility. The HTWTP treats water from the Peninsula System reservoirs and has a peak capacity of 180 mgd and a sustainable capacity of 140 mgd. Treatment processes include ozonation, coagulation, flocculation, filtration, disinfection, fluoridation, corrosion control treatment, and chloramination. Major upgrades to the SVWTP were completed in 2013 and to the HTWTP in 2015.

6.1.4 Water Storage

The majority of the water delivered by the SFPUC is supplied by runoff from the upper Tuolumne River watershed on the western slope of the central Sierra Nevada. Three major reservoirs collect runoff: Hetch Hetchy Reservoir, Lake Lloyd (a.k.a., Cherry Lake), and Lake Eleanor. A "water bank" in Don Pedro Reservoir is also integrated into system operations.[27] Don Pedro Reservoir, which is jointly owned and operated by Modesto Irrigation District and Turlock Irrigation District (the Districts), is located on the Tuolumne River downstream of the Hetch Hetchy System.

As a by-product of water delivery and water supply management, hydroelectric power is generated by the Hetch Hetchy Water and Power System. Water stored in Hetch Hetchy Reservoir is used for hydroelectric generation and also satisfies instream flow requirements when released downstream. Normally, only Hetch Hetchy Reservoir water supplies are exported to the Bay Area, while releases from Lake Eleanor and Lake Lloyd are used to satisfy instream flow requirements, satisfy Raker Act entitlements to the Districts downstream, and produce hydroelectric power. The Hetch Hetchy Water and Power System includes three major hydroelectric powerhouses along the Tuolumne

[27] The Turlock Irrigation District and Modesto Irrigation District have senior water rights to the City for the Tuolumne River water and are provided the first increment of flow in the Upper Tuolumne River watershed according to the apportionment set forth in the Raker Act of 1913 (38 Stat. 242). The water bank at Don Pedro Reservoir provides a credit and debit system, which allows the City to divert water upstream while meeting its obligations to the Turlock Irrigation District and Modesto Irrigation District. Through this mechanism, the SFPUC may pre-deliver the Turlock Irrigation District's and Modesto Irrigation District's entitlements and credit the water bank so that at other times the SFPUC may retain water upstream while the Turlock Irrigation District and Modesto Irrigation District debit the water bank.

River—Holm, Kirkwood, and Moccasin—that have a collective generating capacity of nearly 400 megawatts.

Downstream of the Hetchy Hetchy System, the SFPUC utilizes local watersheds in the Bay Area. Crystal Springs, San Andreas, and Pilarcitos Reservoirs, located in San Mateo County, capture local runoff in the Peninsula watershed, and Calaveras and San Antonio Reservoirs, located in Alameda Country, capture local runoff in the Alameda watershed. In addition to capturing local runoff, San Andreas, San Antonio, and Crystal Springs Reservoirs also provide storage for water from the Hetch Hetchy System and, along with Calaveras Reservoir, are an important water supply in the event of an interruption to Hetch Hetchy System deliveries.

Calaveras Reservoir had been operating in recent years at one-third of its capacity due to restrictions imposed by the DWR Division of Safety of Dams (DSOD). The Calaveras Dam Replacement Project, which took place from 2011 to 2019, involved the construction of a new dam downstream of the existing dam. The SFPUC began impounding water behind the new dam in the winter of 2018/2019 and continued the initial fill of the reservoir during the 2019/2020 winter season.

Table 6-A. Regional Water System Storage Capacity

Reservoir	Storage	
	Acre-Feet (AF)	Billions of Gallons (BG)
Up-Country[a]		
Hetch Hetchy	360,360	117.4
Lake Lloyd[b]	273,300	89.1
Lake Eleanor	27,100	8.8
Subtotal Up-Country	**660,760**	**215.3**
Local		
Calaveras (East Bay)[c]	96,800	31.5
San Antonio (East Bay)	50,500	16.5
Crystal Springs (Peninsula)[d]	69,300	22.6
San Andreas (Peninsula)	19,000	6.2
Pilarcitos (Peninsula)	3,100	1.0
Subtotal Local	**238,700**	**77.8**
Total Regional Water System[e]	**899,460**	**293.1**

a Three other regulating reservoirs are also part of the RWS: Early Intake, Priest, and Moccasin Reservoirs.

b Storage capacity shown includes flashboards, which are structures placed in a spillway to increase the capacity of a reservoir.

c Calaveras Reservoir was constructed with a storage capacity of 96,800 AF. Since December 2001, in response to safety concerns about the seismic stability of the dam and a directive from the Division of Safety of Dams (DSOD), the SFPUC has constructed a new comparably sized replacement dam downstream.

d Crystal Springs Reservoir has a maximum storage capacity of 22.1 BG (at 291.8 feet). When the Lower Crystal Springs Dam Improvement is complete, the reservoir will be operated normally at 287.8 feet (4 feet below capacity) based on permit conditions.

e This includes 63,700 AF in dead storage (i.e., the volume in a reservoir below the lowest controllable level). In addition, the SFPUC may draw against a credit of up to 570,000 AF in storage in a water bank account in Don Pedro Reservoir, for total storage for planning purposes of 1,469,460 AF.

6.1.5 Individual Supply Guarantees

San Francisco has a perpetual commitment (Supply Assurance) to deliver 184 mgd to the 24 permanent Wholesale Customers collectively. San Jose and Santa Clara are not included in the Supply Assurance commitment and each has temporary and interruptible water supply contracts with San Francisco. The Supply Assurance is allocated among the 24 permanent Wholesale Customers through Individual Supply Guarantees (ISG), which represent each Wholesale Customer's allocation of the 184 mgd Supply Assurance.

Cal Water's Individual Supply Guarantee (ISG) is 35.68 MGD (39,993 acre-feet per year; AFY), which is shared among its Bear Gulch, Mid-Peninsula, and South San Francisco Districts (also referred to herein as the "Peninsula Districts").

6.1.6 2028 SFPUC Decisions (formerly 2018 SFPUC Decisions)

Information regarding the 2028 SFPUC Decisions (formerly 2018 SFPUC Decision) was provided by BAWSCA in coordination with SFPUC and is provided verbatim below.

> In the 2009 WSA, the SFPUC committed to make three decisions before 2018 that affect water supply development:
>
> - Whether or not to make the cities of San Jose and Santa Clara permanent customers,
> - Whether or not to supply the additional unmet supply needs of the Wholesale Customers beyond 2018, and
> - Whether or not to increase the wholesale customer Supply Assurance above 184 mgd.
>
> Events since 2009 made it difficult for the SFPUC to conduct the necessary water supply planning and CEQA analysis required to make these three decisions before 2018. Therefore, in the 2018 Amended and Restated WSA, the decisions were deferred for 10 years to 2028.

Additionally, there have been recent changes to instream flow requirements and customer demand projections that have affected water supply planning beyond 2018. As a result, the SFPUC has established an Alternative Water Supply Planning program (AWSP) to evaluate several regional and local water supply options. Through this program, the SFPUC will conduct feasibility studies and develop an Alternative Water Supply Plan by July 2023 to support the continued development of water supplies to meet future needs.

6.2 Groundwater

☑ ***CWC § 10631***

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following:

(4) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information:

(A) The current version of any groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720), any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management for basins underlying the urban water supplier's service area.

(B) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For a basin that has not been adjudicated, information as to whether the department has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to coordinate with groundwater sustainability agencies or groundwater management agencies listed in subdivision (c) of Section 10723 to maintain or achieve sustainable groundwater conditions in accordance with a groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720).

(C) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

As shown in Table 6-1, Cal Water does not operate any groundwater wells to supply water for Bear Gulch District.

Table 6-1. Groundwater Volume Pumped (DWR Table 6-1)

X	Supplier does not pump groundwater. The supplier will not complete the table below.					
	All or part of the groundwater described below is desalinated.					
Groundwater Type	Location or Basin Name	2016	2017	2018	2019	2020
TOTAL						
NOTES:						

6.3 Surface Water

The District obtains a small fraction of its supplies (approximately nine percent of annual deliveries during the 1980-2020 time period) from surface water diverted from Bear Gulch Creek, a perennial stream that flows from a watershed in the Coast Range Mountains northeast to its confluence with San Francisquito Creek and eventually into San Francisco Bay. The District diverts water from two points of diversion (PODs) along the creek – the Upper POD (with an upstream area of 2.5 square miles) and the Lower POD (with an upstream area of 9.4 square miles). Diversions from the Upper and Lower PODs are each governed by separate State Water Resources Control Board (SWRCB)-administered water rights (i.e., pre-1914 claimed water rights and post-1914 SWRCB-issues diversion permits/licenses) that specify the volumes, rates, and timing of allowed diversions at each POD. In addition to these SWRCB-administered water rights, diversions are further constrained by certain diversion limitations and minimum instream flow requirements imposed by the California Department of Fish and Wildlife (CDFW) at the Upper POD and by the National Oceanic and Atmospheric Administration (NOAA) at the Lower POD. There also exists a 1936 agreement with Stanford University that prohibits Cal Water from diverting more than 50 percent of the flows that pass by (i.e., are not diverted at) the Upper POD.

Water diverted from the Upper POD flows through a gravity conveyance pipeline to a junction point where it is joined by water diverted from the Lower POD, at which point the water is pumped into the District-owned Bear Gulch Reservoir, a man-made storage facility impounded by an earthen dam. The Bear Gulch Reservoir is operated to have a minimum “dead pool” storage of 50 million gallons (MG), or approximately 153 acre-feet (AF). The maximum storage capacity of the reservoir has been reduced from 149 MG (547 AF) to 142.7 MG (438 AF), a limit imposed by the California Division of Safety of Dams (DSOD), based on a maximum storage elevation of 230 feet above mean sea level. Cal Water is undertaking capital improvements to Bear Gulch Reservoir to address DSOD’s seismic safety concerns, and may also considered increasing the maximum storage capacity. Outflows from Bear Gulch Reservoir are currently limited by the DSOD to the rate that causes a water surface elevation decline of 0.3 feet per day.

Water stored in Bear Gulch Reservoir is released and sent through the District-owned Bear Gulch Water Treatment Plant (BGWTP) prior to addition to the distribution system. The BGWTP, which was placed into operation in 1977, has a rated capacity of 6.0 MGD. There the water is clarified, filtered, and chloraminated in compliance with the Surface Water Treatment Rule and the Safe Drinking Water Act. Based on data from Water Years 1981 through 2019, annual production from the reservoir has ranged from a high of 2,809 AF (915 MG) in 1983 to a low of 0 AF (0 MG) in 2014.

Recent analysis by the District has shown that the projected long-term average annual diversion amount by the District from the Bear Gulch local surface water system is approximately 840 AFY. This estimate considers the hydrology of the watershed, the various regulatory constraints that

govern diversions (i.e., water rights and instream flow requirements), and current infrastructure limitations (i.e., pump, pipeline and treatment plant capacity). The storage capacity of Bear Gulch Reservoir is relatively small compared to average annual diversion/production, and therefore there is typically no carryover storage from one year to the next. Furthermore, given the various constraints on diversions at the District's two PODs under the SWRCB-administered water rights and the CDFW/NOAA-governed minimum instream flow requirements, the allowable diversions by the District are significantly lower during dry years even though the creek itself maintains flow.

6.4 Stormwater

There are no plans to divert stormwater for beneficial uses in the Bear Gulch District.

6.5 Wastewater and Recycled Water

☑ ***CWC § 10633***

The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.

The recycling of wastewater potentially offers several potential benefits to Cal Water and its customers. Perhaps the greatest of these benefits is to help maintain a sustainable groundwater supply either through direct recharge, or by reducing potable supply needs by utilizing recycled water for appropriate uses (e.g., landscape irrigation) now being served by potable water. Currently, however, no wastewater is recycled for direct reuse within the District.

6.5.1 Recycled Water Coordination

The District relies on and coordinates with the following wastewater collection, treatment and recycling agencies:

- Town of Atherton
- City of Menlo Park
- Town of Portola Valley
- Town of Woodside
- City of Redwood City
- Silicon Valley Clean Water (SVCW)[28]

[28] Formerly known as South Bayside System Authority.

6.5.2 Wastewater Collection, Treatment, and Disposal

☑ ***CWC § 10633 (a)***

A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

☑ ***CWC § 10633 (b)***

A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

Wastewater from the District is treated at the SVCW Wastewater Treatment Plant (WWTP). The SVCW WWTP treats wastewater flows generated from San Carlos, Belmont, Redwood City, Atherton, Menlo Park, East Palo Alto, Woodside, and numerous unincorporated areas in San Mateo County. Municipal wastewater is generated in the SVCW service area by residential and commercial, and industrial sources.

Atherton, Menlo Park, Portola Valley, Woodside, and portions of Redwood City own and operate their own collection systems, while the SVCW owns and operates the regional sewer transmission lines and the associated pump stations. The wastewater at the SVCW WWTP undergoes primary, secondary (activated sludge), dual media filtration, disinfection, and dechlorination treatment before being discharged to a deep-water outfall in the San Francisco Bay. The SVCW WWTP has a capacity to treat 29.5 MGD, but currently receives approximately 20.0 MGD from customers in the SVCW service area. SVCW is currently providing recycled water to sites located in and owned by the Cities of Redwood City and Menlo Park. However, recycled water is not distributed in the District service area at this time.

A summary of wastewater collection for the Bear Gulch District is shown in Table 6-2, including estimates of the volume of wastewater collected from District customers in 2020. The estimate is calculated by annualizing 90 percent of January water use in the service area. As shown in Table 6-3, no wastewater is discharged within the District service area.

As described in Section 6.5.4, there is currently a coordinated effort between Cal Water and other partners to potentially develop recycled water for various uses in the San Francisco Peninsula region. However, a recycled water system for beneficial use within the Bear Gulch District is not planned at this time. Cal Water examined the potential for recycled water use in the Bear Gulch District in the Water Supply and Facilities Master Plan for the District.[29] It was again explored in Cal Water's Integrated Long Term Water Supply Plan for the Three Peninsula Districts. These studies found a potential for 0.76 MGD of recycled water demand in the District. Because of low demand and high unit cost, this supply is not being immediately pursued. Cal Water will continue

[29] California Water Service Company, 2008. Water Supply and Facilities Master Plan – Bear Gulch District.

to evaluate the development of recycled water and will participate in a project if it becomes cost-effective. As such, as shown in Table 6-3, there is no projected recycled water supply for the District through the year 2045, and Cal Water has not implemented any incentive programs to encourage recycled water use.

Table 6-2. Wastewater Collected Within Service Area in 2020 (DWR Table 6-2)

	There is no wastewater collection system. The supplier will not complete the table below.
	Percentage of 2020 service area covered by wastewater collection system *(optional)*
	Percentage of 2020 service area population covered by wastewater collection system *(optional)*

Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected from UWMP Service Area 2020	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party? *(optional)*
Atherton	Estimated	1,345	Silicon Valley Clean Water	Silicon Valley Clean Water Wastewater Treatment Plant	No	
Menlo Park	Estimated	1,594	Silicon Valley Clean Water	Silicon Valley Clean Water Wastewater Treatment Plant	No	
Portola Valley	Estimated	598	Silicon Valley Clean Water	Silicon Valley Clean Water Wastewater Treatment Plant	No	
Woodside	Estimated	996	Silicon Valley Clean Water	Silicon Valley Clean Water Wastewater Treatment Plant	No	
Redwood City	Estimated	448	Silicon Valley Clean Water	Silicon Valley Clean Water Wastewater Treatment Plant	No	
Total Wastewater Collected from Service Area in 2020:		4,981				

NOTES:
(a) Volumes are in units of AF.
(b) The volume of wastewater collected from the Bear Gulch District service area in 2020 is estimated by annualizing 90 percent of January water use in the District.

Table 6-3. Wastewater and Discharge Within Service Area in 2020 (DWR Table 6-3)

X	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.										
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2020 volumes				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
						Total					
NOTES:											

6.5.3 Recycled Water System and Recycled Water Beneficial Uses

☑ ***CWC § 10633 (c-g)***

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

As shown in Table 6-4 and Table 6-5, the Bear Gulch District does not have any current or projected beneficial use of recycled water.

Table 6-4. Recycled Water Direct Beneficial Uses Within Service Area (DWR Table 6-4)

X	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.										
Name of Supplier Producing (Treating) the Recycled Water:											
Name of Supplier Operating the Recycled Water Distribution System:											
Supplemental Water Added in 2020 (volume)											
Source of 2020 Supplemental Water											
Beneficial Use Type	**Potential** Beneficial Uses of Recycled Water (Describe)	Amount of **Potential** Uses of Recycled Water (Quantity)	General Description of 2020 Uses	Level of Treatment	2020	2025	2030	2035	2040	2045	
				Total:							
				2020 Internal Reuse							
NOTES:											

Table 6-5. 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual
(DWR Table 6-5)

X	Recycled water was not used in 2015 nor projected for use in 2020. The supplier will not complete the table below.

Beneficial Use Type	2015 Projection for 2020	2020 Actual Use
Total		
NOTES:		

6.5.4 Actions to Encourage and Optimize Future Recycled Water Use

At this time, as shown in Table 6-6, Cal Water does not have plans to initiate/expand the use of recycled water within the Bear Gulch District. Cal Water's supply portfolio in some districts already includes recycled water; elsewhere, Cal Water is participating in studies of the possibility of adding this supply source.

In the Bear Gulch District, Cal Water is participating in the development of the Crystal Springs Purified Water (PREP) Project, a purified water project that could provide 6 to 12 MGD of water supply through reservoir water augmentation at Crystal Springs Reservoir, which is a facility of the RWS. Treated wastewater from Silicon Valley Clean Water (SVCW) and/or the City of San Mateo would go through an advanced water treatment plant to produce purified water that meets state and federal drinking water quality standards. The purified water would then be transmitted 10 to 20 miles (depending on the alignment) to Crystal Springs Reservoir, blended with regional surface water supplies and treated again at Harry Tracy Water Treatment Plant. Project partners include Cal Water, the SFPUC, Bay Area Water Supply and Conservation Agency (BAWSCA), SVCW, Redwood City, Foster City, and the City of San Mateo. Partner agencies are contributing financial and staff resources towards the work effort.

Potential scenarios include a direct connection to the Bear Gulch District or the Mid-Peninsula District. Additional recycled water expansion efforts by SFPUC are described further in Section 7.1.1.

Table 6-6. Methods to Expand Future Recycled Water Use (DWR Table 6-6)

X	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
Section 6.5.4	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
		Total	
NOTES:			

6.6 Desalinated Water Opportunities

☑ ***CWC § 10631 (g)*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

Opportunities to develop desalinated water supplies from ocean water, brackish surface, and brackish groundwater were investigated by BAWSCA as part of Phase II of its Long-Term Reliable Water Supply Strategy (Strategy, see Section 7.1.1). According to BAWSCA, there are high costs and intensive permitting requirements associated with desalination. However, it does potentially provide a substantial yield given the limited options for generating significant new water supplies for the region. The SFPUC is also exploring desalination as part of its Alternative Water Supply Planning (AWSP) Program (see Section 7.1.1) and Cal Water explored the possibility of developing desalinated water as a source of supply in its Water Supply and Facilities Master Plan for the District.[30] At this time, Cal Water has no plans to implement a desalinated water project; however, Cal Water continues to investigate opportunities to add a potential desalination supply to the District's supply portfolio.

[30] California Water Service Company. Water Supply and Facilities Master Plan – Bear Gulch District.

6.7 Water Exchanges and Transfers

☑ ***CWC § 10631 (c)*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

Cal Water is not pursuing water transfers or exchanges involving the Bear Gulch District at this time.

6.7.1 Exchanges

Cal Water is not pursuing water exchanges involving the Bear Gulch District and other entities at this time.

6.7.2 Transfers

Cal Water is not pursuing water transfers involving the Bear Gulch District and other entities at this time. However, the water supply agreements with SFPUC allow the transfer of supply between wholesale customers without penalty, or additional charges. The available transfer mechanisms can be used if other wholesale customers have excess supply, either due to their contract capacity, or if Cal Water were to fund other projects within these agencies that may free up SFPUC supply for transfer.

6.7.3 Emergency Interties

Cal Water has emergency interties with the City of Redwood City and the City of Menlo Park.

6.8 Future Water Projects

☑ ***CWC § 10631*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

(b) (3) For any planned sources of water supply, a description of the measures that are being undertaken to acquire and develop those water supplies.

(f) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in normal and single-dry water years and for a period of drought lasting five consecutive water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

As shown in Table 6-7, there are no currently planned future water supply projects or programs that are expected to provide a quantifiable increase to the District's water supply. However, Cal Water is planning improvement efforts to benefit the Bear Gulch Reservoir including construction of an earth fill buttress to increase the seismic stability of the dam to acceptable DSOD levels and to maintain maximum reservoir operating pool elevation. This project could increase the yield of the local surface water supply source, but the volumetric benefit is not known at this time.

Furthermore, Cal Water is currently in the process of developing a regional water supply reliability study using integrated resource planning practices to create a long-term supply reliability strategy through 2050 for Cal Water districts in the Bay Area. It is anticipated that the forthcoming study will identify feasible water supply projects which may benefit the Bear Gulch District.

The SFPUC has been implementing its Water System Improvement Plan (WSIP) since it was adopted in 2008. The WSIP includes several water supply projects to address the Level of Service (LOS) Goals and Objectives established in the WSIP and updated in February 2020. The SFPUC's AWSP is also being implemented to explore other projects that would increase overall water supply resiliency. These programs and future water supply projects are described in Section 7.1.1.

Cal Water will continue its annual main replacement program to upgrade and improve the distribution system of the Bear Gulch District. To meet the average day and maximum day requirements of District customers, new booster stations and storage facilities will be constructed and replaced as needed.

Table 6-7. Expected Future Water Supply Projects or Programs (DWR Table 6-7)

	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
X	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
Section 7.3.4	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other suppliers?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier
	Y/N	*If Yes, Supplier Name*				
NOTES:						

6.9 Summary of Existing and Planned Sources of Water

☑ ***CWC § 10631 (b)*** *Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).*

☑ ***CWC § 10631 (b) (2)*** *When multiple sources of water supply are identified, a description of the management of each supply in correlation with the other identified supplies.*

☑ ***CWC § 10631 (b) (4) (D)*** *A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

Table 6-8 summarizes the actual volumes of purchased water and local surface water for the Bear Gulch District in 2020. It should be noted that the District-owned BGWTP was not operated in 2020 due to lack of rainfall and surface water diversions. Thus, surface water diverted from Bear Gulch Creek did not serve as a supply source to the District in 2020.

As discussed above, Cal Water's ISG of 39,993 AFY is shared among all three of its districts on the San Francisco Peninsula to provide the operational flexibility to distribute the supply as needed in each system depending on the availability of local supplies and conditions within each district. As such, the collective "Total Right or Safe Yield" from the RWS shown for the three districts in Table 6-8, Table 6-9A, and Table 6-9B is equal to the ISG. However, the "Reasonably Available Volume" shown in the tables is equal to each District's projected RWS demands through 2045, which are collectively less than the ISG.

An estimate of projected SFPUC supply available to the Bear Gulch District (i.e., the "Reasonably Available Volume") was calculated by subtracting the District's local surface water supply from the District's total demand over the planning horizon. The reasonably available volume of local surface water (840 AFY) is the projected long-term average diversion amount based on analysis conducted by Cal Water considering hydrology and all applicable constraints. The "Total Right or Safe Yield" (1,520 AFY) is based on the upper limit volume of diversion to storage under the District's SWRCB-administered surface water rights. Therefore, the local surface water supply amounts shown in Table 6-9A and Table 6-9B equal 840 AFY.

Consistent with the water supply reliability projections that are discussed in Chapter 7, the purchased supplies from the SFPUC RWS, along with local surface water supply to the Bear Gulch District, will be sufficient to serve normal year demands through 2045.

Table 6-8. Water Supplies – Actual (DWR Table 6-8)

Water Supply	Additional Detail on Water Supply	2020		
		Actual Volume	Water Quality	Total Right or Safe Yield *(optional)*
Surface water (not desalinated)	Bear Gulch Creek	0	Drinking Water	1,520 (b)
Purchased or Imported Water	San Francisco Public Utilities Commission	12,972	Drinking Water	39,993 (c)
	Total	12,972		

NOTES:
(a) Volumes are in units of AF.
(b) The "Total Right or Safe Yield" (1,520 AFY) of local surface water is based on the upper limit volume of diversion to storage under the District's SWRCB-administered surface water rights.
(c) Total SFPUC supply is equal to the ISG shared among Cal Water's three Peninsula districts: South San Francisco, Mid-Peninsula, and Bear Gulch.

Table 6-9A. Water Supplies (Combined Peninsula Districts) – Projected

District	Water Supply	Additional Detail on Water Supply	Projected Water Supply *Report To the Extent Practicable*									
			2025		**2030**		**2035**		**2040**		**2045** *(opt)*	
			Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
South San Francisco	Purchased or Imported Water	San Francisco Public Utilities Commission	6,009	39,993 (b)	5,949	39,993 (b)	6,101	39,993 (b)	6,466	39,993 (b)	6,889	39,993 (b)
	Groundwater/ In-Lieu Surface Water	Westside Basin	1,534	1,534	1,534	1,534	1,534	1,534	1,534	1,534	1,534	1,534
	District Total		7,543		7,483		7,635		8,000		8,423	
Bear Gulch	Purchased or Imported Water	San Francisco Public Utilities Commission	11,956	39,993 (b)	11,859	39,993 (b)	11,890	39,993 (b)	11,835	39,993 (b)	11,854	39,993 (b)
	Surface water (not desalinated)	Bear Gulch Reservoir (c)	840	1,520	840	1,520	840	1,520	840	1,520	840	1,520
	District Total		12,796		12,699		12,730		12,675		12,694	
Mid-Peninsula	Purchased or Imported Water	San Francisco Public Utilities Commission	14,418	39,993 (b)	14,530	39,993 (b)	14,786	39,993 (b)	14,977	39,993 (b)	15,279	39,993 (b)
	District Total		14,418		14,530		14,786		14,977		15,279	
Total			34,757		34,712		35,151		35,652		36,396	

NOTES:
(a) Volumes are in units of AF.
(b) Total SFPUC supply is equal to the ISG shared among Cal Water's three Peninsula districts: South San Francisco, Mid-Peninsula, and Bear Gulch. The reasonably available supply volume is equal to the districts' projected SFPUC purchases. For all years, the total SFPUC purchase volume is within the ISG of 35.68 MGD (39,993 AFY) shared between the three Peninsula districts.
(c) The "Reasonably Available Volume" of local surface water (840 AFY) is the projected long-term average diversion amount based on analysis conducted by Cal Water considering hydrology and all applicable constraints. The “Total Right or Safe Yield” (1,520 AFY) is based on the upper limit volume of diversion to storage under the District’s surface water rights.

Table 6-9B. Water Supplies – Projected (DWR Table 6-9)

Water Supply	Additional Detail on Water Supply	Projected Water Supply									
		2025		2030		2035		2040		2045	
		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Purchased or Imported Water	San Francisco Public Utilities Commission	11,956	39,993 (b)	11,859	39,993 (b)	11,890	39,993 (b)	11,835	39,993 (b)	11,854	39,993 (b)
Surface water (not desalinated)	Bear Gulch Creek (c)	840	1,520	840	1,520	840	1,520	840	1,520	840	1,520
	Total	12,796		12,699		12,730		12,675		12,694	

NOTES:
(a) Volumes are in units of AF.
(b) Total SFPUC supply is equal to the ISG shared among Cal Water's three Peninsula districts: South San Francisco, Mid-Peninsula, and Bear Gulch.
(c) The "Reasonably Available Volume" of local surface water (840 AFY) is the projected long-term average diversion amount based on analysis conducted by Cal Water considering hydrology and all applicable constraints. The “Total Right or Safe Yield” (1,520 AFY) is based on the upper limit volume of diversion to storage under the District’s SWRCB-administered surface water rights.

6.10 Special Conditions

6.10.1 Climate Change Effects

The issue of climate change has become an important factor in water resources planning in California, and is frequently considered in urban water management planning processes, though the extent and precise effects of climate change remain uncertain. There is convincing evidence that increasing concentrations of greenhouse gasses have caused and will continue to cause a rise in temperatures around the world, which will result in a wide range of changes in climate patterns. Moreover, observational data show that a warming trend occurred during the latter part of the 20th century and virtually all projections indicate this will continue through the 21st century. These changes will have a direct effect on water resources in California, and numerous studies have been conducted to determine the potential impacts to water resources. Based on these studies, climate change could result in the following types of water resource impacts, including impacts on the watersheds in the Bay Area:

- Reductions in the average annual snowpack due to a rise in the snowline and a shallower snowpack in the low and medium elevation zones, such as in the Tuolumne River basin, and a shift in snowmelt runoff to earlier in the year;
- Changes in the timing, annual average, intensity and variability of precipitation, and an increased amount of precipitation falling as rain rather than snow;
- Long-term changes in watershed vegetation and increased incidence of wildfires that could affect water quality and quantity;
- Sea level rise and an increase in saltwater intrusion;
- Increased water temperatures with accompanying potential adverse effects on some fisheries and water quality;
- Increases in evaporation and concomitant increased irrigation need; and
- Changes in urban and agricultural water demand.

Both the SFPUC and BAWSCA participated in the 2020 update of the Bay Area Integrated Regional Water Management Plan (BAIRWMP), which includes an assessment of the potential climate change vulnerabilities of the region's water resources and identifies climate change adaptation strategies. In addition, the SFPUC continues to study the effect of climate change on the RWS. These works are summarized below.

Bay Area Integrated Regional Water Management Plan

Climate change adaptation continues to be an overarching theme for the 2019 BAIRWMP update. As stated in the BAIRWMP, identification of watershed characteristics that could potentially be vulnerable to future climate change is the first step in assessing vulnerabilities of water resources in the Bay Area Region (Region). Vulnerability is defined as the degree to which a system is exposed to, susceptible to, and able to cope with or adjust to, the adverse effects of climate change. A vulnerability assessment was conducted in accordance with the DWR's *Climate Change Handbook for Regional Water Planning* and using the most current science available for the Region. The vulnerability assessment, summarized in the table below, provides the main water planning categories applicable to the Region and a general overview of the qualitative assessment of each category with respect to anticipated climate change impacts.

Summary of BAIRWMP Climate Change Vulnerability Assessment

Vulnerability Areas	General Overview of Vulnerabilities
Water Demand	**Urban and Agricultural Water Demand** – Changes to hydrology in the Region as a result of climate change could lead to changes in total water demand and use patterns. Increased irrigation (outdoor landscape or agricultural) is anticipated to occur with temperature rise, increased evaporative losses due to warmer temperature, and a longer growing season. Water treatment and distribution systems are most vulnerable to increases in maximum day demand.
Water Supply	**Imported Water** – Imported water derived from the Sierra Nevada sources and Delta diversions provide 66 percent of the water resources available to the Region. Potential impacts on the availability of these sources resulting from climate change directly affect the amount of imported water supply delivered to the Region. **Regional Surface Water** – Although future projections suggest that small changes in total annual precipitation over the Region will not change much, there may be changes to when precipitation occurs with reductions in the spring and more intense rainfall in the winter. **Regional Groundwater** – Changes in local hydrology could affect natural recharge to the local groundwater aquifers and the quantity of groundwater that could be pumped sustainably over the long-term in

Vulnerability Areas	General Overview of Vulnerabilities
	some areas. Decreased inflow from more flashy or more intense runoff, increased evaporative losses and warmer and shorter winter seasons can alter natural recharge of groundwater. Salinity intrusion into coastal groundwater aquifers due to sea-level rise could interfere with local groundwater uses. Furthermore, additional reductions in imported water supplies would lead to less imported water available for managed recharge of local groundwater basins and potentially more groundwater pumping in lieu of imported water availability.
Water Quality	**Imported Water** – For sources derived from the Delta, sea-level rise could result in increases in chloride and bromide (a disinfection by-product (DBP) precursor that is also a component of sea water), potentially requiring changes in treatment for drinking water. Increased temperature could result in an increase in algal blooms, taste and odor events, and a general increase in DBP formation **Regional Surface Water** – Increased temperature could result in lower dissolved oxygen in streams and prolong thermocline stratification in lakes and reservoirs forming anoxic bottom conditions and algal blooms. Decrease in annual precipitation could result in higher concentrations of contaminants in streams during droughts or in association with flushing rain events. Increased wildfire risk and flashier or more intense storms could increase turbidity loads for water treatment. **Regional Groundwater** – Sea-level rise could result in increases in chlorides and bromide for some coastal groundwater basins in the Region. Water quality changes in imported water used for recharge could also impact groundwater quality.
Sea-Level Rise	Sea-level rise is additive to tidal range, storm surges, stream flows, and wind waves, which together will increase the potential for higher total water levels, overtopping, and erosion. Much of the bay shoreline is comprised of low-lying diked baylands which are already vulnerable to flooding. In addition to rising mean sea

Vulnerability Areas	General Overview of Vulnerabilities
	level, continued subsidence due to tectonic activity will increase the rate of relative sea-level rise. As sea-level rise increases, both the frequency and consequences of coastal storm events, and the cost of damage to the built and natural environment, will increase. Existing coastal armoring (including levees, breakwaters, and other structures) is likely to be insufficient to protect against projected sea-level rise. Crest elevations of structures will have to be raised or structures relocated to reduce hazards from higher total water levels and larger waves.
Flooding	Climate change projections are not sensitive enough to assess localized flooding, but the general expectation is that more intense storms would occur thereby leading to more frequent, longer and deeper flooding. Changes to precipitation regimes may increase flooding. Elevated Bay elevations due to sea-level rise will increase backwater effects exacerbating the effect of fluvial floods and storm drain backwater flooding.
Ecosystem and Habitat	Changes in the seasonal patterns of temperature, precipitation, and fire due to climate change can dramatically alter ecosystems that provide habitats for California's native species. These impacts can result in species loss, increased invasive species ranges, loss of ecosystem functions, and changes in vegetation growing ranges. Reduced rain and changes in the seasonal distribution of rainfall may alter timing of low flows in streams and rivers, which in turn would have consequences for aquatic ecosystems. Changes in rainfall patterns and air temperature may affect water temperatures, potentially affecting coldwater aquatic species. Bay Area ecosystems and habitat provide important ecosystem services, such as: carbon storage, enhanced water supply and quality,

Vulnerability Areas	General Overview of Vulnerabilities
	flood protection, food and fiber production. Climate change is expected to substantially change several of these services. The region provides substantial aquatic and habitat-related recreational opportunities, including: fishing, wildlife viewing, and wine industry tourism (a significant asset to the region) that may be at risk due to climate change effects.
Hydropower	Currently, several agencies in the Region produce or rely on hydropower produced outside of the Region for a portion of their power needs. As the hydropower is produced in the Sierra, there may be changes in the future in the timing and amount of energy produced due to changes in the timing and amount of runoff as a result of climate change. Some hydropower is also produced within the region and could also be affected by changes in the timing and amount of runoff.

Source: 2019 Bay Area Integrated Regional Water Management Plan (BAIRWMP), Table 16-3.

SFPUC Climate Change Studies

The SFPUC views assessment of the effects of climate change as an ongoing project requiring regular updating to reflect improvements in climate science, atmospheric/ocean modeling, and human response to the threat of greenhouse gas emissions. Climate change research by the SFPUC began in 2009 and continues to be refined. In its 2012 report "Sensitivity of Upper Tuolumne River Flow to Climate Change Scenarios," the SFPUC assessed the sensitivity of runoff into Hetch Hetchy Reservoir to a range of changes in temperature and precipitation due to climate change. Key conclusions from the report include the following:

- With differing increases in temperature alone, the median annual runoff at Hetch Hetchy would decrease by 0.7-2.1 percent from present-day conditions by 2040 and by 2.6-10.2 percent from present-day by 2100. Adding differing decreases in precipitation on top of temperature increases, the median annual runoff at Hetch Hetchy would decrease by 7.6-8.6 percent from present-day conditions by 2040 and by 24.7-29.4 percent from present-day conditions by 2100.

- In critically dry years, these reductions in annual runoff at Hetch Hetchy would be significantly greater, with runoff decreasing up to 46.5 percent from present day conditions by 2100 utilizing the same climate change scenarios.

- In addition to the total change in runoff, there will be a shift in the annual distribution of runoff. Winter and early spring runoff would increase and late spring and summer runoff would decrease.

- Under all scenarios, snow accumulation would be reduced and snow would melt earlier in the spring, with significant reductions in maximum peak snow water equivalent under most scenarios.

Currently, the SFPUC is conducting a comprehensive assessment of the potential effects of climate change on water supply using a wide range of plausible increases in temperature and changes in precipitation to address the wide uncertainty in climate projections over the planning horizon 2020 to 2070. There are many uncertain factors such as climate change, changing regulations, water quality, growth and economic cycles that may create vulnerabilities for the Regional Water System's ability to meet levels of service. The uncertainties associated with the degree to which these factors will occur and how much risk they present to the water system is difficult to predict, but nonetheless they need to be considered in SFPUC planning. To address this planning challenge, the project uses a vulnerability-based planning approach to explore a range of future conditions to identify vulnerabilities, assess the risks associated with these vulnerabilities that could lead to developing an adaptation plan that is flexible and robust to a wide range of future outcomes.

Cal Water Climate Change Studies

Cal Water is committed to incorporating climate change into its ongoing water supply planning. Section 4.3 of this Urban Water Management Plan (UWMP or Plan) includes a description of plausible changes to projected demands under climate change conditions, and Cal Water is currently working to consider the effects of climate change in future demand modeling. The impact of climate change on District supplies is addressed in detail in the key resources described below, which are incorporated into this Plan by reference:

- Cal Water is currently in the process of developing a multi-phase climate change study. Phase 1, which primarily consisted of a literature and tools review of previous and complementary studies, was completed in December 2020.[31] Phase 2 will include District-level vulnerability assessments of Cal Water's facilities and operations, including developing an assessment approach that evaluates climate impacts to Cal Water,

[31] ICF, 2020. California Water Service Climate Change – Water Resource Monitoring and Adaptation Plan – Phase 1, prepared by ICF, dated December, 17, 2020.

identifies asset vulnerabilities, and prioritizes climate risks. Phase 3 will focus on an assessment of climate-driven impacts to water supply resources and demand. Phase 2 is expected to be completed by December 2021. The executive summary of Phase 1 of this study is included in this Plan in Appendix G.

- In 2016, Cal Water completed a study of climate change impacts on a representative subset of its districts, including the Bear Gulch District, to gain a better understanding of the potential impacts of climate change on the availability of its diverse supplies.[32] The 2016 study relied on the best available projections of changes in climate (temperature and precipitation) through the end of the century to examine how surface water flows and groundwater recharge rates may change. The executive summary of this study is included in this Plan in Appendix G.

6.10.2 Regulatory Conditions and Project Development

Emerging regulatory conditions (e.g., issues surrounding the Water Quality Control Plan for the San Francisco/Sacramento-San Joaquin Delta Estuary [Bay-Delta Plan]) may affect planned future projects and the characterization of future water supply availability and analysis. A detailed description of the potential impacts of Bay-Delta Plan implementation on RWS supply reliability is included in Section 7.1.1. The District does not have any current plans to develop additional supply sources. If the District does move forward with any plans to develop supply projects, emerging regulatory conditions will be considered, and the associated water supply reliability impacts will be assessed in future UWMP updates.

6.10.3 Other Locally Applicable Criteria

Other locally applicable criteria may affect characterization and availability of an identified water supply (e.g., changes in regional water transfer rules may alter the availability of a water supply that had historically been readily available). Reliability of the RWS is further discussed in Section 7.1.1. The District is exploring potential supply augmentation projects but does not have any current plans to develop additional supply sources. If the District does move forward with any plans to develop supply projects, locally applicable criteria will be considered, and the associated water supply reliability impacts will be assessed in future UWMP updates.

[32] California Water Service Company, 2016. Potential Climate Change Impacts on the Water Supplies of California Water Service, prepared by Gary Fiske and Associates, Inc. and Balance Hydrologics, Inc., dated January 2016.

6.11 Energy Intensity

☑ ***CWC § 10631.2***

(a) In addition to the requirements of Section 10631, an urban water management plan shall include any of the following information that the urban water supplier can readily obtain:
(1) An estimate of the amount of energy used to extract or divert water supplies.
(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.
(3) An estimate of the amount of energy used to treat water supplies.
(4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.
(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.
(6) An estimate of the amount of energy used to place water into or withdraw from storage.
(7) Any other energy-related information the urban water supplier deems appropriate.
(b) The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.
(c) The Legislature finds and declares that energy use is only one factor in water supply planning and shall not be considered independently of other factors.

The "Total Utility Approach" as defined by DWR in the UWMP Guidebook 2020 is used to report water-related energy-consumption data for the Bear Gulch District. Calendar year 2019 is selected as the one-year reporting period, and utility bills for the associated time period are used as the source for energy consumption data. Utility bills reported the following energy consumption data for the Bear Gulch District during calendar year 2019:

$$Total\ Energy\ Consumed\ by\ the\ Bear\ Gulch\ District = 4{,}089{,}238\ kilowatt\ hour\ (kWh)$$

Table 6-10 shows the energy consumed for each acre-foot of water entering the distribution system in the Bear Gulch District, including energy associated with the pumping, treatment, conveyance, and distribution of drinking water, but not including energy associated with the treatment of wastewater. Based on this, the energy intensity is estimated to be 345 kilowatt hours per acre-foot (kWh/AF).

Table 6-10. Recommended Energy Intensity – Total Utility Approach (DWR Table O-1B)

Urban Water Supplier: *Bear Gulch District*

Water Delivery Product

Retail Potable Deliveries

Enter Start Date for Reporting Period	1/1/2019	Urban Water Supplier Operational Control		
End Date	12/31/2019			
Is upstream embedded in the values reported?		Sum of All Water Management Processes	Non-Consequential Hydropower	
Water Volume Units Used	AF	Total Utility	Hydro-power	Net Utility
Volume of Water Entering Process (volume unit)		11,869	0	11,869
Energy Consumed (kWh)		4,089,238	0	4,089,238
Energy Intensity (kWh/volume)		344.5	0.0	344.5

Quantity of Self-Generated Renewable Energy

N/A kWh

Data Quality

Metered Data

Data Quality Narrative:

Utility bills for the associated time period are used as the source for energy consumption data.

Narrative:

Total energy consumption represents the energy consumed during pumping, treatment, conveyance, and distribution.

Chapter 7
Water Supply Reliability Assessment

☑ ***CWC § 10620 (f)***

An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

☑ ***CWC § 10630.5***

Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.

This chapter describes the reliability of the Bear Gulch District's (also referred to herein as "District") water supplies. Assessment of water supply reliability is complex and dependent upon a number of factors, such as the number of water sources, regulatory and legal constraints, hydrological and environmental conditions, climate change, and expected growth, among others. Based on available historical information and projections of future water uses, regulatory and legal constraints, and hydrological and environmental conditions, including climate change, California Water Service Company (Cal Water) has made its best determination of future water supply reliability for the District. This chapter also provides an estimate of the supply volumes available to the District and the corresponding supply and demand reliability assessments in normal years, single dry years, and multiple dry year periods, as well as a drought risk assessment for the next five years. This chapter includes the following sections:

7.1 Constraints on Water Sources

7.2 Reliability by Type of Year

7.3 Supply and Demand Assessment

7.4 Water Supply Management Tools and Options

7.5 Drought Risk Assessment

7.1 Constraints on Water Sources

The Bear Gulch District derives its water supply from a combination of both imported surface water supply purchased from the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS) and local surface water supply from Bear Gulch Creek. Cal Water has relied on the supply reliability estimates provided by the SFPUC for the RWS and the drought allocation structure provided by SFPUC and the Bay Area Water Supply and Conservation Agency (BAWSCA)

to estimate available RWS supplies in dry year types through 2045. Cal Water has identified several potential constraints on future supply availability, water quality, and climate change. These constraints, along with the management strategies that the Bear Gulch District and other affected agencies have employed or will employ to address these constraints are summarized in the following sections.

7.1.1 Regional Water System Supply Availability

☑ ***CWC § 10631 (h)*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).

Detailed information is provided below regarding factors that impact the SFPUC RWS supply reliability. The source for the information is the common language provided by the SFPUC and BAWSCA; see Appendix H.

Level of Service Goals

The SFPUC historically has met demand in its service area in all year types from its watersheds, which consist of:

- Tuolumne River watershed
- Alameda Creek watershed
- San Mateo County watersheds

In general, 85 percent of the supply comes from the Tuolumne River through Hetch Hetchy Reservoir and the remaining 15 percent comes from the local watersheds through the San Antonio, Calaveras, Crystal Springs, Pilarcitos and San Andreas Reservoirs. The adopted Water Supply Improvement Program (WSIP) retains this mix of water supply for all year types.

In 2008, the SFPUC adopted Level of Service (LOS) Goals and Objectives in conjunction with the adoption of the WSIP for the RWS. The SFPUC updated the LOS Goals and

Objectives in February 2020. The SFPUC's LOS Goals and Objectives related to water supply are as follows:

Program Goal	System Performance Objective
Water Supply – *meet customer water needs in non-drought and drought periods*	• Meet all state and federal regulations to support the proper operation of the water system and related power facilities. • Meet average annual water demand of 265 million gallons per day (MGD) from the SFPUC watersheds for retail and Wholesale Customers during non–drought years for system demands consistent with the 2009 Water Supply Agreement (WSA). • Meet dry-year delivery needs while limiting rationing to a maximum 20 percent system-wide reduction in water service during extended droughts. • Diversify water supply options during non-drought and drought periods. • Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers.

Bay-Delta Plan Impacts

Based on information provided by SFPUC and BAWSCA (Appendix H and Appendix I) the adoption of the 2018 Bay-Delta Plan Amendment is anticipated to impact the reliability of the RWS supplies in the future.

In December 2018, the State Water Resources Control Board (SWRCB) adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) to establish water quality objectives to maintain the health of the Bay-Delta ecosystem. The SWRCB is required by law to regularly review this plan. The adopted Bay-Delta Plan Amendment was developed with the stated goal of increasing salmonid populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay-Delta. The Bay-

Delta Plan Amendment requires the release of 30-50% of the "unimpaired flow"[33] on the three tributaries from February through June in every year type. In SFPUC modeling of the new flow standard, it is assumed that the required release is 40% of unimpaired flow.

If the Bay-Delta Plan Amendment is implemented, the SFPUC will be able to meet the projected water demands presented in this Urban Water Management Plan (UWMP) in normal years but would experience supply shortages in single dry years or multiple dry years. Implementation of the Bay-Delta Plan Amendment will require rationing in all single dry years and multiple dry years. The SFPUC has initiated an Alternative Water Supply Planning Program (AWSP) to ensure that San Francisco can meet its Retail and Wholesale Customer water needs, address projected dry years shortages, and limit rationing to a maximum 20 percent system-wide in accordance with adopted SFPUC policies. This program is in early planning stages and is intended to meet future water supply challenges and vulnerabilities such as environmental flow needs and other regulatory changes; earthquakes, disasters, and emergencies; increases in population and employment; and climate change. As the region faces future challenges – both known and unknown – the SFPUC is considering this suite of diverse non-traditional supplies and leveraging regional partnerships to meet Retail and Wholesale Customer needs through 2045.

The SWRCB has stated that it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, assuming all required approvals are obtained by that time. But implementation of the Plan Amendment is uncertain for multiple reasons.

First, since adoption of the Bay-Delta Plan Amendment, over a dozen lawsuits have been filed in both state and federal courts, challenging the SWRCB's adoption of the Bay-Delta Plan Amendment, including a legal challenge filed by the federal government, at the request of the U.S. Department of Interior, Bureau of Reclamation. This litigation is in the early stages and there have been no dispositive court rulings as of this date.

Second, the Bay-Delta Plan Amendment is not self-implementing and does not automatically allocate responsibility for meeting its new flow requirements to the SFPUC or any other water rights holders. Rather, the Bay-Delta Plan Amendment merely provides a regulatory framework for flow allocation, which must be accomplished by other regulatory and/or adjudicatory proceedings, such as a comprehensive water rights adjudication or, in the case of the Tuolumne River, may be implemented through the water quality certification process set forth in section 401 of the Clean Water Act as part

[33] "Unimpaired flow represents the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds." (Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Dec. 12, 2018) p.17, fn. 14, available at https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf.)

of the Federal Energy Regulatory Commission's licensing proceedings for the Don Pedro and La Grange hydroelectric projects. It is currently unclear when the license amendment process is expected to be completed. This process and the other regulatory and/or adjudicatory proceedings would likely face legal challenges and have lengthy timelines, and quite possibly could result in a different assignment of flow responsibility (and therefore a different water supply impact on the SFPUC).

Third, in recognition of the obstacles to implementation of the Bay-Delta Plan Amendment, the SWRCB Resolution No. 2018-0059 adopting the Bay-Delta Plan Amendment directed staff to help complete a "Delta watershed-wide agreement, including potential flow measures for the Tuolumne River" by March 1, 2019, and to incorporate such agreements as an "alternative" for a future amendment to the Bay-Delta Plan to be presented to the SWRCB "as early as possible after December 1, 2019." In accordance with the SWRCB's instruction, on March 1, 2019, SFPUC, in partnership with other key stakeholders, submitted a proposed project description for the Tuolumne River that could be the basis for a voluntary substitute agreement with the SWRCB ("March 1st Proposed Voluntary Agreement"). On March 26, 2019, the Commission adopted Resolution No. 19-0057 to support the SFPUC's participation in the Voluntary Agreement negotiation process. To date, those negotiations are ongoing under the California Natural Resources Agency and the leadership of the Newsom administration.[34]

Drought Allocation Methodology

Given the constraints described above, the SFPUC has provided all of the Wholesale Customers with estimates of the RWS reliability in all year types though 2045, as shown in Appendix I. The Tier One Plan describes the method for allocating RWS water between Retail and Wholesale Customers during system-wide shortages of 20 percent or less. The Tier Two Plan allocates the collective Wholesale Customer share from the Tier One Plan among each of SFPUC's 26 Wholesale Customers.

For the purposes of 2020 UWMP development, BAWSCA provided a revised methodology to allocate RWS supplies during projected future single dry and multiple dry years in the instance where the supply shortfalls are greater than 20 percent. SFPUC and BAWSCA assumed that Tier One allocations for system-wide shortfalls of 16 percent to 20 percent would apply for all shortfalls greater than 20 percent. BAWSCA provided a revised methodology to allocate RWS supplies to Wholesale Agencies. The inclusion of these revised methodologies, which serve as the preliminary basis for UWMP supply reliability analyses, does not in any way imply an agreement by BAWSCA member agencies as to the exact allocation methodologies.

[34] California Natural Resources Agency, "Voluntary Agreements to Improve Habitat and Flow in the Delta and its Watersheds," available at https://files.resources.ca.gov/voluntary-agreements/.

The Tier One and Tier Two Plans and the drought allocation methodologies used in the 2020 UWMP for shortfalls of greater than 20 percent are further described below.

Tier One Drought Allocations

In July 2009, San Francisco and its Wholesale Customers in Alameda County, Santa Clara County, and San Mateo County (Wholesale Customers) adopted the WSA, which includes a Water Shortage Allocation Plan (WSAP) that describes the method for allocating water from the RWS between Retail and Wholesale Customers during system-wide shortages of 20 percent or less. The WSAP, also known as the Tier One Plan, was amended in the 2018 Amended and Restated WSA.

The SFPUC allocates water under the Tier One Plan when it determines that the projected available water supply is up to 20 percent less than projected system-wide water purchases. The following table shows the SFPUC (i.e, Retail Customers) share and the Wholesale Customers' share of the annual water supply available during shortages depending on the level of system-wide reduction in water use that is required. The Wholesale Customers' share will be apportioned among the individual Wholesale Customers based on a separate methodology adopted by the Wholesale Customers, known as the Tier Two Plan, discussed further below.

Level of System-Wide Reduction in Water Use Required	Share of Available Water	
	SFPUC Share	Wholesale Customers Share
5% or less	35.5%	64.5%
6% through 10%	36.0%	64.0%
11% through 15%	37.0%	63.0%
16% through 20%	37.5%	62.5%

The Tier One Plan allows for voluntary transfers of shortage allocations between the SFPUC and any Wholesale Customer as well as between Wholesale Customers themselves. In addition, water "banked" by a Wholesale Customer, through reductions in usage greater than required, may also be transferred.

As amended in 2018, the Tier One Plan requires Retail Customers to conserve a minimum of 5 percent during droughts. If Retail Customer demands are lower than the Retail

Customer allocation (resulting in a "positive allocation" to Retail[35]) then the excess percentage would be re-allocated to the Wholesale Customers' share. The additional water conserved by Retail Customers up to the minimum 5 percent level is deemed to remain in storage for allocation in future successive dry years.

The Tier One Plan will expire at the end of the term of the WSA in 2034, unless mutually extended by San Francisco and the Wholesale Customers.

The Tier One Plan applies only when the SFPUC determines that a system-wide water shortage exists and issues a declaration of a water shortage emergency under California Water Code Section 350. Separate from a declaration of a water shortage emergency, the SFPUC may opt to request voluntary cutbacks from its Retail and Wholesale Customers to achieve necessary water use reductions during drought periods.

As discussed above, the Tier One Plan only applies to system-wide shortages of 20 percent or less, and there is currently no methodology for sharing available water between SFPUC and Wholesale Customers for system-wide shortages of greater than 20 percent. SFPUC and BAWSCA assumed that Tier One allocations for System-Wide shortfalls of 16 percent to 20 percent would apply for all shortfalls greater than 20 percent for purposes of the UWMP supply reliability analyses. The analysis included herein does not in any way imply an agreement by BAWSCA member agencies with the assumed application of the Tier One allocations by SFPUC and BAWSCA for shortages of greater than 20 percent.

Tier Two Drought Allocations

The Wholesale Customers have negotiated and adopted the Tier Two Plan, referenced above, which allocates the collective Wholesale Customer share from the Tier One Plan among each of the 26 Wholesale Customers. These Tier Two allocations are based on a formula that takes into account multiple factors for each Wholesale Customer including:

- Individual Supply Guarantee;
- Seasonal use of all available water supplies; and
- Residential per capita use.

The water made available to the Wholesale Customers collectively will be allocated among them in proportion to each Wholesale Customer's Allocation Basis, expressed in MGD, which in turn is the weighted average of two components. The first component is the Wholesale Customer's Individual Supply Guarantee, as stated in the WSA, and is fixed. The second component, the Base/Seasonal Component, is variable and is calculated using

[35] See Water Supply Agreement, Water Shortage Allocation Plan (Attachment H), Section 2.1.

the monthly water use for three consecutive years prior to the onset of the drought for each of the Wholesale Customers for all available water supplies. The second component is accorded twice the weight of the first, fixed component in calculating the Allocation Basis. Minor adjustments to the Allocation Basis are then made to ensure a minimum cutback level, a maximum cutback level, and a sufficient supply for certain Wholesale Customers.

The Allocation Basis is used in a fraction, as numerator, over the sum of all Wholesale Customers' Allocation Bases to determine each wholesale customer's Allocation Factor. The final shortage allocation for each Wholesale Customer is determined by multiplying the amount of water available to the Wholesale Customers' collectively under the Tier One Plan, by the Wholesale Customer's Allocation Factor.

The Tier Two Plan requires that the Allocation Factors be calculated by BAWSCA each year in preparation for a potential water shortage emergency. As the Wholesale Customers change their water use characteristics (e.g., increases or decreases in SFPUC purchases and use of other water sources, changes in monthly water use patterns, or changes in residential per capita water use), the Allocation Factor for each Wholesale Customer will also change. However, for long-term planning purposes, each Wholesale Customer shall use as its Allocation Factor, the value identified in the Tier Two Plan when adopted.

Per WSA Section 3.11, the Tier One and Tier Two Plans will be used to allocate water from the Regional Water System between Retail and Wholesale Customers during system-wide shortages of 20% or less. For Regional Water System shortages in excess of 20%, San Francisco shall (a) follow the Tier 1 Shortage Plan allocations up to the 20% reduction, (b) meet and discuss how to implement incremental reductions above 20% with the Wholesale Customers, and (c) make a final determination of allocations above the 20% reduction. After the SFPUC has made the final allocation decision, the Wholesale Customers shall be free to challenge the allocation on any applicable legal or equitable basis. For purposes of the 2020 UWMPs, for San Francisco Regional Water System (RWS) shortages in excess of 20%, the allocations among the Wholesale Customers is assumed to be equivalent among them and to equal the drought cutback to Wholesale Customer by the SFPUC.

The Tier Two Plan, which initially expired in 2018, has been extended by the BAWSCA Board of Directors every year since for one additional calendar year. In November 2020, the BAWSCA Board voted to extend the Tier Two Plan through the end of 2021. BAWSCA's workplan for FY 2021-22 includes development of an updated Tier 2 Plan.

BAWSCA's workplan for FY 2021-22 includes development of an updated Tier 2 Plan.

Revised Drought Allocation Plan

As detailed by BAWSCA in multiple memos and workshops (Appendix I), the Tier Two Plan was not designed for RWS shortages greater than 20 percent.[36] In a memoranda dated February 18, 2021, BAWSCA provided a refined methodology to allocate RWS supplies during projected future single dry and multiple dry years in the instance where the supply shortfalls are greater than 20 percent. The revised methodology developed by BAWSCA allocates the wholesale RWS supplies as follows:

1. When the average Wholesale Customers' RWS shortages are 10 percent or less, an equal percent reduction will be applied across all agencies. This is consistent with the existing Tier Two requirement of a minimum 10 percent cutback in any Tier Two application scenario.
2. When average Wholesale Customers' shortages are between 10 and 20 percent, the Tier Two Plan will be applied.
3. When the average Wholesale Customers' RWS shortages are greater than 20 percent, an equal percent reduction will be applied across all agencies.

The associated allocations based on the updated BAWSCA methodology are included as Appendix I. While this allocation methodology has been used herein, Ca Water notes that, per its memoranda dated February 18, 2021 (Appendix I):

> "BAWSCA recognizes that this is not an ideal situation or method for allocation of available drought supplies. In the event of actual RWS shortages greater than 20 percent, the Member Agencies would have the opportunity to negotiate and agree upon a more nuanced and equitable approach. Such an approach would likely consider basic health and safety needs, the water needs to support critical institutions such as hospitals, and minimizing economic impacts on individual communities and the region."

As such, this allocation method is only intended to serve as the preliminary basis for the 2020 UWMP supply reliability analysis. The analysis provided herein does not in any way imply an agreement by BAWSCA member agencies as to the exact allocation methodology. BAWSCA member agencies are in discussions about jointly developing an allocation method that would consider additional multiple equity factors in the event that SFPUC is not able to deliver its contractual supply volume, and its cutbacks to the RWS supply exceed 20 percent.

[36] Note that the Tier One Drought Allocations were also not designed for shortages greater than 20 percent. SFPUC and BAWSCA have assumed for UWMP planning purposes that the Wholesale Share will remain 62.5 percent for all shortfalls greater than 16 percent.

7.1.2 Local Surface Water Supply Availability

The District's local surface water supply is estimated to be available during normal hydrologic years at a volume of 840 acre-feet per year (AFY), based on analysis of the Bear Gulch Creek watershed yield and with consideration of the various diversion constraints under the District's water rights and minimum instream flow requirements. Although local surface water diversions (and subsequent treatment and use of local surface water) have occurred historically during dry years, and the District's analysis indicates that some diversions are likely to occur in future dry years[37], for the purposes of this UWMP the District conservatively assumes that local surface water supplies will be zero during single dry and multiple dry years over the planning horizon.

7.1.3 Water Quality

☑ ***CWC § 10634***

The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Impaired water quality also has the potential to affect water supply reliability. Cal Water has and will continue to meet all state and federal water quality regulations. All drinking water standards are set by the U.S. Environmental Protection Agency (USEPA) under the authorization of the Federal Safe Drinking Water Act of 1974. In California, the State Water Resources Control Board (SWRCB), Division of Drinking Water (DDW) can either adopt the USEPA standards or set more stringent standards, which are then codified in Title 22 of the California Code of Regulations. There are two general types of drinking water standards:

- **Primary Maximum Contaminant Levels (MCLs)** are health protective standards and are established using a very conservative risk-based approach for each constituent that takes into potential health effects, detectability and treatability, and costs of treatment. Public water systems may not serve water that exceeds Primary MCLs for any constituent.

- **Secondary MCLs** are based on the aesthetic qualities of the water such as taste, odor, color, and certain mineral content, and are considered limits for constituents that may affect consumer acceptance of the water.

Cal Water routinely monitors the water that is treated and served to customers to ensure that water delivered to customers meets these drinking water standards. The results of this testing are reported to the SWRCB DDW following each test and are summarized annually in Water Quality Reports (also known as "Consumer Confidence Reports"), which are provided to

[37] Diversions from the Bear Gulch Creek system are estimated at 291 AF with a 90% exceedance probability.

customers by mail and made available on Cal Water's website: https://www.calwater.com/waterquality/water-quality-reports/.

As discussed in Chapter 6, the majority of the water supply to the SFPUC RWS is from the Hetch Hetchy Reservoir in the Sierra Nevada Mountains. The Hetch Hetchy Reservoir is considered a very high-quality water source due to low total dissolved solid (TDS) concentrations and other factors. Additional water supplies from the Alameda and Peninsula sources come from areas with restricted access to protect the source water quality.

The SFPUC's Water Quality Division (WQD) regularly collects and tests water samples from reservoirs and designated sampling points throughout the RWS to ensure that the SFPUC's water meets or exceeds federal and state drinking water standards. In 2019, the WQD conducted more than 53,650 drinking water tests in the sources and transmission systems. This is in addition to the extensive treatment process control monitoring performed by the SFPUC's certified operators and online instruments. The SFPUC also has online instruments providing continuous water quality monitoring at numerous locations.

Given Cal Water and SFPUC's proactive monitoring and management of water quality, water quality is not expected to impact the reliability of the District's available supplies within the planning horizon (i.e., through 2045).

7.1.4 Climate Change

☑ ***CWC § 10631 (b) (1)***

…For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.

Section 6.10.1 provides a summary of the assessments of the applicable climate change on supplies that Cal Water and SFPUC have previously performed and those planned for the near term. The anticipated effects of climate change have been directly factored into the District's assessment of its supply reliability. As discussed in Section 6.10.1, Cal Water is actively working to further quantify and consider future climate change impacts as part of its Cal Water's ongoing supply and operations planning.

7.2 Reliability by Type of Year

☑ ***CWC § 10631 (b)***

Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following:

☑ ***CWC § 10631 (b)(1)***

A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.

☑ ***CWC § 10635 (a)***

Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

Per the UWMP Guidebook 2020, the water service reliability assessment includes three unique year types:

- A normal hydrologic year represents the water supplies available under normal conditions, this could be an averaged range of years or a single representative year,
- A single dry year represents the lowest available water supply, and
- A five-consecutive year drought represents the driest five-year period in the historical record.

Identification of these dry year periods consistent with the UWMP Guidebook 2020 methodology is provided in the language provided by BAWSCA and the SFPUC in Appendix H and Appendix I, and is presented in Table 7-1 and Table 7-2.

Table 7-1. Basis of Water Year Data (Reliability Assessment) (DWR Table 7-1)

Year Type	Base Year	Available Supplies if Year Type Repeats	
		X	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location: Table 7-2
			Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available	% of Average Supply
Average Year			
Single-Dry Year			
Consecutive Dry Years 1st Year			
Consecutive Dry Years 2nd Year			
Consecutive Dry Years 3rd Year			
Consecutive Dry Years 4th Year			
Consecutive Dry Years 5th Year			
NOTES:			

7.2.1 SFPUC Supply Modeled RWS Dry Year Supply Availability

As described in SFPUC's 2020 UWMP, SFPUC used the Hetch Hetchy and Local Simulation Model (HHLSM) to estimate SFPUC RWS supply availability for water service reliability assessment and the drought risk assessment (DRA; Section 7.5). HHLSM simulates supplies over a historical record of hydrology from 1920 through 2017 with a representation of current and planned SFPUC RWS infrastructure and operations.

Water supply shortfalls presented by SFPUC in Appendix I were estimated using SFPUC's design drought methodology. The SFPUC uses a hypothetical 8.5-year design drought that is more severe than what the RWS has historically experienced as the basis for planning and modeling of future scenarios. The design drought consists of the 1987-92 drought, followed by an additional 2.5 years of dry conditions from the hydrologic record that include the 1976-77 drought. The five-consecutive-year dry sequence used for the UWMP represents years 2 through 6 of the design drought. However, the modeling approach assumes water supply rationing each year that is designed to provide sufficient carry-over water in SFPUC reservoirs to continue delivering water, although at reduced levels, during each year of the five-consecutive year drought and the remaining years of the design drought.[38]

[38] SFPUC, 2021. 2020 Urban Water Management Plan, dated June 2021.

SFPUC provided results for two modeled scenarios, which show significantly different supply reliability projections for the RWS:

2. With full implementation of the Bay-Delta Plan Amendment in 2023
3. Without implementation of the Bay-Delta Plan Amendment

The SFPUC decided to present the water reliability analysis with full implementation of the Bay-Delta Plan Amendment in the SFPUC 2020 UWMP Submittal Tables and provided the following rationale for that decision:

> The adoption of the Bay-Delta Plan Amendment may significantly impact the supply available from the RWS. SFPUC recognizes that the Bay-Delta Plan Amendment has been adopted and that, given that it is now state law, we must plan for a future in which it is fully implemented. SFPUC also acknowledges that the plan is not self-implementing and therefore does not automatically go into effect. SFPUC is currently pursuing a voluntary agreement as well as a lawsuit which would limit implementation of the Plan. With both of these processes occurring on an unknown timeline, SFPUC does not know at this time when the Bay-Delta Plan Amendment is likely to go into effect. As a result, it makes sense to conduct future supply modeling for a scenario that doesn't include implementation of the Bay-Delta Plan Amendment, as that represents a potential supply reliability scenario.
>
> Because of the uncertainty surrounding implementation of the Bay-Delta Plan Amendment, the SFPUC conducted water service reliability assessment that includes: (1) a scenario in which the Bay-Delta Plan Amendment is fully implemented in 2023, and (2) a scenario that considers the SFPUC system's current situation without the Bay-Delta Plan Amendment. The two scenarios provide a bookend for the possible future scenarios regarding RWS supplies. The standardized tables associated with the SFPUC's UWMP contain the future scenario that assumes implementation of the Bay-Delta Plan Amendment starting in 2023.
>
> Although the SWRCB has stated it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, given the current level of uncertainty, it is assumed for the purposes of the SFPUC's draft UWMP that the Bay-Delta Plan Amendment will be fully implemented starting in 2023.

As shown in Appendix I, SFPUC also provided results for each of the modeling scenarios described above assuming demands on the RWS equal to both: (1) the total of projected retail demands and projected Wholesale Customer purchases, and (2) a constant water demand of 265 MGD from the SFPUC watersheds for retail and Wholesale Customers, consistent with SFPUC's contractual obligation. According to the SFPUC, the modeling based on a demand of 265 MGD was used to "facilitate planning that supports meeting this Level of Service goal and their

contractual obligations." Supply modeling results presented in the text of the SFPUC's 2020 UWMP reflect an input of projected retail and Wholesale demands on the RWS.

Consistent with SFPUC's approach and guidance from SFPUC and BAWSCA, this UWMP presents results for the water service reliability assessment and the DRA (Section 7.5) based on the modeling scenario that assumes full implementation of the Bay-Delta Plan Amendment in 2023 and uses projected demands on the RWS. SFPUC modeling results for this scenario showing the total RWS supply available to Wholesale Customers during the characteristic year types can be found in Tables 3a-3g of the SFPUC letter dated March 30, 2021. These results show total Wholesale RWS supply shortfalls ranging from 36 percent to 54 percent of projected purchases during dry years after 2023.

For comparison purposes, results for the scenario without the Bay-Delta Plan Amendment can be found in Tables 4a-4g of the same SFPUC letter. These results indicated that the SFPUC would be able to meet 100 percent of Wholesale projected purchases during all year types except during the fourth and fifth consecutive dry years for base year 2045 when 15 percent Wholesale supply shortages are projected.

7.2.2 Cal Water's Year Type Characterization

As discussed in Section 6.1, in accordance with the SFPUC's perpetual obligation to Cal Water's Supply Assurance, Cal Water has an Individual Supply Guarantee (ISG) of 35.68 MGD (39,993 AFY), which is shared among its Bear Gulch, Mid-Peninsula, and South San Francisco Districts (also referred to herein as the "Peninsula Districts"). SFPUC is obligated to provide Cal Water with up to 100 percent of Cal Water's ISG during normal years.

Using the SFPUC modeling results presented in the of the SFPUC letter dated March 30, 2021, BAWSCA provided single and five-consecutive dry-year allocations for each agency based on the methodology described in Section 7.1.1. As discussed therein, for the purposes for the 2020 UWMP supply reliability analysis only, Wholesale Agency drought allocations assume an equal percent reduction across all agencies when the average Wholesale Customers' RWS shortages are greater than 20 percent. These percent reductions for the scenario that assumes the implementation of the Bay-Delta Plan Amendment in 2023 are included in Table E of the BAWSCA updated drought allocation memorandum data April 1, 2021 (Appendix I) and reproduced in Table 7-2, below, for base year 2025 through 2045. The percent reductions shown in Table 7-2 are applied to the District's projected potable demands listed in Table 4-3 for each respective base year to calculate the projected dry-year RWS supplies shown in Table 7-4 and Table 7-5.

Table 7-2. RWS Wholesale Supply Availability During Normal and Dry Years for Based Years 2025 through 2045 (Responds to DWR Table 7-1)

Base Year	Normal Year	Single Dry Year	Multiple Dry Years				
			Year 1	Year 2	Year 3	Year 4	Year 5
2025	100%	64%	64%	55%	55%	55%	55%
2030	100%	64%	64%	55%	55%	55%	55%
2035	100%	64%	64%	54%	54%	54%	50%
2040	100%	63%	63%	54%	54%	48%	48%
2045	100%	54%	54%	54%	54%	46%	46%

NOTES:
(a) Normal-year water supply availability is presented in terms of percentage of Cal Water's ISG (35.68 MGD).
(b) Dry-year water supply availability is presented in terms of percentage of projected RWS demands for each base year consistent the revised BAWSCA Drought Methodology that assumes equal percent cutbacks across all Wholesale Agencies.
(c) Results reflect scenario with Bay-Delta Plan Amendment implemented in 2023 and the use projected RWS purchases.

7.3 Supply and Demand Assessment

Water supply and demand patterns change during normal, single dry, and multiple dry years. Cal Water has relied on the demand modeling described in Chapter 4 to forecast demands for normal, single dry and multiple dry years.

7.3.1 Normal Year Supply and Demand Assessment

Table 7-2 shows the projected supply and demand totals for a normal year. The supply and demand totals are consistent with those in Table 6-9B and Table 4-3, respectively. The District is expected to have adequate water supplies during normal years to meet its projected demands through 2045.

Table 7-3. Normal Year Supply and Demand Comparison (DWR Table 7-2)

	2025	2030	2035	2040	2045
Supply totals *From DWR Table 6-9*	12,796	12,699	12,730	12,675	12,694
Demand totals *From DWR Table 4-3*	12,796	12,699	12,730	12,675	12,694
Difference	0	0	0	0	0

NOTES:
(a) Volumes are in units of AF.

7.3.2 Dry Year Supply and Demand Assessment (with Bay-Delta Plan)

The Bear Gulch District's local surface water supply is conservatively assumed to be zero during single dry and multiple dry years over the planning horizon.

The reliability of the RWS is anticipated to vary greatly in different year types. As described above and detailed in Appendix I, Cal Water has relied on the supply reliability estimates provided by the SFPUC for the RWS and the drought allocation structure provided by SFPUC and BAWSCA to estimate available RWS supplies in dry year types through 2045.[39]

Table 7-4 shows the projected supply and demand totals for the single dry year, and Table 7-5 shows the projected supply and demand totals for multiple dry year periods extending five years.

Dry year RWS supply availability is calculated in accordance with Table 7-2, as a percentage of projected RWS demands for each base year consistent with the revised BAWSCA Drought Methodology that assumes equal percent cutbacks across all Wholesale Agencies.

Table 7-4. Single Dry Year Supply and Demand Comparison (DWR Table 7-3)

	2025	2030	2035	2040	2045
Supply totals	8,546	8,482	8,503	8,334	7,154
Demand totals	13,354	13,253	13,285	13,228	13,248
Difference	(4,808)	(4,771)	(4,782)	(4,894)	(6,094)
NOTES: (a) Volumes are in units of AF.					

[39] The balance between supply and demand totals excludes usage reductions that are not directly a function of Cal Water supplies, but are externally-imposed by other entities, such as the 2015 State-mandated cutbacks.

Table 7-5. Multiple Dry Years Supply and Demand Comparison (DWR Table 7-4)

		2025	2030	2035	2040	2045
First year	Supply totals	8,767	8,701	8,722	8,549	7,339
	Demand totals	13,699	13,595	13,629	13,570	13,591
	Difference	(4,932)	(4,894)	(4,906)	(5,021)	(6,252)
Second year	Supply totals	7,534	7,477	7,360	7,328	7,339
	Demand totals	13,699	13,595	13,629	13,570	13,591
	Difference	(6,164)	(6,118)	(6,269)	(6,242)	(6,252)
Third year	Supply totals	7,534	7,477	7,360	7,328	7,339
	Demand totals	13,699	13,595	13,629	13,570	13,591
	Difference	(6,164)	(6,118)	(6,269)	(6,242)	(6,252)
Fourth year	Supply totals	7,534	7,477	7,360	6,514	6,252
	Demand totals	13,699	13,595	13,629	13,570	13,591
	Difference	(6,164)	(6,118)	(6,269)	(7,057)	(7,339)
Fifth year	Supply totals	7,534	7,477	6,814	6,514	6,252
	Demand totals	13,699	13,595	13,629	13,570	13,591
	Difference	(6,164)	(6,118)	(6,814)	(7,057)	(7,339)

NOTES:
(a) Volumes are in units of AF.

7.3.3 Uncertainties in Dry Year Water Supply Projections

As shown in the above tables, significant water supply shortfalls are currently projected in future single and multiple dry years, directly because of the Bay-Delta Plan Amendment implementation. However, numerous uncertainties remain in the implementation of the Bay-Delta Plan Amendment. The water supply projections presented above likely represent a worst-case scenario in which the Bay-Delta Plan Amendment is implemented without the SFPUC and the SWRCB reaching a Voluntary Agreement and do not account for implementation of SFPUC's AWSP, described in more detail below. Under this supply scenario, SFPUC appears not to be able to meet its contractual obligations (i.e., Level of Service goals) and Cal Water's forecasted demands during droughts.

As discussed in Section 7.2.1, SFPUC also provided water supply reliability projections without the Bay-Delta Plan Amendment (see Appendix I), which likely represents a highly optimistic water supply reliability outcome. These projections indicated that without the Bay-Delta Plan Amendment SFPUC would be able to supply 100 percent of projected RWS demands in all year types through 2045, except for the 4th and 5th consecutive dry year in 2045, during which 90 percent of projected RWS demands (85 percent of the Wholesale demands) would be met. The large disparity in projected water supply reliability between these two scenarios demonstrate the current level uncertainty.

In addition to these two UWMP scenarios, in a March 26, 2021 Special Commission Meeting, SFPUC staff presented HHLSM modeling results for 10 different scenarios, including scenarios with the implementation of the Tuolumne River Voluntary Agreement (TRVA), with the implementation of the Bay-Delta Plan Amendment and the AWSP, and with the use of a modified rationing policy and a modified design drought (Appendix J). Results for the scenarios with the TRVA and with the AWSP (particularly with a modified rationing policy and design drought) showed significantly improved RWS supply availability compared to the Bay-Delta Plan Amendment scenario shown herein.

The current sources of uncertainty in the dry year water supply projections are summarized below:

- *Implementation of the Bay-Delta Plan Amendment is under negotiation.* The SFPUC is continuing negotiations with the SWRCB on implementation of the Bay-Delta Plan Amendment for water supply cutbacks, particularly during droughts. The SFPUC, in partnership with other key stakeholders, has proposed a voluntary substitute agreement to the Bay-Delta Plan Amendment, the TRVA, that provides a collaborative approach to protect the environment and plan for a reliable and high-quality future potable water supply. This is a dynamic situation and the projected drought cutback allocations may need to be revised before the next (i.e., 2025) UWMP depending on the outcome of ongoing negotiations.
- *Benefits of the AWSP are not accounted for in current supply projections.* As discussed in Section 7.3.4 and Appendix I, SFPUC is exploring options to increase its supplies through the AWSP. Implementation of feasible projects developed under the AWSP is not yet reflected in the supply reliability scenarios presented herein and is anticipated to reduce the projected RWS supply shortfalls (Appendix J).
- *SFPUC is considering modifications to its design drought methodology and rationing policy.* Shortening the 8.5-year design drought or modifying the rationing policy to increase rationing in the early years of a drought are anticipated to reduce projected RWS supply shortfalls (Appendix J).
- *Methodology for Tier One and Tier Two Wholesale drought allocations have not been established for wholesale shortages greater than 20 percent.* As discussed in Section 7.1.1, the current Tier One and Tier Two Plans are not designed for RWS supply shortages of greater than 20 percent. For UWMP planning purposes per BAWSCA guidance, the Tier One Wholesale share for a 16 percent to 20 percent supply reduction (62.5 percent) has been applied for reductions greater than 20 percent and an equal percent reduction has been applied across all Wholesale agencies. BAWSCA member agencies have not formally agreed to adopt this shortage allocation methodology and are in discussions about jointly developing an alternative allocation method that would consider additional equity factors

if SFPUC is unable to deliver its contractual supply volume and cutbacks to the RWS supply exceed 20 percent.

- *RWS demands are subject to change.* The RWS supply availability is dependent upon the system demands. As discussed in Section 7.2, the supply scenarios are based on the total projected Wholesale Customer purchases provided by BAWSCA to SFPUC in January 2021. Many BAWSCA agencies have refined their projected demands during the UWMP process after these estimates were provided to SFPUC. Furthermore, the RWS demand projections are subject to change in the future based upon future housing needs, increased conservation, and development of additional local supplies.
- *Frequency and duration of cutbacks are also uncertain.* While the projected shortfalls presented in the UWMP appear severe, the actual frequency and duration of such shortfalls are uncertain. Based on the HHLSM simulations provided by BAWSCA for the with Bay-Delta Plan Amendment scenario (Appendix I), rationing is anticipated to be required 20 percent of years for base year 2025 through 2035, 23 percent of all years for base year 2040, and 25 percent of years for base year 2045. In addition to the supply volumes, the above listed uncertainties would also impact the projected frequency and duration of shortfalls. As such, in addition to evaluating local options to increase supply reliability, Cal Water has placed high priority on working with BAWSCA and SFPUC in the upcoming years to better refine the estimates of RWS supply reliability and may amend this UWMP when new information becomes available.

The above uncertainties notwithstanding, BAWSCA's current drought allocation cutbacks will require the District to apply its Water Shortage Contingency Plan (WSCP) Stage 6, for water use restrictions above 50 percent and will affect Cal Water's short- and long-term water management decisions. As described further below (and in Section 7.4), Cal Water is working independently and with the other BAWSCA agencies to identify regional mitigation measures to improve reliability for regional and local water supplies and meet its customers' water needs. If conditions for large drought cutbacks to the RWS persist, Cal Water will need to implement additional demand management practices to invoke strict restrictions on potable water use, and obtain funding to accelerate developing alternate supplies of water.

Cal Water recommends that users of its 2020 UWMP contact District staff for potential updates about its water supply reliability and the DRA before using the 2020 UWMP drought cutback projections for their planning projects and referencing the drought allocations.

7.3.4 Strategies and Actions to Address Dry Year Supply Shortfalls

Although there remains significant uncertainty in future supply availability, as discussed above, Cal Water, SFPUC, and BAWSCA have developed strategies and actions to address the projected dry year supply shortfalls. These efforts are discussed in the following sections.

SFPUC and Other Regional Strategies and Actions

Dry Year Water Supply Projects

The WSIP authorized the SFPUC to undertake a number of water supply projects to meet dry-year demands with no greater than 20 percent system-wide rationing in any one year. Implementation of these projects is also expected to mitigate impacts of the implementation of the Bay-Delta Plan Amendment. Those projects include the following:

- *Calaveras Dam Replacement Project*. Calaveras Dam is located near a seismically active fault zone and was determined to be seismically vulnerable. To address this vulnerability, the SFPUC constructed a new dam of equal height downstream of the existing dam. Construction on the project occurred between 2011 and July 2019. The SFPUC began impounding water behind the new dam in accordance with California Division of Safety of Dams (DSOD) guidance in the winter of 2018/2019.

- *Alameda Creek Recapture Project*. As a part of the regulatory requirements for future operations of Calaveras Reservoir, the SFPUC must implement bypass and instream flow schedules for Alameda Creek. The Alameda Creek Recapture Project will recapture a portion of the water system yield lost due to the instream flow releases at Calaveras Reservoir or bypassed around the Alameda Creek Diversion Dam and return this yield to the RWS through facilities in the Sunol Valley. Water that naturally infiltrates from Alameda Creek will be recaptured into an existing quarry pond known as SMP (Surface Mining Permit)-24 Pond F2. The project will be designed to allow the recaptured water to be pumped to the Sunol Valley Water Treatment Plant or to San Antonio Reservoir. Construction of this project will occur from spring 2021 to fall 2022.

- *Lower Crystal Springs Dam Improvements*. The Lower Crystal Springs Dam (LCSD) Improvements were substantially completed in November 2011. The joint San Mateo County/SFPUC Bridge Replacement Project to replace the bridge across the dam was completed in January 2019. A WSIP follow up project to modify the LCSD Stilling Basin for fish habitat and upgrade the fish water release and other valves started in April 2019. While the main improvements to the dam have been completed, environmental permitting issues for reservoir operation remain significant. While the reservoir elevation was lowered due to DSOD restrictions, the habitat for the Fountain Thistle, an endangered plant, followed the lowered reservoir elevation. Raising the reservoir elevation now requires that new plant populations be restored incrementally before the reservoir elevation is raised. The result is that it may be several years before pre-project water storage volumes can be restored.

- *Regional Groundwater Storage and Recovery Project*. The Groundwater Storage and Recovery Project (GSRP) is a strategic partnership between SFPUC and three San Mateo County agencies – Cal Water, the City of Daly City, and the City of San Bruno – to conjunctively operate the south Westside Groundwater Basin. The project sustainably manages groundwater and surface water resources in a way that provides supplies during times of drought. During years of normal or heavy rainfall, the project would provide additional surface water to the partner agencies in San Mateo County in lieu of groundwater pumping. Over time, reduced pumping creates water storage through natural recharge of up to 20 billion gallons of new water supply available during dry years.

The project's Final Environmental Impact Report was certified in August 2014, and the project also received Commission approval that month. Phase 1 of this project consists of construction of thirteen well sites and is over 99 percent complete. Phase 2 of this project consists of completing construction of the well station at the South San Francisco Main site and some carryover work that has not been completed from Phase 1. Phase 2 design work began in December 2019.

- *2 MGD Dry-year Water Transfer*. In 2012, the dry-year transfer was proposed between the Modesto Irrigation District and the SFPUC. Negotiations were terminated because an agreement could not be reached. Subsequently, the SFPUC had discussions with the Oakdale Irrigation District for a one-year transfer agreement with the SFPUC for 2 MGD (2,240 acre-feet). No progress towards agreement on a transfer was made in 2019, but the irrigation districts recognize SFPUC's continued interest and SFPUC will continue to pursue transfers.

In order to achieve its target of meeting at least 80 percent of its customer demand during droughts with a system demand of 265 MGD, and to mitigate the impacts of the Bay-Delta Plan, the SFPUC must successfully implement the dry-year water supply projects included in the WSIP.

Furthermore, the permitting obligations for the Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements include a combined commitment of 12.8 MGD for instream flows on average. When this is reduced for an assumed Alameda Creek Recapture Project recovery of 9.3 MGD, the net loss of water supply is 3.5 MGD.

Alternative Water Supply Planning Program

As discussed, below, BAWSCA has taken steps to ensure that SFPUC develops alternative water supplies:

With the adoption of the Bay-Delta Plan Phase 1 (Bay-Delta Plan) by the State Water Resources Control Board in December of 2018, coupled with the uncertainties associated with litigation and the development of Voluntary Agreements that, if successful, would provide an alternative to the 40% unimpaired flow requirement that is required by the Bay-Delta Plan, BAWSCA redoubled its efforts to ensure that the SFPUC took necessary action to develop alternative water supplies such that they would be in place to fill any potential gap in supply by implementation of the Bay-Delta Plan and that the SFPUC would be able to meet its legal and contractual obligations to its Wholesale Customers.

In 2019, BAWSCA held numerous meetings with the SFPUC encouraging them to develop a division within their organization whose chief mission was to spearhead alternative water supply development. On June 25, 2019, BAWSCA provided a written and oral statement to the Commissioners urging the SFPUC to focus on developing new sources of supply in a manner similar to how it addressed the implementation of the Water System Improvement Program (WSIP). BAWSCA urged that a new water supply program was called for, with clear objectives, persistent focus, a dedicated team, adequate funding, and a plan for successful execution. The SFPUC Commission supported BAWSCA's recommendation and directed staff to undertake such an approach.

In early 2020, the SFPUC began implementation of the Alternative Water Supply Planning Program (AWSP), a program designed to investigate and plan for new water supplies to address future long-term water supply reliability challenges and vulnerabilities on the RWS.

Included in the AWSP is a suite of diverse, non-traditional supply projects that, to a great degree, leverage regional partnerships and are designed to meet the water supply needs of the SFPUC Retail and Wholesale Customers through 2045. As of the most recent Alternative Water Supply Planning Quarterly Update, SFPUC has budgeted $264 million over the next ten years to fund water supply projects. BAWSCA is heavily engaged with the SFPUC on its AWSP efforts.

SFPUC's AWSP is described in more detail below:

The SFPUC is increasing and accelerating its efforts to acquire additional water supplies and explore other projects that would increase overall water supply resilience through the AWSP. The drivers for the program include: (1) the adoption of the Bay-Delta Plan Amendment and the resulting potential limitations to RWS supply during dry years, (2) the net supply shortfall following the implementation of WSIP, (3) San Francisco's perpetual obligation to supply 184 MGD to the Wholesale Customers, (4) adopted LOS Goals to limit rationing to no more than 20 percent system-wide during droughts, and (5) the potential need to identify water supplies that would be required to offer permanent status to interruptible customers. Developing additional supplies through this program

would reduce water supply shortfalls and reduce rationing associated with such shortfalls. The planning priorities guiding the framework of the AWSP are as follows:

1. Offset instream flow needs and meet regulatory requirements
2. Meet existing obligations to existing permanent customers
3. Make interruptible customers permanent
4. Meet increased demands of existing and interruptible customers

In conjunction with these planning priorities, the SFPUC considers how the program fits within the LOS Goals and Objectives related to water supply and sustainability when considering new water supply opportunities. The key LOS Goals and Objectives relevant to this effort can be summarized as:

- Meet dry-year delivery needs while limiting rationing to a maximum of 20 percent system-wide reduction in water service during extended droughts;
- Diversify water supply options during non-drought and drought periods;
- Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers;
- Meet, at a minimum, all current and anticipated legal requirements for protection of fish and wildlife habitat;
- Maintain operational flexibility (although this LOS Goal was not intended explicitly for the addition of new supplies, it is applicate here).

Together, the planning priorities and LOS Goals and Objectives provide a lens through which the SFPUC considers water supply options and opportunities to meet all foreseeable water supply needs.

In addition to the Daly City Recycled Water Expansion project[40], which was a potential project identified in the SFPUC's 2015 UWMP and had committed funding at that time, the SFPUC has taken action to fund the study of potential additional water supply projects. Capital projects under consideration to develop additional water supplies include surface water storage expansion, recycled water expansion, water transfers,

[40] While this potential project was identified in the 2015 UWMP, it has since been approved by Daly City following environmental review and has a higher likelihood of being implemented.

desalination, and potable reuse. A more detailed list and descriptions of these efforts are provided below.

The capital projects that are under consideration would be costly and are still in the early feasibility or conceptual planning stages. Because these water supply projects would take 10 to 30 years to implement, and because required environmental permitting negotiations may reduce the amount of water that can be developed, the yield from these projects are not currently incorporated into SFPUC's supply projections. State and federal grants and other financing opportunities would be pursued for eligible projects, to the extent feasible, to offset costs borne by ratepayers.

- *Daly City Recycled Water Expansion (Regional, Normal- and Dry-Year Supply)*. This project can produce up to 3 MGD of tertiary recycled water during the irrigation season (~7 months). On an average annual basis, this is equivalent to 1.25 MGD or 1,400 AFY. The project is envisioned to provide recycled water to 13 cemeteries and other smaller irrigation customers, offsetting existing groundwater pumping from the South Westside Groundwater Basin; this will free up groundwater, enhancing the reliability of the Basin. The project is a regional partnership between the SFPUC and Daly City. The irrigation customers are located largely within California Water Service's (Cal Water's) service area. RWS customers will benefit from the increased reliability of the South Westside Basin for additional drinking water supply during droughts. In this way, this project supports the GSR Project, which is under construction.

- *ACWD-USD Purified Water Partnership (Regional, Normal- and Dry-Year Supply)*. This project could provide a new purified water supply utilizing Union Sanitary District's (USD) treated wastewater. Purified water produced by advanced water treatment at USD could be transmitted to the Quarry Lakes Groundwater Recharge Area to supplement recharge into the Niles Cone Groundwater Basin or put to other uses in Alameda County Water District's (ACWD) service area. With the additional water supply to ACWD, an in-lieu exchange with the SFPUC would result in more water left in the RWS. Additional water supply could also be directly transmitted to the SFPUC through a new intertie between ACWD and the SFPUC.

- *Crystal Springs Purified Water (Regional, Normal- and Dry-Year Supply)*. The Crystal Springs Purified Water (PREP) Project is a purified water project that could provide 6-12 MGD of water supply through reservoir water augmentation at Crystal Springs Reservoir, which is a facility of the RWS. Treated wastewater from Silicon Valley Clean Water (SVCW) and/or the City of San Mateo would go through an advanced water treatment plant to produce purified water that meets state and federal drinking water quality standards. The purified water would then be

transmitted 10 to 20 miles (depending on the alignment) to Crystal Springs Reservoir, blended with regional surface water supplies and treated again at Harry Tracy Water Treatment Plant. Project partners include the SFPUC, Bay Area Water Supply and Conservation Agency (BAWSCA), SVCW, CalWater, Redwood City, Foster City, and the City of San Mateo. Partner agencies are contributing financial and staff resources towards the work effort.

- *Los Vaqueros Reservoir Expansion (Regional, Dry Year Supply)*. The Los Vaqueros Reservoir Expansion (LVE) Project is a storage project that will enlarge the existing reservoir located in northeastern Contra Costa County from 160,000 acre-feet to 275,000 acre-feet. While the existing reservoir is owned and operated by the Contra Costa Water District (CCWD), the expansion will have regional benefits and will be managed by a Joint Powers Authority (JPA) that will be set up prior to construction. Meanwhile, CCWD is leading the planning, design and environmental review efforts. CCWD's Board certified the EIS/EIR and approved the LVE Project on May 13, 2020. The additional storage capacity from the LVE Project would provide a dry year water supply benefit to the SFPUC. BAWSCA is working in concert with the SFPUC to support their work effort on the LVE project.

    - Conveyance Alternatives: The SFPUC is considering two main pathways to move water from storage in a prospective LVE Project to the SFPUC's service area, either directly to RWS facilities or indirectly via an exchange with partner agencies. The SFPUC is evaluating potential alignments for conveyance.

    - Bay Area Regional Reliability Shared Water Access Program (BARR SWAP): As part of the BARR Partnership, a consortium of 8 Bay Area water utilities (including ACWD, BAWSCA, CCWD, EBMUD, Marin Municipal Water District (MMWD), SFPUC, Valley Water, and Zone 7 Water Agency) are exploring opportunities to move water across the region as efficiently as possible, particularly during times of drought and emergencies. The BARR agencies are proposing two separate pilot projects in 2020-2021 through the Shared Water Access Program (SWAP) to test conveyance pathways and identify potential hurdles to better prepare for sharing water during a future drought or emergency. A strategy report identifying opportunities and considerations will accompany these pilot transfers and will be completed in 2021.

- *Bay Area Brackish Water Desalination (Regional, Normal- and Dry-Year Supply)*. The Bay Area Brackish Water Desalination (Regional Desalination) Project is a partnership between CCWD, the SFPUC, Valley Water, and Zone 7 Water Agency.

The East Bay Municipal Utilities District (EBMUD) and ACWD may also participate in the project. The project could provide a new drinking water supply to the region by treating brackish water from CCWD's existing Mallard Slough intake in Contra Costa County. While this project has independent utility as a water supply project, for the current planning effort the SFPUC is considering it as a source of supply for storage in LVE. While the allocations remain to be determined among partners, the SFPUC is considering a water supply benefit of between 5 and 15 MGD during drought conditions when combined with storage at LVE.

- *Calaveras Reservoir Expansion (Regional, Dry Year Supply)*. Calaveras Reservoir would be expanded to create 289,000 acre-feet (AF) additional capacity to store excess Regional Water System supplies or other source water in wet and normal years. In addition to reservoir enlargement, the project would involve infrastructure to pump water to the reservoir, such as pump stations and transmission facilities.

- *Groundwater Banking*. Groundwater banking in the Modesto Irrigation District (MID) and Turlock Irrigation District (TID) service areas could be used to provide some additional water supply to meet instream releases in dry years reducing water supply impacts to the SFPUC service area. For example, additional surface water could be provided to irrigators in wet years, which would offset the use of groundwater, thereby allowing the groundwater to remain in the basin rather than be consumptively used. The groundwater that remains in the basin can then be used in a subsequent dry year for irrigation, freeing up surface water that would have otherwise been delivered to irrigators to meet instream flow requirements.

  A feasibility study of this option is included in the proposed Tuolumne River Voluntary Agreement. Progress on this potential water supply option will depend on the negotiations of the Voluntary Agreement.

- *Inter-Basin Collaborations*. Inter-Basin Collaborations could provide net water supply benefits in dry years by sharing responsibility for in-stream flows in the San Joaquin River and Delta more broadly among several tributary reservoir systems. One mechanism by which this could be accomplished would be to establish a partnership between interests on the Tuolumne River and those on the Stanislaus River, which would allow responsibility for streamflow to be assigned variably based on the annual hydrology.

  As is the case with Groundwater Banking, feasibility of this option is included in the proposed Tuolumne River Voluntary Agreement.

If all the projects identified through the current planning process can be implemented, there would still be a supply shortfall to meet projected needs. Furthermore, each of the supply options being considered has its own inherent challenges and uncertainties that may affect the SFPUC's ability to implement it.

Given the limited availability of water supply alternatives - unless the supply risks are significantly reduced or our needs change significantly - the SFPUC will continue to plan, develop and implement all project opportunities that can help bridge the anticipated water supply gaps during droughts. In 2019, the SFPUC completed a survey among water and wastewater agencies within the service area to identify additional opportunities for purified water. Such opportunities remain limited, but the SFPUC continues to pursue all possibilities.

BAWSCA's Long Term Reliability Water Supply Strategy

BAWSCA's Long-Term Reliable Water Supply Strategy (Strategy), completed in February 2015, quantified the water supply reliability needs of the BAWSCA member agencies through 2040, identified the water supply management projects and/or programs (projects) that could be developed to meet those needs, and prepared an implementation plan for the Strategy's recommendations.

When the 2015 Demand Study concluded it was determined that while there is no longer a regional normal year supply shortfall, there was a regional drought year supply shortfall of up to 43 MGD. In addition, key findings from the Strategy's project evaluation analysis included:

- Water transfers represent a high priority element of the Strategy.
- Desalination potentially provides substantial yield, but its high effective costs and intensive permitting requirements make it a less attractive drought year supply alternative.
- Other potential regional projects provide tangible, though limited, benefit in reducing dry-year shortfalls given the small average yields in drought years.

Since 2015, BAWSCA has completed a comprehensive update of demand projections and engaged in significant efforts to improve regional reliability and reduce the dry-year water supply shortfall.

- *Water Transfers*. BAWSCA successfully facilitated two transfers of portions of Individual Supply Guarantee (ISG) between BAWSCA agencies in 2017 and 2018. Such transfers benefit all BAWSCA agencies by maximizing use of existing supplies.

BAWSCA is currently working on an amendment to the WSA between the SFPUC and BAWSCA agencies to establish a mechanism by which member agencies that have an ISG may participate in expedited transfers of a portion of ISG and a portion of a Minimum Annual Purchase Requirement. In 2019, BAWSCA participated in a pilot water transfer that, while ultimately unsuccessful, surfaced important lessons learned and produced interagency agreements that will serve as a foundation for future transfers. BAWSCA is currently engaged in the Bay Area Regional Reliability Partnership[41] (BARR), a partnership among eight Bay Area water utilities (including the SFPUC, Alameda County Water District, BAWSCA, Contra Costa Water District, Santa Clara Valley Water District) to identify opportunities to move water across the region as efficiently as possible, particularly during times of drought and emergencies.

- *Regional Projects*. Since 2015, BAWSCA has coordinated with local and State agencies on regional projects with potential dry-year water supply benefits for BAWSCA's agencies. These efforts include storage projects, indirect/direct water reuse projects, and studies to evaluate the capacity and potential for various conveyance systems to bring new supplies to the region.

BAWSCA continues to implement the Strategy recommendations in coordination with BAWSCA member agencies. Strategy implementation will be adaptively managed to account for changing conditions and to ensure that the goals of the Strategy are met in an efficient and cost-effective manner. On an annual basis, BAWSCA will reevaluate Strategy recommendations and results in conjunction with development of the BAWSCA's FY 2021-22 Work Plan. In this way, actions can be modified to accommodate changing conditions and new developments.

Cal Water Strategies and Actions

In addition to the management tools and options discussed below, Cal Water has been involved directly and through BAWSCA to advocate for an alternative to the Bay-Delta Plan Amendment, including submitting letters and testimony (see Appendix K) that identify, among other things, the significant impact to local water supply reliability.

Further, as part of this UWMP process, Cal Water submitted a letter to BAWSCA (see Appendix K) enumerating concerns regarding the SFPUC RWS supply allocation methodology. Cal Water's letter to BAWSCA further states that while it is applying BAWSCA's revised Tier Two allocation methodology for RWS shortages greater than 20 percent for preliminary planning purposes, Cal Water is not agreeing to, or adopting, the revised Tier Two methodology. Among other issues,

[41] https://www.bayareareliability.com/

Cal Water notes that the revised Tier Two methodology does not take minimum health and safety standards into account.

As described in Section 7.4, Cal Water is committed to developing a long-term supply reliability strategy for its Peninsula Districts, including evaluation of alternative supply sources and continued commitment to Cal Water's comprehensive water conservation program.

7.4 Water Supply Management Tools and Options

☑ ***CWC § 10620 (f)***

An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

Cal Water coordinates on an ongoing basis with all relevant agencies in the region to optimize the use of regional water supplies. This includes SFPUC, BAWSCA, Town of Atherton, Town of Portola Valley, Town of Woodside, City of Menlo Park, San Mateo County, and other public and private entities with which Cal Water can collaborate to protect and enhance local surface water resources.

In addition to the work being done by SFPUC and BAWSCA, Cal Water is currently in the process of developing multiple regional water supply reliability studies using integrated resource planning practices to create a long-term supply reliability strategy through 2050 for Cal Water districts throughout California. The studies will create long-term strategies to address a wide range of water supply challenges including climate change, new regulatory requirements (e.g., the Bay-Delta Plan), and potential growth in demands due to new development. These water supply reliability studies will be completed on a rolling basis over the next several years, with all studies anticipated to be complete by 2024. The Bear Gulch District will be included in the Bay Area Water Supply Reliability Analysis.

Cal Water also has its own aggressive and comprehensive water conservation program that has and will continue to reduce per-capita usage and therefore demands on critical water sources. Cal Water is committed to helping its customers use water efficiently and has developed a range of water conservation programs to support this goal. To ensure that it is providing the right mix of programs in the most cost-effective manner possible, Cal Water routinely conducts comprehensive conservation program analysis and planning. This is done on a five-year cycle in tandem with the UWMP. Cal Water's Conservation Master Plan provides the basis for the information on the implementation of and expected water savings from Demand Management Measures (DMMs) presented in Chapter 9.

Cal Water also monitors and supports the goals of the Bay Area Integrated Regional Water Management Plan (IRWMP). These goals include:

- Promote environmental, economic, and social sustainability,
- Improve water supply reliability and quality,
- Protect and improve watershed health and function and Bay water quality,
- Improve regional flood management, and
- Create, protect, enhance, and maintain environmental resources and habitats.

7.5 Drought Risk Assessment

☑ ***CWC § 10635(b)***

Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following:

(1) A description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted.

(2) A determination of the reliability of each source of supply under a variety of water shortage conditions. This may include a determination that a particular source of water supply is fully reliable under most, if not all, conditions.

(3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.

(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.

In addition to the long-term water service reliability assessment presented above, the DRA evaluates Cal Water's supply risks under a severe drought period lasting for the next five consecutive years after the assessment is completed, i.e., from 2021 through 2025. The DRA is intended to inform the demand management measures (see Chapter 9) and water supply projects and programs to be included in the UWMP. Suppliers may conduct an interim update or updates to this DRA within the five-year cycle of its urban water management plan update, i.e., before the 2025 UWMP.

7.5.1 Data, Methods, and Basis for Water Shortage Condition

The DRA considers the effects on available water supply sources of an assumed five-year drought commencing the year after the assessment is completed, i.e., from 2021 through 2025. The anticipated effects of climate change have been directly factored into the District's assessment

of its supply reliability. The available potable water supplies assumed in the DRA are based upon the same methodology and assumptions used for the long-term water service reliability assessment (Sections 7.1, 7.2, and 7.3) and relies on information provided by SFPUC and BAWSCA (Appendix H and Appendix I). The available RWS water supplies are estimated based on the following assumptions: (1) The RWS demands are held constant at 132.1 MGD (i.e., 2020 demand levels), (2) implementation of the Bay-Delta Plan Amendment occurs in 2023, and (3) the 2020 infrastructure conditions are maintained (see Table 1 of the January 22, 2021 SFPUC letter in Appendix I). Details of how the District's available supplies are then estimated as part of the DRA are provided below.

7.5.2 Drought Risk Assessment Water Source Reliability

As described in Chapter 6, the Bear Gulch District derives its water supply from a combination of both imported surface water supply purchased from the SFPUC RWS and local surface water supply from Bear Gulch Creek. For the purposes of this UWMP, the District conservatively assumes that local surface water supplies will be zero during single dry and multiple dry years over the planning horizon.

The District*'s* available potable water supplies during the five-consecutive-year drought are based upon information provided by SFPUC and BAWSCA included in Appendix I, as indicated in Section 7.5.1. Specifically, based on the modeling results presented in the March 30, 2021 SFPUC letter, BAWSCA provided percentage-based cutbacks for 2021 to 2025 in Table F1 of the April 1, 2021 BAWSCA drought allocation tables, which are reproduced in Table 7-6, below, and serve as the basis for the RWS Reliability in the DRA.

As shown in Table 7-6, prior to the assumed implementation of the Bay-Delta Plan Amendment in 2023, sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests during the first two consecutive dry years (i.e., 2021 and 2022). Shortages are projected to begin in 2023 with the implementation of the Bay-Delta Plan Amendment. In the event of a shortage, the current Tier 2 Drought Allocation Plan (Section 7.1.1) specifies that each agency's Allocation Factor would be calculated once at the onset of a shortage based on the previous year's use and remain the same until the shortage condition is over. Therefore, for the purpose of drought allocations used in the DRA, the available RWS supply is assumed to remain static in 2023-2025 and the percent cutbacks in 2023-2025 shown in Table 7-6 are presented in terms of the percentage of the District's 2022 projected demands.[42]

[42] Note that this DRA is based on the percentages shown in Table F1 of the April 1, 2021 BAWSCA letter assuming equal percent cutbacks between agencies instead of the volumes shown in Table F2. This DRA does not rely on the supply volumes shown in Table F2 because they are based on outdated RWS supply projections for the District. Specifically, the supply available to the City for years 3, 4 and 5 (i.e., 2023-2025 of the DRA) is estimated as 47% of the District's projected 2022 demand.

Table 7-6. 2020 Base Year Multiple Dry Year Drought Allocations

	2021	2022	2023	2024	2025
SFPUC RWS Supply Cutbacks	0%	0%	47%	47%	47%

NOTES:
(a) With system-wide shortages projected starting in 2023, Wholesale RWS demand is assumed to be static for the remainder of the drought sequence per the Water Supply Agreement. Water supply cutbacks in 2023 to 2025 are presented in terms of percentage of the District's 2022 projected demands.
(b) Source: Table F1 from the BAWSCA drought allocation tables dated April 1, 2021.
(c) Five consecutive year drought assumed to start in 2021.
(d) Scenario reflects implementation of the Bay-Delta Plan Amendment in 2023.
(e) Sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests during the first two consecutive dry years, prior to implementation of the Bay-Delta Plan Amendment.

7.5.3 Drought Risk Assessment Total Water Supply and Use Comparison

As described in Chapter 6, the Bear Gulch District derives its water supply from a combination of both imported surface water supply purchased from the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS) and local surface water supply from Bear Gulch Creek.

As shown in Table 7-3, the District's supply is expected to be sufficient to meet demands in normal year conditions. However, based on SFPUC dry year cutbacks (discussed in further detail in Appendix I), the District is expected to experience significant shortfalls during single dry and multiple dry year conditions, as shown in Table 7-4 and Table 7-5.

For the purposes of this UWMP, the District conservatively assumes that local surface water supplies will be zero during single dry and multiple dry years over the planning horizon. Dry year RWS supply availability is calculated in accordance with Table 7-6, as a percentage of projected RWS demands for each base year consistent the revised BAWSCA Drought Methodology that assumes equal percent cutbacks across all Wholesale Agencies.

Table 7-7 provides a comparison of the water supply sources available to the District with the total projected water use for an assumed drought period of 2021 through 2025. This includes current climate change conditions. As described in Section 4.2.6, the District's demand forecast model generates separate forecasts for: (1) normal weather conditions, (2) wet-year weather conditions, (3) single-year dry weather conditions, and (4) multi-year dry weather conditions. The DRA is based on the District's multi-year dry weather demand forecast.

Cal Water has developed a Water Shortage Contingency Plan (WSCP, Appendix L) to address water shortage conditions resulting from any cause (e.g., droughts, impacted distribution system infrastructure, regulatory-imposed shortage restrictions, etc.). The WSCP identifies a variety of actions that Cal Water will implement to reduce demands and further ensure supply reliability at various levels of water shortage.

Given the current uncertainty, Cal Water could update its DRA prior to the 2025 UWMP update if significant new information becomes available. CWC §10635(b) permits urban water suppliers to conduct an interim update or updates to their DRA within the five-year cycle of its UWMP update. Cal Water anticipates that by the 2025 UWMP update, SFPUC will provide more specific information about the AWSP, with estimated water supply contributions from such projects. Additionally, Cal Water expects that SFPUC will provide more specific information and a refined estimate of the Bay-Delta Plan Amendment impacts to the SFPUC supply. Further, it is anticipated that the Wholesale Customers will negotiate a revised Tier Two allocation formula that could affect each agency's share of available supplies in drought years relative to what has been presented herein.

Cal Water recommends that users of its 2020 UWMP contact District staff for potential updates about its water supply reliability and the DRA before using the 2020 UWMP drought cutback projections for their planning projects and referencing the drought allocations.

Table 7-7. Five-Year Drought Risk Assessment Tables (DWR Table 7-5)

2021	Total
Total Water Use	13,690
Total Supplies	13,690
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	N/A

2022	Total
Total Water Use	13,689
Total Supplies	13,689
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	N/A

2023	Total
Total Water Use	13,695
Total Supplies	7,258
Surplus/Shortfall w/o WSCP Action	(6,437)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	6,437
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	47%

Table 7-7. Five-Year Drought Risk Assessment Tables (DWR Table 7-5)

2024	Total
Total Water Use	13,707
Total Supplies	7,265
Surplus/Shortfall w/o WSCP Action	(6,442)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	6,442
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	47%

2025	Total
Total Water Use	13,699
Total Supplies	7,260
Surplus/Shortfall w/o WSCP Action	(6,438)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	6,438
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	47%
NOTES: (a) Volumes are in units of AF.	

Chapter 8
Water Shortage Contingency Planning

☑ ***CWC § 10640***

(a) Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

(b) Every urban water supplier required to prepare a water shortage contingency plan shall prepare a water shortage contingency plan pursuant to Section 10632. The supplier shall likewise periodically review the water shortage contingency plan as required by paragraph (10) of subdivision (a) of Section 10632 and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

The Water Shortage Contingency Plan (WSCP) for the Bear Gulch District is included in this Urban Water Management Plan (UWMP) as Appendix L. The WSCP serves as a standalone document to be engaged in the case of a water shortage event, such as a drought or supply interruption, and defines specific policies and actions that will be implemented at various shortage level scenarios. The primary objective of the WSCP is to ensure that the District has in place the necessary resources and management responses needed to protect health and human safety, minimize economic disruption, and preserve environmental and community assets during water supply shortages and interruptions. Consistent with CWC §10632, the WSCP includes six levels to address shortage conditions ranging from up to 10 percent to greater than 50 percent shortage, identifies a suite of demand mitigation measures for the District to implement at each level, and identifies procedures for the District to annually assess whether or not a water shortage is likely to occur in the coming year, among other things.

A summary of the key elements of the WSCP including water shortage levels and demand-reduction actions is shown in Table 8-1, Table 8-2, and Table 8-3. Additional details are provided in Appendix L.

Table 8-1. Water Shortage Contingency Plan Levels (DWR Table 8-1)

Shortage Level	Percent Shortage Range	Shortage Response Actions
1	Up to 10%	Demand reduction (See Table 8-2)
2	Up to 20%	Demand reduction (See Table 8-2)
3	Up to 30%	Demand reduction (See Table 8-2)
4	Up to 40%	Demand reduction (See Table 8-2)
5	Up to 50%	Demand reduction (See Table 8-2)
6	>50%	Demand reduction (See Table 8-2)
NOTES:		

Table 8-2. Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
1	Other	8%	1. Limit landscape irrigation to specific times 2. Customers must repair leaks, breaks, and malfunctions in a timely manner 3. Restrict or prohibit runoff from landscape irrigation 4. Prohibit application of potable water to outdoor landscapes within 48 hours of measurable rainfall 5. Prohibit use of potable water for washing hard surfaces 6. Lodging establishments must offer opt out of linen service	Yes
1	Other	--	1. Expand Public Information/Media Campaign 2. Water Bill Inserts 3. Promote online water waste reporting 4. Expand Rebates or Giveaways of Plumbing Fixtures and Devices 5. Expand Rebates for Landscape Irrigation Efficiency 6. Expand CII Water Use Surveys 7. Expand Res Water Use Surveys	No

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
2	Other	16%	1. Continue with Stage 1 restrictions and prohibitions except where superseded by more stringent actions. 2. Prohibit the use of non-recirculating systems in all new conveyer car wash and commercial laundry systems 3. Prohibit the use of single pass cooling systems in new connections 4. Restaurants may only serve water upon request 5. No watering of landscape of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development 6. Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Yes
2	Other	--	1. Continue with Stage 1 actions except where superseded by more stringent actions. 2. Water Efficiency Workshops, Public Events	No

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
			3. Offer Water Use Surveys 4. Provide Rebates or Giveaways of Plumbing Fixtures and Devices 5. Provide Rebates for Landscape Irrigation Efficiency	
3	Other	26%	1. Continue with Stage 1 restrictions and prohibitions except where superseded by more stringent actions. 2. Landscape - Limit landscape irrigation to 1-3 days/week 3. Landscape - Prohibit irrigation of ornamental turf on public street medians with potable water 4. Prohibit Filling Ornamental Lakes or Ponds	Yes
3	Other	--	1. Continue with Stage 1 actions except where superseded by more stringent actions. 2. Home or Mobile Water Use Reports 3. Decrease Frequency and Length of Line Flushing 4. Reduce System Water Loss 5. Increase Water Waste Patrols/Enforcement 6. Implement Drought Rate Structure and Customer Water Budgets (Res)	No

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
			7. Implement Drought Rate Structure and Customer Water Budgets (CII)	
4	Other	34%	1. Continue with Stage 1 restrictions and prohibitions except where superseded by more stringent actions. 2. Prohibit use of potable water for construction and dust control 3. Prohibit use of potable water for street washing 4. Prohibit vehicle washing except with recycled water	Yes
4	Other	35	1. Continue with Stage 1 actions except where superseded by more stringent actions. 2. Promote / Expand Use of Recycled Water	No
5	Other	43%	1. Continue with Stage 1 restrictions and prohibitions except where superseded by more stringent actions. 2. Require net zero demand Increase on new water service connections 3. Prohibit filling of pools 4. Prohibit single-pass cooling systems	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
5	Other	--	1. Continue with Stage 1 actions except where superseded by more stringent actions. 2. Require Pool Covers	No
6	Other	57%	1. Continue with Stage 1 restrictions and prohibitions except where superseded by more stringent actions. 2. Moratorium on new water service connections 3. Prohibit all landscape irrigation	Yes
NOTES:				

Table 8-3. Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*
NOTES:			

Chapter 9
Demand Management Measures

☑ ***CWC § 10631 (e)***

Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:

(i) Water waste prevention ordinances.

(ii) Metering.

(iii) Conservation pricing.

(iv) Public education and outreach.

(v) Programs to assess and manage distribution system real loss.

(vi) Water conservation program coordination and staffing support.

(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.

This chapter provides a summary of past and planned demand management measure (DMM) implementation in the Bear Gulch District (also referred to herein as the "District"), as well as an overview of the expected water savings.

This chapter contains the following sections:

9.1 Demand Management Measures for Wholesale Agencies

9.2 Demand Management Measures for Retail Suppliers

9.3 Implementation over the Past Five Years

9.4 Implementation to Achieve Water Use Targets

9.5 Water Use Objectives

9.1 Demand Management Measures for Wholesale Agencies

Because the District is a retail water supplier, this section does not apply.

9.2 Demand Management Measures for Retail Suppliers

California Water Service Company (Cal Water) centrally administers its conservation programs for all the districts it operates. For purposes of this section, these programs have been grouped in accordance with the DMM categories in CWC §10631(e). These categories are:

(i) Water waste prevention ordinances
(ii) Metering
(iii) Conservation pricing
(iv) Public education and outreach
(v) Programs to assess and manage distribution system real loss
(vi) Water conservation program coordination and staffing support, and
(vii) Other demand management measures

Following are descriptions of the conservation programs Cal Water operates within each of these DMM categories. The District's Conservation Master Plan, provided in Appendix M, contains additional information on Cal Water's conservation programs.

9.2.1 Water Waste Prevention Ordinances

Cal Water's enforcement of water waste prevention and water use restrictions is authorized and overseen by the California Public Utilities Commission via Rule 14.1 or Schedule 14.1. Local government in districts operated by Cal Water may also adopt ordinances regulating water use. Cal Water coordinates its efforts to prevent water waste with the appropriate local governmental entities.

Rule 14.1 defines the District's Water Shortage Contingency Plan (WSCP, Appendix L), including its prohibitions on water waste and restrictions on water use. Prohibitions include:

- Use of potable water through a broken or defective plumbing fixture or irrigation system when Cal Water has notified the customer in writing to repair the broken or defective plumbing fixture or irrigation system, and the customer has failed to effect such repairs within seven (7) business days of receipt of such notice.
- The application of potable water to landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures.
- The use of a hose that dispenses potable water to wash vehicles, including cars, trucks, buses, boats, aircraft, and trailers, whether motorized or not, except where the hose is

fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use.

Restrictions on water use during shortages include, but are not necessarily limited to:

- Outdoor irrigation restrictions in terms of time of day and weekly frequency.
- Obligations to fix leaks, breaks, or malfunctions within five (5) business days of written notification by Cal Water.
- Application of potable water to driveways and sidewalks.
- The use of potable water in a water feature, except where the water is part of a recirculating system.
- The application of potable water to outdoor landscapes during and within 48 hours after measurable rainfall.
- The serving of drinking water other than upon request in eating or drinking establishments.
- Irrigation of ornamental landscape on public street medians.
- Irrigation outside of newly constructed homes and buildings with potable water in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.
- Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guest room using clear and easily understood language.
- Limits on filling ornamental lakes or ponds.
- Use of potable water for street cleaning with trucks, except for initial wash-down for construction purposes.
- Use of potable water for construction purposes, such as consolidation of backfill, dust control, or other uses unless no other source of water or other method can be used.

9.2.2 Metering

☑ ***CWC § 526 (a)***

Notwithstanding any other provision of law, an urban water supplier that, on or after January 1, 2004, receives water from the federal Central Valley Project under a water service contract or subcontract … shall do both of the following:

(1) On or before January 1, 2013, install water meters on all service connections to residential and nonagricultural commercial buildings constructed prior to January 1, 1992, located within its service area.

(2) On and after March 1, 2013, or according to the terms of the Central Valley Project water contract in operation, charge customers for water based on the actual volume of deliveries, as measured by a water meter.

☑ ***CWC § 527 (a)***

(a) An urban water supplier that is not subject to Section 526 shall do both of the following:

(1) Install water meters on all municipal and industrial service connections located within its service area on or before January 1, 2025.

The District meters all service connections and bills customers for water use monthly. Cal Water is also piloting automatic meter reading (AMR) and advanced metering infrastructure (AMI) in several of its districts. AMI may be used by Cal Water in the future to detect and alert households of leaks and other possible problems as well as to provide customers with tailored water use information to help them use water more efficiently.

9.2.3 Conservation Pricing

The CPUC reviews and authorizes District water rates in a General Rate Case every three years. Currently, the District uses a three-tier increasing block rate design for residential water use and a single-tier uniform rate design for non-residential use. The District provides rate assistance to lower income households through its Customer Assistance Program (CAP).

9.2.4 Public Education and Outreach

The District's public outreach program is divided into four components, as follows:

Public Information Program – Cal Water operates an extensive public information program to provide information to customers on ways to use water efficiently and to market its conservation programs through multiple media outlets, including the Cal Water website, direct mail and bills, digital media, social media, and email.

School Education Program - Cal Water's school education program includes the Cal Water H2O Challenge, a project-based learning competition for grades 4-6, individual student competitions

for grades K-12 and general information and learning materials for students and teachers. Cal Water deploys its school education program in all its districts. Cal Water H2O Challenge is a project-based competition for classrooms, grades 4-6. The program is offered in partnership with DoGoodery, the California Association of Science Educators (CASE), and the WestEd K-12 Alliance. The program aligns with the Common Core State Standards and the Next Generation Science Standards. The Cal Water H2O Challenge offers a unique opportunity for upper elementary teachers to facilitate their students' learning of standards-based content, while developing the core understanding of environmental principles necessary to becoming science-literate citizens.

Smart Landscape Tune-Up Program – This program provides customers with an irrigation system evaluation and installation of approved efficient irrigation system equipment, such as a smart irrigation controller and high-efficiency sprinkler nozzles. The program also includes irrigation system adjustments and detection and repair of irrigation system leaks. This program is available to all Cal Water customers at no charge.

Residential Customer Portal – Through its residential customer portal, Cal Water provides tailored assistance to each residential customer via customized water-efficiency targets, water savings calculators, and customer-specific recommendations for programs and water-saving tips.

Non-Residential Customer Assistance – Cal Water provides tailored assistance to commercial customers through customized incentives, commercial water surveys, and large landscape water use surveys. The non-residential assistance program helps commercial customers efficiently use water for sanitation/cleaning, heating/cooling, process, and landscape purposes.

9.2.5 Programs to Assess and Manage Distribution System Real Loss

Cal Water took part in the California Water Loss Technical Assistance Program (TAP) in 2016 and 2017. Cal Water conducts regular distribution system audits using the American Water Works Association (AWWA) Free Water Audit Software. Cal Water is developing a Water Loss Control Optimization Plan and Water Loss Control Policy to guide future water loss management and has solicited technical support with respect to:

- Satisfying current and future CPUC and state water loss standards and regulations
- Improving audit data and validity scores
- Implementing cost-effective water loss control actions

Recently, Cal Water has created a Water Loss Program Analyst position to coordinate and oversee these activities.

9.2.6 Water Conservation Program Coordination and Staffing Support

The CPUC reviews and authorizes Cal Water conservation program and staffing level in a general rate case every three years. Currently, Cal Water has nine full-time conservation positions, as follows:

- Director of Water Resource Sustainability,
- Conservation Program Manager,
- Research, Analytics and Reporting Manager,
- Water Resource Sustainability Analyst,
- Water Loss Program Analyst,
- Three Conservation Program Coordinators, and
- Conservation Assistant.

These staff manage all aspects of Cal Water's conservation programs that are run in 24 districts serving a combined population of 1.8 million people.

9.2.7 Other Demand Management Measures

In addition to the DMM programs described above, Cal Water operates rebate, give-away, and direct installation programs aimed at plumbing fixture replacement and irrigation equipment and landscape efficiency improvements. Following are brief descriptions of each of these DMMs.

High-Efficiency Toilet Replacement – This program replaces old toilets with MaP certified high-efficiency toilets via financial rebates, direct installation, or direct distribution.[43] Current rebate amounts are up to $50/toilet for residential toilet replacement and up to $100/toilet for commercial toilet replacement.

High-Efficiency Urinal Replacement – This program replaces old urinals with high-efficiency urinals meeting the state's 0.125 gallon per flush water use standard via financial rebates and direct installation. While available to all non-residential customers, the program targets sites with higher-than-average bathroom utilization, such as restaurants and office buildings. The current rebate amount is up to $150/urinal.

Clothes Washer Replacement – This program provides a financial rebate to replace an old inefficient clothes washer with a new high-efficiency washer. The program is available to all residential and multi-family customers. The current rebate amount is up to $150/washer.

Residential Conservation Kit Distribution – This program offers residential customers conservation kits featuring a range of water-saving plumbing retrofit devices. The kits are

[43] For information on MaP certified toilets, see: https://www.map-testing.com/.

available at no charge and include two high-efficiency showerheads (1.5 gpm), two bathroom faucet aerators (1.0 gpm), one kitchen faucet aerator (1.5 gpd), toilet leak tablets, and an outside multi-function, full-stop hose nozzle.

Smart Irrigation Controller Installation – This program provides a financial rebate for the installation of a smart irrigation controller that automatically adjusts watering schedule in response to changing weather conditions. The current rebate amount is $125/controller for residential customers and $25/station for commercial customers.

High-Efficiency Sprinkler Nozzle Rebate – This program provides a financial rebate for the installation of high-efficiency sprinkler nozzles. This program is available to all Cal Water customers. The current rebate amount is $5/nozzle.

Large Rotary Nozzle Rebate – This program provides a financial rebate for the installation of high-efficiency large rotary nozzles. This program is available to all Cal Water customers. The current rebate amount is up to $30/nozzle toward the nozzle purchase cost and up to $8/spray body toward installation cost, if installed by a C-27 licensed landscape contractor.

Spray Body with Integrated Pressure Regulation and Check Valve Rebate – This program provides a financial rebate for the installation of high-efficiency spray bodies with integrated pressure regulation. This program is available to all Cal Water customers. The current rebate amount is up to $10/body toward the spray body purchase cost and up to $8/spray body toward installation cost, if installed by a C-27 licensed landscape contractor.

Turf Replacement Rebate – This program provides a financial rebate for replacement of turf with approved drought-tolerant landscaping. Cal Water operated this program in 2015/16 as a drought response measure. The program will be re-started as part of Cal Water's irrigation equipment/landscape upgrade program offerings.

Table 9-1 summarizes the DMMs available to District customers at the time this Plan was prepared.

Table 9-1. Cal Water DMMs Available to District Customers

Programs Offered	Customer Eligibility		
	Single-Family	Multi-Family	Commercial
Plumbing Fixture Replacement			
High-Efficiency Toilet Replacement	✓	✓	✓
High-Efficiency Urinal Replacement			✓
High-Efficiency Clothes Washer Rebate	✓	✓	
Conservation Kits	✓	✓	
Irrigation Equipment/Landscape Upgrades			
Smart Irrigation Controller Rebate	✓	✓	✓
High-Efficiency Sprinkler Nozzle Rebate	✓	✓	✓
Large Rotary Nozzle Rebate		✓	✓
Spray Body Rebate		✓	✓
Turf Replacement Rebate	✓	✓	✓
Customer Assistance			
Smart Landscape Tune-Up Program	✓	✓	✓
Residential Customer Portal	✓		
Non-Residential Customer Assistance		✓	✓

9.3 Implementation over the Past Five Years

Table 9-2 summarizes program implementation for the previous five years. Estimated water savings do not include savings from water waste prevention ordinances, conservation pricing, public information, or distribution system water loss management. Cal Water uses the Alliance for Water Efficiency's Water Conservation Tracking Tool to estimate water savings.

Table 9-2. Implementation of Customer DMMs: 2016-2020

Indoor Programs	2016 – 2020 Total	Average Annual
Toilets & Urinals (number distributed)	1,933	387
Clothes Washers (number distributed)	325	65
Conservation Kits (number distributed)	238	48
Outdoor Programs		
Smart Controllers (number distributed)	422	84
Nozzles & Spray Bodies (number distributed)	1,206	241
Turf Buy-Back (sq ft removed)	52,850	10,570
Residential Assistance Programs		
Surveys/Audits (homes receiving)	60	12
Non-Residential Assistance Programs		
Surveys/Audits (sites receiving)	5	1
Large Landscape Reports (sites receiving)	78	16
Estimated Water Savings (AF)	480	96
NOTES: Estimated water savings for 2016-2020. DMMs will continue to generate savings after 2020 for their useful life.		

9.4 Implementation to Achieve Water Use Targets

All the DMMs described above contributed to the District's compliance with its SB X7-7 2020 target GPCD.

9.5 Water Use Objectives (Future Requirements)

CWC §10609 requires that urban retail water suppliers develop new water use objectives that are based on specific standards for certain water use sectors. These water use objectives will not be developed until 2023. Suppliers are encouraged in this UWMP cycle to consider how they will align their conservation management actions in order to meet these future obligations.

As noted above, Cal Water's conservation programs are subject to review and approval by the CPUC through a General Rate Case every three years. In making conservation program recommendations to the CPUC, Cal Water carefully considers how they will advance multiple objectives, including compliance with the pending water use objectives. Specific objectives identified in Cal Water's most recent General Rate Case included:

- Maintaining continuity with and furthering implementation of conservation programs authorized by the previous General Rate Case.
- Preserving gains in water conservation achieved during the 2013-2017 drought.
- Ensuring Cal Water districts are well-positioned to comply with state regulations and policies pertaining to water conservation, water loss management, and groundwater management, including Executive Order B-37-16, SB 555, and the Sustainable Groundwater Management Act (SGMA).
- Advancing cost-effective water use efficiency alternatives in districts with high water supply costs.

Cal Water developed a scoring methodology to adjust conservation programs and budgets to further these objectives. The methodology specifically considers five distinct conservation policy drivers:

1. State Conservation Standards and Water Use Objectives
2. SGMA Compliance
3. SB 555 Water Loss Management Requirements
4. Commercial, Institutional, and Industrial (CII) Water Management
5. Avoided Water Cost and Affordability

The methodology assigns greater weight to the State Conservation Standards and Water Use Objectives and SGMA Compliance policy drivers, reflecting their importance in terms of overall water resources management.

Scoring for the SGMA Compliance policy driver is based on groundwater basin priority, district dependence on groundwater supply, and basin adjudication status. The highest scores are assigned to districts in unadjudicated and critically overdrafted or high priority basins where groundwater comprises more than 45 percent of the water supply. The Bear Gulch District ranked in the bottom third of Cal Water's districts for this policy driver.

Scoring for the State Conservation Standards and Water Use Objectives policy driver is based on four metrics that are used to gauge which districts are most likely to require adjustments to their conservation program mix or level of implementation to comply with the new standards. These metrics are:

1. Residential per capita landscape area
2. Residential per capita turf area
3. Size and number of large residential landscapes
4. Difference between a simulated water use budget and average water use for 2011-15

The Bear Gulch District ranked in the top third of Cal Water's districts for this policy driver.

Scoring for the SB 555 Water Loss Management Requirements policy driver is based on the district's infrastructure leakage index (ILI) from its most recent validated water loss audit. The ILI is a performance indicator of real (physical) water loss from the water distribution system. A high ILI indicates possible distribution system inefficiencies and may also indicate significant water system leakage. Proposed adjustments to funding for water loss management are based on the ILI scoring criteria. The Bear Gulch District ranked in the bottom third of Cal Water's districts for this policy driver.

Scoring for the CII Water Management policy driver is based on the ratio of CII water uses to total water uses in a district. The Bear Gulch District ranked in the bottom third of Cal Water's districts for this policy driver.

Scoring for the Avoided Water Cost and Affordability policy driver is based on the District's avoided cost of water supply, as estimated by the California Urban Water Conservation Council (CUWCC)/Water Research Foundation Avoided Cost Model. The Bear Gulch District ranked in the top third of Cal Water's districts for this policy driver.

The combination of scores on each policy driver were used by Cal Water to recommend to the CPUC in its most recent General Rate Case adjustments to the conservation budgets of its districts. The purpose of the adjustments is to increase Cal Water's capacity to deploy conservation programs in districts expected to face the most significant regulatory and water management challenges in coming years. Recommended adjustments ranged from a low of 5 percent to a high of 25 percent. The recommended adjustment for the Bear Gulch District was 15 percent.

Chapter 10
Plan Adoption, Submittal, and Implementation

☑ ***CWC § 10621 (b)***

Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

This chapter provides information on a public hearing, the adoption process for the Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP), the adopted UWMP and WSCP submittal process, plan implementation, and the process for amending the adopted UWMP or WSCP. This chapter includes the following sections:

10.1 Inclusion of All 2020 Data

10.2 Notice of Public Hearing

10.3 Public Hearing and Adoption

10.4 Plan Submittal

10.5 Public Availability

10.6 Notification of Public Utilities Commission

10.7 Amending an Adopted UWMP or Water Shortage Contingency Plan

10.1 Inclusion of All 2020 Data

This UWMP includes the water use and planning data for the entire calendar year of 2020, per the UWMP Guidebook 2020.

10.2 Notice of Public Hearing

☑ ***CWC § 10642***

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

Prior to adopting the Plan, California Water Service Company (Cal Water) held a virtual public hearing to present information on its Bear Gulch District (also referred to herein as "District") 2020 UWMP and WSCP on June 9, 2021, 5:00 PM.[44]

Relevant entities were notified of the UWMP and WSCP review at least 60 days prior to the public hearing, including: (1) cities and counties, and (2) the public. These same entities were noticed again with the specific date, time and location of the hearing at least two weeks prior to the public hearing. The notice to the public, as specified in Government Code 6066, and letters to relevant agencies can be found in Appendix C and Appendix B, respectively.

10.2.1 Notice to Cities and Counties

☑ ***CWC § 10631 (a)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

Table 10-1 lists the cities and counties that were notified. Copies of these letters are provided in Appendix B.

[44] Restrictions related to the COVID-19 pandemic prevented the District from holding an in-person public hearing as previously planned.

Table 10-1. Notification to Cities and Counties (DWR Table 10-1)

City Name	60 Day Notice	Notice of Public Hearing
Town of Atherton	X	X
Town of Portola Valley	X	X
Town of Woodside	X	X
City of Menlo Park	X	X
County Name	**60 Day Notice**	**Notice of Public Hearing**
San Mateo County	X	X
Other Agency Name	**60 Day Notice**	**Notice of Public Hearing**
Bay Area Water Supply and Conservation Agency	X	X
San Francisco Public Utilities Commission	X	X
Silicon Valley Clean Water	X	X
Tuolumne River Trust	X	X
NOTES:		

10.2.2 Notice to the Public

Notification to the public and to cities and counties also provided instructions on how to view the 2020 UWMP and WSCP prior to the hearing, the revision schedule, and contact information of the UWMP and WSCP preparer. A copy of this notice is included in Appendix C.

10.3 Public Hearing and Adoption

☑ ***CWC § 10608.26***

(a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:

(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.

(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.

(3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.

☑ ***CWC § 10621 (b)***

Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

The deadline for public comments on the UWMP and WSCP was June 11, 2021. The final Plan was formally adopted by Cal Water's Vice President of Engineering June 20, 2021, and was submitted to California Department of Water Resources (DWR) within 30 days of approval. Appendix N presents a copy of the signed Resolution of Plan Adoption. Appendix B contains the following:

- Letters sent to and received from various agencies regarding this plan, and
- Correspondence between Cal Water and participating agencies.

10.4 Plan Submittal

☑ ***CWC § 10621 (f)***

(1) Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.

☑ ***CWC § 10635 (c)***

The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

☑ ***CWC § 10644 (a)***

(1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1) shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

This UWMP and WSCP were submitted to DWR within 30 days of adoption and by the July 1, 2021 deadline. The submittal was done electronically through Water Use Efficiency Data Portal, an online submittal tool. The adopted UWMP and WSCP were also sent to the California State Library and to the cities and counties listed in Table 10-1 no later than 30 days after adoption.

10.5 Public Availability

☑ ***CWC § 10645***

(a) Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

(b) Not later than 30 days after filing a copy of its water shortage contingency plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

On or about May 10, 2021, a an electronic version of the draft 2020 UWMP and WSCP were made available for review by visiting Cal Water's website: https://www.calwater.com/conservation/uwmp-review/.[45]

[45] Restrictions related to the COVID-19 pandemic prevented the District from making a printed hard-copy available for public review as previously planned.

10.6 Notification of Public Utilities Commission

☑ ***CWC § 10621 (c)***

An urban water supplier regulated by the Public Utilities Commission shall include its most recent plan and water shortage contingency plan as part of the supplier's general rate case filings.

Cal Water is an urban water supplier regulated by the California Public Utilities Commission. Cal Water included the District's 2020 UWMP and WSCP as part of its general rate case filings.

10.7 Amending an Adopted UWMP or Water Shortage Contingency Plan

☑ ***CWC § 10644 (b)***

If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its water shortage contingency plan prepared pursuant to subdivision (a) of Section 10632 no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.

If the 2020 UWMP or WSCP is amended, each of the steps for notification, public hearing, adoption and submittal will also be followed for the amended document.

Appendix A: UWMP Act Checklist

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and Overview	Chapter 1
x	x	Chapter 1	10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a supplier may also choose to include a simple description at the beginning of each chapter.	Summary	Section 1.6
x	x	Section 2.2	10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.4 and Table 2-1
x	x	Section 2.6	10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.5 and Table 2-4
x	x	Section 2.6.2	10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	Section 2.5
x		Section 2.6, Section 6.1	10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	Section 2.5.1
	x	Section 2.6	10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	N/A
x	x	Section 3.1	10631(a)	Describe the water supplier service area.	System Description	Chapter 3
x	x	Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3
x	x	Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Section 3.4 and Table 3-1

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 3.4 and Table 3-2
x	x	Sections 3.4 and 5.4	10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Setion 3.4 and Table 3-2
x	x	Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	Section 3.5
x	x	Section 4.2	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2 and Tables 4-1 to 4-3
x	x	Section 4.2.4	10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Section 4.2.3
x	x	Section 4.2.6	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System Water Use	Section 4.2.4 and Tables 4-5 and 4-6
x	x	Section 4.2.6	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System Water Use	Section 4.2.4
x	optional	Section 4.3.2.4	10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	System Water Use	Section 4.2.3 and Table 4-4
x	optional	Section 4.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.2.5 and Table 4-7
x	x	Section 4.5	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System Water Use	Section 7.5.3
x		Chapter 5	10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Chapter 5
x		Chapter 5	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 5.5 and Table 5-2
	x	Section 5.1	10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	N/A

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x		Section 5.2	10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Section 5.4
x		Section 5.5	10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5-year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.4
x		Section 5.5 and Appendix E	10608.4	Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SBX7-7 2020 Compliance Form.	Baselines and Targets	Section 5.5
x	x	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	System Supplies	Chapter 7
x	x	Sections 6.1	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, *including changes in supply due to climate change.*	System Supplies	Section 7.1.4
x	x	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	Section 6.9 and Table 6-9A and 6-9B
x	x	Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Section 6.8
x	x	Section 6.2.8	10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Section 6.9
x	x	Section 6.2	10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2
x	x	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.2

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 6.2
x	x	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2
x	x	Section 6.2.2.1	10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	Section 6.2
x	x	Section 6.2.2.4	10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years.	System Supplies	Section 6.2 and Table 6-1
x	x	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Section 6.9
x	x	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	System Supplies	Section 6.7
x	x	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.5.2 and Tables 6-4 and 6-5
x	x	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.3 and Table 6-5
x	x	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.5.3
x	x	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.5.3 and Table 6-4
x	x	Section 6.2.5	10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.5.3

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.3 and Table 6-6
x	x	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6
x	x	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area with quantified amount of collection and treatment and the disposal methods.	System Supplies (Recycled Water)	Section 6.5.2 and Table 6-3
x	x	Section 6.2.8, Section 6.3.7	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	Section 6.8 and Table 6-7
x	x	Section 6.4 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a supplier can readily obtain.	System Suppliers, Energy Intensity	Section 6.11 and Table 6-10
x	x	Section 7.2	10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability.	Water Supply Reliability Assessment	Section 7.1.3
x	x	Section 7.2.4	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.4
x	x	Section 7.3	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.2 and 7.3 Tables 7-2 to 7-5
x	x	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Section 7.5
x	x	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	Section 7.5
x	x	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Section 7.5

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Section 7.5 and Table 7-7
x	x	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Section 7.5
x	x	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Appendix L
x	x	Chapter 8	10632(a)(1)	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.2	10632(a)(2)(A)	Provide the written decision- making process and other methods that the supplier will use each year to determine its water reliability.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.3	10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.4	10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	Appendix L

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	Appendix L
x	x	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.5 and 8.6	10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water Shortage Contingency Planning	Appendix L
x		Section 8.6	10632(a)(6)	Retail supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.7	10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.7	10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix L

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x		Section 8.8	10632(a)(8)(C)	Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought.	Water Shortage Contingency Planning	Appendix L
x		Section 8.9	10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	Appendix L
x		Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water Shortage Contingency Planning	Appendix L
x	x	Sections 8.12 and 10.4	10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Section 10.3
x	x	Section 8.14	10632(c)	Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan.	Water Shortage Contingency Planning	Section 10.4
	x	Sections 9.1 and 9.3	10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	N/A
x		Sections 9.2 and 9.3	10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Chapter 9
x		Chapter 10	10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan Adoption, Submittal, and Implementation	Section 10.3
x	x	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1.	Plan Adoption, Submittal, and Implementation	Section 10.2

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 10.4	10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	Chapter 10
x	x	Section 10.2.2	10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Section 10.2.1
x	x	Section 10.3.2	10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3
x	x	Section 10.4	10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Section 10.4	10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Sections 10.4.1 and 10.4.2	10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5
x	x	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5
x	x	Section 10.6	10621(c)	If supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan Adoption, Submittal, and Implementation	Section 10.6
x	x	Section 10.7.2	10644(b)	If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption.	Plan Adoption, Submittal, and Implementation	Section 10.7

Appendix B: Correspondence

- UWMP Notice of Preparation
- District Mailing List
- Growth Projection and Land Use Letter
- UWMP and WSCP Public Draft Comments

Notice of Preparation of Urban Water Management Plan and Water Shortage Contingency Plan - 2020 Update

The Urban Water Management Planning Act (California Water Code §10608–10656) requires that California Water Service (Cal Water) update its Urban Water Management Plan (UWMP) and associated Water Shortage Contingency Plan (WSCP) every 5 years.

Cal Water is currently reviewing its existing UWMP and associated WSCP, which were updated in 2016, and considering revisions for each plan. Coordination with other water suppliers, cities, counties, and community organizations in the region is an important part of the preparation of Cal Water's UWMP and WSCP. We are available to discuss the assumptions used in the development of the plans including available water supply, water demands, land use, as well as other aspects of the plans.

A draft of the 2020 UWMP and WSCP will be made available for public review and a public hearing will be scheduled in Spring 2021. We will notify you when the draft is available for review, how to access it, and details regarding the public hearing.

The updated UWMP and WSCP are due by July 1, 2021. If you would like more information regarding our 2015 UWMP and WSCP and the schedule for updating these documents, or if you would like to participate in the preparation of the 2020 UWMP and WSCP, please contact:

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Senior Engineer
California Water Service
Phone: (408) 367-8338
Email: PlanningInfo@calwater.com

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Warren Slocum
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San Mateo County Board of Supervisors
wslocum@smcgov.org

Bolzowski, Michael R.

From: Bolzowski, Michael R.
Sent: Tuesday, June 1, 2021 9:43 PM
To: slrobinson@menlopark.org
Cc: McCusker, Kevin; Smithson, Dawn; Ken Jenkins (kjenkins@calwater.com); Michael Hurley (mhurley@calwater.com); Maximilian Storms (Max) (mstorms@calwater.com)
Subject: Cal Water's 2020 Draft UWMP for Bear Gulch District
Attachments: Bear Gulch (CM MP) - Cal Water UWMP.pdf

Ms. Jerome-Robinson,

California Water Service (Cal Water) is currently updating its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to reflect changed conditions in the Bear Gulch District.

The State requires all urban water suppliers that provide water for municipal purposes either directly or indirectly to more than 3,000 customers or supply more than 3,000 acre-feet of water annually to prepare an UWMP and WSCP at least once every five years. These documents support Cal Water's long-term resource planning to ensure that adequate water supplies are available to meet existing and future water demands under defined conditions.

Cal Water's estimates of future water demands are based on demographic projections and current and projected land use forecasts for each of its service area. For the Bear Gulch District, Cal Water's water demand forecast is tied to Association of Bay Area Governments (ABAG) census tract level projections of population, housing, and employment. These projections are developed by ABAG through detailed land use modeling of the Bay Area. The areas included in the ABAG land use model include all incorporated and unincorporated areas of the nine-county Bay Area.

The UWMP also incorporates water supply assessments (WSA) for projects in or near the Bear Gulch District into the demand forecast. As additional large-scale projects and/or specified land use planning processes arise (e.g., general plans, specific plans), additional WSAs will be developed to consider their impacts on available supplies.

We have attached the current public review draft of the UWMP, and incorporated WSCP for your review. Please share this with others in your organization that may be interested in the information.

Cal Water is available to discuss the assumptions used in the development of UWMP for the South San Francisco service area, including available supply, water demands, land use, as well as any other aspects of the plan. Should you have any questions or comments, please contact Michael Bolzowski at mbolzowski@calwater.com.

Sincerely,

Michael Hurley
WATER RESOURCES MANAGER
CALIFORNIA WATER SERVICE
(323) 430-0250

Bolzowski, Michael R.

From: Bolzowski, Michael R.
Sent: Tuesday, June 1, 2021 9:45 PM
To: grodericks@ci.atherton.ca.us
Cc: McCusker, Kevin; Smithson, Dawn; Ken Jenkins (kjenkins@calwater.com); Michael Hurley (mhurley@calwater.com); Maximilian Storms (Max) (mstorms@calwater.com)
Subject: Cal Water's 2020 Draft UWMP for Bear Gulch District
Attachments: Bear Gulch (CM TOA) - Cal Water UWMP.pdf

Mr. Rodericks,

California Water Service (Cal Water) is currently updating its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to reflect changed conditions in the Bear Gulch District.

The State requires all urban water suppliers that provide water for municipal purposes either directly or indirectly to more than 3,000 customers or supply more than 3,000 acre-feet of water annually to prepare an UWMP and WSCP at least once every five years. These documents support Cal Water's long-term resource planning to ensure that adequate water supplies are available to meet existing and future water demands under defined conditions.

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Sincerely,

Michael Hurley
WATER RESOURCES MANAGER
CALIFORNIA WATER SERVICE
(323) 430-0250

Bolzowski, Michael R.

From: Bolzowski, Michael R.
Sent: Tuesday, June 1, 2021 9:39 PM
To: 'mcallagy@smcgov.org'
Cc: McCusker, Kevin; Smithson, Dawn; Ken Jenkins (kjenkins@calwater.com); Michael Hurley (mhurley@calwater.com); Maximilian Storms (Max) (mstorms@calwater.com)
Subject: Cal Water's 2020 Draft UWMP for Bear Gulch District
Attachments: Bear Gulch (CoM) - Cal Water UWMP.pdf

Mr. Callagy,

California Water Service (Cal Water) is currently updating its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to reflect changed conditions in the Bear Gulch District.

The State requires all urban water suppliers that provide water for municipal purposes either directly or indirectly to more than 3,000 customers or supply more than 3,000 acre-feet of water annually to prepare an UWMP and WSCP at least once every five years. These documents support Cal Water's long-term resource planning to ensure that adequate water supplies are available to meet existing and future water demands under defined conditions.

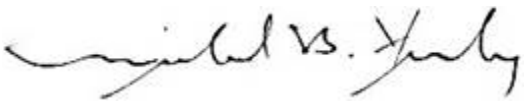
Cal Water's estimates of future water demands are based on demographic projections and current and projected land use forecasts for each of its service area. For the Bear Gulch District, Cal Water's water demand forecast is tied to Association of Bay Area Governments (ABAG) census tract level projections of population, housing, and employment. These projections are developed by ABAG through detailed land use modeling of the Bay Area. The areas included in the ABAG land use model include all incorporated and unincorporated areas of the nine-county Bay Area.

The UWMP also incorporates water supply assessments (WSA) for projects in or near the Bear Gulch District into the demand forecast. As additional large-scale projects and/or specified land use planning processes arise (e.g., general plans, specific plans), additional WSAs will be developed to consider their impacts on available supplies.

We have attached the current public review draft of the UWMP, and incorporated WSCP for your review. Please share this with others in your organization that may be interested in the information.

Cal Water is available to discuss the assumptions used in the development of UWMP for the South San Francisco service area, including available supply, water demands, land use, as well as any other aspects of the plan. Should you have any questions or comments, please contact Michael Bolzowski at mbolzowski@calwater.com.

Sincerely,



Michael Hurley
WATER RESOURCES MANAGER
CALIFORNIA WATER SERVICE
(323) 430-0250

Bolzowski, Michael R.

From: Bolzowski, Michael R.
Sent: Tuesday, June 1, 2021 9:49 PM
To: jdennis@portolavalley.net
Cc: McCusker, Kevin; Smithson, Dawn; Ken Jenkins (kjenkins@calwater.com); Michael Hurley (mhurley@calwater.com); Maximilian Storms (Max) (mstorms@calwater.com)
Subject: Cal Water's 2020 Draft UWMP for Bear Gulch District
Attachments: Bear Gulch (TM TOPV) - Cal Water UWMP.pdf

Mr. Dennis,

California Water Service (Cal Water) is currently updating its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to reflect changed conditions in the Bear Gulch District.

The State requires all urban water suppliers that provide water for municipal purposes either directly or indirectly to more than 3,000 customers or supply more than 3,000 acre-feet of water annually to prepare an UWMP and WSCP at least once every five years. These documents support Cal Water's long-term resource planning to ensure that adequate water supplies are available to meet existing and future water demands under defined conditions.

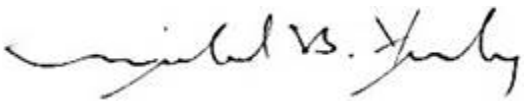
Cal Water's estimates of future water demands are based on demographic projections and current and projected land use forecasts for each of its service area. For the Bear Gulch District, Cal Water's water demand forecast is tied to Association of Bay Area Governments (ABAG) census tract level projections of population, housing, and employment. These projections are developed by ABAG through detailed land use modeling of the Bay Area. The areas included in the ABAG land use model include all incorporated and unincorporated areas of the nine-county Bay Area.

The UWMP also incorporates water supply assessments (WSA) for projects in or near the Bear Gulch District into the demand forecast. As additional large-scale projects and/or specified land use planning processes arise (e.g., general plans, specific plans), additional WSAs will be developed to consider their impacts on available supplies.

We have attached the current public review draft of the UWMP, and incorporated WSCP for your review. Please share this with others in your organization that may be interested in the information.

Cal Water is available to discuss the assumptions used in the development of UWMP for the South San Francisco service area, including available supply, water demands, land use, as well as any other aspects of the plan. Should you have any questions or comments, please contact Michael Bolzowski at mbolzowski@calwater.com.

Sincerely,



Michael Hurley
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CALIFORNIA WATER SERVICE
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Bolzowski, Michael R.

From: Bolzowski, Michael R.
Sent: Tuesday, June 1, 2021 9:57 PM
To: kbryant@woodsidetown.org
Cc: McCusker, Kevin; Smithson, Dawn; Ken Jenkins (kjenkins@calwater.com); Michael Hurley (mhurley@calwater.com); Maximilian Storms (Max) (mstorms@calwater.com)
Subject: Cal Water's 2020 Draft UWMP for Bear Gulch District
Attachments: Bear Gulch (TM TOW) - Cal Water UWMP.pdf

Dear Mr. Bryant,

The attachment with the previous email did not include the draft UWMP. The full attachment is included above.

Sorry for any inconvenience.

Sincerely,

Michael Bolzowski
408-367-8338

From: Bolzowski, Michael R.
Sent: Tuesday, June 1, 2021 9:49 PM
To: kbryant@woodsidetown.org
Cc: McCusker, Kevin <kmccusker@calwater.com>; Smithson, Dawn <dsmithson@calwater.com>; Ken Jenkins (kjenkins@calwater.com) <kjenkins@calwater.com>; Michael Hurley (mhurley@calwater.com) <mhurley@calwater.com>; Maximilian Storms (Max) (mstorms@calwater.com) <mstorms@calwater.com>
Subject: Cal Water's 2020 Draft UWMP for Bear Gulch District

Mr. Bryant,

California Water Service (Cal Water) is currently updating its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to reflect changed conditions in the Bear Gulch District.

The State requires all urban water suppliers that provide water for municipal purposes either directly or indirectly to more than 3,000 customers or supply more than 3,000 acre-feet of water annually to prepare an UWMP and WSCP at least once every five years. These documents support Cal Water's long-term resource planning to ensure that adequate water supplies are available to meet existing and future water demands under defined conditions.

Cal Water's estimates of future water demands are based on demographic projections and current and projected land use forecasts for each of its service area. For the Bear Gulch District, Cal Water's water demand forecast is tied to Association of Bay Area Governments (ABAG) census tract level projections of population, housing, and employment. These projections are developed by ABAG through detailed land use modeling of the Bay Area. The areas included in the ABAG land use model include all incorporated and unincorporated areas of the nine-county Bay Area.

The UWMP also incorporates water supply assessments (WSA) for projects in or near the Bear Gulch District into the demand forecast. As additional large-scale projects and/or specified land use planning processes arise (e.g., general plans, specific plans), additional WSAs will be developed to consider their impacts on available supplies.

We have attached the current public review draft of the UWMP, and incorporated WSCP for your review. Please share this with others in your organization that may be interested in the information.

Cal Water is available to discuss the assumptions used in the development of UWMP for the South San Francisco service area, including available supply, water demands, land use, as well as any other aspects of the plan. Should you have any questions or comments, please contact Michael Bolzowski at mbolzowski@calwater.com.

Sincerely,

Michael Hurley
WATER RESOURCES MANAGER
CALIFORNIA WATER SERVICE
(323) 430-0250

Quality. Service. Value.
calwater.com

Bolzowski, Michael R.

From: Kevin <greenwoodspecialty@gmail.com>
Sent: Wednesday, June 9, 2021 5:03 PM
To: Bolzowski, Michael R.

This is an EXTERNAL EMAIL. Stop and think before clicking a link or opening attachments.

Will Call Water consider a water cut off for abusers. During the last drought Woodside residents averaged 421 gallons p/person p/day. As a household that continues to conserve water we didn't see financial incentives work in the last drought - except your profits may have. Rich people just spent the money rather than any meaningful reduction or restriction.

Kevin Greenwood
(650) 701-7017

Appendix C: Public Meeting Notice

- Public Meeting Notice of Intent
- Proof of Publication
- Public Meeting Presentation

Good Afternoon!

We hope that this note finds you well.

We wanted to provide you with an update on the preparation of our updated Urban Water Management Plans and Water Shortage Contingency Plans.

These plans are a critical component of the steps we take to ensure there are sufficient water supplies to meet the current and future water needs of our customers, and we look forward to working with you on this important project.

Please let us know if you have any questions or need any additional information.

Cal Water Community Affairs

Urban Water Management Plan and
Water Shortage Contingency Plan - 2020 Update

As a defined urban water supplier, California Water Service (Cal Water) is preparing an update to its Urban Water Management Plans (UWMP) and Water Shortage Contingency Plans (WSCP) that will address the water service conditions in our service areas. These documents support a water supplier's long-term resource planning to ensure that adequate water supplies are available to meet existing and future water demands under defined conditions. It is Cal Water's intent to adopt the UWMPs, and the incorporated WSCPs, and file the plans as required with the Department of Water Resources, the California State Library, and any city or county within which Cal Water provides service no later than 30 days after adoption.

Schedule of upcoming actions:

After a public review period, a public meeting to receive comments on the Draft UWMP and WSCP will be held. As the information becomes available for each service area, the electronic copy of the UWMP, WSCP, and information on the public meeting, including a link to participate, will be available at the following internet address:

https://www.calwater.com/conservation/uwmp-review/

If you are unable to attend the scheduled public meeting but want to provide comments regarding the proposed UWMP or WSCP, you may send your comments via email to PlanningInfo@calwater.com.

California Water Service
1720 North 1st Street - San Jose, CA 95112
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EMILY HERNANDEZ
CALIFORNIA WATER SERVICE CO/PLANNING DEPT.
1720 NORTH FIRST ST.
SAN JOSE, CA 95112

CNS 3470053

COPY OF NOTICE

Notice Type: GPN GOVT PUBLIC NOTICE

Ad Description CALIFORNIA WATER SERVICE ? BEAR GULCH DISTRICT

To the right is a copy of the notice you sent to us for publication in the THE ALMANAC. Please read this notice carefully and call us with any corrections. The Proof of Publication will be filed with the County Clerk, if required, and mailed to you after the last date below. Publication date(s) for this notice is (are):

05/21/2021 , 05/28/2021

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NOTICE OF INTENT TO ADOPT AN URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN AND HOLD A PUBLIC MEETING TO RECEIVE COMMENTS ON THE PROPOSED PLANS CALIFORNIA WATER SERVICE – BEAR GULCH DISTRICT

California Water Code (CWC) sections 10610 through 10656, known as the "Urban Water Management Planning Act" (Act), require all urban water suppliers that provide water for municipal purposes either directly or indirectly to more than 3,000 customers or supply more than 3,000 acre-feet of water annually to prepare an Urban Water Management Plan (UWMP) at least once every five years.

UWMPs support a water supplier's long-term resource planning to ensure that adequate water supplies are available to meet existing and future water demands under defined conditions. The UWMP must describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation, and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The UWMP must also address measures for residential, commercial, governmental, and industrial water demand management. Further, Section 10632 of the CWC requires that every urban water supplier shall prepare and adopt a Water Shortage Contingency Plan (WSCP) as part of its plan (UWMP). Section 10632.2 provides that,

"An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan...or reasonable alternative actions, provided that descriptions of the alternative actions are submitted with the annual water shortage assessment report pursuant to Section 10632.1." The WSCP will be incorporated as an appendix of the UWMP.

One of Cal Water's service areas is the Bear Gulch District, which serves Portola Valley, Woodside, Atherton, and portions of Menlo Park and Redwood City, in San Mateo County. As a defined urban water supplier, Cal Water is preparing an update to its UWMP that will address the water service conditions in the Bear Gulch District. It is Cal Water's intent to adopt that UWMP, and the incorporated WSCP, and file that plan as required with the Department of Water Resources, the California State Library, and any city or county within which Cal Water provides service no later than 30 days after adoption.

Schedule of upcoming actions:

On or about May 10, 2021, an electronic copy of the Draft 2020 UWMP and WSCP will be available for review. After a public review period, a public meeting to receive comments on the Draft UWMP and WSCP Plan for the Bear Gulch District will be held online on June 9, 2021, at 5:00 p.m. The electronic copy of the UWMP, WSCP, and additional information on the public meeting, including a link to participate, is available at the following internet address: https://www.calwater.com/conservation/uwmp-review/

If you are unable to attend the scheduled public meeting but want to provide comments regarding the proposed UWMP or WSCP, you may send your comments via email to PlanningInfo@calwater.com. Cal Water will receive comments on the Draft 2021 UWMP and WSCP from May 10 through June 9, 2021.

Please share this notice with others that may have interest in this matter.

5/21, 5/28/21

CNS-3470053#
THE ALMANAC

California Water Service

June 9, 2021

Quality. Service. Value.

Bear Gulch District

2020 Urban Water Management Plan
2020 Water Shortage Contingency Plan

Meeting Agenda

- Introduce California Water Service (CWS) staff and consultants
- Purpose and objectives
- Presentation of the 2020 Urban Water Management Plan (UWMP)
- Presentation of 2020 Water Shortage Contingency Plan (WSCP)
- Drought update
- Public comments and questions

2020 UWMP Update: Public Outreach

- Preliminary information sent to relevant entities in February 2021
- Second notice sent to relevant entities in May 2021
- Two notices posted in local newspaper
- Draft 2020 UWMP and WSCP available for review at **https://www.calwater.com/conservation/uwmp-review/**
- Public hearing

Urban Water Management Planning Act

- Supports long-term water resource planning to ensure adequate supplies
- California Water Code - Sections 10610-10656
- Threshold: Utilities with 3,000+ services or 3,000+ acre-feet per year (AFY) water sales
- At least a 20-year planning horizon, Cal Water's plan covers 25 years
- Must be updated every 5 years and submitted by July 1, 2021
- Basis for SB-610 Water Supply Assessments and SB-221 Water Supply Verifications

UWMP Elements

- Service area description
- Population forecast
- Supply and demand projections through 2045 in normal, single dry and multiple dry years
- Water supply reliability
- Conservation/Demand Management Measures
- Climate change
- Water Shortage Contingency Plan

District Overview

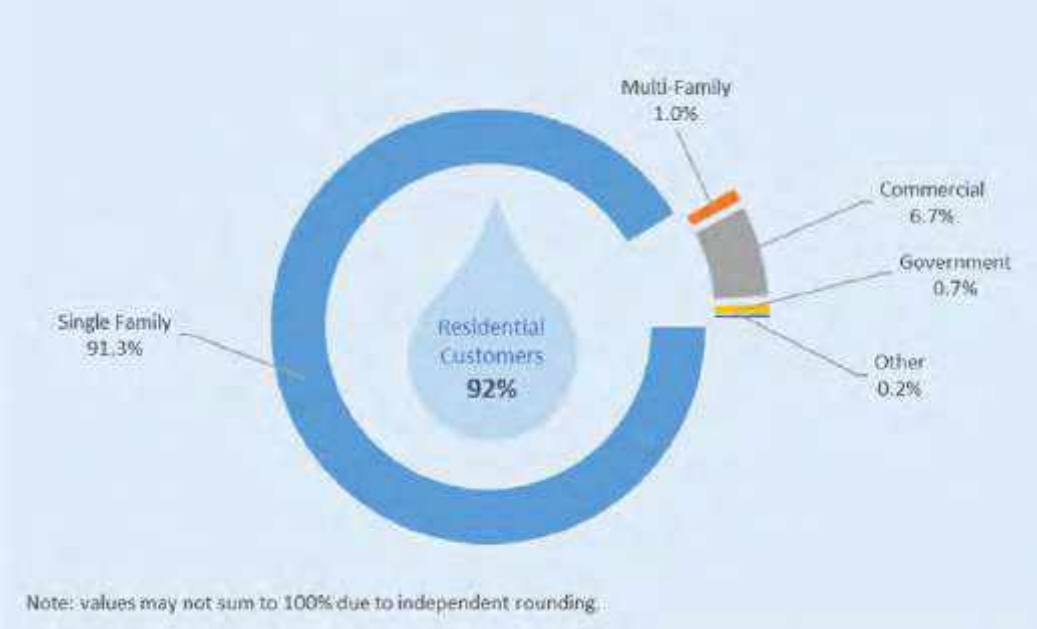
- Serving Bear Gulch District since 1936
- One Public Water System
- Surface water purchased from the San Francisco Public Utilities Commission (SFPUC)
- Local surface water diverted from Bear Gulch Creek

Water Supply Sources

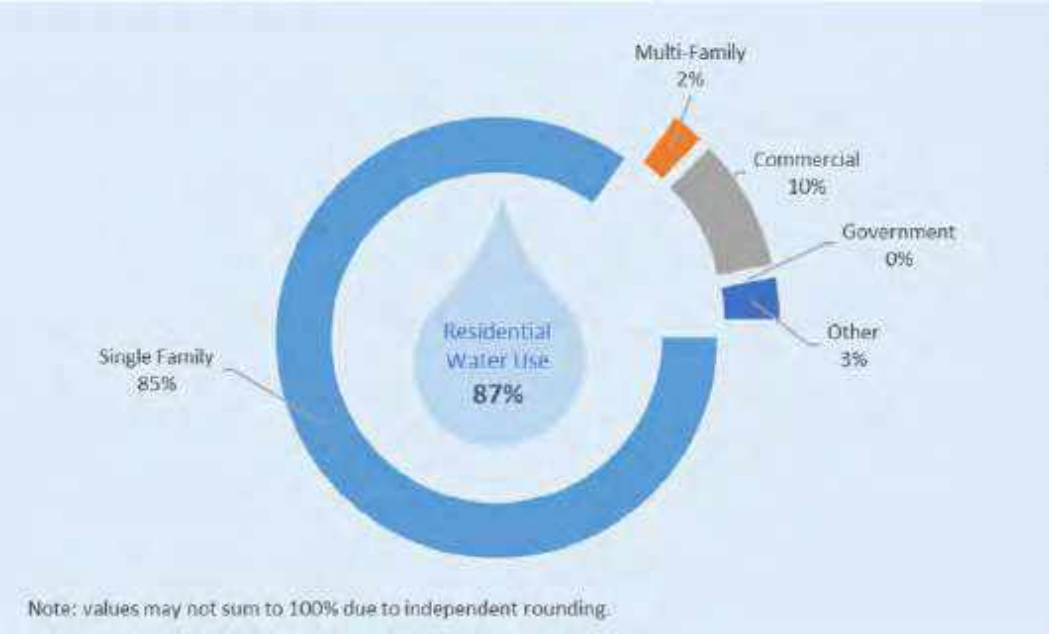
- Main source of water supply is treated water purchased from the SFPUC Regional Water System (RWS)
- Local surface water diverted from Bear Gulch Creek makes up approximately nine percent of annual deliveries
- Cal Water continues to investigate additional supply sources, however there is no current or projected use of recycled water or other supply sources

Distribution of Services/Demand

Types of Customers



Demand



Demand Projection Methodology

- Forecast horizon is beyond 20 years required by UWMP
- Generates normal-, wet-, and dry-year demand forecasts
- Directly considers impacts of climate change
- Demand model uses historical data on services, sales, production, population, and proposed conservation measures
- Regional Growth Forecast: housing and employment growth forecasts based on census-tract level growth forecasts prepared by the Association of Bay Area Governments (ABAG)

Population & Account Projections

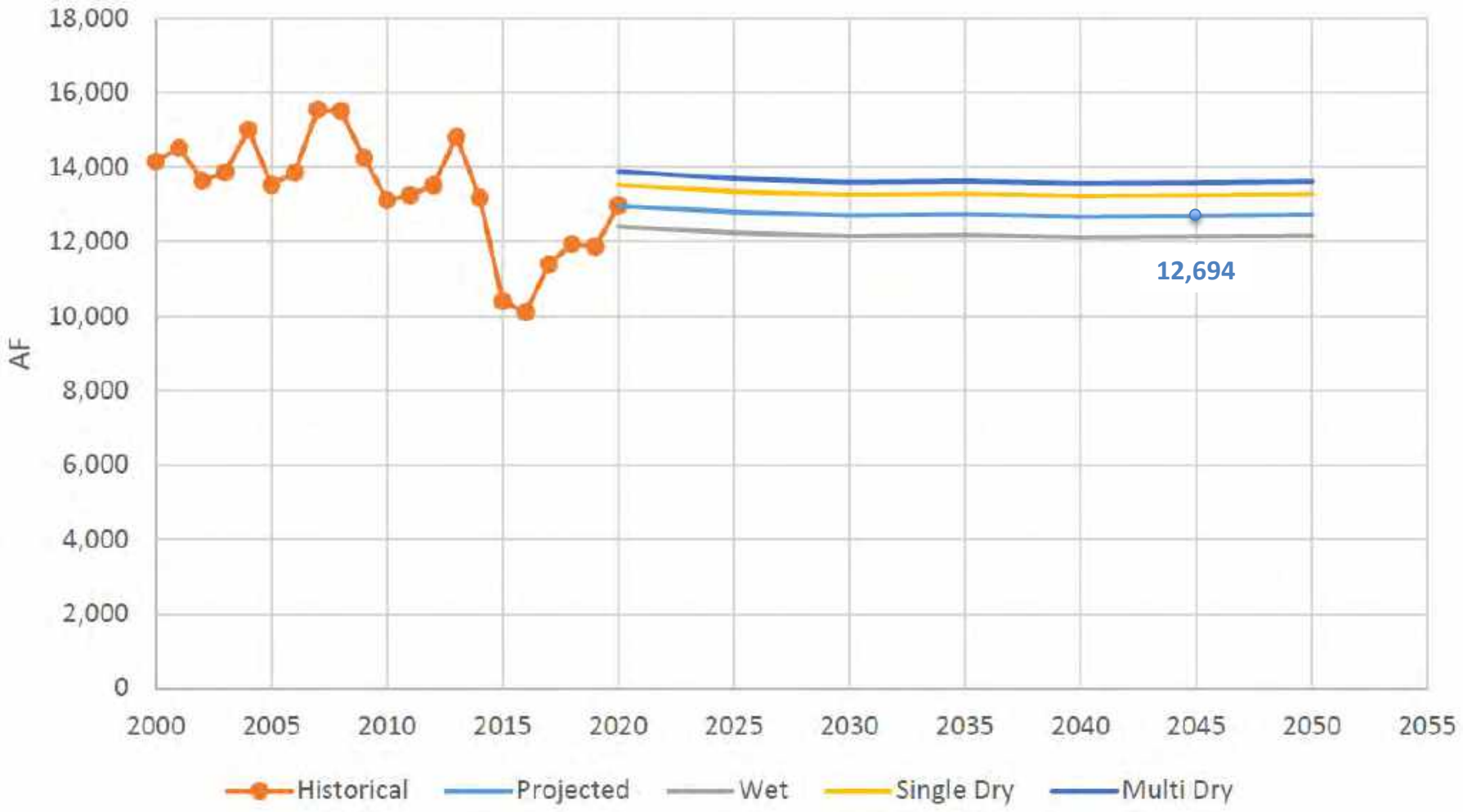
Historical and Projected Population

Historical and Projected Services

Average Demand Per Service

Demands for Potable Water - Projected

- 2045 demand projected to be 12,694 acre-feet per year
- 2% decrease relative to 2020 demands



SB X7-7 (20% by 2020)

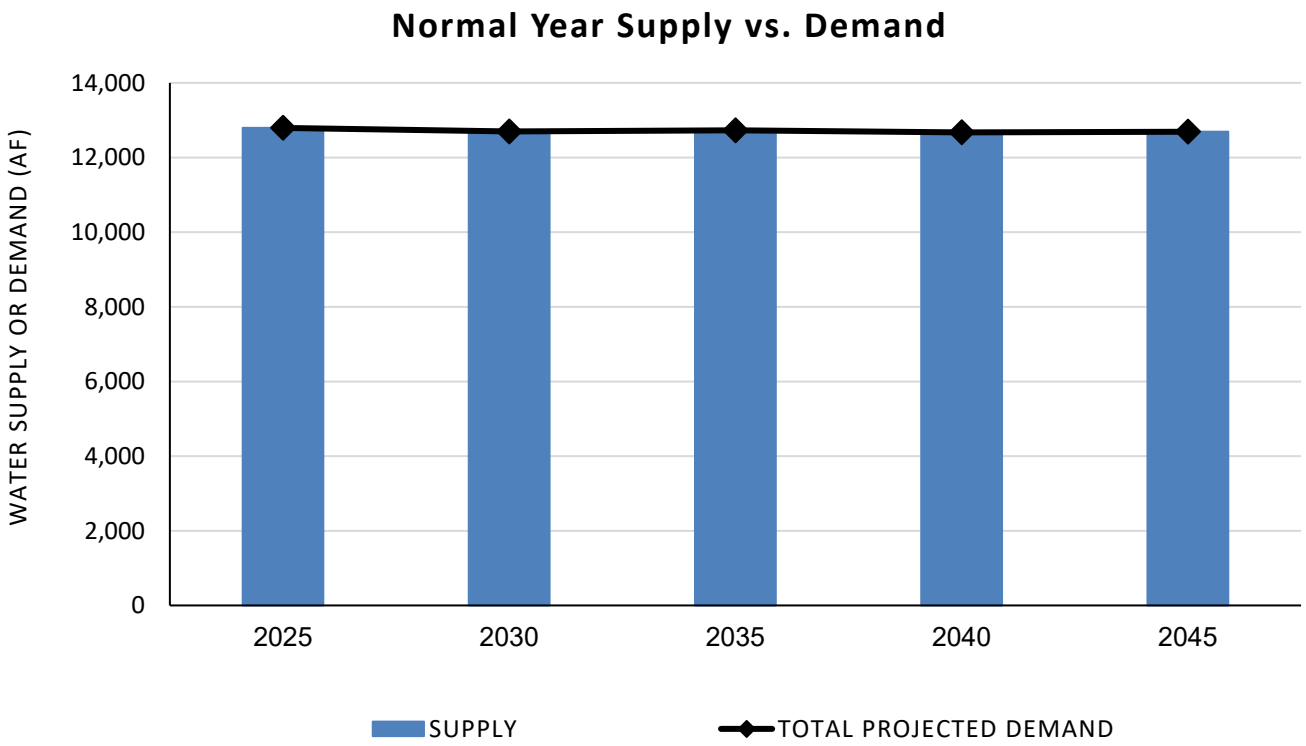
- Goal is to reduce per capita urban water use below baseline by:
  - 10% by Dec. 31, 2015
  - 20% by Dec. 31, 2020
- Bear Gulch District met its 2020 Target via Cal Water - San Francisco Bay Regional Alliance

2020 Actual GPCD	Optional Adjustment for Economic Growth[1]	Adjusted 2020 Actual GPCD	2020 Target GPCD [2]	Did Alliance Achieve Targeted Reduction for 2020?
130			150	Yes

[1]Adjustments for economic growth can be applied to either the individual supplier's data or to the aggregate regional alliance data (but not both), depending upon availability of suitable data and methods. [2] 2020 Target GPCD will be taken from the Regional Alliance's SB X7-7 Verification Form, Weighted Target Table.

Supply Sufficiency

- Supply sufficiency analysis is based on the following:
  - RWS purchased water availability is based on projections provided by BAWSCA and SFPUC
  - Local surface water supply availability during normal hydrologic years estimated to be 840 AFY, conservatively assumed to be zero during dry years
- Supply is projected to be sufficient to meet projected demand under normal year conditions
- Significant shortfalls are projected in single-dry and multiple-dry years if Bay-Delta Plan Amendment is adopted as written, but numerous uncertainties remain
- Any shortages will be addressed by the Water Shortage Contingency Plan

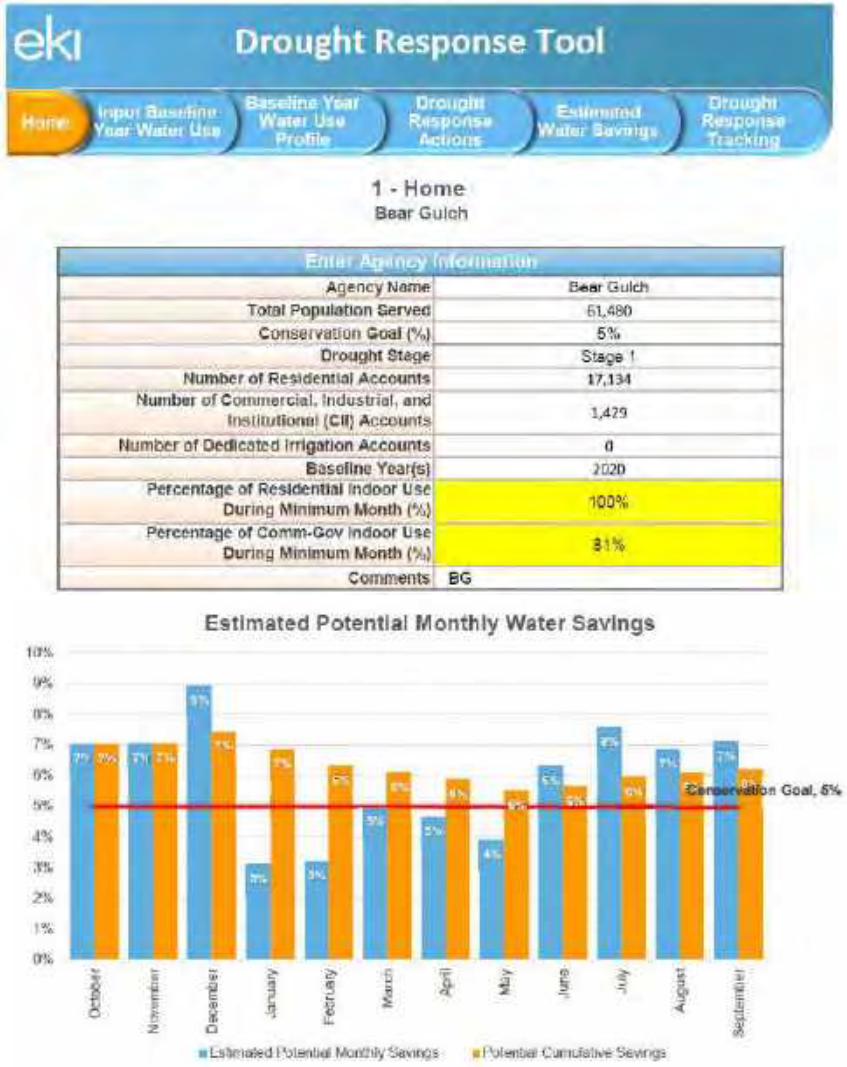


Local Topics – Bear Gulch District

- Implementation of the Bay-Delta Plan Amendment may impact future supply reliability
  - Requires the release of 30-50% of the “unimpaired flow” on the San Joaquin River tributaries from February through June in every year type - SFPUC modeling assumes 40% of unimpaired flow
  - SFPUC has provided all wholesale customers with estimates of RWS reliability, which predict shortfalls in excess of 50% during a five-year extended drought scenario
  - Numerous uncertainties remain and Cal Water is committed to developing a long-term supply reliability strategy for its Peninsula Districts, including evaluation of alternative supply sources and continued commitment to Cal Water’s comprehensive water conservation program

Water Shortage Contingency Plan Elements

- Comprehensive drought response plan
  - Annual assessment of water supply reliability
  - Six standard shortage stages (10% to >50%)
  - Shortage response actions
  - Communication protocols
  - Monitoring, enforcement, and reporting
- Quantitatively assessed using Drought Response Tool



Drought Update

- Governor has issued drought emergencies in the majority of counties in California
- Cal Water is monitoring drought conditions in all of its service territories
  - Established a Drought Response Committee
  - Proactively developing conservation messaging
- Cal Water is closely coordinating its drought response with other water agencies and regulatory bodies
- Cal Water will follow protocols outlined in the WSCP as needed
  - Based on local conditions or state mandates

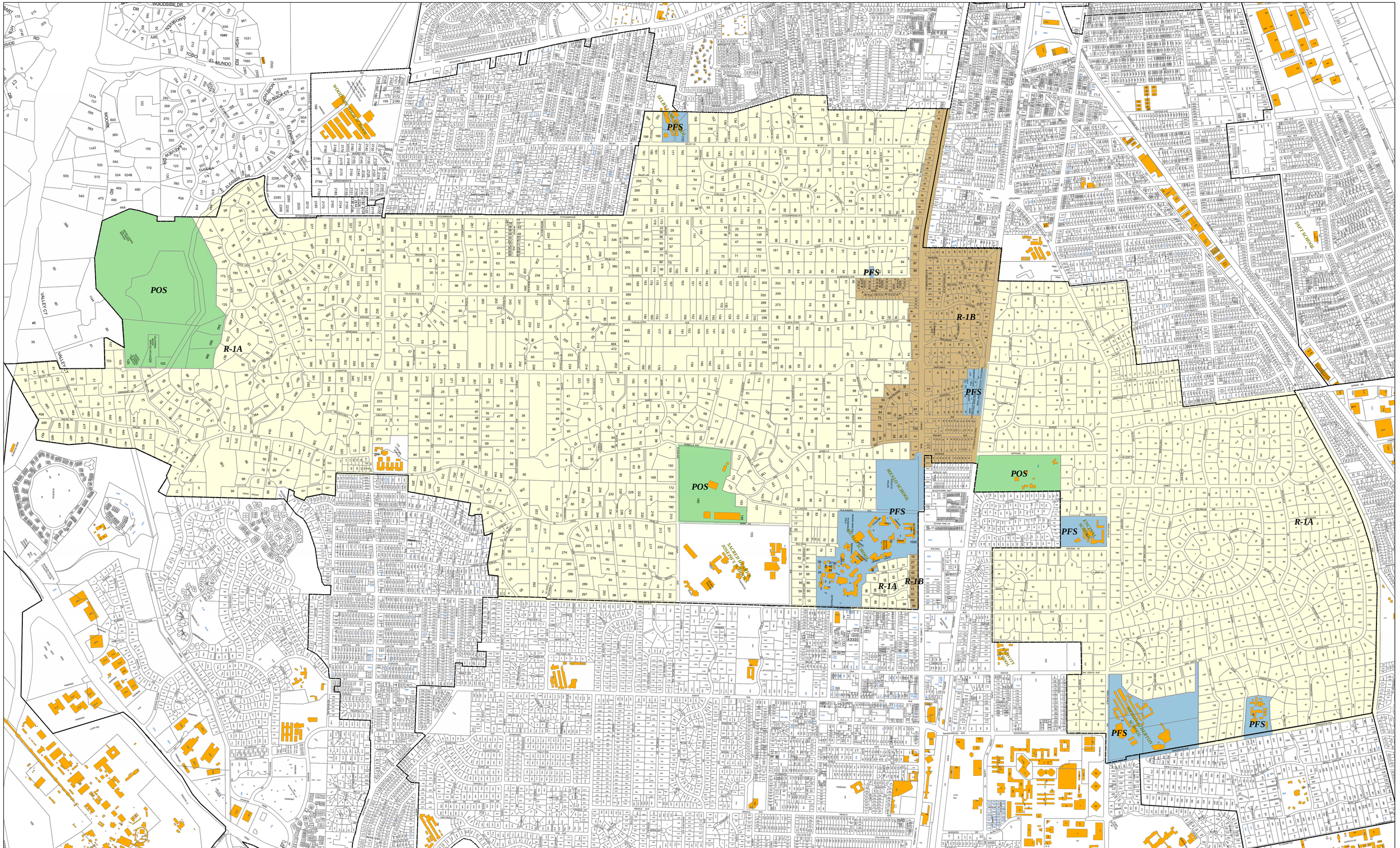
Questions or Comments

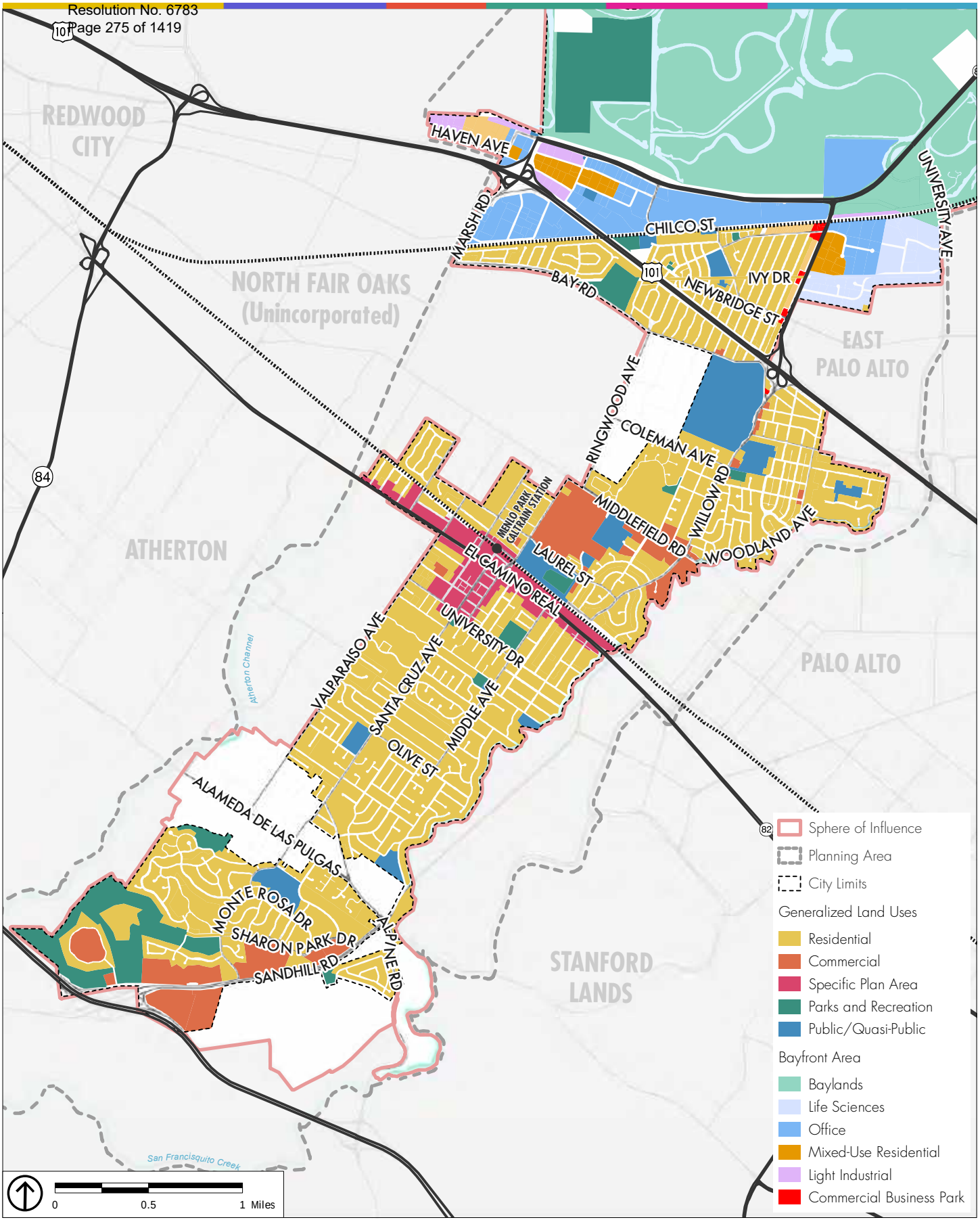
- Draft 2020 UWMP and 2020 WSCP available at **https://www.calwater.com/conservation/uwmp-review/**
- Comments on any parts of the UWMP will be accepted through Friday June 11
- Send 2020 UWMP and WSCP comments to: planninginfo@calwater.com

Appendix D: Land Use Maps

- Town of Atherton Zoning Map
- Menlo Park General Plan Land Use Designations
- North Fair Oaks Land Use Designations
- Town of Portola Valley Comprehensive Plan Diagram
- Town of Woodside Zoning Map

Town of Atherton Zoning Map

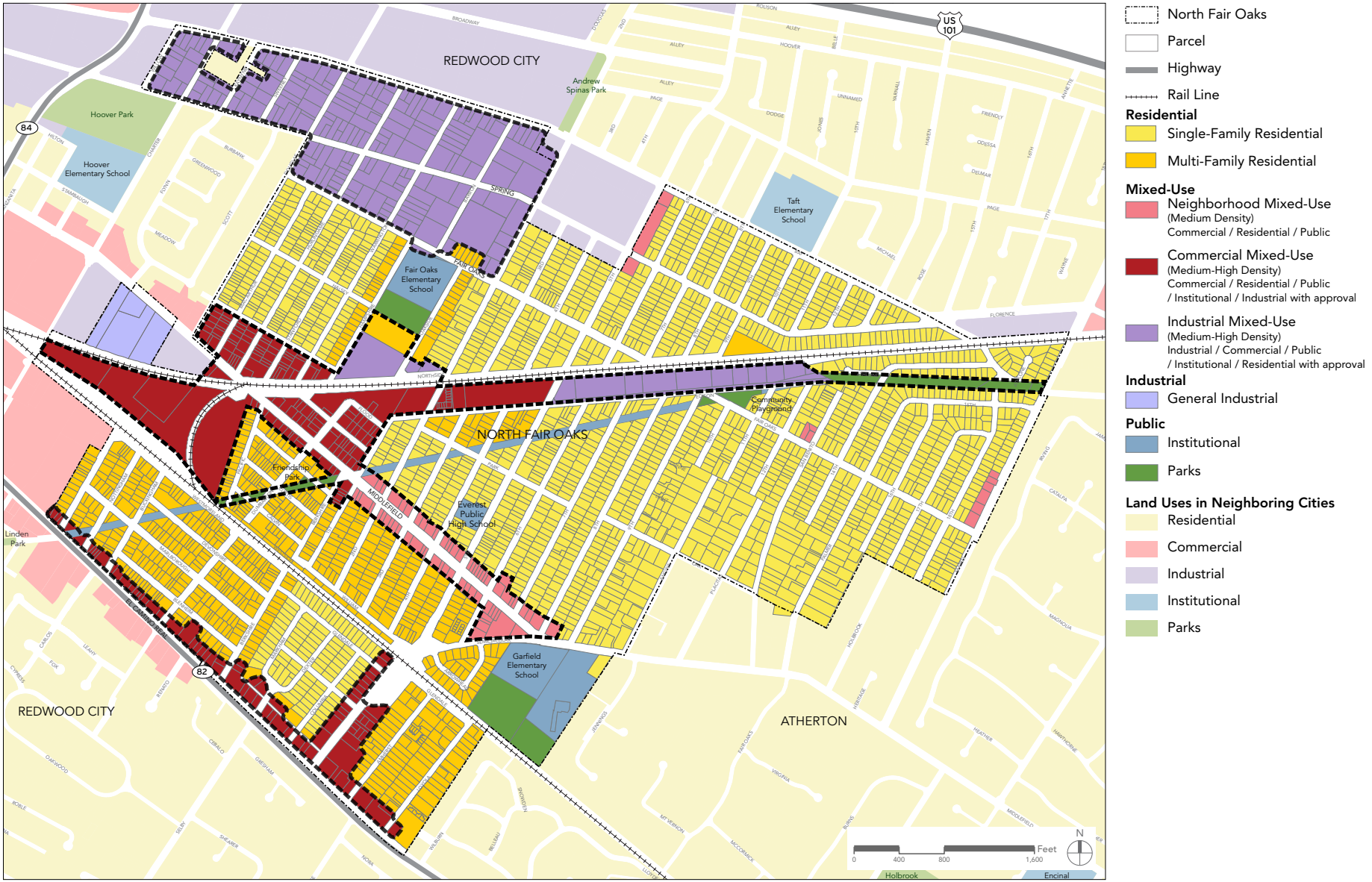


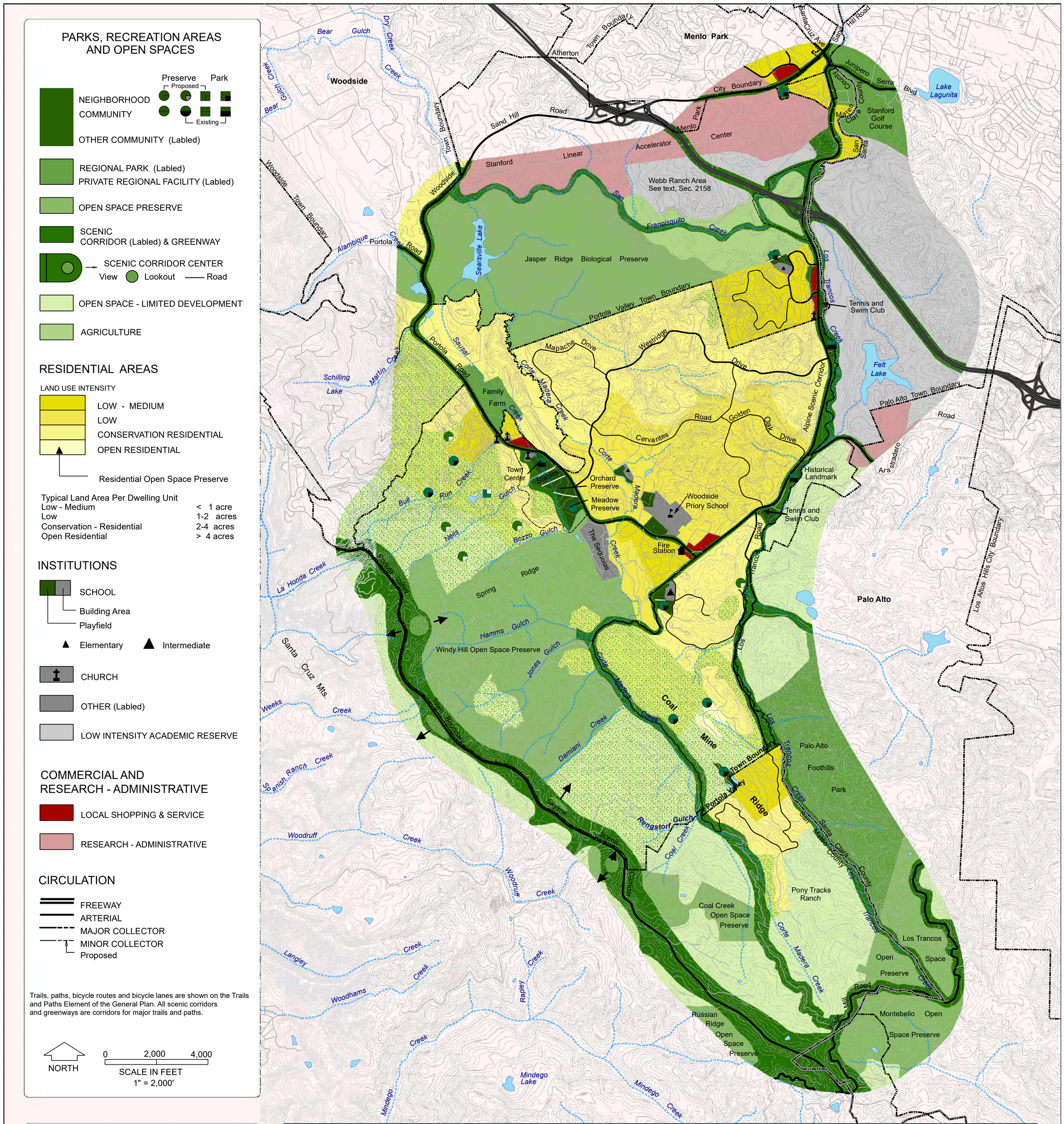


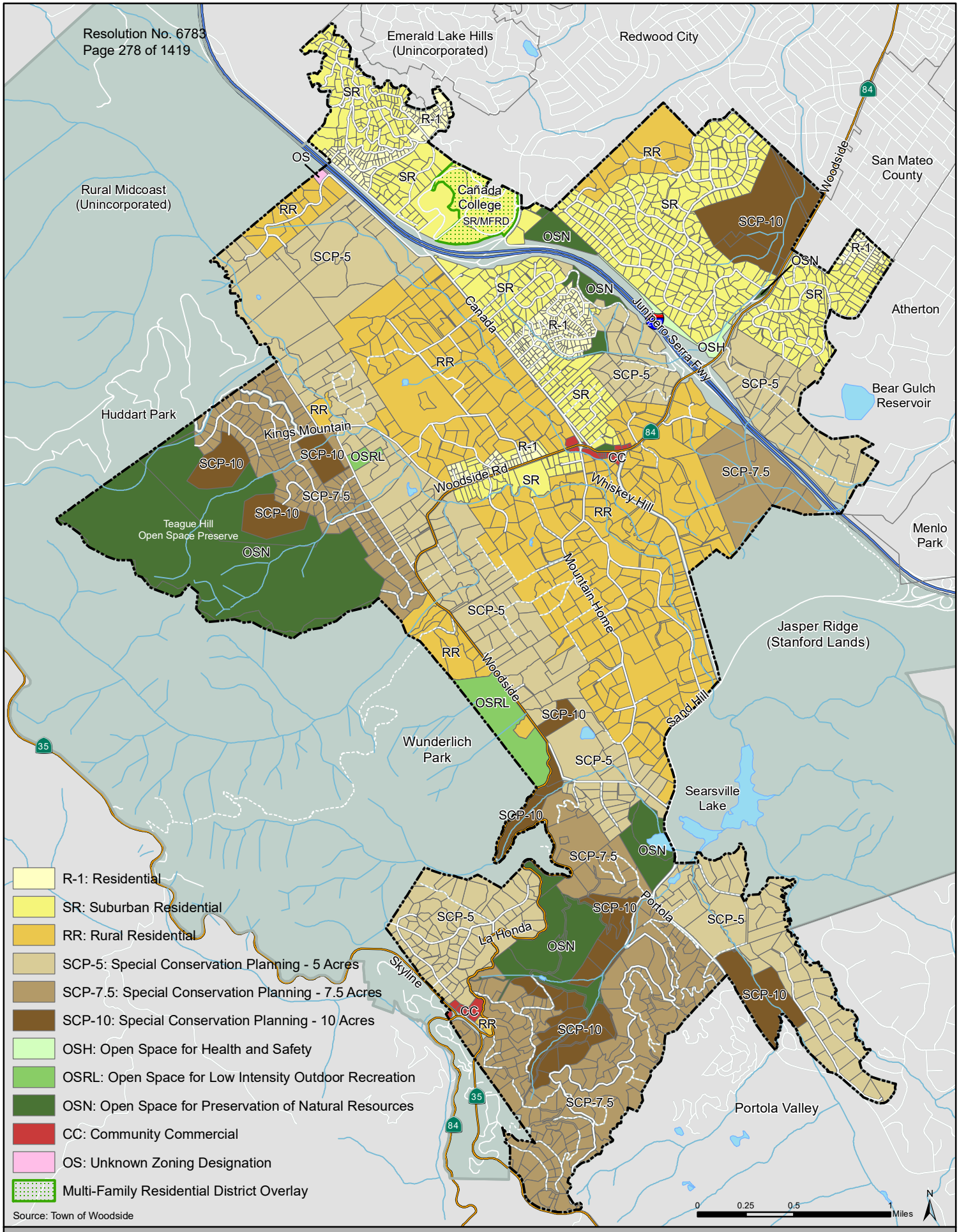
CONNECTMENLO

FIGURE 5: GENERAL PLAN LAND USE DESIGNATIONS

FIGURE 2.5: North Fair Oaks Land Use Designations




PARKS, RECREATION AREAS AND OPEN SPACES
Preserve
Park
Proposed
Existing
NEIGHBORHOOD
COMMUNITY
OTHER COMMUNITY (Labled)
REGIONAL PARK (Labled)
PRIVATE REGIONAL FACILITY (Labled)
OPEN SPACE PRESERVE
SCENIC
CORRIDOR (Labled) & GREENWAY
SCENIC CORRIDOR CENTER
View
Lookout
Road
OPEN SPACE - LIMITED DEVELOPMENT
AGRICULTURE
RESIDENTIAL AREAS
LAND USE INTENSITY
LOW - MEDIUM
LOW
CONSERVATION RESIDENTIAL
OPEN RESIDENTIAL
Residential Open Space Preserve
Typical Land Area Per Dwelling Unit
Low - Medium < 1 acre
Low 1-2 acres
Conservation - Residential 2-4 acres
Open Residential > 4 acres
INSTITUTIONS
SCHOOL
Building Area
Playfield
Elementary
Intermediate
CHURCH
OTHER (Labled)
LOW INTENSITY ACADEMIC RESERVE
COMMERCIAL AND RESEARCH - ADMINISTRATIVE
LOCAL SHOPPING & SERVICE
RESEARCH - ADMINISTRATIVE
CIRCULATION
FREEWAY
ARTERIAL
MAJOR COLLECTOR
MINOR COLLECTOR
Proposed
Trails, paths, bicycle routes and bicycle lanes are shown on the Trails and Paths Element of the General Plan. All scenic corridors and greenways are corridors for major trails and paths.
NORTH
0 2,000 4,000
SCALE IN FEET
1" = 2,000'
Menlo Park
Atherton
Woodside
Palo Alto
Portola Valley
Town Boundary
City Boundary
Santa Cruz Ave
Sand Hill Road
Junipero Serra Blvd
Lake Lagunita
Stanford Golf Course
Menlo Park Center
Stanford Linear Accelerator
Webb Ranch Area
See text, Sec. 2158
Jasper Ridge Biological Preserve
Searsville Lake
San Francisquito Creek
Portola Road
Alambique Creek
Bear Gulch
Dry Creek
Bear Gulch Creek
Bear Creek
Woodside Town Boundary
Sand Hill Road
Los Trancos Creek
Tennis and Swim Club
Felt Lake
Palo Alto Town Boundary
Alpine Scenic Corridor
Golden Oak Drive
Cervantes Road
Family Farm Creek
Schilling Lake
Martin Creek
Portola Road
Corte Madera Creek
Mapache Drive
Westridge Drive
Town Center
Stables
Orchard Preserve
Meadow Preserve
Woodside Priory School
Historical Landmark
Tennis and Swim Club
Fire Station
Arastradero Road
Los Altos Hills City Boundary
Bull Run
Nelis Gulch
Bozzo Gulch
The Sequoias
La Honda Creek
Spring Ridge
Hamms Gulch
Windy Hill Open Space Preserve
Jones Gulch
Santa Cruz Mts.
Weeks Creek
Spanish Ranch Creek
Skyline Scenic Corridor
Coal Mine
Damiani Creek
Pony Tracks Ranch
Coal Creek Open Space Preserve
Los Trancos Open Space Preserve
Montebello Open Space Preserve
Russian Ridge Open Space Preserve
Palo Alto Foothills Park
Ridge
Bear Creek
Santa Clara County Los Trancos
Page Mill Road
Woodruff Creek
Langley Creek
Woodhams Creek
Rapley Creek
Mindego Lake
Mindego Creek
Ranch Creek
Ridge Corridor
Ridge Scenic Corridor
Rengstorff Gulch
Coal Creek
Pulgas Ridge
Open Space Preserve
ADOPTED BY TOWN COUNCIL RESOLUTION
1965-17, 07/08/1965
LAST AMENDED BY TOWN COUNCIL RESOLUTION
NO. 1891-2001, 04/25/2001
REPRINTED, 03/2007
PREPARED BY:
SPANGLE ASSOCIATES
URBAN PLANNING AND RESEARCH
770 MENLO AVE. #200, MENLO PARK, CA 94025
COMPREHENSIVE PLAN DIAGRAM
Part 5 of the General Plan - Town of Portola Valley



Zoning Map

Town of Woodside

Created By Woodside GIS 4/17/2012; Revised 03-26-17

Appendix E: Summary of Demand Projection Methodology and Assumptions

Cal Water Long-Term Demand Forecast Model Overview

Forecast Domain

The forecast model generates separate forecasts for each customer class and distribution system. Table 1 lists Cal Water districts and distribution systems. Table 2 lists customer classes.

Forecast Horizon and Time Step

The forecast horizon is 30 years. The forecast has an annual time-step.

Normal, Wet, and Dry Year Forecasts

The forecast model generates normal-, wet-, and dry-year demand forecasts. The normal-year forecast is the default forecast. The wet- and dry-year forecasts can be substituted for the default forecast as necessary for system planning purposes. The model produces two different dry year forecasts: the single dry year forecast and the multiple dry year forecast. The latter represents the expected effect of prolonged drought conditions on unconstrained water demand.[1]

Relationship to GRC Sales Forecast

The first year of the forecast can be set to the current GRC sales forecast or actual consumption.

Relationship to PAWS

The demand model uses historical data on services, sales, production, and population from Cal Water's Production Analysis Worksheets (PAWS).

Accounting Rules

The model uses the following accounting rules to ensure forecast consistency:

- Population and conservation savings forecasts are functions of the service forecast.
- The sales forecast for a distribution system is the sum of the class-level sales forecasts for the distribution system. The production forecast for a distribution system is the sum of the sales and non-revenue water (NRW) forecasts for the distribution system.
- The sales and production forecasts for a district are the sum of the sales and production forecasts for its distribution systems.

Volume Units

Sales and production forecasts are in acre-feet (AF). Average sales and per capita forecasts are in gallons per day.

Per Capita Water Use

The model generates per capita forecasts for water use by single-family customers, water use by multi-family customers, water use by all residential customers, and water use by all district customers.

[1] Unconstrained demand is what demand would be in the absence of water use restrictions or policies intended to curtail water use.

Service Forecast

The forecast model generates three alternative service forecasts:

- Average Y-Y Change in Services. The model bases the forecast on the historical year-to-year (y-y) change in the number of services. This forecast assumes additive growth.
- Average Y-Y % Change in Services. The model bases the forecast on the historical y-y percentage change in services. This forecast assumes exponential growth.
- Regional Growth Forecast. The model uses regional housing and employment growth forecasts to project future services. Districts in the Bay Area use census-tract level growth forecasts prepared by the Association of Bay Area Governments (ABAG). Districts in Southern California use census-tract-level growth forecasts prepared by the Southern California Association of Governments (SCAG). The remaining districts use county-level forecasts prepared by Caltrans.

Regional Forecasts

Table 3 lists the regional forecasts in the model. Table 4 summarizes how the model uses the regional forecasts to project future services.

Service Floors and Ceilings

The forecast can include floors and ceilings on the service growth. The floor (ceiling) is the minimum (maximum) number of services allowed in the forecast.

User-Specified Growth Rates

The model allows user-specified growth rates.

Water Supply Assessments

The user can add to the forecast projected services and water use from Water Supply Assessments prepared for proposed development projects. The user can specify how much of this projected growth in services and water use the model should treat as additive to the baseline forecast.

Population Forecasts

The population projection is a function of the residential service projections to ensure internal consistency. Population in year t is:

$$Population_{\cdot} = \left[\text{———}\right]_{SFR} \cdot \qquad _t + \left[\text{———}\right]_{MFR} \cdot \qquad _t$$

For multi-family services, the calculation of average persons per service uses the equation below. The model uses county assessor data linked to Cal Water customer data to estimate average dwelling units per parcel and average parcels per service. It uses census data to estimate average persons per dwelling unit.

$$\left[\text{———}\right]_{MFR} = \text{———————} \cdot \text{———} \cdot \text{———}$$

Sales/Service Forecast

The model generates separate forecasts of sales/service for each customer class and distribution system.

Sales/Service Initialization

The model user sets sales/service for first year of the forecast to either current year water use or the most recent General Rate Case sales forecast. The 2020 UWMP projections start with 2020 actual sales/service.

Sales/Service Adjustments

In each forecast year, the model adjusts the previous year's sales/service estimate for:

1. Rebound from the 2012-16 drought
2. Passive water savings from plumbing codes and appliance standards
3. Active water savings from Cal Water conservation programs
4. Real changes in the marginal cost of water service
5. Real changes in per capita income

The user can select which adjustments to apply. The 2020 UWMP projections include all the adjustments except the drought rebound adjustment. The 2020 UWMP projections exclude the drought rebound adjustment because analysis of recent consumption trends showed that further rebound from the 2012-2016 drought was unlikely.

A description of each adjustment follows.

Drought Rebound

The model adjusts the sales/service forecast for demand recovery following the 2012-2016 drought. The model makes this adjustment using data on the growth in sales/service between 2016 and 2017. The model assumes some of the savings achieved during the drought will be permanent. The user can set the level of permanent drought savings. The default setting is 20%.

Passive Water Savings

The model uses DWR projections of water savings from plumbing/building codes to forecast passive water savings.[2] The model extends the DWR projections, which run through 2040, to 2050.

Active Water Savings

The model uses conservation program savings projections from Cal Water's 2015 Conservation Master Plans to forecast active water savings.

Price and Income Adjustments

The model adjusts average sales for expected changes in real income and cost of water service. The adjustment equation is:[3]

[2] M.Cubed. 2016. Projected Statewide and County-Level Effects of Plumbing Codes and Appliance Standards on Indoor GPCD. Technical Memorandum prepared by David Mitchell for the California Department of Water Resources. August 30, 2016.

[3] The model uses a constant-elasticity-of-demand specification: $_t = \ ^{\varepsilon}_{t}\ ^{\delta}_{t}$

$$\Delta_t = {}_0\left(1 - \left(\frac{t}{0}\right)^{\varepsilon}\left(\frac{t}{0}\right)^{\delta}\right)$$

where ${}_0$ is sales/service in the base year of the forecast, $\left(\frac{P_t}{P_0}\right)$ and $\left(\frac{I_t}{I_0}\right)$ are the price of water and income relative to the base year of the forecast, and and are empirically derived estimates of price and income elasticity.

Sales Forecast

The sales forecast is the product of the service and average use per service forecasts.

Non-Revenue Water Forecast

The non-revenue water forecast is a function of the services forecast. The forecast starts with an initial estimate of non-revenue water, expressed in gallons/connection/day. The model decomposes this estimate into real and apparent loss. The model assumes future apparent loss is equal to the average apparent loss for the five year before the start of the forecast. In the case of real loss, the model assumes Cal Water's loss management program will reduce real losses over time. The amount of reduction depends on the staring estimate of real loss. If this estimate is 10 gallons/connection/day or less, the model assumes no further reduction. Otherwise, the model assumes real losses (in gallons/connection/day) will decrease until they are equal to 75% of the average real loss for the five years before the start of the forecast or the State Water Board draft real water loss standard for the distribution system, whichever is greater.[4] The model assumes the reduction in real loss will occur between 2020 and 2030.

Production Forecast

The production forecast is the sum of the sales and NRW forecasts.

Normal, Wet, Single Dry, and Multiple Dry Year Projections

The model generates normal, wet, single dry, and multiple dry year forecasts of sales and production. The model bases these forecasts on empirically derived relationships between monthly water sales, rainfall, and air temperature estimated for each Cal Water district.[5]

- Wet year – minus one standard deviation weather effect on sales and production
- Single dry year – plus one standard deviation weather effect on sales and production
- Multiple dry year – plus 1.6 standard deviations weather effect on sales and production

In the case of the dry year forecasts, the model is forecasting demand in the absence of drought water use restrictions or other policies that would limit water use in dry years.

[4] The State Water Board did not develop a draft water loss standard for every Cal Water distribution system. For those without a draft standard, the model assumes real losses will decrease until they are equal to 75% of the average real loss for the five year before the start of the forecast.

[5] A&N Technical Services, Cal Water Long Term Water Demand Forecast Model, December 2014.

Table 1. Long-Term Demand Model Districts and Systems

Label	District-System	Notes
AV	**Antelope Valley District**	
AV-FMT	Fremont System	
AV-LAN	Lancaster System	
AV-LKH	Lake Hughes System	
AV-LVY	Leona Valley System	
BG	**Bear Gulch District**	No sub-systems in district
BK	**Bakersfield District**	
BK-BK	Bakersfield System	
BK-NG	North Garden System	
CH	**Chico District**	
CH-CH	Chico System	
CH-HAM	Hamilton City System	
DIX	**Dixon District**	No sub-systems in district
DOM	**Dominguez District**	No sub-systems in district
ELA	**East Los Angeles District**	No sub-systems in district
HAW	**Hawthorne District**	No sub-systems in district
HR	**Hermosa-Redondo District**	No sub-systems in district
KC	**King City District**	No sub-systems in district
KRV	**Kern River Valley District**	
KRV-BDFLO	Lower Bodfish System	
KRV-BDFUP	Upper Bodfish System	
KRV-KNVARD	Kernville & Arden System	Includes KNV, KRVArdenWaterCo, COUN, MSH, POND
KRV-LKL	Lakeland System	
KRV-ONX	Onyx System	
KRV-SLK	South Lake System	Includes SQM
KRV-SPM	Split Mountain System	
LAS	**Los Altos District**	No sub-systems in district
LIV	**Livermore District**	No sub-systems in district

Label	District-System	Notes
MPS	**Mid-Peninsula District**	
MPS-SM	San Mateo System	
MPS-SC	San Carlos System	
MRL	**Marysville District**	No sub-systems in district
ORO	**Oroville District**	No sub-systems in district
PV	**Palos Verdes District**	No sub-systems in district
RDV	**Redwood Valley District**	
RDV-ARM	Armstrong System	
RDV-CSP	Coast Springs System	
RDV-HKN	Hawkins Water System	
RDV-LUC	Lucerne System	
RDV-NOH	Noel Heights System	
RDV-RPD	Rancho del Paradiso System	
SEL	**Selma District**	No sub-systems in district
SLN	**Salinas District**	
SLN-SLN	Salinas System	Includes Bolsa Knolls, Country Meadows
SLN-SLNH	Salinas Hills System	Includes Buena Vista, Indian Springs
SLN-OH	Oak Hill System	
SLN-LL	Las Lomas System	
SSF	**South San Francisco District**	No sub-systems in district
STK	**Stockton District**	No sub-systems in district
VIS	**Visalia District**	No sub-systems in district
WIL	**Willows District**	No sub-systems in district
WLK	**Westlake District**	No sub-systems in district

Table 2. Long-Term Demand Model Customer Classes

Label	Description	Revenue Class #
SFR	Single-Family Residential	1
FLT	Single-Family Flat Rate	4
RES	SFR + FLT	1, 4
MFR	Multi-Family	15
COM	Commercial/Business	2
GOV	Government/Public Authority	11
IND	Industrial	3
OTH	Other/miscellaneous	8,13
IRR	Dedicated irrigation customers	7

Table 3. Regional Forecasts used in First Generation Long-term Demand Model Forecasts

Regional Forecast	Version	Range
ABAG	Plan Bay Area 2040, GEOID10-level summary	2010 to 2040
SCAG	RTP07 GEOID10-level	2010 to 2035
Caltrans	2017 County Forecasts	2010 to 2050

Table 4. Regional Growth Rates used in the Service Growth Forecasts

Service Class	ABAG	SCAG	Caltrans
SFR	y-y % change in single-family dwelling units	y-y % change in all residential dwelling units	y-y % change in single-family dwelling units
MFR	y-y % change in multi-family dwelling units	y-y % change in all residential dwelling units	y-y % change in multi-family dwelling units
COM	y-y % change in total number of jobs	y-y % change in total number of jobs	y-y % change in county employment in retail, wholesale, information, financial, professional, and leisure sectors
GOV	y-y % change in gov't, information, and construction jobs	y-y % change in total number of jobs	y-y % change in county employment in federal, state, local government and education and healthcare sectors
IND	y-y % change in manufacturing jobs	y-y % change in total number of jobs	y-y % change in county employment in manufacturing sectors

Historical and Projected Services, Water Sales, and Total Production

District Demand Projection Report
Bear Gulch

General Rate Case Sales Baseline 2020

Historical Data Range
First Year 2000
Last Year 2020

Forecast Range
First Year 2020
Last Year 2050

Service Growth Basis ABAG Growth Forecasts

Service Growth Rates

Class	ABAG Projected	Historical %Y-Y[1] 5-Yr	10-Yr	15-Yr	20-Yr
RES[2]	0.1%	0.0%	0.1%	0.3%	0.3%
MFR	0.7%	10.4%	9.5%	7.5%	5.5%
COM	0.0%	-1.2%	-0.9%	-0.2%	-0.1%
GOV	0.1%	2.7%	1.6%	2.4%	1.7%
IND	-0.7%	0.0%	0.0%	0.0%	0.0%
TOT		0.0%	0.1%	0.4%	0.4%

Water Supply Assessments

	WSA Name	Completion Date	Incorporated into Forecast (Y/N)
1			
2			
3			
4			
5			

Sales Forecast Adjustments

Drought Rebound	OFF
Plumbing Code	ON
Active Conservation	ON
Price Response	ON
Income Response	ON

Non-Revenue Water (NRW) Basis

Real loss (gal/con/day):
2016-2020 average if <= 10 gal/con/day
Draft Water Board standard or 75% of 2016-2020 average, whichever is greater, by 2030.
Apparent loss (gal/con/day): 2016-2020 average.

1. Account reclassifications can impact historical %Y-Y growth rates for individual customer classes.
2. RES = Metered and unmetered single-family residential customers.

District Demand Projection Report
Bear Gulch

Historical Service Counts

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2000	15,816	64	1,276	96	1	34	0	17,288
2001	15,875	64	1,280	95	1	38	0	17,354
2002	15,919	64	1,279	95	1	41	0	17,400
2003	15,890	64	1,278	96	1	31	0	17,359
2004	15,910	64	1,274	97	1	31	2	17,379
2005	16,134	63	1,280	95	1	27	5	17,605
2006	16,256	63	1,274	96	1	23	9	17,721
2007	16,271	63	1,279	96	1	34	10	17,755
2008	16,260	70	1,326	107	1	32	8	17,804
2009	16,528	76	1,364	116	1	28	7	18,119
2010	16,781	75	1,365	116	1	24	7	18,369
2011	16,857	83	1,359	118	1	25	8	18,450
2012	16,884	84	1,351	118	1	27	7	18,473
2013	16,887	85	1,350	117	1	35	8	18,482
2014	16,944	85	1,349	119	1	27	8	18,532
2015	16,970	114	1,326	119	1	23	8	18,560
2016	16,968	175	1,272	119	1	27	8	18,569
2017	16,960	185	1,261	117	1	36	8	18,570
2018	16,958	187	1,250	119	1	35	8	18,558
2019	16,946	187	1,244	136	1	37	8	18,559
2020	16,944	187	1,248	136	1	37	8	18,561
2021								
2022								
2023								
2024								
2025								
2026								
2027								
2028								
2029								
2030								

CAGR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
5-Year	0.0%	10.4%	-1.2%	2.7%	0.0%	10.1%	0.4%	0.0%
10-Year	0.1%	9.5%	-0.9%	1.6%	0.0%	4.4%	1.0%	0.1%
15-Year	0.3%	7.5%	-0.2%	2.4%	0.0%	2.1%	2.7%	0.4%
20-Year	0.3%	5.5%	-0.1%	1.7%	0.0%	0.4%		0.4%

CAGR = Compound Annual Growth Rate

District Demand Projection Report
Bear Gulch

Historical Sales (AF)

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2000	11,552	268	1,544	269	7	139	0	13,779
2001	11,952	265	1,512	279	5	71	0	14,083
2002	11,995	252	1,442	317	8	21	0	14,035
2003	11,534	248	1,375	274	7	56	0	13,495
2004	12,429	248	1,409	293	6	52	-4	14,434
2005	11,285	250	1,363	255	7	48	15	13,223
2006	11,393	251	1,394	260	5	50	14	13,365
2007	12,600	236	1,388	289	6	66	38	14,623
2008	12,615	231	1,449	339	5	49	38	14,726
2009	11,572	244	1,339	322	6	41	29	13,552
2010	10,629	232	1,309	297	4	20	32	12,523
2011	10,478	232	1,313	303	4	20	25	12,375
2012	11,176	228	1,314	321	5	19	28	13,091
2013	11,973	233	1,308	371	5	26	26	13,941
2014	10,853	220	1,212	287	3	28	24	12,627
2015	8,376	223	1,065	220	2	24	26	9,935
2016	8,001	235	980	218	2	31	24	9,491
2017	9,000	264	1,048	292	2	25	26	10,656
2018	9,742	285	1,111	323	2	22	29	11,514
2019	9,361	242	1,152	299	2	22	27	11,104
2020	10,598	279	1,038	303	3	20	21	12,262
2021								
2022								
2023								
2024								
2025								
2026								
2027								
2028								
2029								
2030								

CAGR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
5-Year	4.8%	4.6%	-0.5%	6.6%	9.9%	-4.0%	-3.8%	4.3%
10-Year	0.0%	1.8%	-2.3%	0.2%	-5.0%	0.1%	-4.1%	-0.2%
15-Year	-0.4%	0.7%	-1.8%	1.2%	-6.9%	-5.7%	2.6%	-0.5%
20-Year	-0.4%	0.2%	-2.0%	0.6%	-4.8%	-9.2%		-0.6%

CAGR = Compound Annual Growth Rate

District Demand Projection Report
Bear Gulch

Historical Sales/Service (GPD)

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2000	652	3,744	1,080	2,490	6,082	3,613		712
2001	672	3,693	1,054	2,621	4,183	1,644		725
2002	673	3,520	1,007	2,975	7,433	449		720
2003	648	3,460	960	2,560	6,619	1,646		694
2004	697	3,465	987	2,708	5,168	1,518	-1,748	741
2005	624	3,518	951	2,395	6,609	1,587	2,430	671
2006	626	3,569	977	2,415	4,123	1,913	1,337	673
2007	691	3,358	968	2,676	5,730	1,733	3,288	735
2008	693	2,926	976	2,828	4,681	1,380	4,069	738
2009	625	2,882	876	2,480	5,226	1,324	3,556	668
2010	565	2,748	856	2,290	3,773	737	3,974	609
2011	555	2,489	862	2,294	3,492	715	3,005	599
2012	591	2,429	868	2,422	4,547	637	3,394	633
2013	633	2,454	865	2,822	4,195	662	3,052	673
2014	572	2,308	802	2,166	2,859	927	2,743	608
2015	441	1,746	717	1,655	1,414	959	2,930	478
2016	421	1,200	688	1,640	1,748	1,033	2,705	456
2017	474	1,271	741	2,220	1,920	619	2,893	512
2018	513	1,360	794	2,415	1,916	552	3,219	554
2019	493	1,154	826	1,960	1,842	527	2,991	534
2020	558	1,331	743	1,994	2,267	484	2,364	590
2021								
2022								
2023								
2024								
2025								
2026								
2027								
2028								
2029								
2030								

CAGR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
5-Year	4.9%	-5.3%	0.7%	3.8%	9.9%	-12.8%	-4.2%	4.3%
10-Year	-0.1%	-7.0%	-1.4%	-1.4%	-5.0%	-4.1%	-5.1%	-0.3%
15-Year	-0.7%	-6.3%	-1.6%	-1.2%	-6.9%	-7.6%	-0.2%	-0.9%
20-Year	-0.8%	-5.0%	-1.9%	-1.1%	-4.8%	-9.6%		-0.9%

CAGR = Compound Annual Growth Rate

District Demand Projection Report
Bear Gulch

Historical Production (AF)

YEAR	SALES	NRW	PROD	NRW %	NRW GPD/Svc
2000	13,779	370	14,149	2.6%	19
2001	14,083	435	14,518	3.0%	22
2002	14,035	-396	13,639	-2.9%	-20
2003	13,495	366	13,861	2.6%	19
2004	14,434	574	15,008	3.8%	30
2005	13,223	304	13,527	2.3%	15
2006	13,365	493	13,858	3.6%	25
2007	14,623	931	15,554	6.0%	47
2008	14,726	785	15,510	5.1%	39
2009	13,552	693	14,245	4.9%	34
2010	12,523	598	13,121	4.6%	29
2011	12,375	875	13,250	6.6%	42
2012	13,091	428	13,519	3.2%	21
2013	13,941	872	14,813	5.9%	42
2014	12,627	554	13,181	4.2%	27
2015	9,935	466	10,401	4.5%	22
2016	9,491	614	10,105	6.1%	30
2017	10,656	739	11,395	6.5%	36
2018	11,514	422	11,936	3.5%	20
2019	11,104	766	11,869	6.5%	37
2020	12,262	711	12,972	5.5%	34
2021					
2022					
2023					
2024					
2025					
2026					
2027					
2028					
2029					
2030					

CAGR	SALES	NRW	PROD		NRW GPD/Svc
5-Year	4.3%	8.8%	4.5%		8.8%
10-Year	-0.2%	1.7%	-0.1%		1.6%
15-Year	-0.5%	5.8%	-0.3%		5.4%
20-Year	-0.6%	3.3%	-0.4%		3.0%

CAGR = Compound Annual Growth Rate

District Demand Projection Report
Bear Gulch

Historical GPCD

		GPCD	
YEAR	POPULATION	RESIDENTIAL	TOTAL
2000	53,885	196	234
2001	54,162	201	239
2002	54,392	201	224
2003	54,421	193	227
2004	54,574	207	246
2005	55,252	186	219
2006	55,653	187	222
2007	55,769	205	249
2008	55,812	205	248
2009	56,560	187	225
2010	57,254	169	205
2011	57,876	165	204
2012	58,376	174	207
2013	58,812	185	225
2014	59,387	166	198
2015	59,883	128	155
2016	60,307	122	150
2017	60,719	136	168
2018	60,864	147	175
2019	60,827	141	174
2020	60,814	160	190
2021			
2022			
2023			
2024			
2025			
2026			
2027			
2028			
2029			
2030			

CAGR	POPULATION	RESIDENTIAL GPCD	TOTAL GPCD
5-Year	0.3%	4.5%	4.2%
10-Year	0.6%	-0.6%	-0.7%
15-Year	0.6%	-1.0%	-0.9%
20-Year	0.6%	-1.0%	-1.0%

CAGR = Compound Annual Growth Rate

District Demand Projection Report
Bear Gulch

Projected Services

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2020	16,944	187	1,248	136	1	37	8	18,561
2021	16,945	187	1,251	136	1	33	8	18,561
2022	16,946	187	1,254	136	1	33	8	18,565
2023	16,946	187	1,257	136	1	33	8	18,569
2024	16,947	188	1,260	137	1	33	8	18,574
2025	16,947	189	1,263	137	1	33	8	18,578
2026	16,948	191	1,265	137	1	33	8	18,584
2027	16,949	193	1,268	137	1	33	8	18,589
2028	16,949	195	1,270	137	1	33	8	18,594
2029	16,950	196	1,273	137	1	33	8	18,599
2030	16,956	199	1,279	138	1	33	8	18,615
2031	16,963	201	1,285	139	1	33	8	18,631
2032	16,970	204	1,291	140	1	33	8	18,647
2033	16,977	207	1,297	141	1	33	8	18,663
2034	16,983	209	1,303	142	1	33	8	18,679
2035	17,005	211	1,300	142	1	33	8	18,700
2036	17,027	212	1,298	142	1	33	8	18,721
2037	17,049	213	1,295	142	1	33	8	18,742
2038	17,071	215	1,293	142	1	33	8	18,763
2039	17,094	216	1,290	142	1	33	8	18,784
2040	17,116	217	1,288	142	1	33	8	18,805
2041	17,138	219	1,285	142	1	33	8	18,826
2042	17,160	220	1,283	142	1	33	8	18,847
2043	17,182	222	1,280	142	1	33	8	18,868
2044	17,205	223	1,278	142	1	33	8	18,890
2045	17,227	224	1,275	142	1	33	8	18,911
2046	17,249	226	1,273	142	1	33	8	18,932
2047	17,271	227	1,270	142	1	33	8	18,954
2048	17,294	229	1,268	142	1	33	8	18,975
2049	17,316	230	1,265	142	1	33	8	18,996
2050	17,339	232	1,263	142	1	33	8	19,018

District Demand Projection Report
Bear Gulch

Projected Sales (AF)

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2020	10,598	279	1,038	303	3	20	21	12,262
2021	10,464	271	1,015	298	3	18	21	12,090
2022	10,495	268	999	295	3	18	21	12,099
2023	10,531	266	984	292	3	18	21	12,115
2024	10,572	264	970	289	3	18	21	12,137
2025	10,591	264	957	286	3	18	21	12,139
2026	10,614	264	944	283	3	18	21	12,147
2027	10,597	264	932	281	3	18	21	12,116
2028	10,592	265	922	278	3	18	21	12,099
2029	10,592	266	916	277	3	18	21	12,092
2030	10,595	267	913	278	3	18	21	12,095
2031	10,602	269	910	278	3	18	21	12,101
2032	10,585	271	908	279	3	18	21	12,085
2033	10,603	273	906	280	3	18	21	12,104
2034	10,612	276	904	280	3	18	21	12,114
2035	10,629	277	897	279	3	18	21	12,123
2036	10,620	277	890	278	3	18	21	12,107
2037	10,610	278	883	277	3	18	21	12,090
2038	10,614	279	876	276	3	18	21	12,087
2039	10,608	280	870	275	3	18	21	12,075
2040	10,605	281	864	274	3	18	21	12,065
2041	10,609	282	858	273	3	18	21	12,064
2042	10,617	283	852	272	3	18	21	12,066
2043	10,626	284	847	271	3	18	21	12,070
2044	10,644	285	841	270	3	18	21	12,083
2045	10,647	286	836	270	3	18	21	12,081
2046	10,652	288	830	269	3	18	21	12,081
2047	10,656	289	825	268	3	18	21	12,080
2048	10,664	290	820	267	3	18	21	12,083
2049	10,676	291	815	266	3	18	21	12,090
2050	10,691	293	810	265	3	18	21	12,101

District Demand Projection Report
Bear Gulch

Projected Sales/Service (GPD)

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2020	558	1,331	743	1,994	2,267	484	2,364	590
2021	551	1,294	724	1,957	2,267	484	2,364	581
2022	553	1,279	711	1,932	2,267	484	2,364	582
2023	555	1,267	699	1,910	2,267	484	2,364	582
2024	557	1,255	687	1,888	2,267	484	2,364	583
2025	558	1,244	676	1,867	2,267	484	2,364	583
2026	559	1,234	666	1,846	2,267	484	2,364	584
2027	558	1,224	657	1,828	2,267	484	2,364	582
2028	558	1,215	648	1,811	2,267	484	2,364	581
2029	558	1,207	642	1,801	2,267	484	2,364	580
2030	558	1,200	637	1,793	2,267	484	2,364	580
2031	558	1,193	632	1,785	2,267	484	2,364	580
2032	557	1,187	628	1,777	2,267	484	2,364	579
2033	558	1,182	624	1,769	2,267	484	2,364	579
2034	558	1,177	620	1,762	2,267	484	2,364	579
2035	558	1,173	616	1,755	2,267	484	2,364	579
2036	557	1,168	612	1,748	2,267	484	2,364	577
2037	556	1,164	609	1,741	2,267	484	2,364	576
2038	555	1,160	605	1,735	2,267	484	2,364	575
2039	554	1,157	602	1,728	2,267	484	2,364	574
2040	553	1,153	599	1,722	2,267	484	2,364	573
2041	553	1,150	596	1,716	2,267	484	2,364	572
2042	552	1,147	593	1,710	2,267	484	2,364	572
2043	552	1,145	590	1,704	2,267	484	2,364	571
2044	552	1,142	588	1,698	2,267	484	2,364	571
2045	552	1,140	585	1,692	2,267	484	2,364	570
2046	551	1,137	582	1,687	2,267	484	2,364	570
2047	551	1,134	580	1,681	2,267	484	2,364	569
2048	551	1,132	577	1,675	2,267	484	2,364	568
2049	550	1,130	575	1,670	2,267	484	2,364	568
2050	550	1,128	572	1,664	2,267	484	2,364	568

District Demand Projection Report
Bear Gulch

Projected Production (AF)

YEAR	SALES	NRW	PROD	% NRW	NRW GPD/Svc
2020	12,262	711	12,972	5.5%	34
2021	12,090	700	12,790	5.5%	34
2022	12,099	689	12,788	5.4%	33
2023	12,115	679	12,794	5.3%	33
2024	12,137	668	12,805	5.2%	32
2025	12,139	657	12,796	5.1%	32
2026	12,147	647	12,794	5.1%	31
2027	12,116	636	12,752	5.0%	31
2028	12,099	625	12,724	4.9%	30
2029	12,092	614	12,706	4.8%	29
2030	12,095	604	12,699	4.8%	29
2031	12,101	605	12,706	4.8%	29
2032	12,085	605	12,690	4.8%	29
2033	12,104	606	12,709	4.8%	29
2034	12,114	606	12,720	4.8%	29
2035	12,123	607	12,730	4.8%	29
2036	12,107	608	12,715	4.8%	29
2037	12,090	608	12,698	4.8%	29
2038	12,087	609	12,696	4.8%	29
2039	12,075	610	12,684	4.8%	29
2040	12,065	610	12,675	4.8%	29
2041	12,064	611	12,675	4.8%	29
2042	12,066	612	12,677	4.8%	29
2043	12,070	612	12,682	4.8%	29
2044	12,083	613	12,696	4.8%	29
2045	12,081	614	12,694	4.8%	29
2046	12,081	614	12,695	4.8%	29
2047	12,080	615	12,695	4.8%	29
2048	12,083	616	12,699	4.8%	29
2049	12,090	617	12,707	4.9%	29
2050	12,101	617	12,718	4.9%	29

District Demand Projection Report
Bear Gulch

Projected GPCD

		GPCD	
YEAR	POPULATION	RESIDENTIAL	TOTAL
2020	60,814	189	190
2021	60,822	187	188
2022	60,830	187	188
2023	60,838	188	188
2024	60,846	188	188
2025	60,907	188	188
2026	60,968	189	187
2027	61,029	188	187
2028	61,091	188	186
2029	61,153	188	185
2030	61,255	187	185
2031	61,359	187	185
2032	61,463	187	184
2033	61,568	186	184
2034	61,675	186	184
2035	61,778	186	184
2036	61,882	186	183
2037	61,987	185	183
2038	62,091	185	183
2039	62,196	184	182
2040	62,302	184	182
2041	62,408	184	181
2042	62,514	184	181
2043	62,621	183	181
2044	62,728	183	181
2045	62,835	183	180
2046	62,943	183	180
2047	63,051	182	180
2048	63,159	182	179
2049	63,268	182	179
2050	63,378	182	179

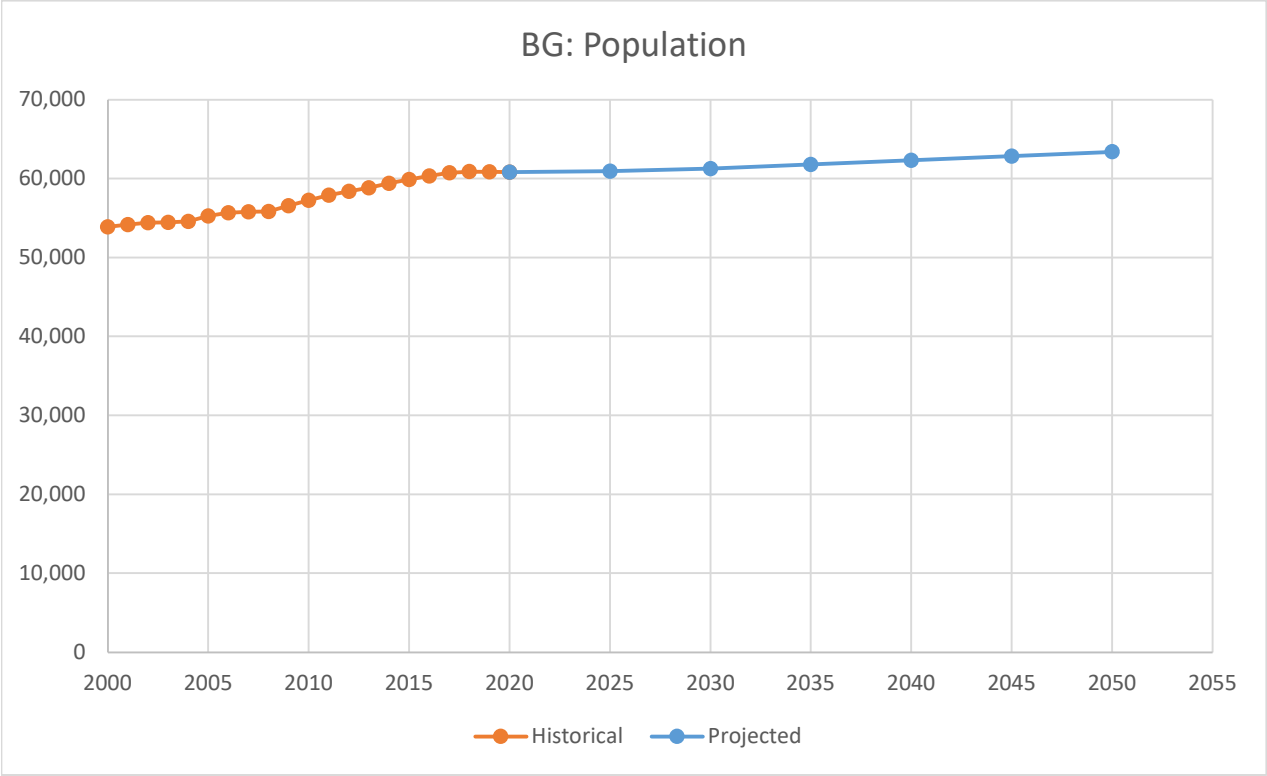
District Demand Projection Report
Bear Gulch

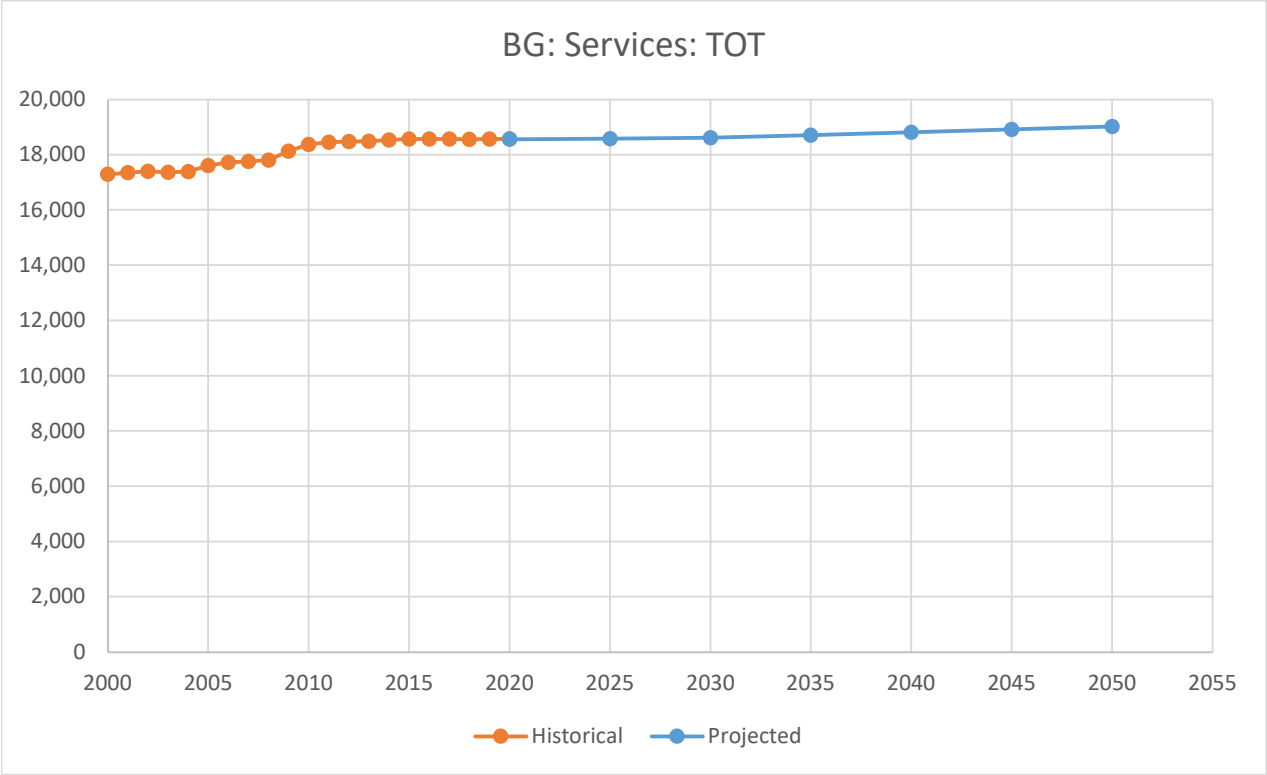
Normal, Single-Year, and Multi-Year Dry Year Demand (AF)

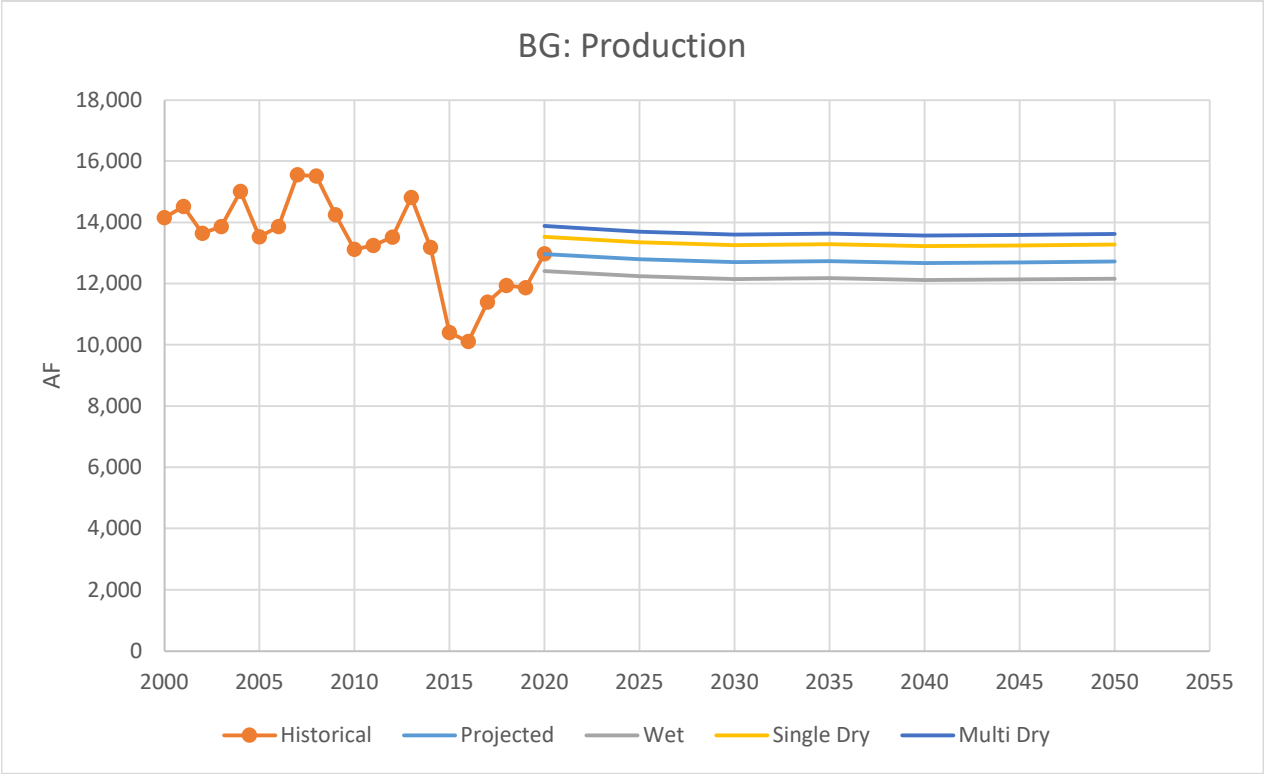
YEAR		NORMAL		SINGLE DRY YEAR	% OF NORMAL		MULTI DRY YEAR	% OF NORMAL
2020		12,972		13,536	104%		13,885	107%
2021		12,790		13,346	104%		13,690	107%
2022		12,788		13,344	104%		13,689	107%
2023		12,794		13,350	104%		13,695	107%
2024		12,805		13,362	104%		13,707	107%
2025		12,796		13,354	104%		13,699	107%
2026		12,794		13,351	104%		13,696	107%
2027		12,752		13,308	104%		13,652	107%
2028		12,724		13,279	104%		13,622	107%
2029		12,706		13,260	104%		13,603	107%
2030		12,699		13,253	104%		13,595	107%
2031		12,706		13,260	104%		13,603	107%
2032		12,690		13,243	104%		13,586	107%
2033		12,709		13,263	104%		13,606	107%
2034		12,720		13,274	104%		13,617	107%
2035		12,730		13,285	104%		13,629	107%
2036		12,715		13,269	104%		13,612	107%
2037		12,698		13,252	104%		13,594	107%
2038		12,696		13,250	104%		13,593	107%
2039		12,684		13,237	104%		13,580	107%
2040		12,675		13,228	104%		13,570	107%
2041		12,675		13,228	104%		13,570	107%
2042		12,677		13,230	104%		13,573	107%
2043		12,682		13,236	104%		13,578	107%
2044		12,696		13,249	104%		13,592	107%
2045		12,694		13,248	104%		13,591	107%
2046		12,695		13,249	104%		13,592	107%
2047		12,695		13,249	104%		13,592	107%
2048		12,699		13,253	104%		13,596	107%
2049		12,707		13,261	104%		13,604	107%
2050		12,718		13,273	104%		13,617	107%

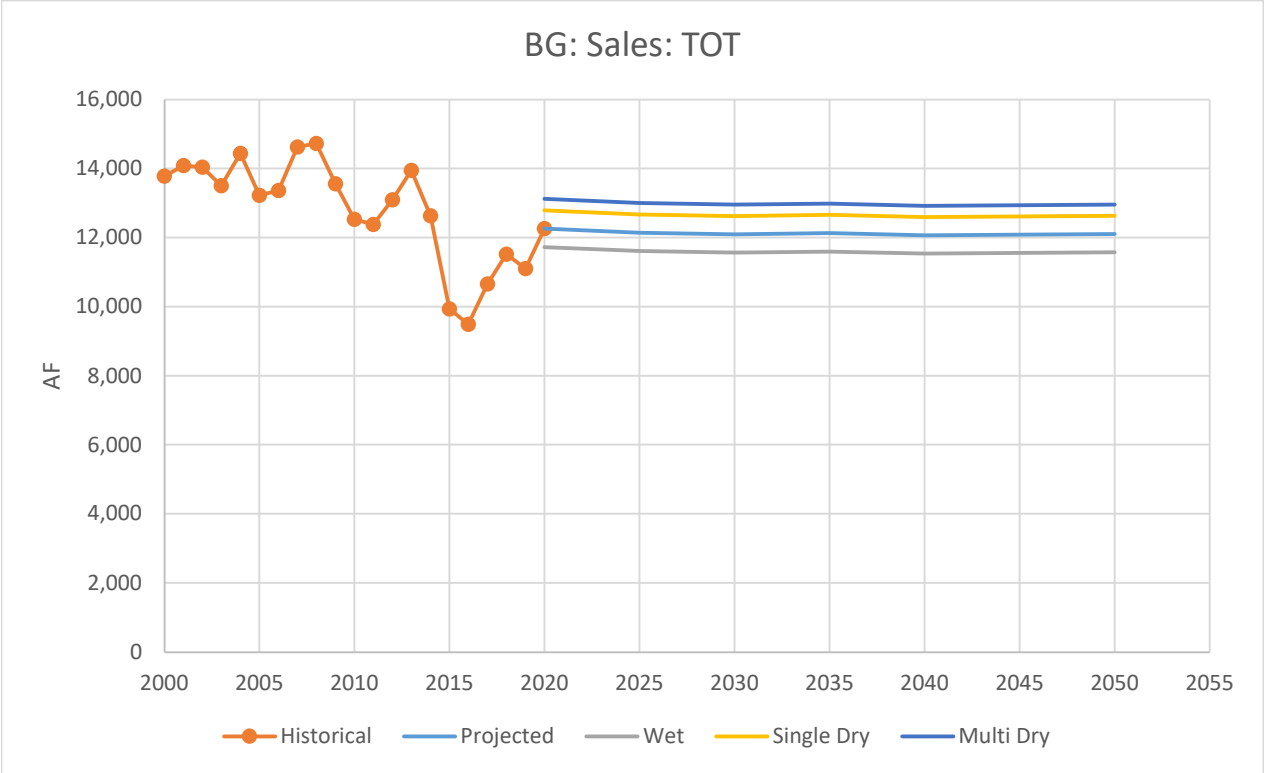
District Demand Projection Report
Bear Gulch

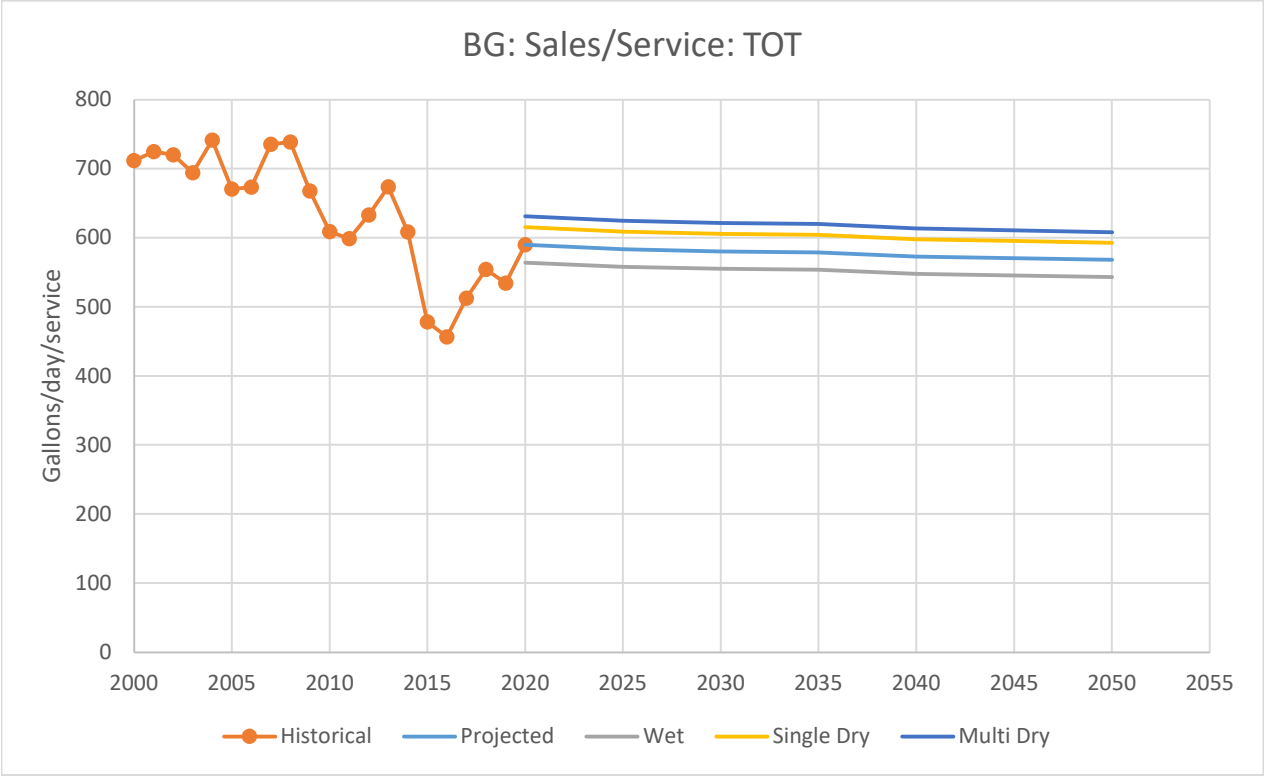
Charts

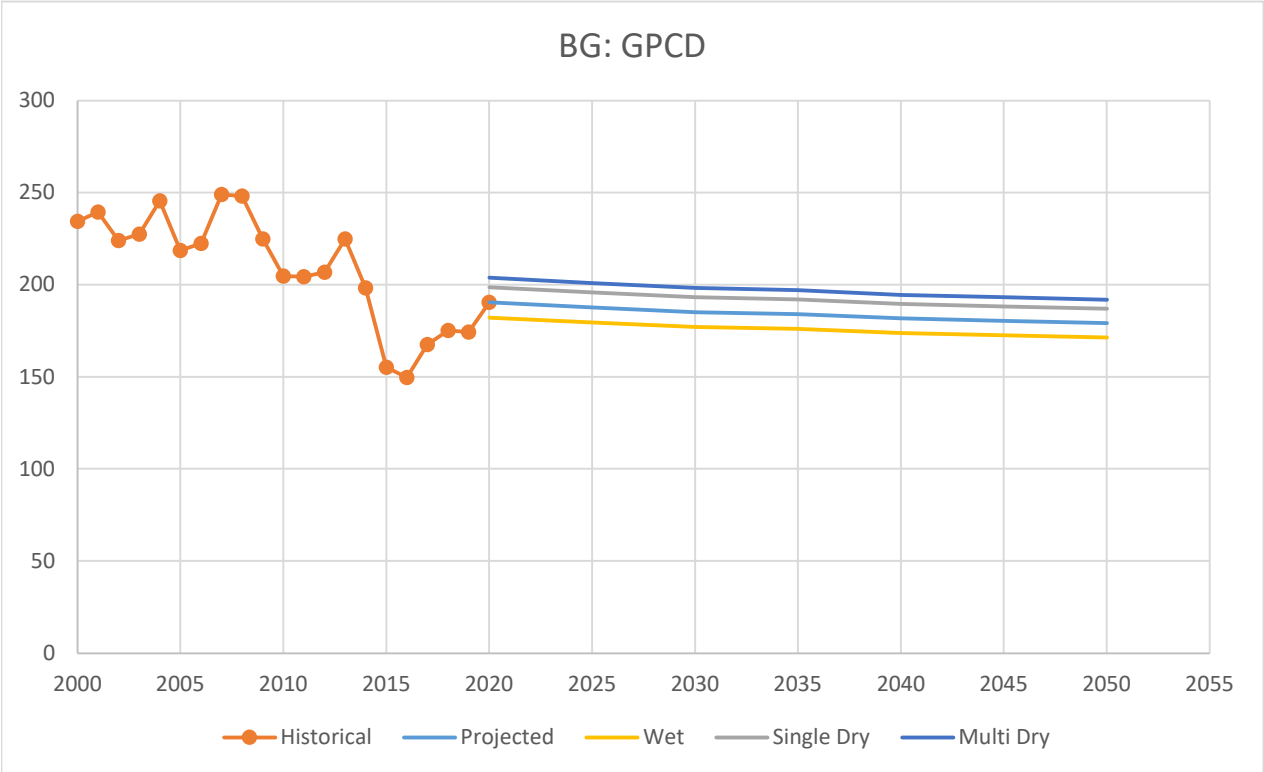





BG: Production
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
AF
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
2055
Historical
Projected
Wet
Single Dry
Multi Dry


BG: Sales: TOT
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
AF
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
2055
Historical
Projected
Wet
Single Dry
Multi Dry


BG: Sales/Service: TOT
Gallons/day/service
800
700
600
500
400
300
200
100
0
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
2055
Historical
Projected
Wet
Single Dry
Multi Dry


BG: GPCD
300
250
200
150
100
50
0
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
2055
Historical
Projected
Wet
Single Dry
Multi Dry

Appendix F: DWR SB X7-7 Verification Forms

Water Conservation Act of 2009
SB X7-7
Verification Forms

Bear Gulch District

2020 Urban Water Management Plan
Appendix F

SB X7-7 Table-1: Baseline Period Ranges

Baseline	Parameter	Value	Units
10- to 15-year baseline period	2008 total water deliveries	15,510	Acre Feet
	2008 total volume of delivered recycled water	-	Acre Feet
	2008 recycled water as a percent of total deliveries	0.00%	Percent
	Number of years in baseline period[1, 2]	10	Years
	Year beginning baseline period range	2000	
	Year ending baseline period range[3]	2009	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2004	
	Year ending baseline period range[4]	2008	

[1] If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period. *[2] The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.*

[3] The ending year must be between December 31, 2004 and December 31, 2010.

[4] The ending year must be between December 31, 2007 and December 31, 2010.

SB X7-7 Table 2: Method for Population Estimates	
Method Used to Determine Population (may check more than one)	
☐	**1. Department of Finance** (DOF) DOF Table E-8 (1990 - 2000) and (2000-2010) and DOF Table E-5 (2011 - 2015) when available
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☑	**4. Other** DWR recommends pre-review

NOTES: Cal Water uses a population estimation methodology based on overlaying Census Block data from the 2000 and 2010 Censuses with the District's service area. LandView 5 and MARPLOT software are used with these data to estimate population per dwelling unit for 2000 and 2010. The per dwelling unit population estimates are then combined with Cal Water data on number of dwelling units served to estimate service area population for non-Census years. Cal Water also estimated service area population using DWR's Population Tool. The estimates prepared using Cal Water's methodology and DWR's Population Tool differed by less than one percent. Cal Water is electing to use the population estimates produced by its methodology in order to maintain consistency with population projections it has prepared in other planning documents and reports.

SB X7-7 Table 3: Service Area Population		
Year		**Population**
10 to 15 Year Baseline Population		
Year 1	2000	53,885
Year 2	2001	54,162
Year 3	2002	54,392
Year 4	2003	54,421
Year 5	2004	54,574
Year 6	2005	55,252
Year 7	2006	55,651
Year 8	2007	55,741
Year 9	2008	55,791
Year 10	2009	56,484
Year 11		
Year 12		
Year 13		
Year 14		
Year 15		
5 Year Baseline Population		
Year 1	2004	54,574
Year 2	2005	55,252
Year 3	2006	55,651
Year 4	2007	55,741
Year 5	2008	55,791
2015 Compliance Year Population		
2015		59,883

SB X7-7 Table 4: Annual Gross Water Use *

Baseline Year *Fm SB X7-7 Table 3*		Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.*	Deductions					Annual Gross Water Use
			Exported Water	Change in Dist. System Storage (+/-)	Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.*	Water Delivered for Agricultural Use	Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.*	
10 to 15 Year Baseline - Gross Water Use								
Year 1	2000	14,149			-		-	14,149
Year 2	2001	14,518			-		-	14,518
Year 3	2002	13,639			-		-	13,639
Year 4	2003	13,861			-		-	13,861
Year 5	2004	15,008			-		-	15,008
Year 6	2005	13,527			-		-	13,527
Year 7	2006	13,858			-		-	13,858
Year 8	2007	15,554			-		-	15,554
Year 9	2008	15,510			-		-	15,510
Year 10	2009	14,245			-		-	14,245
Year 11	0	-			-		-	-
Year 12	0	-			-		-	-
Year 13	0	-			-		-	-
Year 14	0	-			-		-	-
Year 15	0	-			-		-	-
10 - 15 year baseline average gross water use								**14,387**
5 Year Baseline - Gross Water Use								
Year 1	2004	15,008			-		-	15,008
Year 2	2005	13,527			-		-	13,527
Year 3	2006	13,858			-		-	13,858
Year 4	2007	15,554			-		-	15,554
Year 5	2008	15,510			-		-	15,510
5 year baseline average gross water use								**14,692**
2015 Compliance Year - Gross Water Use								
2015		10,401	-		-		-	**10,401**

* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3

SB X7-7 Table 4-A: Volume Entering the Distribution System(s)
Complete one table for each source.

Name of Source	Bear Gulch Creek		
This water source is:			
☑	The supplier's own water source		
☐	A purchased or imported source		
Baseline Year *Fm SB X7-7 Table 3*	Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System			
Year 1	2000	1,557		1,557
Year 2	2001	920		920
Year 3	2002	1,191		1,191
Year 4	2003	1,278		1,278
Year 5	2004	692		692
Year 6	2005	1,774		1,774
Year 7	2006	1,923		1,923
Year 8	2007	754		754
Year 9	2008	528		528
Year 10	2009	716		716
Year 11	0			-
Year 12	0			-
Year 13	0			-
Year 14	0			-
Year 15	0			-
5 Year Baseline - Water into Distribution System			
Year 1	2004	692		692
Year 2	2005	1,774		1,774
Year 3	2006	1,923		1,923
Year 4	2007	754		754
Year 5	2008	528		528
2015 Compliance Year - Water into Distribution System			
2015		437		437

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: Volume Entering the Distribution				
Name of Source	SFPUC			
This water source is:				
☐	The supplier's own water source			
☑	A purchased or imported source			
Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	2,000	12592.5139		12,593
Year 2	2,001	13598.3495		13,598
Year 3	2,002	12447.8222		12,448
Year 4	2,003	12582.8346		12,583
Year 5	2,004	14315.7622		14,316
Year 6	2,005	11753.5518		11,754
Year 7	2,006	11935.733		11,936
Year 8	2,007	14800.3297		14,800
Year 9	2,008	14981.9492		14,982
Year 10	2,009	13528.5324		13,529
Year 11	-			0
Year 12	-			0
Year 13	-			0
Year 14	-			0
Year 15	-			0
5 Year Baseline - Water into Distribution System				
Year 1	2,004	14315.7622		14,316
Year 2	2,005	11753.5518		11,754
Year 3	2,006	11935.733		11,936
Year 4	2,007	14800.3297		14,800
Year 5	2,008	14981.9492		14,982
2015 Compliance Year - Water into Distribution System				
2015		9,964		9,964
** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*				
NOTES:				

SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Annual Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	2000	53,885	14,149	234
Year 2	2001	54,162	14,518	239
Year 3	2002	54,392	13,639	224
Year 4	2003	54,421	13,861	227
Year 5	2004	54,574	15,008	246
Year 6	2005	55,252	13,527	219
Year 7	2006	55,651	13,858	222
Year 8	2007	55,741	15,554	249
Year 9	2008	55,791	15,510	248
Year 10	2009	56,484	14,245	225
Year 11	0	-	-	
Year 12	0	-	-	
Year 13	0	-	-	
Year 14	0	-	-	
Year 15	0	-	-	
10-15 Year Average Baseline GPCD				**233**
5 Year Baseline GPCD				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use
Year 1	2004	54,574	15,008	246
Year 2	2005	55,252	13,527	219
Year 3	2006	55,651	13,858	222
Year 4	2007	55,741	15,554	249
Year 5	2008	55,791	15,510	248
5 Year Average Baseline GPCD				**237**
2015 Compliance Year GPCD				
2015		59,883	10,401	**155**

SB X7-7 Table 6: Gallons per Capita per Day *Summary From Table SB X7-7 Table 5*	
10-15 Year Baseline GPCD	233
5 Year Baseline GPCD	237
2015 Compliance Year GPCD	155

SB X7-7 Table 7: 2020 Target Method *Select Only One*		
Target Method		Supporting Documentation
☑	Method 1	SB X7-7 Table 7A
☐	Method 2	SB X7-7 Tables 7B, 7C, and 7D *Contact DWR for these tables*
☐	Method 3	SB X7-7 Table 7-E
☐	Method 4	Method 4 Calculator

SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	**2020 Target GPCD**
233	**187**

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target			
5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target[1]	Calculated 2020 Target[2]	**Confirmed 2020 Target**
237	225	187	**187**

[1] Maximum 2020 Target is 95% of the 5 Year Baseline GPCD *[2] 2020 Target is calculated based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target.*

Appendix G: Climate Change Studies – Executive Summaries

- Climate Change – Water Resource Monitoring and Adaptation Plan – Phase 1
- Potential Climate Change Impacts on the Water Supplies of California Water Service

Climate Change-Water Resource Monitoring and Adaptation Plan – Phase 1

December 17, 2020

California Water Service
1720 North First Street
San Jose, CA 95112

Submitted by:
ICF
555 W 5th St
Suite 3100
Los Angeles, CA 90013

Executive Summary

Shifts in the frequency and severity of natural hazards resulting from climate change, often referred to as climate hazards, increasingly threaten water resources in California. These relevant climate hazards include reductions to snowpack, greater concentrations of precipitation in both a shorter rain season and isolated atmospheric river events, and more volatility between wet and dry water years.

To identify and prepare for impacts from these hazards, California Water Service (Cal Water) is seeking to identify climate change vulnerabilities to water supplies, operations and facilities, and to develop adaptation strategies to address those vulnerabilities through a Climate Change Water Resources Monitoring and Adaptation Plan. This body of work is intended to provide Cal Water with information to inform decisions on water system/asset management and resource planning to better prepare for and respond to current and projected changes to climate. This work represents a forward-looking approach in addressing climate risks for California utilities, as the large majority of water wholesaler and utilities have not completed climate vulnerability and adaptation plans.

In the first phase of this effort, the ICF team collaborated with Cal Water to conduct a literature and tools review as the foundation for subsequent phases of work. In Phase 2 of this project, the ICF team and Cal Water will undertake a vulnerability assessment of Cal Water's facilities and operations by developing an assessment approach that evaluates climate impacts to Cal Water, identifies asset vulnerabilities, and prioritizes climate risks. Phase 3 will focus on an assessment of climate-driven impacts to water supply resources and demand. This first phase of research and assessment will provide Cal Water with a clear "lay of the land" in understanding available methodologies and lessons learned in conducting vulnerability assessments and developing adaptation plans in the water sector. This work can provide key insights for Cal Water, industry practitioners, and Cal Water customers on best practices and needs in climate vulnerability and adaptation efforts.

This first phase will also act as a foundation for Cal Water to build on in subsequent phases of work. ICF and Cal Water will build on research and findings developed in Phase 1 to define the scope of Phases 2 and 3.

In Phase 1, the ICF team undertook three areas of review:

1) Literature and tools related to adaptation planning by water suppliers and other relevant organizations
2) Methods and data in Cal Water's 2016 Vulnerability Study "Potential Climate Change Impacts on the Water Supplies of California Water Service"
3) Climate change impact assessments and adaptation plans beyond Cal Water (wholesalers, state agencies) that could affect Cal Water's vulnerability or adaptive capacity

In the first part of our assessment, the studies we reviewed conclude that there is high certainty of climate-driven reductions to snowpack, wetter winter months, and more volatility between wet and dry water years. While California water systems are designed to operate under a wide

range of hydrologic conditions, they are not designed to absorb and adapt to the projected levels of change, which could have impacts on historical supplies from reservoir systems and groundwater systems. These studies also revealed a suite of potential approaches to vulnerability assessment and risk assessment that are applicable to Phases 2 and 3.

Key studies that the ICF team referenced include Brown and Caldwell's "Impacts of Climate Change on Honolulu Water Supplies and Planning Strategies for Mitigation", the Water Research Foundation's (WRF)'s "Mapping Climate Exposure and Climate Information Needs to Water Utility Business Functions", the Metropolitan Water District's (MWD)'s "2015 Integrated Water Resources Plan" and "2015 Urban Water Management Plan", and the U.S. Environmental Protection Agency's (EPA's) Climate Resilience Evaluation and Awareness Toolkit (CREAT).

In the second part of our review, we found that Cal Water's 2016 Climate Change Vulnerability Study undertook a high-level investigation of impacts of climate change on water supply, including surface water, groundwater, and imported water throughout Cal Water service areas. However, the study did not use uniform metrics across water suppliers, was unable to apply the currently available downscaled climate projections, and did not consider the full suite of potential climate impacts to Cal Water's systems, including impacts of compounding climate hazards and impacts on Cal Water facilities and operations.

In the third part of this work, the ICF team researched and assessed existing climate vulnerability assessments and adaptation efforts that have an impact on Cal Water's ability to mitigate impacts from climate change. This included efforts by water supply wholesalers connected to Cal Water's system, and state agencies that regulate Cal Water's supplies, operations, and planning efforts. This will allow Cal Water to build on existing actions and avoid recreating adaptation efforts that are planned or have been implemented.

Cal Water has undertaken key steps toward adaptation planning since the 2016 Vulnerability Study, such as this work to provide additional vulnerability analysis, working locally to identify and prepare to meet Sustainable Groundwater Management Act (SGMA) requirements, and coordinating with wholesalers on their identified climate-driven vulnerabilities. Phases 2 and 3 of this work will further frame system vulnerabilities within an adaptation planning context for a flexible and anticipatory response.

The ICF team's literature review focused on identifying approaches for assessing water utility vulnerabilities of assets and water resources, and adaptation planning needs (summarized in Table 1). To identify these priority approaches, the team reviewed a list of publications with input from Cal Water on key sources. We reviewed and analyzed the relevant literature for applicability to Cal Water, the advantages and fit within a robust plan for assessment, and the potential disadvantages. We highlighted those approaches in the sections on key takeaways and the applicability of approaches to Cal Water. Table 1 provides important considerations raised by the ICF team during this process.

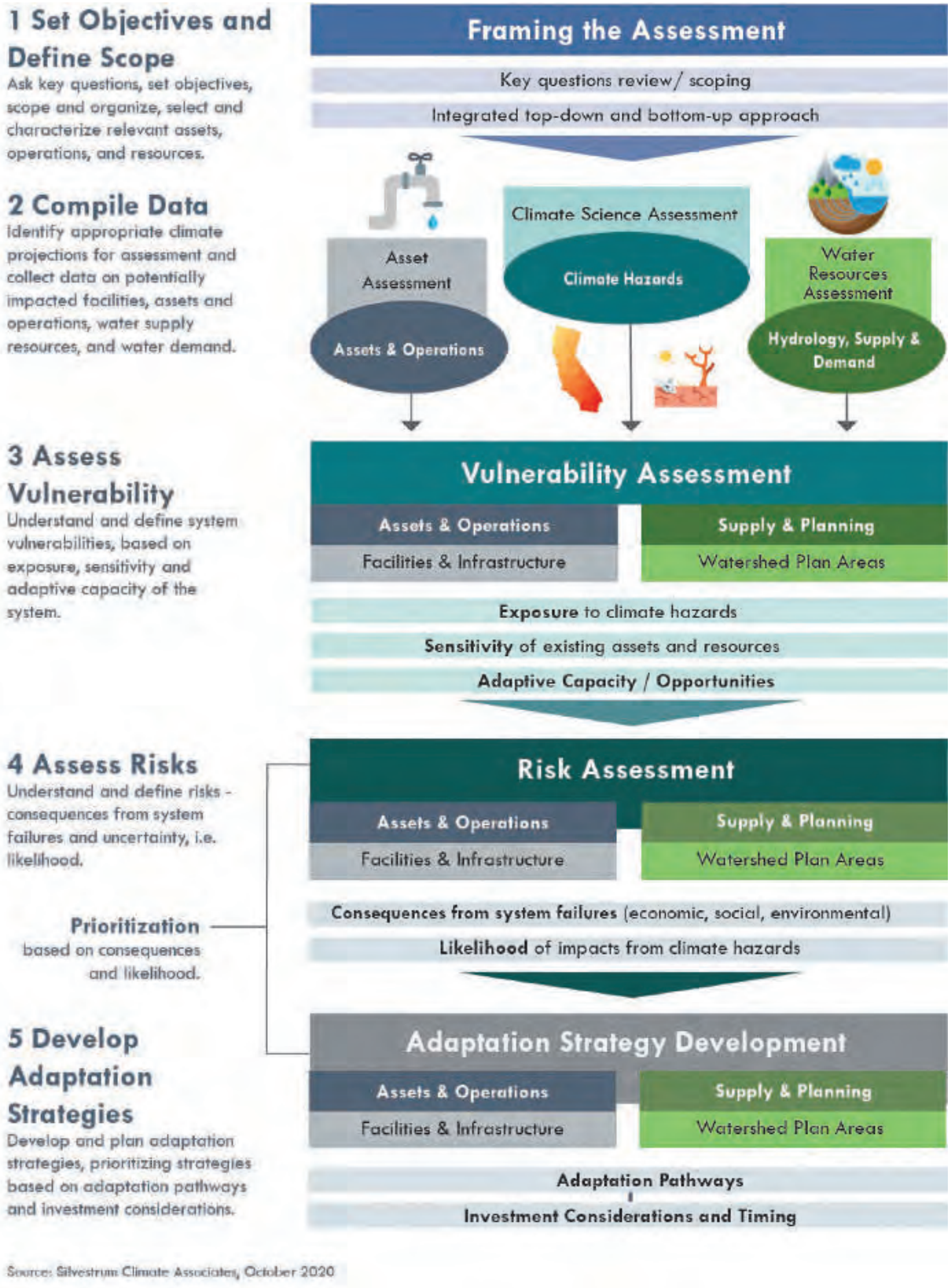
Table 1: Advantages and disadvantages of identified approaches

Identified Approach	Advantages	Disadvantages
Integrated resource-level (i.e., top-down) and asset-level (i.e., bottom-up) approaches to vulnerability assessment	• Allows for matching available information with appropriate methodologies • Supports evaluation of vulnerabilities in both water supply resources and physical systems: an integrated approach can help to address gaps in either area	• Bottom-up approaches can require extensive historical data and asset-level data • Integration of climate projections into hydrological models can be challenging. For example, data inputs for hydrological models and the outputs from climate projections may be incompatible or require additional data processing
Robust Decision-Making	• Supports identification of decisions for response under a range of potential climate futures • Supports alignment between climate impacts and operating units/business functions • Ensures the scope focuses on critical services, assets, and resources • Supports the development of adaptation pathways and measures • Provides a framework for information that can signal the need for critical decisions on adaptation	• Involves significant investment of time to identify performance metrics, business functions, and key variables • Even with significant time invested on the front end, scope can change and require rescoping later in the effort • Requires a strong understanding of utility decision-making
Applying climate projections to hydrologic modeling, future demand and planning scenarios	• Generates better understanding of impacts of extreme scenarios, snowpack loss, drought, increased temperatures, precipitation whiplash, and other hydrologic changes in water supply resources and downstream demands • Allows for modeling of a range of climate scenarios to better account for uncertainties in resource management and climate outcomes • Integrates climate projections with scaled historical time series data	• Can require substantial data, and may introduce bias (due to selected climate scenarios) • It is necessary to identify performance metrics and thresholds related to available climate variables; these can be difficult to identify and thresholds may not exist • Relies on necessary simplifying assumptions to model complex hydrologic systems
Stress testing and scenarios	• Supports management of uncertainty, especially in the absence of data • Allows for understanding of climate impacts on system performance within a risk framework	• Can require refined climate information (e.g. hydrological variables) and detailed asset information • Can require the integration of climate information into hydrological models, which may require

Identified Approach	Advantages	Disadvantages
	• Supports identification of major performance metrics and their potential for failure • Helps in understanding how the severity of impacts varies for facilities, operations, and water supplies under different climate change conditions.	significant data processing to be compatible with one another • Can result in qualitative or directional findings that don't provide straightforward adaptation responses
Engaging staff in climate change vulnerability assessments and adaptation plans	• Provides perspective for setting study parameters • Provides targeted input and data into assessment • Identifies existing data gaps and actions to address gaps • Supports development of institutional capacity for monitoring impacts, adaptation planning, and implementation	• Can be time-consuming for team members attending workshops and interviews; requires a targeted approach to ensure efficiency and that the right data is captured • Requires cross-team coordination that may be outside of "normal" communication pathways, e.g. between engineers and policy specialists
Evaluating costs of inaction	• Helps to prioritize adaptation planning needs • Creates a better understanding of the risks to Cal Water	• Requires scaling information on past costs without clear data on future impacts, creating uncertainties in estimates
Use of Flexible Adaptation Pathways	• Helps to select appropriate timing (including lead time from planning to implementation) and application of adaptation measures • Considers and compares multiple strategies in adaptation planning • Includes triggers that signal when decision-makers should decide on switching to another pathway • Allows for adaptive decisions under uncertainty by integrating points for re-assessing pathway and actions • Considers alternative external developments over time	• Does not provide a fixed timeline for actions • This approach is relatively new and may require coordination with budget cycles and external policy updates, since actions evolve over time • May push decision burden onto future decision-makers who did not develop original pathway

Our team synthesized these identified methodologies, findings, and insights into an overarching approach for characterizing climate vulnerabilities and planning for adaptation at both an asset level and water supply planning level to suit Cal Water's needs in addressing climate change impacts, shown in Figure 1.

Figure 1: Climate Assessment Framework



Source: Silvestrum Climate Associates, October 2020

Based on this review, the ICF team is making the following key recommendations for guiding Cal Water's efforts in identifying climate vulnerabilities and planning for adaptation:

- **Apply a standard conceptual framework to vulnerability assessment which integrates both top-down analysis and bottom-up analysis (see Figure 1).** The standard conceptual framework for assessing climate vulnerabilities and risks includes understanding exposure, sensitivity, and adaptive capacity, and potential impacts as components of vulnerability, and consequence and likelihood as components of risk. Top-down analysis would begin by applying downscaled Global Climate Model (GCM) projections to assess impacts on water supply resources and the bottom-up analysis would begin by identifying system sensitivities to climate hazards. These analyses are complementary.
- **Use a robust decision making (RDM) framework for vulnerability assessment and adaptation planning** by seeking to identify decisions for response under a range of potential climate futures, mapping impacts on operating units/business functions, and ensuring that the scope focuses on critical services, assets, and resources. A robust decision-making framing will support the development of adaptation pathways and measures by monitoring information that signals the need for critical decisions on adaptation.
- **Engage staff and key stakeholders in the planning process** to gain a holistic planning perspective for setting study parameters, providing targeted input into assessment and plan development, and supporting institutional capacity for adaptation.
- **Build off of the 2016 Cal Water Climate Change Impact study by applying updated climate models and projections for additional hydrologic variables** to hydrologic modeling, future demand and planning scenarios, and scaled historical time series data to better understand impacts of extremes, precipitation whiplash, and other hydrologic changes in water supply resources. We recommend presentation of this with uniform metrics for more actionable findings.
- **Assess climate impact consequence by stress-testing key water system performance metrics.** This includes developing a range of impact scenarios to understand how the severity of impacts varies for facilities, operations, and water supplies under different climate change conditions.
- **Evaluating the order of magnitude cost of inaction.** We recommend communicating consequences in terms of direct costs to Cal Water and customers without adaptation actions to prioritize adaptation response.
- **Follow a step-by-step, iterative process to adaptive management which fully aligns with potential exposure to climate hazards and vulnerabilities**, including:
    - Utilizing Flexible Adaptation Pathways in planning for selecting appropriate timing and application of adaptation measures
    - Planning for monitoring and evaluation
    - Evaluating adaptation investment decisions

During Phases 2 and 3 in which Cal Water and the ICF team will further assess vulnerability, we will frame the study outputs within a decision-making context for compatibility with adaptation planning concepts and eventual investment in adaptation measures.

Potential Climate Change Impacts on the Water Supplies of California Water Service

Prepared by

Gary Fiske and Associates, Inc.
Balance Hydrologics, Inc.

January 2016

Executive Summary

Introduction

California Water Service Company (Cal Water) provides water service to roughly 478,000 customers – about 1.7 million people – located in 83 state-wide communities in 24 service districts. Cal Water's districts rely on a variety of supply sources, including local groundwater, local surface water, and imported supplies. It is critical for Cal Water to gain a better understanding of the potential impacts of climate change on the availability of those supplies. Impacts are inherently uncertain, but Cal Water believes that the only responsible course is to carefully incorporate climate change into its ongoing water supply planning.

The present project and report represent a first step in that path. In order for Cal Water to determine how its long-term water supply planning should reflect climate change impacts, it must first have an understanding of what the impacts of climate change on its supply sources might be. That is the purpose of this study.

The work reported on here focuses on the sample of Cal Water districts highlighted in Figure ES-1. These districts account for 85% of Cal Water's total 2014 production and reflect the diversity of all Cal Water districts, including geographic, hydrologic, and climatic conditions and primary and secondary supply sources.

Changes in climate can affect the availability of local groundwater and surface water supplies, as well as purchased imported supplies. This study separately addresses the impacts on each of these for each sample district. It relies on the best available projections of changes in climate (temperature and precipitation) through the end of the century. It then uses the climate projections to examine how surface water flows and groundwater recharge rates may change.

For imported supplies, this study relies on studies already completed by wholesale providers where possible. Where no such studies have been done or where the data from such studies was unavailable, other approaches were developed to estimate climate change impacts on these supplies.

The results reported here provide an integrated view of how projected climate changes may affect water supply availability for Cal Water's service districts. The results also represent a first step in integrating potential future climate change impacts into Cal Water's ongoing supply planning. Because of the inherent uncertainties, a nuanced risk assessment may be needed to guide the incorporation of these results into long-range planning. Beyond the Company's supply/infrastructure planning, the results also can affect the Company's triennial General Rate Cases; they may also have potential operational implications.

Figure ES- 1. Cal Water Service Districts with Sample Districts Highlighted

Estimating Changes in Climate

Climate change is primarily driven by increased concentrations of greenhouse gases (GHGs) in the atmosphere. The trajectory of future climate change is a function of the rate at which those concentrations are projected to increase and the manner in which the atmosphere and oceans respond to increased concentrations. Both are difficult to model. Thus, while the scientific community overwhelmingly agrees that climate change will occur (and indeed may already have begun), the trajectory of those changes is very uncertain.

The projections of temperature and precipitation that underlie this study are based on 40 of the latest Global Circulation Models (GCMs) run as part of the Coupled Model Intercomparison Project Phase 5 (CMIP5). Generally speaking, this type of approach is termed an ensemble analysis, for which the downscaled climate projections for any particular Cal Water Service District were based on the median of the 40 downscaled GCM datasets. The GCMs used by the analysis are driven by two GHG emission pathways that bound the possible trajectories of GHG concentrations.

Impacts of Climate Change on Water Supplies

The supplies for each district consist of a mix of local surface water, local groundwater, and/or purchased imports. Climate change impacts were estimated for each of these components. The approaches used for each are described below. Based on the breakdown of district production among the supply sources, Table ES-1 shows the ranges of projected overall climate change impacts on available supply, relative to the historic average.[1] Table ES-2 groups this vulnerability into 4 categories of expected change, and Figure ES-2 maps the end-of-century vulnerability.

[1] The historical averages used here, and elsewhere in this report, are based on the entire range of historical data available for the district-specific analyses. These ranges vary across districts, and are specified within the district-specific technical memoranda.

Table ES- 1. Projected Changes in Available Supply due to Climate Change

District		Percentage Change in Supply		
		2020	2050	2100
BK	Minimum	-10%	-10%	-12%
	Maximum	-12%	-16%	-20%
VIS	Minimum	-7%	-8%	-8%
	Maximum	-9%	-10%	-14%
KRV	Minimum	-13%	-16%	-19%
	Maximum	-16%	-21%	-31%
MPS/SSF/BG	Minimum	0%	-2%	-6%
	Maximum	0%	-7%	-15%
LAS	Minimum	-3%	-3%	-10%
	Maximum	-4%	-18%	-28%
CH	Minimum	2%	2%	0%
	Maximum	3%	1%	-3%
ORO	Minimum	0%	8%	5%
	Maximum	0%	-8%	-7%
DOM/HR/PV	Minimum	0%	0%	-1%
	Maximum	0%	-2%	-3%
STK	Minimum	0%	0%	-8%
	Maximum	0%	-14%	-17%
SLN	Minimum	-6%	-6%	-6%
	Maximum	-7%	-7%	-7%

Table ES- 2. Categories of Projected Supply Vulnerability

District	Supply Vulnerability		
	2020	2050	2100
KRV	3	4	4
BK	3	3	4
LAS	1	3	4
VIS	2	2	3
STK	1	2	3
SLN	2	2	2
MPS/SSF/BG	1	1	3
DOM/HR/PV	1	1	1
ORO	1	1	1
CH	1	1	1

Districts in Category 1 expect <5% reduction in supply. Category 2 indicates a reduction of 5-10%. Category 3 indicates an expected reduction of 10-15%. Category 4 reductions exceed 15%.

Figure ES- 2. Cal Water 2100 Vulnerability to Climate Change

Vulnerability levels:
Green = Low
Yellow = Moderate
Light Red = High
Dark Red = Very High

Estimating Climate Change Impacts on Local Surface Supplies

For those Cal Water districts that obtain a portion of their water supplies from local surface water, projected average annual precipitation in each of three forecast years (2020, 2050, 2100) were compared to historical precipitation to estimate the projected average annual discharge for that forecast year. Table ES-3 shows the estimated percent changes in surface water availability compared to historical averages.

Table ES- 3. Estimated Impacts on Local Surface Supply Availability

District		Percent Change in Runoff		
		2020	2050	2100
BK	Minimum Impact	-17%	-18%	-19%
	Maximum Impact	-18%	-19%	-23%
KRV	Minimum Impact	-17%	-18%	-19%
	Maximum Impact	-18%	-19%	-23%
MPS/SSF/BG	Minimum Impact	+3%	+6%	+12%
	Maximum Impact	+3%	+5%	+6%

Of the three districts, the two in the southern San Joaquin Valley are projected to experience significant reductions in their local surface supplies. In contrast, the Bear Gulch district surface supply is forecast to increase.

Estimating Climate Change Impacts on Local Groundwater Supplies

Climate change impacts on Cal Water's local groundwater supplies result from changes in projected groundwater recharge. The three groundwater recharge components include:

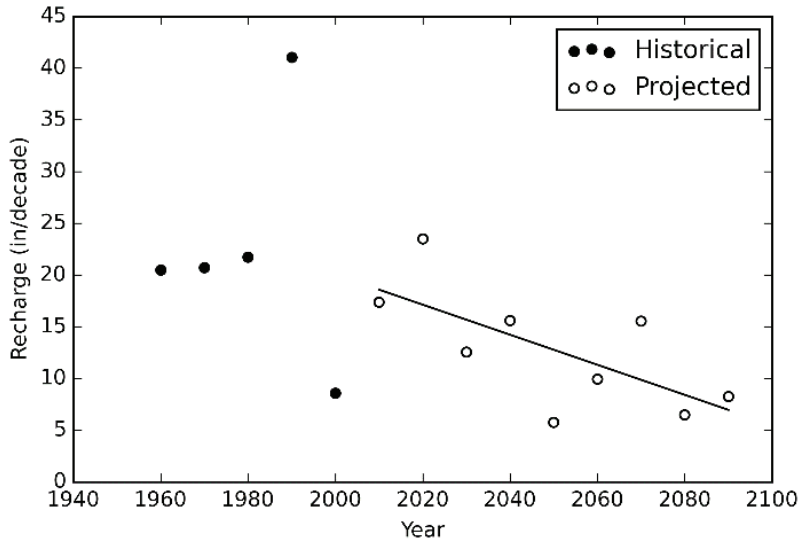
- Local river sources;
- Direct recharge from precipitation on the groundwater basin; and
- Recharge from agricultural and urban deep percolation.

The analysis first estimated the split of local recharge among these three components using geographic and geologic data, geochemical markers, and previously published reports and other supporting information. The climate change impacts on each component were then estimated, consolidated into overall projections of recharge impacts, and compared to estimated historical recharge rates.

Estimates of impacts on river recharge used the methodology for local surface supply described above. For the purposes of this phase of work, it was assumed that the change in recharge from the river is proportional to the change in total annual discharge. The estimated amount of water that will recharge directly into a groundwater basin from rain (or snow) is based on a balance of evapotranspiration (ET), precipitation rates, and soil

water capacity. Recharge is estimated using both historical and projected precipitation and temperature data. Decadal averages in projected recharge are then used to calculate long-term trends. This is illustrated in Figure ES-3 for Kern River Valley.

Figure ES- 3. Historic and Projected Decadal Direct-Precipitation Recharge for Kern River Valley



A quantitative projection of recharge from deep percolation beneath irrigated fields and urban areas is beyond the scope of this phase. Instead, districts for which a significant proportion of recharge is from agricultural and urban water are identified and expected trends under climate change of this water source for those districts are estimated. At-risk service areas with decreasing agricultural and urban water sources can be explored further in future work.

The estimated percentage impacts on each of the recharge components are multiplied by the expected fractions that each component is of total recharge to calculate the range of expected recharge reductions. Table ES-4 shows those results for each district, excluding the impacts of urban/agricultural applied water percolation.

Actual impacts on Cal Water's ability to pump groundwater may be less than these recharge reductions because the storage volumes in different basins have differing degrees of responsiveness to changes in recharge. The degree to which changes in recharge volumes translate into available groundwater supply is a function of the hydrogeologic attributes of the basin. A detailed understanding of those characteristics would require a level of modeling that is well beyond the scope of this phase of work. Instead, the estimates of basin responsiveness were based on the historical record of how the basin's water level has varied with recent climate variability. For some districts, the basin appears to be highly responsive, while for others changes in climate do not have much impact.

Table ES- 4. Projected Changes in Average Annual Groundwater Recharge

District		Percentage Change in Recharge		
		2020	2050	2100
BK	Minimum	-14%	-15%	-15%
	Maximum	-14%	-15%	-18%
VIS	Minimum	-9%	-10%	-11%
	Maximum	-9%	-10%	-14%
KRV	Minimum	-13.4%	-19%	-23%
	Maximum	-15%	-22%	-35%
MPS/SSF/BG	Minimum	-2%	-4%	-6%
	Maximum	-2%	-6%	-12%
LAS	Minimum	-7%	-8%	-13%
	Maximum	-8%	-18%	-25%
CH	Minimum	6%	4%	1%
	Maximum	6%	2%	-4%
ORO	Minimum	0%	0%	0%
	Maximum	0%	0%	0%
DOM/HR/PV	Minimum	0%	0%	0%
	Maximum	0%	0%	0%
STK	Minimum	-2%	-3%	-6%
	Maximum	-2%	-4%	-7%
SLN	Minimum	-7%	-7%	-7%
	Maximum	-7%	-7%	-7%

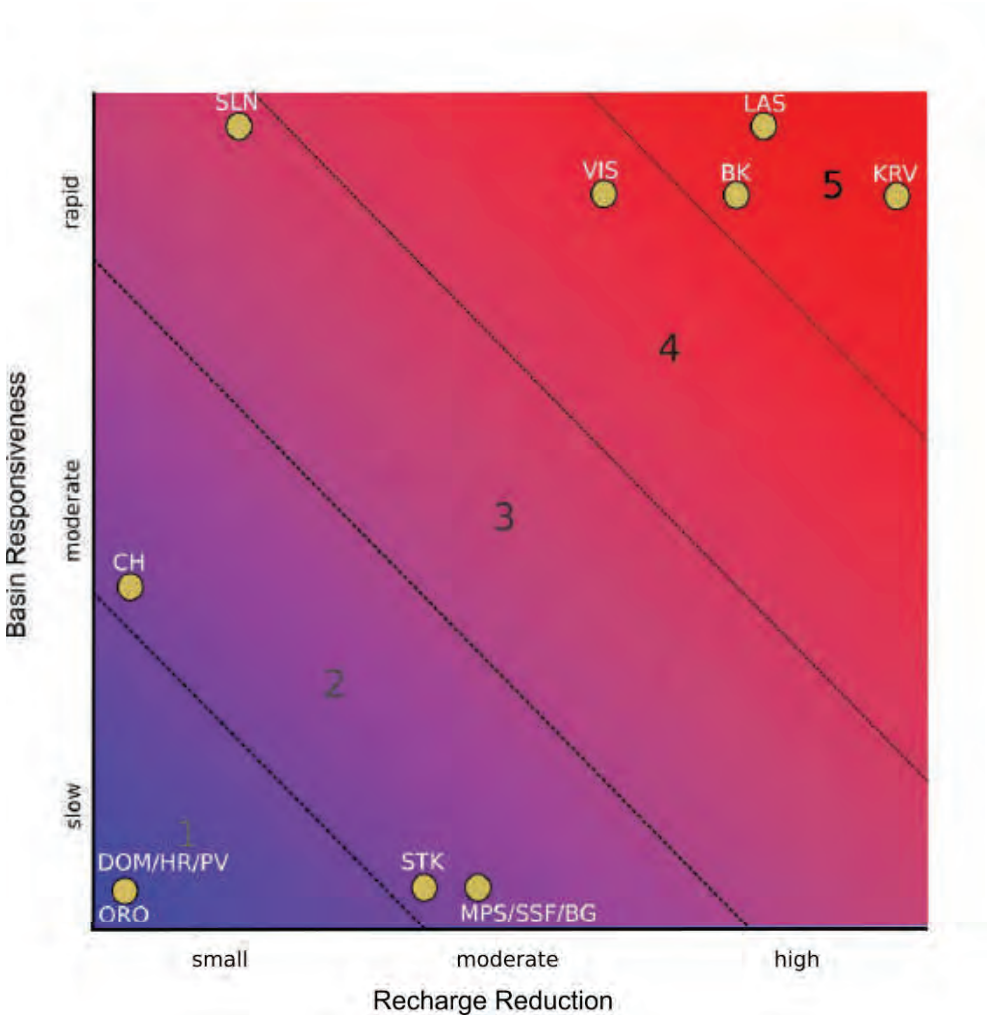
The overall risk to Cal Water's groundwater supplies for each district is based on the expected recharge reductions and the expected responsiveness of basin water level to those reductions. Table ES-5 rates each district's groundwater supply risk on a 1-5 scale, with 1 indicating little or no risk and 5 indicating high risk. Figure ES-4 is a visual depiction of these ratings.

Generally speaking, the groundwater supply impacts are large for the districts in the southern San Joaquin Valley. The Los Altos District also shows a high impact, largely because a significant portion of its recharge is from imported supplies, which are forecast to decrease significantly. Further north in the Central Valley, groundwater supplies are less affected. The Bay Area and Los Angeles Basin districts also show relatively smaller impacts.

Table ES- 5. District Groundwater Risk Ratings

District	Rating
BK	5
KRV	5
LAS	5
VIS	4
SLN	3
CH	2
MPS/SSF/BG	2
STK	2
ORO	1
DOM/HR/PV	1

Figure ES- 4. Groundwater Risk Ratings



Impacts of Climate Change on Imported Water Supplies

About half of Cal Water's supply is imported water that is purchased from wholesale suppliers. The supply and delivery systems of these suppliers are generally very complex and it is impossible within the confines of this project to independently model the impacts of climate change on those systems. The analysis therefore relied on available data, including the results of any climate change modeling that these suppliers themselves have done and other indicators of climate change impacts.

As a result, the climate change scenarios on which the estimates of impacts on different wholesale supplies are based will differ from one another and from the approach described above for the analysis of local supply impacts. The time frames of the results also differ. However, despite those limitations, important information about potential future climate change impacts on wholesale water supply availability was developed. Table ES-6 compares summary measures of central tendency for the potential district-specific climate change impacts on the availability of imported supplies.

Table ES- 6. Projected Climate Change Impacts on Imported Supplies

District	Source	Mid-Century	Late-Century
BK	SWP	-7%	-17%
LAS	SWP, CVP	-9%	-21%
ORO	SWP	-1%	-3%
MPS/SSF/BG	SFPUC	-10%	-20%
DOM/HR/PV	MWD	-1% to -2%	-2% to -5%
STK	USBR	-5%	-10%

Conclusions and Next Steps

The study results indicate significant risks for some districts. This points to the need for Cal Water to account for these risks in its future water supply planning if it is to minimize the adverse effects on its customers. The sole focus of this effort was to assess the potential climate change impacts on Cal Water's supplies. That is an important first step in integrating climate change into supply planning, but this study was not designed to:

- Analyze the impacts of these future supply limitations on Cal Water's ability to serve future customer demands. This is a function of such factors as water rights and contractual arrangements, how future demands are forecast to grow, how water conservation programming will affect those demands, and how Cal Water might modify the manner in which it operates its system.

- Develop mitigation plan to evaluate how potential supply and infrastructure investments and/or acquisition of new supplies might address any adverse impacts on water supply reliability.

- Formally assess alternative approaches to incorporating climate change in Cal Water's supply planning.

Possible next steps for Cal Water include:

- Methodological enhancements to reduce some of the uncertainties in the results reported herein;

- Development and acquisition of better and more complete data;

- Extending this study to other Cal Water districts;

- Developing a plan to mitigate anticipated climate change impacts on supply; and

- Integrating climate change into the Company's ongoing water supply planning.

Despite the study's limitations and uncertainties, three critical messages emerge:

- Cal Water supplies in the 21st century are likely to be adversely affected by climate change.

- These impacts will vary considerably across districts, depending on geography and source mix. For some districts, the impacts can be significant; for others, little or no impacts are projected.

- The impacts will generally increase over time. Anticipated late-century impacts are forecast to be significantly higher in some districts than impacts at mid-century. Moreover, during the period that climate change is forecast to increasingly constrain supplies, demands are also generally forecast to increase, further exacerbating the adverse impacts on water supply reliability.

Appendix H: SFPUC and BAWSCA Common Language

- Draft Common Language for BAWSCA Member Agencies' 2020 UWMPs, dated February 3, 2021
- Common Language for BAWSCA Member Agencies' 2020 UWMP Updates, dated April 30, 2021
- Common Language for Wholesale Customers about Rate Impacts of Water Shortages, dated March 4, 2021
- Additional Language Requested by the Member Agencies, dated March 24, 2021

February 3, 2021

Draft Common Language for BAWSCA Member Agencies' 2020 UWMPs

Tier One Drought Allocations

In July 2009, San Francisco and its Wholesale Customers in Alameda County, Santa Clara County, and San Mateo County (Wholesale Customers) adopted the Water Supply Agreement (WSA), which includes a Water Shortage Allocation Plan (WSAP) that describes the method for allocating water from the Regional Water System (RWS) between Retail and Wholesale Customers during system-wide shortages of 20 percent or less. The WSAP, also known as the Tier One Plan, was amended in the 2018 Amended and Restated WSA.

The SFPUC allocates water under the Tier One Plan when it determines that the projected available water supply is up to 20 percent less than projected system-wide water purchases. The following table shows the SFPUC (i.e, Retail Customers) share and the Wholesale Customers' share of the annual water supply available during shortages depending on the level of system-wide reduction in water use that is required. The Wholesale Customers' share will be apportioned among the individual Wholesale Customers based on a separate methodology adopted by the Wholesale Customers, known as the Tier Two Plan, discussed further below.

Level of System-Wide Reduction in Water Use Required	Share of Available Water	
	SFPUC Share	Wholesale Customers Share
5% or less	35.5%	64.5%
6% through 10%	36.0%	64.0%
11% through 15%	37.0%	63.0%
16% through 20%	37.5%	62.5%

The Tier One Plan allows for voluntary transfers of shortage allocations between the SFPUC and any Wholesale Customer as well as between Wholesale Customers themselves. In addition, water "banked" by a Wholesale Customer, through reductions in usage greater than required, may also be transferred.

As amended in 2018, the Tier One Plan requires Retail Customers to conserve a minimum of 5% during droughts. If Retail Customer demands are lower than the Retail Customer allocation (resulting in a "positive allocation" to Retail[1]) then the excess percentage would be re-allocated to the Wholesale Customers' share. The additional water conserved by Retail Customers up to the minimum 5% level is deemed to remain in storage for allocation in future successive dry years.

The Tier One Plan will expire at the end of the term of the WSA in 2034, unless mutually extended by San Francisco and the Wholesale Customers.

The Tier One Plan applies only when the SFPUC determines that a system-wide water shortage exists and issues a declaration of a water shortage emergency under California Water Code

[1] See Water Supply Agreement, Water Shortage Allocation Plan (Attachment H), Section 2.1.

Section 350. Separate from a declaration of a water shortage emergency, the SFPUC may opt to request voluntary cutbacks from its Retail and Wholesale Customers to achieve necessary water use reductions during drought periods.

Tier Two Drought Allocations

The Wholesale Customers have negotiated and adopted the Tier Two Plan, referenced above, which allocates the collective Wholesale Customer share from the Tier One Plan among each of the 26 Wholesale Customers. These Tier Two allocations are based on a formula that takes into account multiple factors for each Wholesale Customer including:

- Individual Supply Guarantee;
- Seasonal use of all available water supplies; and
- Residential per capita use.

The water made available to the Wholesale Customers collectively will be allocated among them in proportion to each Wholesale Customer's Allocation Basis, expressed in millions of gallons per day (mgd), which in turn is the weighted average of two components. The first component is the Wholesale Customer's Individual Supply Guarantee, as stated in the WSA, and is fixed. The second component, the Base/Seasonal Component, is variable and is calculated using the monthly water use for three consecutive years prior to the onset of the drought for each of the Wholesale Customers for all available water supplies. The second component is accorded twice the weight of the first, fixed component in calculating the Allocation Basis. Minor adjustments to the Allocation Basis are then made to ensure a minimum cutback level, a maximum cutback level, and a sufficient supply for certain Wholesale Customers.

The Allocation Basis is used in a fraction, as numerator, over the sum of all Wholesale Customers' Allocation Bases to determine each wholesale customer's Allocation Factor. The final shortage allocation for each Wholesale Customer is determined by multiplying the amount of water available to the Wholesale Customers' collectively under the Tier One Plan, by the Wholesale Customer's Allocation Factor.

The Tier Two Plan requires that the Allocation Factors be calculated by BAWSCA each year in preparation for a potential water shortage emergency. As the Wholesale Customers change their water use characteristics (e.g., increases or decreases in SFPUC purchases and use of other water sources, changes in monthly water use patterns, or changes in residential per capita water use), the Allocation Factor for each Wholesale Customer will also change. However, for long-term planning purposes, each Wholesale Customer shall use as its Allocation Factor, the value identified in the Tier Two Plan when adopted.

The Tier Two Plan, which initially expired in 2018, has been extended by the BAWSCA Board of Directors every year since for one additional calendar year. In November 2020, the BAWSCA Board voted to extend the Tier Two Plan through the end of 2021.

Individual Supply Guarantee

San Francisco has a perpetual commitment (Supply Assurance) to deliver 184 mgd to the 24 permanent Wholesale Customers collectively. San Jose and Santa Clara are not included in the Supply Assurance commitment and each has temporary and interruptible water supply

contracts with San Francisco. The Supply Assurance is allocated among the 24 permanent Wholesale Customers through Individual Supply Guarantees (ISG), which represent each Wholesale Customer's allocation of the 184 mgd Supply Assurance.

[Name of Agency's] ISG is _____ mgd.

2028 SFPUC Decisions (formerly 2018 SFPUC Decisions)
[Note: This section is intended to be optional language that individual BAWSCA member agencies may use.]

In the 2009 WSA, the SFPUC committed to make three decisions before 2018 that affect water supply development:

- Whether or not to make the cities of San Jose and Santa Clara permanent customers,
- Whether or not to supply the additional unmet supply needs of the Wholesale Customers beyond 2018, and
- Whether or not to increase the wholesale customer Supply Assurance above 184 mgd.

Events since 2009 made it difficult for the SFPUC to conduct the necessary water supply planning and CEQA analysis required to make these three decisions before 2018. Therefore, in the 2018 Amended and Restated WSA, the decisions were deferred for 10 years to 2028.

Additionally, there have been recent changes to instream flow requirements and customer demand projections that have affected water supply planning beyond 2018. As a result, the SFPUC has established an Alternative Water Supply Planning program to evaluate several regional and local water supply options. Through this program, the SFPUC will conduct feasibility studies and develop an Alternative Water Supply Plan by July 2023 to support the continued development of water supplies to meet future needs.

Reliability of the Regional Water System

In 2008, the SFPUC adopted Level of Service (LOS) Goals and Objectives in conjunction with the adoption of WSIP. The SFPUC updated the LOS Goals and Objectives in February 2020.

The SFPUC's LOS Goals and Objectives related to water supply are:

Program Goal	System Performance Objective
Water Supply – *meet customer water needs in non-drought and drought periods*	• Meet all state and federal regulations to support the proper operation of the water system and related power facilities. • Meet average annual water demand of 265 mgd from the SFPUC watersheds for retail and Wholesale Customers during non–drought years for system demands consistent with the 2009 Water Supply Agreement. • Meet dry-year delivery needs while limiting rationing to a maximum 20 percent system-wide reduction in water service during extended droughts. • Diversify water supply options during non-drought and drought periods. • Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers.

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Factors Impacting Supply Reliability

Adoption of the 2018 Bay-Delta Plan Amendment

In December 2018, the State Water Resources Control Board (SWRCB) adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) to establish water quality objectives to maintain the health of the Bay-Delta ecosystem. The SWRCB is required by law to regularly review this plan. The adopted Bay-Delta Plan Amendment was developed with the stated goal of increasing salmonid populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay-Delta. The Bay-Delta Plan Amendment requires the release of 30-50% of the "unimpaired flow"[2] on the three tributaries from February through June in every year type. In SFPUC modeling of the new flow standard, it is assumed that the required release is 40% of unimpaired flow.

If the Bay-Delta Plan Amendment is implemented, the SFPUC will be able to meet the projected water demands presented in this UWMP in normal years but would experience supply shortages in single dry years or multiple dry years. Implementation of the Bay-Delta Plan Amendment will require rationing in all single dry years and multiple dry years. The SFPUC has initiated an Alternative Water Supply Planning Program to ensure that San Francisco can meet its Retail and Wholesale Customer water needs, address projected dry years shortages, and limit rationing to a maximum 20 percent system-wide in accordance with adopted SFPUC policies. This program is in early planning stages and is intended to meet future water supply challenges and vulnerabilities such as environmental flow needs and other regulatory changes; earthquakes, disasters, and emergencies; increases in population and employment; and climate

[2] "Unimpaired flow represents the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds." (Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Dec. 12, 2018) p.17, fn. 14, available at https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf.)

change. As the region faces future challenges – both known and unknown – the SFPUC is considering this suite of diverse non-traditional supplies and leveraging regional partnerships to meet Retail and Wholesale Customer needs through 2045.

The SWRCB has stated that it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, assuming all required approvals are obtained by that time. But implementation of the Plan Amendment is uncertain for multiple reasons.

First, since adoption of the Bay-Delta Plan Amendment, over a dozen lawsuits have been filed in both state and federal courts, challenging the SWRCB's adoption of the Bay-Delta Plan Amendment, including a legal challenge filed by the federal government, at the request of the U.S. Department of Interior, Bureau of Reclamation. This litigation is in the early stages and there have been no dispositive court rulings as of this date.

Second, the Bay-Delta Plan Amendment is not self-implementing and does not automatically allocate responsibility for meeting its new flow requirements to the SFPUC or any other water rights holders. Rather, the Bay-Delta Plan Amendment merely provides a regulatory framework for flow allocation, which must be accomplished by other regulatory and/or adjudicatory proceedings, such as a comprehensive water rights adjudication or, in the case of the Tuolumne River, may be implemented through the water quality certification process set forth in section 401 of the Clean Water Act as part of the Federal Energy Regulatory Commission's licensing proceedings for the Don Pedro and La Grange hydroelectric projects. It is currently unclear when the license amendment process is expected to be completed. This process and the other regulatory and/or adjudicatory proceedings would likely face legal challenges and have lengthy timelines, and quite possibly could result in a different assignment of flow responsibility (and therefore a different water supply impact on the SFPUC).

Third, in recognition of the obstacles to implementation of the Bay-Delta Plan Amendment, the SWRCB Resolution No. 2018-0059 adopting the Bay-Delta Plan Amendment directed staff to help complete a "Delta watershed-wide agreement, including potential flow measures for the Tuolumne River" by March 1, 2019, and to incorporate such agreements as an "alternative" for a future amendment to the Bay-Delta Plan to be presented to the SWRCB "as early as possible after December 1, 2019." In accordance with the SWRCB's instruction, on March 1, 2019, SFPUC, in partnership with other key stakeholders, submitted a proposed project description for the Tuolumne River that could be the basis for a voluntary substitute agreement with the SWRCB ("March 1st Proposed Voluntary Agreement"). On March 26, 2019, the Commission adopted Resolution No. 19-0057 to support the SFPUC's participation in the Voluntary Agreement negotiation process. To date, those negotiations are ongoing under the California Natural Resources Agency and the leadership of the Newsom administration.[3]

Water Supply – All Year Types

The SFPUC historically has met demand in its service area in all year types from its watersheds, which consist of:

- Tuolumne River watershed
- Alameda Creek watershed

[3] California Natural Resources Agency, "Voluntary Agreements to Improve Habitat and Flow in the Delta and its Watersheds," available at https://files.resources.ca.gov/voluntary-agreements/.

- San Mateo County watersheds

In general, 85 percent of the supply comes from the Tuolumne River through Hetch Hetchy Reservoir and the remaining 15 percent comes from the local watersheds through the San Antonio, Calaveras, Crystal Springs, Pilarcitos and San Andreas Reservoirs. The adopted WSIP retains this mix of water supply for all year types.

WSIP Dry Year Water Supply Projects

The WSIP authorized the SFPUC to undertake a number of water supply projects to meet dry-year demands with no greater than 20 percent system-wide rationing in any one year. Those projects include the following:

- **Calaveras Dam Replacement Project**

  Calaveras Dam is located near a seismically active fault zone and was determined to be seismically vulnerable. To address this vulnerability, the SFPUC constructed a new dam of equal height downstream of the existing dam. Construction on the project occurred between 2011 and July 2019. The SFPUC began impounding water behind the new dam in accordance with California Division of Safety of Dams (DSOD) guidance in the winter of 2018/2019.

- **Alameda Creek Recapture Project**

  As a part of the regulatory requirements for future operations of Calaveras Reservoir, the SFPUC must implement bypass and instream flow schedules for Alameda Creek. The Alameda Creek Recapture Project will recapture a portion of the water system yield lost due to the instream flow releases at Calaveras Reservoir or bypassed around the Alameda Creek Diversion Dam and return this yield to the RWS through facilities in the Sunol Valley. Water that naturally infiltrates from Alameda Creek will be recaptured into an existing quarry pond known as SMP (Surface Mining Permit)-24 Pond F2. The project will be designed to allow the recaptured water to be pumped to the Sunol Valley Water Treatment Plant or to San Antonio Reservoir. Construction of this project will occur from spring 2021 to fall 2022.

- **Lower Crystal Springs Dam Improvements**

  The Lower Crystal Springs Dam (LCSD) Improvements were substantially completed in November 2011. The joint San Mateo County/SFPUC Bridge Replacement Project to replace the bridge across the dam was completed in January 2019. A WSIP follow up project to modify the LCSD Stilling Basin for fish habitat and upgrade the fish water release and other valves started in April 2019. While the main improvements to the dam have been completed, environmental permitting issues for reservoir operation remain significant. While the reservoir elevation was lowered due to DSOD restrictions, the habitat for the Fountain Thistle, an endangered plant, followed the lowered reservoir elevation. Raising the reservoir elevation now requires that new plant populations be restored incrementally before the reservoir elevation is raised. The result is that it may be several years before pre-project water storage volumes can be restored.

- **Regional Groundwater Storage and Recovery Project**

  The Groundwater Storage and Recovery (GSR) Project is a strategic partnership between SFPUC and three San Mateo County agencies – the California Water Service Company (serving South San Francisco and Colma), the City of Daly City, and the City

of San Bruno – to conjunctively operate the south Westside Groundwater Basin. The project sustainably manages groundwater and surface water resources in a way that provides supplies during times of drought. During years of normal or heavy rainfall, the project would provide additional surface water to the partner agencies in San Mateo County in lieu of groundwater pumping. Over time, reduced pumping creates water storage through natural recharge of up to 20 billion gallons of new water supply available during dry years.

The project's Final Environmental Impact Report was certified in August 2014, and the project also received Commission approval that month. Phase 1 of this project consists of construction of thirteen well sites and is over 99 percent complete. Phase 2 of this project consists of completing construction of the well station at the South San Francisco Main site and some carryover work that has not been completed from Phase 1. Phase 2 design work began in December 2019.

- **2 mgd Dry-year Water Transfer**

  In 2012, the dry-year transfer was proposed between the Modesto Irrigation District and the SFPUC. Negotiations were terminated because an agreement could not be reached. Subsequently, the SFPUC had discussions with the Oakdale Irrigation District for a one-year transfer agreement with the SFPUC for 2 mgd (2,240 acre-feet). No progress towards agreement on a transfer was made in 2019, but the irrigation districts recognize SFPUC's continued interest and SFPUC will continue to pursue transfers.

In order to achieve its target of meeting at least 80 percent of its customer demand during droughts with a system demand of 265 mgd, the SFPUC must successfully implement the dry-year water supply projects included in the WSIP.

Furthermore, the permitting obligations for the Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements include a combined commitment of 12.8 mgd for instream flows on average. When this is reduced for an assumed Alameda Creek Recapture Project recovery of 9.3 mgd, the net loss of water supply is 3.5 mgd.

Alternative Water Supply Planning Program

The SFPUC is increasing and accelerating its efforts to acquire additional water supplies and explore other projects that would increase overall water supply resilience through the Alternative Water Supply Planning Program. The drivers for the program include: (1) the adoption of the Bay-Delta Plan Amendment and the resulting potential limitations to RWS supply during dry years, (2) the net supply shortfall following the implementation of WSIP, (3) San Francisco's perpetual obligation to supply 184 MGD to the Wholesale Customers, (4) adopted Level of Service Goals to limit rationing to no more than 20 percent system-wide during droughts, and (5) the potential need to identify water supplies that would be required to offer permanent status to interruptible customers. Developing additional supplies through this program would reduce water supply shortfalls and reduce rationing associated with such shortfalls. The planning priorities guiding the framework of the Alternative Water Supply Planning Program are as follows:

1. Offset instream flow needs and meet regulatory requirements
2. Meet existing obligations to existing permanent customers
3. Make interruptible customers permanent
4. Meet increased demands of existing and interruptible customers

In conjunction with these planning priorities, the SFPUC considers how the program fits within the LOS Goals and Objectives related to water supply and sustainability when considering new water supply opportunities. The key LOS Goals and Objectives relevant to this effort can be summarized as:

- Meet dry-year delivery needs while limiting rationing to a maximum of 20 percent system-wide reduction in water service during extended droughts;
- Diversify water supply options during non-drought and drought periods;
- Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers;
- Meet, at a minimum, all current and anticipated legal requirements for protection of fish and wildlife habitat;
- Maintain operational flexibility (although this LOS Goal was not intended explicitly for the addition of new supplies, it is applicate here).

Together, the planning priorities and LOS Goals and Objectives provide a lens through which the SFPUC considers water supply options and opportunities to meet all foreseeable water supply needs.

In addition to the Daly City Recycled Water Expansion project[4], which was a potential project identified in the 2015 UWMP and had committed funding at that time, the SFPUC has taken action to fund the study of potential additional water supply projects. Capital projects under consideration to develop additional water supplies include surface water storage expansion, recycled water expansion, water transfers, desalination, and potable reuse. A more detailed list and descriptions of these efforts are provided below.

The capital projects that are under consideration would be costly and are still in the early feasibility or conceptual planning stages. Because these water supply projects would take 10 to 30 years to implement, and because required environmental permitting negotiations may reduce the amount of water that can be developed, the yield from these projects are not currently incorporated into SFPUC's supply projections. State and federal grants and other financing opportunities would be pursued for eligible projects, to the extent feasible, to offset costs borne by ratepayers.

- **Daly City Recycled Water Expansion** (Regional, Normal- and Dry-Year Supply)

  This project can produce up to 3 mgd of tertiary recycled water during the irrigation season (~7 months). On an average annual basis, this is equivalent to 1.25 mgd or 1,400 acre-feet per year. The project is envisioned to provide recycled water to 13 cemeteries and other smaller irrigation customers, offsetting existing groundwater pumping from the South Westside Groundwater Basin; this will free up groundwater, enhancing the reliability of the Basin. The project is a regional partnership between the SFPUC and Daly City. The irrigation customers are located largely within California Water Service's (Cal Water's) service area. RWS customers will benefit from the increased reliability of the South Westside Basin for additional drinking water supply during droughts. In this way, this project supports the GSR Project, which is under construction.

[4] While this potential project was identified in the 2015 UWMP, it has since been approved by Daly City following environmental review and has a higher likelihood of being implemented.

- **ACWD-USD Purified Water Partnership** (Regional, Normal- and Dry-Year Supply)

  This project could provide a new purified water supply utilizing Union Sanitary District's (USD) treated wastewater. Purified water produced by advanced water treatment at USD could be transmitted to the Quarry Lakes Groundwater Recharge Area to supplement recharge into the Niles Cone Groundwater Basin or put to other uses in Alameda County Water District's (ACWD) service area. With the additional water supply to ACWD, an in-lieu exchange with the SFPUC would result in more water left in the RWS. Additional water supply could also be directly transmitted to the SFPUC through a new intertie between ACWD and the SFPUC.

- **Crystal Springs Purified Water** (Regional, Normal- and Dry-Year Supply)

  The Crystal Springs Purified Water (PREP) Project is a purified water project that could provide 6-12 mgd of water supply through reservoir water augmentation at Crystal Springs Reservoir, which is a facility of the RWS. Treated wastewater from Silicon Valley Clean Water (SVCW) and/or the City of San Mateo would go through an advanced water treatment plant to produce purified water that meets state and federal drinking water quality standards. The purified water would then be transmitted 10-20 miles (depending on the alignment) to Crystal Springs Reservoir, blended with regional surface water supplies and treated again at Harry Tracy Water Treatment Plant. Project partners include the SFPUC, BAWSCA, SVCW, CalWater, Redwood City, Foster City, and the City of San Mateo. Partner agencies are contributing financial and staff resources towards the work effort.

- **Los Vaqueros Reservoir Expansion** (Regional, Dry Year Supply)

  The Los Vaqueros Reservoir Expansion (LVE) Project is a storage project that will enlarge the existing reservoir located in northeastern Contra Costa County from 160,000 acre-feet to 275,000 acre-feet. While the existing reservoir is owned and operated by the Contra Costa Water District (CCWD), the expansion will have regional benefits and will be managed by a Joint Powers Authority (JPA) that will be set up prior to construction. Meanwhile, CCWD is leading the planning, design and environmental review efforts. CCWD's Board certified the EIS/EIR and approved the LVE Project on May 13, 2020. The additional storage capacity from the LVE Project would provide a dry year water supply benefit to the SFPUC. BAWSCA is working in concert with the SFPUC to support their work effort on the LVE project.
    - **Conveyance Alternatives:** The SFPUC is considering two main pathways to move water from storage in a prospective LVE Project to the SFPUC's service area, either directly to RWS facilities or indirectly via an exchange with partner agencies. The SFPUC is evaluating potential alignments for conveyance.
    - **Bay Area Regional Reliability Shared Water Access Program (BARR SWAP):** As part of the BARR Partnership, a consortium of 8 Bay Area water utilities (including ACWD, BAWSCA, CCWD, EBMUD, Marin Municipal Water District (MMWD), SFPUC, Valley Water, and Zone 7 Water Agency) are exploring opportunities to move water across the region as efficiently as possible, particularly during times of drought and emergencies. The BARR agencies are proposing two separate pilot projects in 2020-2021 through the Shared Water Access Program (SWAP) to test conveyance pathways and identify potential hurdles to better prepare for sharing water during a future drought or emergency. A strategy report identifying opportunities and considerations will accompany these pilot transfers and will be completed in 2021.

- **Bay Area Brackish Water Desalination** (Regional, Normal- and Dry-Year Supply)

  The Bay Area Brackish Water Desalination (Regional Desalination) Project is a partnership between CCWD, the SFPUC, Valley Water, and Zone 7 Water Agency. East Bay Municipal Utilities District (EBMUD) and ACWD may also participate in the project. The project could provide a new drinking water supply to the region by treating brackish water from CCWD's existing Mallard Slough intake in Contra Costa County. While this project has independent utility as a water supply project, for the current planning effort the SFPUC is considering it as a source of supply for storage in LVE. While the allocations remain to be determined among partners, the SFPUC is considering a water supply benefit of between 5 and 15 mgd during drought conditions when combined with storage at LVE.

- **Calaveras Reservoir Expansion** (Regional, Dry Year Supply)

  Calaveras Reservoir would be expanded to create 289,000 AF additional capacity to store excess Regional Water System supplies or other source water in wet and normal years. In addition to reservoir enlargement, the project would involve infrastructure to pump water to the reservoir, such as pump stations and transmission facilities.

- **Groundwater Banking**

  Groundwater banking in the Modesto Irrigation District (MID) and Turlock Irrigation District (TID) service areas could be used to provide some additional water supply to meet instream releases in dry years reducing water supply impacts to the SFPUC service area. For example, additional surface water could be provided to irrigators in wet years, which would offset the use of groundwater, thereby allowing the groundwater to remain in the basin rather than be consumptively used. The groundwater that remains in the basin can then be used in a subsequent dry year for irrigation, freeing up surface water that would have otherwise been delivered to irrigators to meet instream flow requirements.

  A feasibility study of this option is included in the proposed Tuolumne River Voluntary Agreement. Progress on this potential water supply option will depend on the negotiations of the Voluntary Agreement.

- **Inter-Basin Collaborations**

  Inter-Basin Collaborations could provide net water supply benefits in dry years by sharing responsibility for in-stream flows in the San Joaquin River and Delta more broadly among several tributary reservoir systems. One mechanism by which this could be accomplished would be to establish a partnership between interests on the Tuolumne River and those on the Stanislaus River, which would allow responsibility for streamflow to be assigned variably based on the annual hydrology.

  As is the case with Groundwater Banking, feasibility of this option is included in the proposed Tuolumne River Voluntary Agreement.

If all the projects identified through the current planning process can be implemented, there would still be a supply shortfall to meet projected needs. Furthermore, each of the supply options being considered has its own inherent challenges and uncertainties that may affect the SFPUC’s ability to implement it.

Given the limited availability of water supply alternatives - unless the supply risks are significantly reduced or our needs change significantly - the SFPUC will continue to plan,

develop and implement all project opportunities that can help bridge the anticipated water supply gaps during droughts. In 2019, the SFPUC completed a survey among water and wastewater agencies within the service area to identify additional opportunities for purified water. Such opportunities remain limited, but the SFPUC continues to pursue all possibilities.

Projected SFPUC Regional Water System Supply Reliability

The SFPUC will provide tables presenting the projected RWS supply reliability under normal, single dry year, and multiple dry year scenarios.

Climate Change

The issue of climate change has become an important factor in water resources planning in the State, and is frequently considered in urban water management planning processes, though the extent and precise effects of climate change remain uncertain. There is convincing evidence that increasing concentrations of greenhouse gasses have caused and will continue to cause a rise in temperatures around the world, which will result in a wide range of changes in climate patterns. Moreover, observational data show that a warming trend occurred during the latter part of the 20th century and virtually all projections indicate this will continue through the 21st century. These changes will have a direct effect on water resources in California, and numerous studies have been conducted to determine the potential impacts to water resources. Based on these studies, climate change could result in the following types of water resource impacts, including impacts on the watersheds in the Bay Area:

- Reductions in the average annual snowpack due to a rise in the snowline and a shallower snowpack in the low and medium elevation zones, such as in the Tuolumne River basin, and a shift in snowmelt runoff to earlier in the year;
- Changes in the timing, annual average, intensity and variability of precipitation, and an increased amount of precipitation falling as rain rather than snow;
- Long-term changes in watershed vegetation and increased incidence of wildfires that could affect water quality and quantity;
- Sea level rise and an increase in saltwater intrusion;
- Increased water temperatures with accompanying potential adverse effects on some fisheries and water quality;
- Increases in evaporation and concomitant increased irrigation need; and
- Changes in urban and agricultural water demand.

Both the SFPUC and BAWSCA participated in the 2020 update of the Bay Area Integrated Regional Water Management Plan (BAIRWMP), which includes an assessment of the potential climate change vulnerabilities of the region's water resources and identifies climate change adaptation strategies. In addition, the SFPUC continues to study the effect of climate change on the Regional Water System (RWS). These works are summarized below.

Bay Area Integrated Regional Water Management Plan

Climate change adaptation continues to be an overarching theme for the 2019 BAIRWMP update. As stated in the BAIRWMP, identification of watershed characteristics that could

potentially be vulnerable to future climate change is the first step in assessing vulnerabilities of water resources in the Bay Area Region (Region). Vulnerability is defined as the degree to which a system is exposed to, susceptible to, and able to cope with or adjust to, the adverse effects of climate change. A vulnerability assessment was conducted in accordance with the Department of Water Resources' (DWR's) *Climate Change Handbook for Regional Water Planning* and using the most current science available for the Region. The vulnerability assessment, summarized in the table below, provides the main water planning categories applicable to the Region and a general overview of the qualitative assessment of each category with respect to anticipated climate change impacts.

Summary of BAIRWMP Climate Change Vulnerability Assessment

Vulnerability Areas	General Overview of Vulnerabilities
Water Demand	**Urban and Agricultural Water Demand** – Changes to hydrology in the Region as a result of climate change could lead to changes in total water demand and use patterns. Increased irrigation (outdoor landscape or agricultural) is anticipated to occur with temperature rise, increased evaporative losses due to warmer temperature, and a longer growing season. Water treatment and distribution systems are most vulnerable to increases in maximum day demand.
Water Supply	**Imported Water** – Imported water derived from the Sierra Nevada sources and Delta diversions provide 66 percent of the water resources available to the Region. Potential impacts on the availability of these sources resulting from climate change directly affect the amount of imported water supply delivered to the Region. **Regional Surface Water** – Although future projections suggest that small changes in total annual precipitation over the Region will not change much, there may be changes to when precipitation occurs with reductions in the spring and more intense rainfall in the winter. **Regional Groundwater** – Changes in local hydrology could affect natural recharge to the local groundwater aquifers and the quantity of groundwater that could be pumped sustainably over the long-term in some areas. Decreased inflow from more flashy or more intense runoff, increased evaporative losses and warmer and shorter winter seasons can alter natural recharge of groundwater. Salinity intrusion into coastal groundwater aquifers due to sea-level rise could interfere with local groundwater uses. Furthermore, additional reductions in imported water supplies would lead to less imported water available for managed recharge of local groundwater basins and potentially more groundwater pumping in lieu of imported water availability.
Water Quality	**Imported Water** – For sources derived from the Delta, sea-level rise could result in increases in chloride and bromide (a disinfection by-product (DBP) precursor that is also a component of sea water),

Vulnerability Areas	General Overview of Vulnerabilities
	potentially requiring changes in treatment for drinking water. Increased temperature could result in an increase in algal blooms, taste and odor events, and a general increase in DBP formation **Regional Surface Water** – Increased temperature could result in lower dissolved oxygen in streams and prolong thermocline stratification in lakes and reservoirs forming anoxic bottom conditions and algal blooms. Decrease in annual precipitation could result in higher concentrations of contaminants in streams during droughts or in association with flushing rain events. Increased wildfire risk and flashier or more intense storms could increase turbidity loads for water treatment. **Regional Groundwater** – Sea-level rise could result in increases in chlorides and bromide for some coastal groundwater basins in the Region. Water quality changes in imported water used for recharge could also impact groundwater quality.
Sea-Level Rise	Sea-level rise is additive to tidal range, storm surges, stream flows, and wind waves, which together will increase the potential for higher total water levels, overtopping, and erosion. Much of the bay shoreline is comprised of low-lying diked baylands which are already vulnerable to flooding. In addition to rising mean sea level, continued subsidence due to tectonic activity will increase the rate of relative sea-level rise. As sea-level rise increases, both the frequency and consequences of coastal storm events, and the cost of damage to the built and natural environment, will increase. Existing coastal armoring (including levees, breakwaters, and other structures) is likely to be insufficient to protect against projected sea-level rise. Crest elevations of structures will have to be raised or structures relocated to reduce hazards from higher total water levels and larger waves.
Flooding	Climate change projections are not sensitive enough to assess localized flooding, but the general expectation is that more intense storms would occur thereby leading to more frequent, longer and deeper flooding. Changes to precipitation regimes may increase flooding. Elevated Bay elevations due to sea-level rise will increase backwater effects exacerbating the effect of fluvial floods and storm drain backwater flooding.

Vulnerability Areas	General Overview of Vulnerabilities
Ecosystem and Habitat	Changes in the seasonal patterns of temperature, precipitation, and fire due to climate change can dramatically alter ecosystems that provide habitats for California's native species. These impacts can result in species loss, increased invasive species ranges, loss of ecosystem functions, and changes in vegetation growing ranges. Reduced rain and changes in the seasonal distribution of rainfall may alter timing of low flows in streams and rivers, which in turn would have consequences for aquatic ecosystems. Changes in rainfall patterns and air temperature may affect water temperatures, potentially affecting coldwater aquatic species. Bay Area ecosystems and habitat provide important ecosystem services, such as: carbon storage, enhanced water supply and quality, flood protection, food and fiber production. Climate change is expected to substantially change several of these services. The region provides substantial aquatic and habitat-related recreational opportunities, including: fishing, wildlife viewing, and wine industry tourism (a significant asset to the region) that may be at risk due to climate change effects.
Hydropower	Currently, several agencies in the Region produce or rely on hydropower produced outside of the Region for a portion of their power needs. As the hydropower is produced in the Sierra, there may be changes in the future in the timing and amount of energy produced due to changes in the timing and amount of runoff as a result of climate change. Some hydropower is also produced within the region and could also be affected by changes in the timing and amount of runoff.

Source: 2019 Bay Area Integrated Regional Water Management Plan (BAIRWMP), Table 16-3.

SFPUC Climate Change Studies

The SFPUC views assessment of the effects of climate change as an ongoing project requiring regular updating to reflect improvements in climate science, atmospheric/ocean modeling, and human response to the threat of greenhouse gas emissions. Climate change research by the SFPUC began in 2009 and continues to be refined. In its 2012 report "Sensitivity of Upper Tuolumne River Flow to Climate Change Scenarios," the SFPUC assessed the sensitivity of runoff into Hetch Hetchy Reservoir to a range of changes in temperature and precipitation due to climate change. Key conclusions from the report include the following:

- With differing increases in temperature alone, the median annual runoff at Hetch Hetchy would decrease by 0.7-2.1% from present-day conditions by 2040 and by 2.6-10.2% from

present-day by 2100. Adding differing decreases in precipitation on top of temperature increases, the median annual runoff at Hetch Hetchy would decrease by 7.6-8.6% from present-day conditions by 2040 and by 24.7-29.4% from present-day conditions by 2100.

- In critically dry years, these reductions in annual runoff at Hetch Hetchy would be significantly greater, with runoff decreasing up to 46.5% from present day conditions by 2100 utilizing the same climate change scenarios.
- In addition to the total change in runoff, there will be a shift in the annual distribution of runoff. Winter and early spring runoff would increase and late spring and summer runoff would decrease.
- Under all scenarios, snow accumulation would be reduced and snow would melt earlier in the spring, with significant reductions in maximum peak snow water equivalent under most scenarios.

Currently, the SFPUC is conducting a comprehensive assessment of the potential effects of climate change on water supply using a wide range of plausible increases in temperature and changes in precipitation to address the wide uncertainty in climate projections over the planning horizon 2020 to 2070. There are many uncertain factors such as climate change, changing regulations, water quality, growth and economic cycles that may create vulnerabilities for the Regional Water System's ability to meet levels of service. The uncertainties associated with the degree to which these factors will occur and how much risk they present to the water system is difficult to predict, but nonetheless they need to be considered in SFPUC planning. To address this planning challenge, the project uses a vulnerability-based planning approach to explore a range of future conditions to identify vulnerabilities, assess the risks associated with these vulnerabilities that could lead to developing an adaptation plan that is flexible and robust to a wide range of future outcomes.

Common Language for BAWSCA Member Agencies'

2020 UWMP Updates

BAWSCA

Description of BAWSCA

BAWSCA provides regional water reliability planning and conservation programming for the benefit of its 26 member agencies that purchase wholesale water supplies from the San Francisco Public Utilities Commission (SFPUC). Collectively, the BAWSCA member agencies deliver water to over 1.8 million residents and nearly 40,000 commercial, industrial and institutional accounts in Alameda, San Mateo and Santa Clara Counties.

BAWSCA also represents the collective interests of these wholesale water customers on all significant technical, financial, and policy matters related to the operation and improvement of the SFPUC's Regional Water System (RWS).

BAWSCA's role in the development of the 2020 Urban Water Management Plan (UWMP) updates is to work with its member agencies and the SFPUC to seek consistency among UWMP documents.

Regional Water Demand and Conservation Projections

In June 2020, BAWSCA completed the Regional Water Demand and Conservation Projections Report (Demand Study).[1] The goal of the Demand Study was to develop transparent, defensible, and uniform demand and conservation savings projections for each Wholesale Customer using a common methodology to support both regional and individual agency planning efforts and compliance with the new statewide water efficiency targets required by Assembly Bill (AB) 1668 and Senate Bill (SB) 606.

Through the Demand Study process, BAWSCA and the Wholesale Customers (1) quantified the total average-year water demand for each BAWSCA member agency through 2045, (2) quantified passive and active conservation water savings potential for each individual Wholesale Customer through 2045, and (3) identified 24 conservation programs with high water savings potential and/or member agency interest. Implementation of these conservation measures, along with passive conservation, is anticipated to yield an additional 37.3 MGD of water savings by 2045. Based on the revised water demand projections, the identified water conservation savings, increased development and use of other local supplies by the Wholesale Customers, and other actions, the collective purchases of the BAWSCA member agencies from the SFPUC are projected to stay below 184 MGD through 2045.

As part of the Demand Study, each Wholesale Customer was provided with a demand model that can be used to support ongoing demand and conservation planning efforts, including UWMP preparation.

[1] Phase III Final Report: http://bawsca.org/uploads/pdf/BAWSCA_Regional_Water_Demand_and_Conservation%20Projections%20Report_Final.pdf

Long-Term Reliable Water Supply Strategy

BAWSCA's Long-Term Reliable Water Supply Strategy (Strategy), completed in February 2015, quantified the water supply reliability needs of the BAWSCA member agencies through 2040, identified the water supply management projects and/or programs (projects) that could be developed to meet those needs, and prepared an implementation plan for the Strategy's recommendations.

When the 2015 Demand Study concluded it was determined that while there is no longer a regional normal year supply shortfall, there was a regional drought year supply shortfall of up to 43 MGD. In addition, key findings from the Strategy's project evaluation analysis included:

- Water transfers represent a high priority element of the Strategy.
- Desalination potentially provides substantial yield, but its high effective costs and intensive permitting requirements make it a less attractive drought year supply alternative.
- Other potential regional projects provide tangible, though limited, benefit in reducing dry-year shortfalls given the small average yields in drought years.

Since 2015, BAWSCA has completed a comprehensive update of demand projections and engaged in significant efforts to improve regional reliability and reduce the dry-year water supply shortfall.

Water Transfers. BAWSCA successfully facilitated two transfers of portions of Individual Supply Guarantee (ISG) between BAWSCA agencies in 2017 and 2018. Such transfers benefit all BAWSCA agencies by maximizing use of existing supplies. BAWSCA is currently working on an amendment to the Water Supply Agreement between the SFPUC and BAWSCA agencies to establish a mechanism by which member agencies that have an ISG may participate in expedited transfers of a portion of ISG and a portion of a Minimum Annual Purchase Requirement. In 2019, BAWSCA participated in a pilot water transfer that, while ultimately unsuccessful, surfaced important lessons learned and produced interagency agreements that will serve as a foundation for future transfers. BAWSCA is currently engaged in the Bay Area Regional Reliability Partnership[2] (BARR), a partnership among eight Bay Area water utilities (including the SFPUC, Alameda County Water District, BAWSCA, Contra Costa Water District, Santa Clara Valley Water District) to identify opportunities to move water across the region as efficiently as possible, particularly during times of drought and emergencies.

Regional Projects. Since 2015, BAWSCA has coordinated with local and State agencies on regional projects with potential dry-year water supply benefits for BAWSCA's agencies. These efforts include storage projects, indirect/direct water reuse projects, and studies to evaluate the capacity and potential for various conveyance systems to bring new supplies to the region.

BAWSCA continues to implement the Strategy recommendations in coordination with BAWSCA member agencies. Strategy implementation will be adaptively managed to account for changing conditions and to ensure that the goals of the Strategy are met in an efficient and cost-effective manner. On an annual basis, BAWSCA will reevaluate Strategy recommendations and results in conjunction with development of the BAWSCA's FY 2021-22 Work Plan. In this way, actions can be modified to accommodate changing conditions and new developments.

[2] https://www.bayareareliability.com/

Making Conservation a Way of Life Strategic Plan

Following the 2014-2016 drought, the State of California (State) developed the "Making Water Conservation a California Way of Life" framework to address the long-term water use efficiency requirements called for in executive orders issued by Governor Brown. In May of 2018, AB 1668 and SB 606 (collectively referred to as the efficiency legislation) went into effect, which built upon the executive orders implementing new urban water use objectives for urban retail water suppliers.

BAWSCA led its member agencies in a multi-year effort to develop and implement a strategy to meet these new legislative requirements. BAWSCA's Making Conservation a Way of Life Strategic Plan (Strategic Plan) provided a detailed roadmap for member agencies to improve water efficiency. BAWSCA implementing the following elements of the Strategic Plan:

- Conducted an assessment of the agencies' current practices and water industry best practices for three components of the efficiency legislation that, based on a preliminary review, present the greatest level of uncertainty and potential risk to the BAWSCA agencies. The three components were:
    1. Development of outdoor water use budgets in a manner that incorporates landscape area, local climate, and new satellite imagery data.
    2. Commercial, Industrial, and Institutional water use performance measures.
    3. Water loss requirements.
- Organized an Advanced Metering Infrastructure symposium to enable information exchange, including case studies, implementation strategies, and data analysis techniques.
- Initiated a regional CII audit pilot program, which BAWSCA aims to complete in 2021.[3]
- Implemented a regional program for water loss control to help BAWSCA agencies comply with regulatory requirements and implement cost-effective water loss interventions.
- Engaged with the SFPUC to audit meter testing and calibration practices for SFPUC's meters at BAWSCA agency turnouts.

Finally, BAWSCA's Demand Study developed water demand and conservation projections through 2045 for each BAWSCA agency. These projects are designed to provide valuable insights on long-term water demand patterns and conservation savings potential to support regional efforts, such as implementation of BAWSCA's Long-Term Reliable Water Supply Strategy.

[3] Efforts on the CII audit pilot program stalled in March 2020 due to the COVID 19 pandemic and related shelter-in-place orders.

Tier Two Drought Allocations

The Wholesale Customers have negotiated and adopted the Tier Two Plan, referenced above, which allocates the collective Wholesale Customer share from the Tier One Plan among each of the 26 Wholesale Customers. These Tier Two allocations are based on a formula that takes into account multiple factors for each Wholesale Customer including:

- Individual Supply Guarantee;
- Seasonal use of all available water supplies; and
- Residential per capita use.

The water made available to the Wholesale Customers collectively will be allocated among them in proportion to each Wholesale Customer's Allocation Basis, expressed in millions of gallons per day (mgd), which in turn is the weighted average of two components. The first component is the Wholesale Customer's Individual Supply Guarantee, as stated in the WSA, and is fixed. The second component, the Base/Seasonal Component, is variable and is calculated using the monthly water use for three consecutive years prior to the onset of the drought for each of the Wholesale Customers for all available water supplies. The second component is accorded twice the weight of the first, fixed component in calculating the Allocation Basis. Minor adjustments to the Allocation Basis are then made to ensure a minimum cutback level, a maximum cutback level, and a sufficient supply for certain Wholesale Customers.

The Allocation Basis is used in a fraction, as numerator, over the sum of all Wholesale Customers' Allocation Bases to determine each Wholesale Customer's Allocation Factor. The final shortage allocation for each Wholesale Customer is determined by multiplying the amount of water available to the Wholesale Customers' collectively under the Tier One Plan, by the Wholesale Customer's Allocation Factor.

The Tier Two Plan requires that the Allocation Factors be calculated by BAWSCA each year in preparation for a potential water shortage emergency. As the Wholesale Customers change their water use characteristics (e.g., increases or decreases in SFPUC purchases and use of other water sources, changes in monthly water use patterns, or changes in residential per capita water use), the Allocation Factor for each Wholesale Customer will also change. However, for long-term planning purposes, each Wholesale Customer shall use as its Allocation Factor, the value identified in the Tier Two Plan when adopted.

Per WSA Section 3.11, the Tier One and Tier Two Plans will be used to allocate water from the Regional Water System between Retail and Wholesale Customers during system-wide shortages of 20% or less. For Regional Water System shortages in excess of 20%, San Francisco shall (a) follow the Tier 1 Shortage Plan allocations up to the 20% reduction, (b) meet and discuss how to implement incremental reductions above 20% with the Wholesale Customers, and (c) make a final determination of allocations above the 20% reduction. After the SFPUC has made the final allocation decision, the Wholesale Customers shall be free to challenge the allocation on any applicable legal or equitable basis. For purposes of the 2020 UWMPs, for San Francisco Regional Water System (RWS) shortages in excess of 20%, the allocations among the Wholesale Customers is assumed to be equivalent among them and to equal the drought cutback to Wholesale Customer by the SFPUC.

The Tier Two Plan, which initially expired in 2018, has been extended by the BAWSCA Board of Directors every year since for one additional calendar year. In November 2020, the BAWSCA Board voted to extend the Tier Two Plan through the end of 2021.

SFPUC's Efforts to Develop of Alternative Water Supplies

With the adoption of the Bay-Delta Plan Phase 1 (Bay-Delta Plan) by the State Water Resources Control Board in December of 2018, coupled with the uncertainties associated with litigation and the development of Voluntary Agreements that, if successful, would provide an alternative to the 40% unimpaired flow requirement that is required by the Bay-Delta Plan, BAWSCA redoubled its efforts to ensure that the SFPUC took necessary action to develop alternative water supplies such that they would be in place to fill any potential gap in supply by implementation of the Bay-Delta Plan and that the SFPUC would be able to meet its legal and contractual obligations to its Wholesale Customers.

In 2019, BAWSCA held numerous meetings with the SFPUC encouraging them to develop a division within their organization whose chief mission was to spearhead alternative water supply development. On June 25, 2019, BAWSCA provided a written and oral statement to the Commissioners urging the SFPUC to focus on developing new sources of supply in a manner similar to how it addressed the implementation of the Water System Improvement Program (WSIP). BAWSCA urged that a new water supply program was called for, with clear objectives, persistent focus, a dedicated team, adequate funding, and a plan for successful execution. The SFPUC Commission supported BAWSCA's recommendation and directed staff to undertake such an approach.

In early 2020, the SFPUC began implementation of the Alternative Water Supply Planning Program (AWSP), a program designed to investigate and plan for new water supplies to address future long-term water supply reliability challenges and vulnerabilities on the RWS.

Included in the AWSP is a suite of diverse, non-traditional supply projects that, to a great degree, leverage regional partnerships and are designed to meet the water supply needs of the SFPUC Retail and Wholesale Customers through 2045. As of the most recent Alternative Water Supply Planning Quarterly Update, SFPUC has budgeted $264 million over the next ten years to fund water supply projects. BAWSCA is heavily engaged with the SFPUC on its AWSS efforts.

BAWSCA Conservation Programs

BAWSCA manages a Regional Water Conservation Program comprised of several programs and initiatives that support and augment member agencies' and customers' efforts to use water more efficiently. These efforts extend limited water supplies that are available to meet both current and future water needs; increase drought reliability of the existing water system; and save money for both the member agencies and their customers.

The implementation of the Regional Water Conservation Program builds upon both the Water Conservation Implementation Plan (WCIP, completed in September 2009) and the Regional Demand and Conservation Projections Project (Demand Study, completed in June of 2020). These efforts include both Core Programs (implemented regionally throughout the BAWSCA service area) and Subscription Programs (funded by individual member agencies that elect to participate and implement them within their respective service areas).

BAWSCA's Core Conservation Programs include organizing classes open to the public on topics such as water efficient landscape education and water-wise gardening, assistance related to automated metering infrastructure, and other associated programs that work to promote smart water use and practices. BAWSCA's Subscription Programs include numerous rebate programs, educational programs that can be offered to area schools, technical assistance to member agencies in evaluating water loss, and programs to train and certify contractors employed to install water efficient landscape. In total, BAWSCA offers 22 programs to its member agencies and that number continues to grow over time.

Each fiscal year, BAWSCA prepares an Annual Water Conservation Report that documents how all of BAWSCA's 26 member agencies have benefitted from the Core Conservation Programs. Additionally, the report highlights how all 26 member agencies participate in one or more of the Subscription Programs offered by BAWSCA, such as rebates, water loss management and large landscape audits. The Demand Study indicates that through a combination of active and passive conservation, 37.3 MGD will be conserved by BAWSCA's member agencies by 2045.
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Common Language for Wholesale Customers about Rate Impacts of Water Shortages

The SFPUC includes a variable component to water rates for most customer classes. As a result, as sales decrease, revenues are lost on a per unit basis. Because the marginal cost of water production is relatively small, as production is reduced, the cost of service remains the same. For both retail and wholesale customers, a reduction in water purchases – whether voluntary or mandated – would require the SFPUC to raise rates, cut costs, or use existing fund balance reserves to cover its expenses. The financial planning and rate-setting process is complex and iterative. While major impacts of a water shortage on rates are described below, the full process, especially for large water shortages, would incorporate significant stakeholder discussion about tradeoffs and financial impacts.

The SFPUC's current retail water rates have a provision for a "drought surcharge" that automatically increases adopted rates in the event of a declared water shortage. The drought surcharge is calculated so that, accounting for the expected reduction in retail water usage, total revenues are equal to what they would have been without the reduction. The drought surcharge protects the SFPUC's financial stability during water shortages, and provides customers an incentive to meet conservation targets.

For wholesale customers, the rate-setting process is governed by the terms of the WSA, which provides that, in the event of a water shortage emergency, the Commission may adjust wholesale rates in an expedited way concurrently with the imposition of drought surcharges on retail customers. Beyond drought rate setting and emergency rate setting, rates are set annually in coordination with the SFPUC annual budget process and are based on the forecasted wholesale share of regional water system expenditures and total purchases. If wholesale customer usage is expected to decrease – either voluntarily, or due to shortages – this would be incorporated into the wholesale rate forecast, and rates may increase.

7. Additional language requested by the Member Agencies

SFPUC's Decision to use With Bay-Delta Plan Scenario in UWMP Submittal Tables

The adoption of the Bay-Delta Plan Amendment may significantly impact the supply available from the RWS. SFPUC recognizes that the Bay-Delta Plan Amendment has been adopted and that, given that it is now state law, we must plan for a future in which it is fully implemented. SFPUC also acknowledges that the plan is not self-implementing and therefore does not automatically go into effect. SFPUC is currently pursuing a voluntary agreement as well as a lawsuit which would limit implementation of the Plan. With both of these processes occurring on an unknown timeline, SFPUC does not know at this time when the Bay-Delta Plan Amendment is likely to go into effect. As a result, it makes sense to conduct future supply modeling for a scenario that doesn't include implementation of the Bay-Delta Plan Amendment, as that represents a potential supply reliability scenario.

Because of the uncertainty surrounding implementation of the Bay-Delta Plan Amendment, the SFPUC conducted water service reliability assessment that includes: (1) a scenario in which the Bay-Delta Plan Amendment is fully implemented in 2023, and (2) a scenario that considers the SFPUC system's current situation without the Bay-Delta Plan Amendment. The two scenarios provide a bookend for the possible future scenarios regarding RWS supplies. The standardized tables associated with the SFPUC's UWMP contain the future scenario that assumes implementation of the Bay-Delta Plan Amendment starting in 2023.

Bay-Delta Plan Implementation Starting Year

Because of the uncertainty surrounding implementation of the Bay-Delta Plan Amendment, the water service reliability assessment presented in the SFPUC's draft UWMP looks at two future supply scenarios, both with and without implementation of the Bay-Delta Plan Amendment. Although the SWRCB has stated it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, given the current level of uncertainty, it is assumed for the purposes of the SFPUC's draft UWMP that the Bay-Delta Plan Amendment will be fully implemented starting in 2023.

SFPUC's Decision to Present Both Modeling Results in its UWMP

A key input for the HHLSM model is the anticipated level of demand on the RWS. Supply modeling results presented in the text of the SFPUC's UWMP reflect an input of projected demands on the RWS consisting of (1) projected retail demands on the RWS (total retail demands minus local groundwater and recycled water supplies), and (2) projected Wholesale Customer purchases. The SFPUC has a Level of Service objective of meeting average annual water demand of 265 mgd from the SFPUC watersheds for retail and Wholesale Customers during non-drought years, as well as a contractual obligation to supply 184 mgd to the Wholesale Customers. Therefore, the SFPUC has also conducted modeling based on a demand of 265 mgd in order to facilitate planning that supports meeting this Level of Service goal and their contractual obligations.

Appendix I: Regional Water Supply Reliability and BAWSCA Tier 2 Drought Implementation Scenarios

- UWMP 2020 Additional Modeling, dated March 30, 2021
- Updated Drought Allocations, dated April 1, 2021
- Memorandum on Updated Drought Cutbacks, dated February 18, 2021 with Attachment B, dated April 8, 2021
- Memorandum on Regional Water System Supply Reliability and UWMP 2020, dated June 2, 2021

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March 30, 2021

Danielle McPherson
Senior Water Resources Specialist
Bay Area Water Supply and Conservation Agency
155 Bovet Road, Suite 650
San Mateo, CA 94402

Dear Ms. McPherson,

Attached please find additional supply reliability modeling results conducted by the SFPUC. The SFPUC has conducted additional supply reliability modeling under the following planning scenarios:

- Projected supply reliability for years 2020 through 2045, assuming that demand is equivalent to the sum of the projected retail demands on the Regional Water System (RWS) and Wholesale Customer purchase request projections provided to SFPUC by BAWSCA on January 21st (see Table 1 below).
- Under the above demand conditions, projected supply reliability for scenarios both with and without implementation of the Bay-Delta Plan Amendment starting in 2023.

The SFPUC will be using this supply modeling in the text of its draft UWMP and moving the original modeling results into an appendix.

Table 1: Retail and Wholesale RWS Demand Assumptions Used for Additional Supply Reliability Modeling (mgd)

	2020	2025	2030	2035	2040	2045
Retail	66.5	67.2	67.5	68.6	70.5	73.7
Wholesale[1, 2]	132.1	146.0	147.9	151.9	156.3	162.8
Total	**198.6**	**213.2**	**215.4**	**220.5**	**226.8**	**236.5**

[1] Wholesale purchase request projections provided to the SFPUC by BAWSCA on January 21st, 2021
[2] Includes demands for Cities of San Jose and Santa Clara

Please note the following about the information presented in the attached tables:

London N. Breed
Mayor
Sophie Maxwell
President
Anson Moran
Vice President
Tim Paulson
Commissioner
Ed Harrington
Commissioner
Michael Carlin
Acting
General Manager

- Assumptions about infrastructure conditions remain the same as what was provided in our January 22nd letter.
- The Tier 1 allocations were applied to the RWS supplies to determine the wholesale supply, as was also described in the January 22nd letter; for any system-wide shortage above 20%, the Tier 1 split for a 20% shortage was applied.
- The SFPUC water supply planning methodology, including simulation of an 8.5-year design drought, is used to develop these estimates of water supply available from the RWS for five dry years. In each demand scenario for 2020 through 2045, the RWS deliveries are estimated using the standard SFPUC procedure, which includes adding increased levels of rationing as needed to balance the demands on the RWS system with available water supply. Some simulations may have increased levels of rationing in the final years of the design drought sequence, which can influence the comparison of results in the first five years of the sequence.
- Tables 7 and 8 in the attached document provide RWS and wholesale supply availability for the five-year drought risk assessment from 2021 to 2025. SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. Therefore, the supply projections for 2021 to 2025 are based on meeting 2020 levels of demand. However, in years when the Bay-Delta Plan Amendment is not in effect, sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests assuming that they are between the 2020 and 2025 projected levels. This is not reflected in Tables 7 and 8 because SFPUC did not want to make assumptions about the growth of purchase requests between 2020 and 2025.

In our draft UWMP, we acknowledge that we have a Level of Service objective of meeting average annual water demand of 265 mgd from the SFPUC watersheds for retail and Wholesale Customers during non-drought years, as well as a contractual obligation to supply 184 mgd to the Wholesale Customers. Therefore, we will still include the results of our modeling based on a demand of 265 mgd in order to facilitate planning that supports meeting this Level of Service objective and our contractual obligations. The results of this modeling will be in an appendix to the draft UWMP. As will be shown in this appendix, in a normal year the SFPUC can provide up to 265 mgd of supply from the RWS. The RWS supply projections shown in the attached tables are more accurately characterized as supplies that will be used to meet projected retail and Wholesale Customer demands.

It is our understanding that you will pass this information on to the Wholesale Customers. If you have any questions or need additional information, please do not hesitate to contact Sarah Triolo, at striolo@sfwater.org or (628) 230 0802.

Sincerely,

Paula Kehoe
Director of Water Resources

Table 2: Projected Total RWS Supply Utilized and Portion of RWS Supply Utilized by Wholesale Customers in Normal Years [For Table 6-9]:

Year	2020	2025	2030	2035	2040	2045
RWS Supply Utilized (mgd)	198.6	213.2	215.4	220.5	226.8	236.5
RWS Supply Utilized by Wholesale Customers[a] (mgd)	132.1	146.0	147.9	151.9	156.3	162.8

[a] RWS supply utilized by Wholesale Customers is equivalent to purchase request projections provided to SFPUC by BAWSCA on January 21, 2021, and includes Cities of San Jose and Santa Clara.

Basis of Water Supply Data: With Bay-Delta Plan Amendment

Table 3a: Basis of Water Supply Data [For Table 7-1], Base Year 2020, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2020	198.6	100%	132.1	
Single dry year		198.6	100%	132.1	
Consecutive 1st Dry year		198.6	100%	132.1	
Consecutive 2nd Dry year		198.6	100%	132.1	
Consecutive 3rd Dry year[1]		119.2	60%	74.5	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 4th Dry year		119.2	60%	74.5	• Same as above
Consecutive 5th Dry year		119.2	60%	74.5	• Same as above

[1] Assuming this year represents 2023, when Bay Delta Plan Amendment would come into effect.

Table 3b: Basis of Water Supply Data [For Table 7-1], Base Year 2025, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2025	213.2	100%	146.0	
Single dry year		149.2	70%	93.3	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		149.2	70%	93.3	• Same as above
Consecutive 2nd Dry year		127.9	60%	80.0	• Same as above
Consecutive 3rd Dry year		127.9	60%	80.0	• Same as above
Consecutive 4th Dry year		127.9	60%	80.0	• Same as above
Consecutive 5th Dry year		127.9	60%	80.0	• Same as above

Table 3c: Basis of Water Supply Data [For Table 7-1], Base Year 2030, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2030	215.4	100%	147.9	
Single dry year		150.8	70%	94.2	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		150.8	70%	94.2	• Same as above
Consecutive 2nd Dry year		129.2	60%	80.8	• Same as above
Consecutive 3rd Dry year		129.2	60%	80.8	• Same as above
Consecutive 4th Dry year		129.2	60%	80.8	• Same as above
Consecutive 5th Dry year		129.2	60%	80.8	• Same as above

Table 3d: Basis of Water Supply Data [For Table 7-1], Base Year 2035, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2035	220.5	100%	151.9	
Single dry year		154.4	70%	96.5	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		154.4	70%	96.5	• Same as above
Consecutive 2nd Dry year		132.3	60%	82.7	• Same as above
Consecutive 3rd Dry year		132.3	60%	82.7	• Same as above
Consecutive 4th Dry year		132.3	60%	82.7	• Same as above
Consecutive 5th Dry year		121.3	55%	75.8	• Same as above

Table 3e: Basis of Water Supply Data [For Table 7-1], Base Year 2040, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2040	226.8	100%	156.3	
Single dry year		158.8	70%	99.2	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		158.8	70%	99.2	• Same as above
Consecutive 2nd Dry year		136.1	60%	85.1	• Same as above
Consecutive 3rd Dry year		136.1	60%	85.1	• Same as above
Consecutive 4th Dry year		120.2	53%	75.1	• Same as above
Consecutive 5th Dry year		120.2	53%	75.1	• Same as above

Table 3f: Basis of Water Supply Data [For Table 7-1], Base Year 2045, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2045	236.5	100%	162.8	
Single dry year		141.9	60%	88.7	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		141.9	60%	88.7	• Same as above
Consecutive 2nd Dry year		141.9	60%	88.7	• Same as above
Consecutive 3rd Dry year		141.9	60%	88.7	• Same as above
Consecutive 4th Dry year		120.6	51%	75.4	• Same as above
Consecutive 5th Dry year		120.6	51%	75.4	• Same as above

Table 3g: Projected RWS Supply Availability [Alternative to Table 7-1], Years 2020-2045, With Bay-Delta Plan Amendment

Year	2020	2025	2030	2035	2040	2045
Average year	100%	100%	100%	100%	100%	100%
Single dry year	100%	70%	70%	70%	70%	60%
Consecutive 1st Dry year	100%	70%	70%	70%	70%	60%
Consecutive 2nd Dry year	100%	60%	60%	60%	60%	60%
Consecutive 3rd Dry year[1]	60%	60%	60%	60%	60%	60%
Consecutive 4th Dry year	60%	60%	60%	60%	53%	51%
Consecutive 5th Dry year	60%	60%	60%	55%	53%	51%

[1] Assuming that at base year 2020, this year represents 2023, when Bay Delta Plan Amendment would come into effect.

Basis of Water Supply Data: Without Bay-Delta Plan Amendment

Table 4a: Basis of Water Supply Data [For Table 7-1], Base Year 2020, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2020	198.6	100%	132.1	
Single dry year		198.6	100%	132.1	
Consecutive 1st Dry year		198.6	100%	132.1	
Consecutive 2nd Dry year		198.6	100%	132.1	
Consecutive 3rd Dry year		198.6	100%	132.1	
Consecutive 4th Dry year		198.6	100%	132.1	
Consecutive 5th Dry year		198.6	100%	132.1	

Table 4b: Basis of Water Supply Data [For Table 7-1], Base Year 2025, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2025	213.2	100%	146.0	
Single dry year		213.2	100%	146.0	
Consecutive 1st Dry year		213.2	100%	146.0	
Consecutive 2nd Dry year		213.2	100%	146.0	
Consecutive 3rd Dry year		213.2	100%	146.0	
Consecutive 4th Dry year		213.2	100%	146.0	
Consecutive 5th Dry year		213.2	100%	146.0	

Table 4c: Basis of Water Supply Data [For Table 7-1], Base Year 2030, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2030	215.4	100%	147.9	
Single dry year		215.4	100%	147.9	
Consecutive 1st Dry year		215.4	100%	147.9	
Consecutive 2nd Dry year		215.4	100%	147.9	
Consecutive 3rd Dry year		215.4	100%	147.9	
Consecutive 4th Dry year		215.4	100%	147.9	
Consecutive 5th Dry year		215.4	100%	147.9	

Table 4d: Basis of Water Supply Data [For Table 7-1], Base Year 2035, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2035	220.5	100%	151.9	
Single dry year		220.5	100%	151.9	
Consecutive 1st Dry year		220.5	100%	151.9	
Consecutive 2nd Dry year		220.5	100%	151.9	
Consecutive 3rd Dry year		220.5	100%	151.9	
Consecutive 4th Dry year		220.5	100%	151.9	
Consecutive 5th Dry year		220.5	100%	151.9	

Table 4e: Basis of Water Supply Data [For Table 7-1], Base Year 2040, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2040	226.8	100%	156.3	
Single dry year		226.8	100%	156.3	
Consecutive 1st Dry year		226.8	100%	156.3	
Consecutive 2nd Dry year		226.8	100%	156.3	
Consecutive 3rd Dry year		226.8	100%	156.3	
Consecutive 4th Dry year		226.8	100%	156.3	
Consecutive 5th Dry year		226.8	100%	156.3	

Table 4f: Basis of Water Supply Data [For Table 7-1], Base Year 2045, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2045	236.5	100%	162.8	
Single dry year		236.5	100%	162.8	
Consecutive 1st Dry year		236.5	100%	162.8	
Consecutive 2nd Dry year		236.5	100%	162.8	
Consecutive 3rd Dry year		236.5	100%	162.8	
Consecutive 4th Dry year		212.8	90%	139.1	• At a 10% shortage level, the wholesale allocation is 64% of available supply • The retail allocation is 36% of supply, which resulted in a positive allocation to retail of 2.9 mgd, which was re-allocated to the Wholesale Customers
Consecutive 5th Dry year		212.8	90%	139.1	• Same as above

Table 4g: Projected RWS Supply [Alternative to Table 7-1], Years 2020-2045, Without Bay-Delta Plan Amendment

Year	2020	2025	2030	2035	2040	2045
Average year	100%	100%	100%	100%	100%	100%
Single dry year	100%	100%	100%	100%	100%	100%
Consecutive 1st Dry year	100%	100%	100%	100%	100%	100%
Consecutive 2nd Dry year	100%	100%	100%	100%	100%	100%
Consecutive 3rd Dry year	100%	100%	100%	100%	100%	100%
Consecutive 4th Dry year	100%	100%	100%	100%	100%	90%
Consecutive 5th Dry year	100%	100%	100%	100%	100%	90%

Supply Projections for Consecutive Five Dry Year Sequences

Table 5: Projected Multiple Dry Years Wholesale Supply from RWS [For Table 7-4], With Bay-Delta Plan Amendment

	2025	2030	2035	2040	2045
First year	93.3	94.2	96.5	99.2	88.7
Second year	80.0	80.8	82.7	85.1	88.7
Third year	80.0	80.8	82.7	85.1	88.7
Fourth year	80.0	80.8	82.7	75.1	75.4
Fifth year	80.0	80.8	75.8	75.1	75.4

Table 6: Projected Multiple Dry Years Wholesale Supply from RWS [For Table 7-4], Without Bay-Delta Plan Amendment

	2025	2030	2035	2040	2045
First year	146.0	147.9	151.9	156.3	162.8
Second year	146.0	147.9	151.9	156.3	162.8
Third year	146.0	147.9	151.9	156.3	162.8
Fourth year	146.0	147.9	151.9	156.3	139.1
Fifth year	146.0	147.9	151.9	156.3	139.1

Table 7: Projected Regional Water System Supply for 5-Year Drought Risk Assessment [For Table 7-5], With Bay-Delta Plan Amendment. This table assumes Bay Delta Plan comes into effect in 2023.

Year	2021	2022	2023	2024	2025
RWS Supply (mgd)	198.6	198.6	119.2	119.2	119.2
Wholesale Supply (mgd)	132.1	132.1	74.5	74.5	74.5

Table 8: Projected Regional Water System Supply for 5-Year Drought Risk Assessment [For Table 7-5], Without Bay Delta Plan

Year	2021	2022	2023	2024	2025
RWS Supply (mgd)	198.6	198.6	198.6	198.6	198.6
Wholesale Supply (mgd)	132.1	132.1	132.1	132.1	132.1

Section 1: Basis for Calculations. Projected Wholesale RWS Purchases Through 2045

Table A: Wholesale RWS Actual Purchases in 2020 and Projected Purchases for 2025, 2030, 2035, 2040, and 2045 (mgd)[a]

Agency	2020 Actual	Projected Wholesale RWS Purchases 2025	2030	2035	2040	2045
ACWD	7.87	7.68	7.68	7.68	7.68	9.11
Brisbane/GVMID	0.64	0.89	0.89	0.88	0.89	0.89
Burlingame	3.48	4.33	4.40	4.47	4.58	4.69
Coastside	1.02	1.40	1.38	1.36	1.33	1.33
CalWater Total	29.00	29.99	29.74	29.81	30.27	30.70
Daly City	3.97	3.57	3.52	3.49	3.46	3.43
East Palo Alto	1.57	1.88	1.95	2.10	2.49	2.89
Estero	4.34	4.07	4.11	4.18	4.23	4.38
Hayward	13.92	17.86	18.68	19.75	20.82	22.14
Hillsborough	2.62	3.26	3.25	3.26	3.26	3.26
Menlo Park	2.96	3.55	3.68	3.87	4.06	4.29
Mid-Peninsula	2.66	2.86	2.84	2.88	2.89	2.93
Millbrae	1.90	2.29	2.50	2.45	2.82	3.20
Milpitas	5.92	6.59	6.75	7.03	7.27	7.53
Mountain View	7.67	8.60	8.90	9.20	9.51	9.93
North Coast	2.37	2.34	2.33	2.34	2.34	2.34
Palo Alto	9.75	10.06	10.15	10.28	10.51	10.79
Purissima Hills	1.75	2.09	2.09	2.12	2.13	2.15
Redwood City	8.76	8.46	8.49	8.64	8.74	8.90
San Bruno	0.95	3.24	3.22	3.20	3.20	3.21
San Jose	4.26	4.50	4.50	4.50	4.50	4.50
Santa Clara	3.27	4.50	4.50	4.50	4.50	4.50
Stanford	1.43	2.01	2.18	2.35	2.53	2.70
Sunnyvale	9.33	9.16	9.30	10.70	11.44	12.10
Westborough	0.82	0.86	0.85	0.85	0.84	0.84
Total	**132.22**	**146.01**	**147.87**	**151.90**	**156.31**	**162.76**

[a] Wholesale RWS purchase projections for 2025, 2030, 2035, 2040, and 2045 were provided to BAWSCA between July 2020 and January 2021 by the Member Agencies following the completion of the June 2020 Demand Study.

Table B: Basis for the 5-Year Drought Risk Assessment Wholesale RWS Actual Purchases in 2020 and 2021-2025 Projected Purchases (mgd)

Agency	2020 Actual	Projected and Estimated Wholesale RWS Purchases 2021[b]	2022[b]	2023[c]	2024[c]	2025[c]
ACWD	7.87	9.44	9.46	9.46	9.46	9.46
Brisbane/GVMID	0.64	0.62	0.65	0.65	0.65	0.65
Burlingame	3.48	3.34	3.35	3.35	3.35	3.35
Coastside	1.02	1.54	1.23	1.23	1.23	1.23
CalWater Total	29.00	29.66	29.81	29.81	29.81	29.81
Daly City	3.97	4.00	4.01	4.01	4.01	4.01
East Palo Alto	1.57	1.63	1.69	1.69	1.69	1.69
Estero	4.34	4.48	4.51	4.51	4.51	4.51
Hayward	13.92	14.47	15.12	15.12	15.12	15.12
Hillsborough	2.62	2.95	3.05	3.05	3.05	3.05
Menlo Park	2.96	2.92	2.93	2.93	2.93	2.93
Mid-Peninsula	2.66	2.65	2.80	2.80	2.80	2.80
Millbrae	1.90	1.95	2.15	2.15	2.15	2.15
Milpitas	5.92	5.88	5.34	5.34	5.34	5.34
Mountain View	7.67	7.80	8.05	8.05	8.05	8.05
North Coast	2.37	2.58	2.66	2.66	2.66	2.66
Palo Alto	9.75	9.44	9.66	9.66	9.66	9.66
Purissima Hills	1.75	1.97	2.02	2.02	2.02	2.02
Redwood City	8.76	8.72	9.07	9.07	9.07	9.07
San Bruno	0.95	3.39	3.40	3.40	3.40	3.40
San Jose	4.26	4.31	4.51	4.51	4.51	4.51
Santa Clara	3.27	3.29	3.50	3.50	3.50	3.50
Stanford	1.43	1.40	1.54	1.54	1.54	1.54
Sunnyvale	9.33	9.35	9.45	9.45	9.45	9.45
Westborough	0.82	0.84	0.81	0.81	0.81	0.81
Total	**132.22**	**138.61**	**140.77**	**140.77**	**140.77**	**140.77**

[b] Wholesale RWS purchase projections for 2021 and 2022 were provided to Christina Tang, BAWSCA's Finance Manager, by the Member Agencies in January 2021.

[c] The SFPUC's supply reliability tables assume the Bay-Delta Plan takes effect in 2023. In the event of a shortage, the Tier 2 Plan specifies that each agencies' Allocation Factor would be calculated once at the onset of a shortage based on the previous year's use and remains the same until the shortage condition is over. Therefore, for the purpose of drought allocations for the 5-year Drought Risk Assessment, wholesale RWS demand is assumed to remain static from 2022 through the drought sequence.

Section 2: Drought Allocations *With* Bay-Delta Plan

Table C: RWS Supply Available to the Wholesale Customers (Combined Tables 3a-3f from the SFPUC's March 30th letter) *With* Bay-Delta Plan (mgd)

	2020[e]	2025	2030	2035	2040	2045
Projected Purchases[d]	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 1st Dry Year	138.6	93.3	94.2	96.5	99.2	88.7
Consecutive 2nd Dry Year	140.8	80.0	80.8	82.7	85.1	88.7
Consecutive 3rd Dry Year	74.5	80.0	80.8	82.7	85.1	88.7
Consecutive 4th Dry Year	74.5	80.0	80.8	82.7	75.1	75.4
Consecutive 5th Dry Year	74.5	80.0	80.8	75.8	75.1	75.4

[d] Values for 2020 are actual purchases. This row aligns with what is labeled as an "Average Year" in Tables 3a-3f in the SFPUC's March 30th letter. However, these values do not represent an average year and instead are actual purchases for 2020 or projected purchases for 2025 through 2045.

[e] In years when the Bay-Delta Plan is not in effect, sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests assuming that they are between the 2020 and 2025 projected levels. As such, RWS supply available to the Wholesale Customers in the 1st and 2nd consecutive dry years under base year 2020 is equal to the cumulative projected wholesale RWS purchases for 2021 and 2022, respectively.

Table D: Wholesale RWS Demand (Combined Totals from Tables A and B) (mgd)[f]

	2020	2025	2030	2035	2040	2045
Projected Purchases[d]	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 1st Dry Year	138.6	146.0	147.9	151.9	156.3	162.8
Consecutive 2nd Dry Year	140.8	146.0	147.9	151.9	156.3	162.8
Consecutive 3rd Dry Year	140.8	146.0	147.9	151.9	156.3	162.8
Consecutive 4th Dry Year	140.8	146.0	147.9	151.9	156.3	162.8
Consecutive 5th Dry Year	140.8	146.0	147.9	151.9	156.3	162.8

[f] The SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. Additionally, the Tier 2 Plan calculates each agencies' Allocation Factor once at the onset of a drought and it remains the same until the shortage condition is over. When system-wide shortages are projected, wholesale RWS demand is assumed to be static for the remainder of the drought sequence.

Table E: Percent Cutback to the Wholesale Customers *With* Bay-Delta Plan[g]

	2020	2025	2030	2035	2040	2045
Projected Purchases[d]	0%	0%	0%	0%	0%	0%
Consecutive 1st Dry Year	0%	36%	36%	36%	37%	46%
Consecutive 2nd Dry Year	0%	45%	45%	46%	46%	46%
Consecutive 3rd Dry Year	47%	45%	45%	46%	46%	46%
Consecutive 4th Dry Year	47%	45%	45%	46%	52%	54%
Consecutive 5th Dry Year	47%	45%	45%	50%	52%	54%

[g] Agencies that wish to use new or different projected RWS purchases may use the percent cutbacks listed in this table to determine their drought allocation.

Table F1: Basis of Water Supply Data [For Tables 7-1 and 7-5], Base Year 2020, *With* Bay-Delta Plan (mgd)

Year Consecutive Dry Year	2020 Actual	2021 1st	2022 2nd	2023 3rd	2024 4th	2025 5th
Wholesale RWS Demand	132.2	138.6	140.8	140.8	140.8	140.8
Wholesale RWS Supply Available	132.2	138.6	140.8	74.5	74.5	74.5
Percent Cutback	0%	0%	0%	47%	47%	47%

Table F2: Individual Agency Drought Allocations [For Tables 7-1 and 7-5], Base Year 2020, *With* Bay-Delta Plan (mgd)

	2020	Wholesale RWS Drought Allocations				
Agency	Actual	2021	2022	2023	2024	2025
ACWD	7.87	9.44	9.46	5.01	5.01	5.01
Brisbane/GVMID	0.64	0.62	0.65	0.34	0.34	0.34
Burlingame	3.48	3.34	3.35	1.77	1.77	1.77
Coastside	1.02	1.54	1.23	0.65	0.65	0.65
CalWater Total	29.00	29.66	29.81	15.78	15.78	15.78
Daly City	3.97	4.00	4.01	2.12	2.12	2.12
East Palo Alto	1.57	1.63	1.69	0.89	0.89	0.89
Estero	4.34	4.48	4.51	2.39	2.39	2.39
Hayward	13.92	14.47	15.12	8.00	8.00	8.00
Hillsborough	2.62	2.95	3.05	1.61	1.61	1.61
Menlo Park	2.96	2.92	2.93	1.55	1.55	1.55
Mid-Peninsula	2.66	2.65	2.80	1.48	1.48	1.48
Millbrae	1.90	1.95	2.15	1.14	1.14	1.14
Milpitas	5.92	5.88	5.34	2.83	2.83	2.83
Mountain View	7.67	7.80	8.05	4.26	4.26	4.26
North Coast	2.37	2.58	2.66	1.41	1.41	1.41
Palo Alto	9.75	9.44	9.66	5.11	5.11	5.11
Purissima Hills	1.75	1.97	2.02	1.07	1.07	1.07
Redwood City	8.76	8.72	9.07	4.80	4.80	4.80
San Bruno	0.95	3.39	3.40	1.80	1.80	1.80
San Jose	4.26	4.31	4.51	2.39	2.39	2.39
Santa Clara	3.27	3.29	3.50	1.85	1.85	1.85
Stanford	1.43	1.40	1.54	0.82	0.82	0.82
Sunnyvale	9.33	9.35	9.45	5.00	5.00	5.00
Westborough	0.82	0.84	0.81	0.43	0.43	0.43
Total	**132.2**	**138.6**	**140.8**	**74.5**	**74.5**	**74.5**

Table G1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2025, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	146.0	146.0	146.0	146.0	146.0
Wholesale RWS Supply Available	93.3	80.0	80.0	80.0	80.0
Percent Cutback	36%	45%	45%	45%	45%

Table G2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2025, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.91	4.21	4.21	4.21	4.21
Brisbane/GVMID	0.57	0.49	0.49	0.49	0.49
Burlingame	2.76	2.37	2.37	2.37	2.37
Coastside	0.89	0.77	0.77	0.77	0.77
CalWater Total	19.16	16.43	16.43	16.43	16.43
Daly City	2.28	1.96	1.96	1.96	1.96
East Palo Alto	1.20	1.03	1.03	1.03	1.03
Estero	2.60	2.23	2.23	2.23	2.23
Hayward	11.41	9.78	9.78	9.78	9.78
Hillsborough	2.08	1.79	1.79	1.79	1.79
Menlo Park	2.27	1.95	1.95	1.95	1.95
Mid-Peninsula	1.83	1.57	1.57	1.57	1.57
Millbrae	1.46	1.25	1.25	1.25	1.25
Milpitas	4.21	3.61	3.61	3.61	3.61
Mountain View	5.49	4.71	4.71	4.71	4.71
North Coast	1.49	1.28	1.28	1.28	1.28
Palo Alto	6.43	5.51	5.51	5.51	5.51
Purissima Hills	1.33	1.14	1.14	1.14	1.14
Redwood City	5.40	4.63	4.63	4.63	4.63
San Bruno	2.07	1.77	1.77	1.77	1.77
San Jose	2.88	2.47	2.47	2.47	2.47
Santa Clara	2.88	2.47	2.47	2.47	2.47
Stanford	1.28	1.10	1.10	1.10	1.10
Sunnyvale	5.85	5.02	5.02	5.02	5.02
Westborough	0.55	0.47	0.47	0.47	0.47
Total	**93.3**	**80.0**	**80.0**	**80.0**	**80.0**

Table H1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2030, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	147.9	147.9	147.9	147.9	147.9
Wholesale RWS Supply Available	94.2	80.8	80.8	80.8	80.8
Percent Cutback	36%	45%	45%	45%	45%

Table H2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2030, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.89	4.20	4.20	4.20	4.20
Brisbane/GVMID	0.56	0.48	0.48	0.48	0.48
Burlingame	2.80	2.40	2.40	2.40	2.40
Coastside	0.88	0.75	0.75	0.75	0.75
CalWater Total	18.94	16.25	16.25	16.25	16.25
Daly City	2.24	1.92	1.92	1.92	1.92
East Palo Alto	1.24	1.07	1.07	1.07	1.07
Estero	2.62	2.24	2.24	2.24	2.24
Hayward	11.90	10.21	10.21	10.21	10.21
Hillsborough	2.07	1.78	1.78	1.78	1.78
Menlo Park	2.35	2.01	2.01	2.01	2.01
Mid-Peninsula	1.81	1.55	1.55	1.55	1.55
Millbrae	1.59	1.37	1.37	1.37	1.37
Milpitas	4.30	3.69	3.69	3.69	3.69
Mountain View	5.67	4.86	4.86	4.86	4.86
North Coast	1.48	1.27	1.27	1.27	1.27
Palo Alto	6.47	5.55	5.55	5.55	5.55
Purissima Hills	1.33	1.14	1.14	1.14	1.14
Redwood City	5.41	4.64	4.64	4.64	4.64
San Bruno	2.05	1.76	1.76	1.76	1.76
San Jose	2.87	2.46	2.46	2.46	2.46
Santa Clara	2.87	2.46	2.46	2.46	2.46
Stanford	1.39	1.19	1.19	1.19	1.19
Sunnyvale	5.92	5.08	5.08	5.08	5.08
Westborough	0.54	0.47	0.47	0.47	0.47
Total	**94.2**	**80.8**	**80.8**	**80.8**	**80.8**

Table I1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2035, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	151.9	151.9	151.9	151.9	151.9
Wholesale RWS Supply Available	96.5	82.7	82.7	82.7	75.8
Percent Cutback	36%	46%	46%	46%	50%

Table I2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2035, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.88	4.18	4.18	4.18	3.83
Brisbane/GVMID	0.56	0.48	0.48	0.48	0.44
Burlingame	2.84	2.44	2.44	2.44	2.23
Coastside	0.86	0.74	0.74	0.74	0.68
CalWater Total	18.94	16.23	16.23	16.23	14.88
Daly City	2.22	1.90	1.90	1.90	1.74
East Palo Alto	1.33	1.14	1.14	1.14	1.05
Estero	2.66	2.28	2.28	2.28	2.09
Hayward	12.55	10.75	10.75	10.75	9.86
Hillsborough	2.07	1.78	1.78	1.78	1.63
Menlo Park	2.46	2.10	2.10	2.10	1.93
Mid-Peninsula	1.83	1.57	1.57	1.57	1.44
Millbrae	1.56	1.34	1.34	1.34	1.22
Milpitas	4.47	3.83	3.83	3.83	3.51
Mountain View	5.84	5.01	5.01	5.01	4.59
North Coast	1.49	1.27	1.27	1.27	1.17
Palo Alto	6.53	5.60	5.60	5.60	5.13
Purissima Hills	1.34	1.15	1.15	1.15	1.06
Redwood City	5.49	4.70	4.70	4.70	4.31
San Bruno	2.03	1.74	1.74	1.74	1.60
San Jose	2.86	2.45	2.45	2.45	2.25
Santa Clara	2.86	2.45	2.45	2.45	2.25
Stanford	1.49	1.28	1.28	1.28	1.17
Sunnyvale	6.80	5.83	5.83	5.83	5.34
Westborough	0.54	0.46	0.46	0.46	0.42
Total	**96.5**	**82.7**	**82.7**	**82.7**	**75.8**

Table J1: Basis of Water Supply Data [For Table 7-1 and 7-4], Base Year 2040, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	156.3	156.3	156.3	156.3	156.3
Wholesale RWS Supply Available	99.2	85.1	85.1	75.1	75.1
Percent Cutback	37%	46%	46%	52%	52%

Table J2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2040, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.87	4.18	4.18	3.69	3.69
Brisbane/GVMID	0.56	0.48	0.48	0.43	0.43
Burlingame	2.91	2.49	2.49	2.20	2.20
Coastside	0.85	0.73	0.73	0.64	0.64
CalWater Total	19.21	16.48	16.48	14.54	14.54
Daly City	2.20	1.88	1.88	1.66	1.66
East Palo Alto	1.58	1.36	1.36	1.20	1.20
Estero	2.69	2.30	2.30	2.03	2.03
Hayward	13.21	11.34	11.34	10.00	10.00
Hillsborough	2.07	1.78	1.78	1.57	1.57
Menlo Park	2.58	2.21	2.21	1.95	1.95
Mid-Peninsula	1.84	1.58	1.58	1.39	1.39
Millbrae	1.79	1.53	1.53	1.35	1.35
Milpitas	4.62	3.96	3.96	3.49	3.49
Mountain View	6.03	5.18	5.18	4.57	4.57
North Coast	1.49	1.27	1.27	1.12	1.12
Palo Alto	6.67	5.72	5.72	5.05	5.05
Purissima Hills	1.35	1.16	1.16	1.03	1.03
Redwood City	5.55	4.76	4.76	4.20	4.20
San Bruno	2.03	1.74	1.74	1.54	1.54
San Jose	2.86	2.45	2.45	2.16	2.16
Santa Clara	2.86	2.45	2.45	2.16	2.16
Stanford	1.61	1.38	1.38	1.22	1.22
Sunnyvale	7.26	6.23	6.23	5.49	5.49
Westborough	0.54	0.46	0.46	0.41	0.41
Total	**99.2**	**85.1**	**85.1**	**75.1**	**75.1**

Table K1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2045, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	162.8	162.8	162.8	162.8	162.8
Wholesale RWS Supply Available	88.7	88.7	88.7	75.4	75.4
Percent Cutback	46%	46%	46%	54%	54%

Table K2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2045, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.97	4.97	4.97	4.22	4.22
Brisbane/GVMID	0.49	0.49	0.49	0.41	0.41
Burlingame	2.56	2.56	2.56	2.17	2.17
Coastside	0.72	0.72	0.72	0.61	0.61
CalWater Total	16.73	16.73	16.73	14.22	14.22
Daly City	1.87	1.87	1.87	1.59	1.59
East Palo Alto	1.58	1.58	1.58	1.34	1.34
Estero	2.39	2.39	2.39	2.03	2.03
Hayward	12.07	12.07	12.07	10.26	10.26
Hillsborough	1.78	1.78	1.78	1.51	1.51
Menlo Park	2.34	2.34	2.34	1.99	1.99
Mid-Peninsula	1.59	1.59	1.59	1.36	1.36
Millbrae	1.74	1.74	1.74	1.48	1.48
Milpitas	4.11	4.11	4.11	3.49	3.49
Mountain View	5.41	5.41	5.41	4.60	4.60
North Coast	1.28	1.28	1.28	1.09	1.09
Palo Alto	5.88	5.88	5.88	5.00	5.00
Purissima Hills	1.17	1.17	1.17	1.00	1.00
Redwood City	4.85	4.85	4.85	4.12	4.12
San Bruno	1.75	1.75	1.75	1.49	1.49
San Jose	2.45	2.45	2.45	2.08	2.08
Santa Clara	2.45	2.45	2.45	2.08	2.08
Stanford	1.47	1.47	1.47	1.25	1.25
Sunnyvale	6.59	6.59	6.59	5.61	5.61
Westborough	0.46	0.46	0.46	0.39	0.39
Total	**88.7**	**88.7**	**88.7**	**75.4**	**75.4**

Section 3: Drought Allocations *Without* Bay-Delta Plan

Table L: RWS Supply Available to the Wholesale Customers (Combined Tables 4a-4f from the SFPUC's March 30th letter) *Without* Bay-Delta Plan (mgd)[h]

	2020	2025	2030	2035	2040	2045
Projected Purchases[i]	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 1st Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 2nd Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 3rd Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 4th Dry Year	132.2	146.0	147.9	151.9	156.3	139.1
Consecutive 5th Dry Year	132.2	146.0	147.9	151.9	156.3	139.1

[h] The SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. However, the SFPUC has indicated that sufficient supplies are available to meet wholesale RWS demand so long as they reasonably stay within 2020 and 2040 levels. The SFPUC's modeling does not indicate cutbacks will be required till the 4th and 5th consecutive dry year at 2045 levels.

[i] Values for 2020 are actual purchases. This row aligns with what is labeled as an "Average Year" in Tables 4a-4f in the SFPUC's March 30th letter. However, these values do not represent an average year and instead are actual purchases for 2020 or projected purchases for 2025 through 2045.

Table M: Wholesale RWS Demand (Combined Totals from Tables A and B) (mgd)

	2020	2025	2030	2035	2040	2045
Projected Purchases[i]	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 1st Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 2nd Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 3rd Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 4th Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 5th Dry Year	132.2	146.0	147.9	151.9	156.3	162.8

Table N: Percent Cutback to the Wholesale Customers *Without* Bay-Delta Plan

	2020	2025	2030	2035	2040	2045
Projected Purchases[i]	0%	0%	0%	0%	0%	0%
Consecutive 1st Dry Year	0%	0%	0%	0%	0%	0%
Consecutive 2nd Dry Year	0%	0%	0%	0%	0%	0%
Consecutive 3rd Dry Year	0%	0%	0%	0%	0%	0%
Consecutive 4th Dry Year	0%	0%	0%	0%	0%	15%
Consecutive 5th Dry Year	0%	0%	0%	0%	0%	15%

Table O1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2045, *Without* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	162.8	162.8	162.8	162.8	162.8
Wholesale RWS Supply Available	162.8	162.8	162.8	139.1	139.1
Percent Cutback	0%	0%	0%	Tier 2 Plan	Tier 2 Plan

Table O2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2045, *Without* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations					Tier 2 Drought Cutback
Consecutive Dry Year	1st	2nd	3rd	4th	5th	
ACWD	9.11	9.11	9.11	8.20	8.20	10.0%
Brisbane/GVMID	0.89	0.89	0.89	0.74	0.74	16.8%
Burlingame	4.69	4.69	4.69	4.02	4.02	14.3%
Coastside	1.33	1.33	1.33	1.19	1.19	10.0%
CalWater Total	30.70	30.70	30.70	26.73	26.73	12.9%
Daly City	3.43	3.43	3.43	3.01	3.01	12.4%
East Palo Alto	2.89	2.89	2.89	2.68	2.68	7.3%
Estero	4.38	4.38	4.38	3.94	3.94	10.0%
Hayward	22.14	22.14	22.14	18.67	18.67	15.7%
Hillsborough	3.26	3.26	3.26	2.93	2.93	10.2%
Menlo Park	4.29	4.29	4.29	3.58	3.58	16.5%
Mid-Peninsula	2.93	2.93	2.93	2.63	2.63	10.0%
Millbrae	3.20	3.20	3.20	2.54	2.54	20.7%
Milpitas	7.53	7.53	7.53	6.55	6.55	13.1%
Mountain View	9.93	9.93	9.93	8.91	8.91	10.3%
North Coast	2.34	2.34	2.34	2.11	2.11	10.0%
Palo Alto	10.79	10.79	10.79	9.71	9.71	10.0%
Purissima Hills	2.15	2.15	2.15	1.41	1.41	34.5%
Redwood City	8.90	8.90	8.90	7.92	7.92	11.1%
San Bruno	3.21	3.21	3.21	2.60	2.60	19.1%
San Jose	4.50	4.50	4.50	2.95	2.95	34.5%
Santa Clara	4.50	4.50	4.50	2.95	2.95	34.5%
Stanford	2.70	2.70	2.70	2.27	2.27	16.0%
Sunnyvale	12.10	12.10	12.10	10.11	10.11	16.5%
Westborough	0.84	0.84	0.84	0.76	0.76	10.0%
Total	**162.8**	**162.8**	**162.8**	**139.1**	**139.1**	

BAWSCA
Bay Area Water Supply & Conservation Agency

February 18, 2021

TO: BAWSCA Member Agencies

FROM: Danielle McPherson, Senior Water Resources Specialist
Tom Francis, Water Resources Manager

SUBJECT: San Francisco Regional Water System Supply Reliability for 2020 Urban Water Management Plans

The purpose of this memorandum is to provide updated drought allocations among the Member Agencies under the various scenarios provided in the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS) Supply Reliability Letter dated January 22, 2021 and transmitted to the Member Agencies via email on January 25th ("Supply Reliability Letter", Attachment A). As presented and discussed at the February 12th BAWSCA Urban Water Management Plan (UWMP) Workshop, the Tier 2 Drought Allocation Plan was not designed for RWS shortages greater than 20 percent. As a result, the Tier 2 allocation tables shared with the Supply Reliability Letter showed unexpected and wide-ranging results between Member Agencies that should not be used for UWMP purposes.

As provided for in the 2018 Amended and Restated Water Supply Agreement (WSA), the SFPUC will honor new Tier 2 allocations agreed upon by all Member Agencies if an RWS shortage greater than 20 percent is declared. However, at this time, there is no method for allocating supplies under such significant cutbacks. Additionally, the time it would take to negotiate a modified Tier 2 plan to address those significant cutbacks would be extensive and greater than the timeline required for BAWSCA to provide your agency with numbers for input into your 2020 UWMP submittals.

For these reasons, BAWSCA is recommending that for the purpose of the 2020 UWMP updates, allocation of wholesale RWS supplies should be as follows:

1. When the average Wholesale Customers' RWS shortages are 10 percent or less, an equal percent reduction will be applied across all agencies. This is consistent with the existing Tier 2 requirement of a minimum 10 percent cutback in any Tier 2 application scenario.
2. When average Wholesale Customers' shortages are between 10 and 20 percent, the Tier 2 Drought Allocation Plan will be applied.
3. When the average Wholesale Customers' RWS shortages are greater than 20 percent, an equal percent reduction will be applied across all agencies.

Attachment B "Updated 2020 UWMP Drought Cutbacks" provides further detail, including recommended wholesale RWS allocation tables, for use in your agency's 2020 UWMP.

BAWSCA recognizes that this is not an ideal situation or method for allocation of available drought supplies. In the event of actual RWS shortages greater than 20 percent, the Member Agencies would have the opportunity to negotiate and agree upon a more nuanced and equitable approach. Such an approach would likely consider basic health and safety needs, the

water needs to support critical institutions such as hospitals, and minimizing economic impacts on individual communities and the region.

Enclosed: Attachment A: Supply Reliability Letter
Attachment B: Updated 2020 UWMP Drought Cutbacks

cc: Nicole Sandkulla
Allison Schutte

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

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January 22, 2021

Danielle McPherson
Senior Water Resources Specialist
Bay Area Water Supply and Conservation Agency
155 Bovet Road, Suite 650
San Mateo, CA 94402

Dear Ms. McPherson,

Attached please find the information you requested on the Regional Water System's supply reliability for use in the Wholesale Customer's 2020 Urban Water Management Plan (UWMP) updates. The SFPUC has assessed the water supply reliability under the following planning scenarios:

- Projected supply reliability for year 2020 through 2045
- Projected single dry year and multiple dry year reliability for base year 2020, both with and without implementation of the Bay-Delta Plan Amendment
- Projected single dry year and multiple dry year reliability for base year 2025, both with and without implementation of the Bay-Delta Plan Amendment

The tables presented below assume full implementation of the Bay-Delta Plan Amendment will begin in 2023. All tables assume that the wholesale customers will purchase 184 mgd from the RWS through 2045. Assumptions about the status of the dry-year water supply projects included in the Water Supply Improvement Program (WSIP) are provided below in the table 'WSIP Project Assumptions'. The tables reflect instream flow requirements at San Mateo and Alameda Creeks, as described in the common language provided to BAWSCA separately.

Concerning allocation of supply during dry years, the Water Shortage Allocation Plan (WSAP) was utilized to allocate shortages between the SFPUC and the Wholesale Customers collectively. The WSAP implements a method for allocating water between the SFPUC retail customers and wholesale customers collectively which has been adopted by the Wholesale Customers per the July 2009 Water Supply Agreement between the City and County of

London N. Breed
Mayor

Sophie Maxwell
President

Anson Moran
Vice President

Tim Paulson
Commissioner

Ed Harrington
Commissioner

Michael Carlin
Acting
General Manager

San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County. The WSAP, also known as the Tier One Plan, was amended in the 2018 Amended and Restated Water Supply Agreement. The wholesale customers have adopted the Tier Two Plan, the second component of the WSAP, which allocates the collective wholesale customer share among each of the 26 wholesale customers.

Compared to the reliability projections that were provided previously for the 2015 UWMP update, the biggest difference in projected future deliveries is caused by the implementation of the Bay-Delta Plan Amendment. Given the uncertainty about the implementation of the Amendment (described further in the common language provided to BAWSCA), tables are included to show future projected supplies both with and without the Bay-Delta Plan Amendment.

It is our understanding that you will pass this information on to the Wholesale Customers. If you have any questions or need additional information, please do not hesitate to contact Sarah Triolo, at striolo@sfwater.org or (628) 230 0802.

Sincerely,

Paula Kehoe
Director of Water Resources

Table 1: WSIP Project Assumptions

	2020	2025 and Beyond
Calaveras Dam Replacement Project	Calaveras Reservoir partially refilled at spring 2020 level of 63,900 AF	Calaveras Reservoir fully refilled
Lower Crystal Springs Dam Improvements	Crystal Springs storage not restored	
Regional Groundwater Storage and Recovery (GSR) Project	GSR account partially filled at spring 2020 level of 23,500 AF; GSR recovery rate of 6.2 mgd	GSR account fully filled; GSR recovery rate of 6.2 mgd
Alameda Creek Recapture Project	Project not built	Project built
Dry-year Transfers	Not in effect	

Table 2: Projected Wholesale Supply from Regional Water System [For Table 6-9]:

Year	2020	2025	2030	2035	2040	2045
RWS Supply (mgd)	265	265	265	265	265	265
Wholesale Supply (mgd)	184	184	184	184	184	184

Table 3: Basis of Water Supply Data [For Table 7-1], 2020 Infrastructure Conditions With Bay Delta Plan

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2020	265	100%	184	
Single dry year		238.5	90%	157.5	• At 10% shortage, wholesale allocation is 64%, or 152.6 mgd • Retail allocation is 36%, or 85.9 mgd • Retail allocations above 81 mgd are re-allocated to Wholesale Customers, per the 2018 WSA • 4.9 mgd added to wholesale allocation, bringing it to 157.5 mgd
Consecutive 1st Dry year		238.5	90%	157.5	• Same as above
Consecutive 2nd Dry year		212	80%	132.5	• At a 20% shortage, wholesale allocation is 62.5%, or 132.5 mgd • Retail allocation is 37.5%, or 79.5 mgd
Consecutive 3rd Dry year[1]		119.25	45%	74.5	• WSA does not define percentage split above a 20% shortage level • Assume same split as for a 20% shortage level, i.e. Wholesale Customers receive 62.5%
Consecutive 4th Dry year		119.25	45%	74.5	• Same as above
Consecutive 5th Dry year		119.25	45%	74.5	• Same as above

[1] Assuming this year represents 2023, when Bay Delta Plan Amendment would come into effect.

Table 4: Basis of Water Supply Data [For Table 7-1], 2020 Infrastructure Conditions Without Bay Delta Plan

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2020	265	100%	184	
Single dry year		238.5	90%	157.5	• At 10% shortage, wholesale allocation is 64%, or 152.6 mgd • Retail allocation is 36%, or 85.9 mgd • Retail allocations above 81 mgd are re-allocated to Wholesale Customers, per the 2018 WSA • 4.9 mgd added to wholesale allocation, bringing it to 157.5 mgd
Consecutive 1st Dry year		238.5	90%	157.5	• Same as above
Consecutive 2nd Dry year		212	80%	132.5	• At a 20% shortage, wholesale allocation is 62.5%, or 132.5 mgd • Retail allocation is 37.5%, or 79.5 mgd
Consecutive 3rd Dry year		212	80%	132.5	• Same as above
Consecutive 4th Dry year		212	80%	132.5	• Same as above
Consecutive 5th Dry year		212	80%	132.5	• Same as above

Table 5: Basis of Water Supply Data [For Table 7-1], 2025 Infrastructure With Bay Delta Plan

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2025	265	100%	184	
Single dry year		132.5	50%	82.8	• WSA does not define percentage split above a 20% shortage level • Assume same split as for a 20% shortage level, i.e. Wholesale Customers receive 62.5%
Consecutive 1st Dry year		132.5	50%	82.8	• Same as above
Consecutive 2nd Dry year		119.25	45%	74.5	• Same as above
Consecutive 3rd Dry year		119.25	45%	74.5	• Same as above
Consecutive 4th Dry year		119.25	45%	74.5	• Same as above
Consecutive 5th Dry year		119.25	45%	74.5	• Same as above

Table 6: Basis of Water Supply Data [For Table 7-1], 2025 Infrastructure Without Bay Delta Plan

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2025	265	100%	184	
Single dry year		238.5	90%	157.5	• At 10% shortage, wholesale allocation is 64% • Retail allocation is 36%, or 85.9 mgd; retail allocations above 81 mgd are re-allocated to Wholesaler Customers, per the 2018 WSA • 4.9 mgd added to wholesale allocation, bringing it to 157.5 mgd
Consecutive 1st Dry year		238.5	90%	157.5	• Same as above
Consecutive 2nd Dry year		238.5	90%	157.5	• Same as above
Consecutive 3rd Dry year		238.5	90%	157.5	• Same as above
Consecutive 4th Dry year		212	80%	132.5	• At a 20% shortage, wholesale allocation is 62.5%, or 132.5 mgd • Retail allocation is 37.5%, or 79.5 mgd
Consecutive 5th Dry year		212	80%	132.5	• Same as above

Table 7: Projected Multiple Dry Years Wholesale Supply from RWS [For Table 7-4], With Bay Delta Plan

	2025	2030	2035	2040	2045
First year	82.8	82.8	82.8	82.8	82.8
Second year	74.5	74.5	74.5	74.5	74.5
Third year	74.5	74.5	74.5	74.5	74.5
Fourth year	74.5	74.5	74.5	74.5	74.5
Fifth year	74.5	74.5	74.5	74.5	74.5

Table 8: Projected Multiple Dry Years Wholesale Supply from RWS [For Table 7-4], Without Bay Delta Plan

	2025	2030	2035	2040	2045
First year	157.5	157.5	157.5	157.5	157.5
Second year	157.5	157.5	157.5	157.5	157.5
Third year	157.5	157.5	157.5	157.5	157.5
Fourth year	132.5	132.5	132.5	132.5	132.5
Fifth year	132.5	132.5	132.5	132.5	132.5

Table 9: Projected Regional Water System Supply for 5-Year Drought Risk Assessment [For Table 7-5], With Bay Delta Plan. This table assumes Bay Delta Plan comes into effect in 2023.

Year	2021	2022	2023	2024	2025
RWS Supply (mgd)	238.5	212	119.25	119.25	119.25
Wholesale Supply (mgd)	157.5	132.5	74.5	74.5	74.5

Table 10: Projected Regional Water System Supply for 5-Year Drought Risk Assessment [For Table 7-5], Without Bay Delta Plan

Year	2021	2022	2023	2024	2025
RWS Supply (mgd)	238.5	212	212	212	212
Wholesale Supply (mgd)	157.5	132.5	132.5	132.5	132.5

Attachment B: Updated 2020 UWMP Drought Cutbacks

The January 22, 2021, SFPUC Regional Water System (RWS) Supply Reliability Letter (Supply Reliability Letter) provides RWS supplies available to the Wholesale Customers under two scenarios: (1) With Bay-Delta Plan, and (2) Without Bay-Delta Plan. Your agency must choose which scenario to use for your agency's 2020 UWMP submittal tables. However, you may discuss both scenarios in the body of your agency's UWMP. The purpose of this attachment is to provide further detail about your agency's allocation of total RWS supplies available to the Wholesale Customers under both scenarios.

Data Sources for Projected RWS Purchases

Supply allocations are based on projected RWS purchases provided to BAWSCA by the Member Agencies. Following the completion of the Demand Study in June 2020, BAWSCA used the results to develop a table for each Member Agency listing possible supplies and total demand for 2025, 2030, 2035, 2040, and 2045. BAWSCA populated the tables with total demand after passive conservation and entered active conservation, as calculated in the agencies' DSS Model, as a source of supply. Multi-source agencies were asked to complete the table with supply projections, including from the RWS, to meet total demand. Single-source agencies were offered the opportunity to review the tables upon request. Because active conservation was treated as a source of supply, projected RWS purchases are after passive and active conservation.

Water Management Representatives (WMRs) received a draft copy of all projected wholesale RWS purchase requests as part of the January 7, 2021 WMR meeting agenda packet and meeting slides. Agencies were asked to notify BAWSCA if changes were necessary regarding their purchase requests prior to BAWSCA sending those purchase requests to the SFPUC. Purchase requests were transmitted to the SFPUC via a letter dated January 15, 2021 for use in their 2020 UWMP efforts.

Note that the projected RWS purchases used by BAWSCA for fiscal years 2020-21 and for 2021-22 were provided to Christina Tang, BAWSCA's Finance Manager, by each Member Agency in January 2021. This annual reporting is part of the SFPUC's wholesale rate setting process. Member Agencies have provided BAWSCA with these projected purchases annually for the past 10 years.

UWMP Tables 7-1 and 7-5

UWMP Table 7-1 requests supply reliability for a normal year, a single dry year, and multiple (five) dry years. Tables 3, 4, 5, and 6 provided in the Supply Reliability Letter will help your agency complete UWMP Table 7-1. The Drought Risk Assessment (DRA) in UWMP Table 7-5 also requests a five-year drought sequence but specifies years 2021 through 2025. Supply Reliability Letter Tables 9 and 10 will help your agency complete UWMP Table 7-5.

The Supply Reliability Letter provides four tables for completing UWMP Table 7-1. The Supply Reliability Letter Tables 3 (with Bay-Delta Plan) and 4 (without Bay-Delta Plan) use 2020 as the base year. Depending on which scenario you choose, these will be the basis for your agency's five-year DRA (UWMP Table 7-5). The Supply Reliability Letter Tables 5 (with Bay-Delta Plan) and 6 (without Bay-Delta Plan) use 2025 as the base year. Depending on which scenario you choose, these will be the basis for UWMP Tables 7-2 through 7-4. Your agency may submit multiple UWMP Tables 7-1 with different base years (see Figure 1 below).

Attachment B: Updated 2020 UWMP Drought Cutbacks

Figure 1: Footnote from Draft UWMP Table 7-1

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a Supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.

Total RWS supplies available to the Wholesale Customers in the first through fifth consecutive dry years in Supply Reliability Letter Table 3 align with those in Table 9 of the same letter. Similarly, Supply Reliability Letter Table 4 aligns with Table 10 of the same letter.

Table A below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Tables 7-1and 7-5.

Table A: Wholesale Customer Drought Cutbacks Based on a Single Dry Year and Multiple Dry Years (Base Year 2020)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
(1)	Projected SF RWS Wholesale Purchases	132.2 MGD	138.6 MGD	140.8 MGD	140.8 MGD	140.8 MGD	140.8 MGD
(2)	Supply Available to the Wholesale Customers	Percent Cutback on Wholesale RWS Purchases					
		2020	**2021**	**2022**	**2023**	**2024**	**2025**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
(4)	132.5 MGD	0.0%	-4.4%	-5.9%	-5.9%	-5.9%	-5.9%
(5)	82.8 MGD	-37.4%	-40.3%	-41.2%	-41.2%	-41.2%	-41.2%
(6)	74.5 MGD	-43.7%	-46.3%	-47.1%	-47.1%	-47.1%	-47.1%

Table A, column (a), rows 3 through 6 lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative actual wholesale RWS purchases for 2020. In years when the Bay-Delta Plan is not in effect, sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests assuming that they are between the 2020 and 2025 projected levels. As such, RWS supply available to the Wholesale Customers in the 2021 and 2022 is equal to the cumulative projected wholesale RWS.. Projected RWS purchases for years 2021 and 2022 were provided to Christina Tang, BAWSCA's Finance Manager, by the Member Agencies in January 2021. The SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. Additionally, the Tier 2 Plan calculates each agencies' Allocation Factor once at the onset of a drought and it remains the same until the shortage condition is over. Therefore, wholesale RWS demand in 2023 through 2025 is assumed to be static based on the 2022 projected demand.

Table B below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Table 7-1.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table B: Wholesale Customer Drought Cutbacks Based on a Single Dry Year and Multiple Dry Years (Base Year 2025)

	(a)	(b)	(c)	(d)	(e)	(f)
(1)	Projected SF RWS Wholesale Purchases	146.0 MGD	146.0 MGD	146.0 MGD	146.0 MGD	146.0 MGD
(2)	Supply Available to the Wholesale Customers	Percent Cutback on Wholesale RWS Purchases				
		2025	**2026**	**2027**	**2028**	**2029**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	0.0%
(4)	132.5 MGD	-9.2%	-9.2%	-9.2%	-9.2%	-9.2%
(5)	82.8 MGD	-43.3%	-43.3%	-43.3%	-43.3%	-43.3%
(6)	74.5 MGD	-49.0%	-49.0%	-49.0%	-49.0%	-49.0%

Table B, column (a), rows 3 through 6 lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative projected wholesale RWS purchases for 2025 through 2029. The SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. Additionally, the Tier 2 Plan calculates each agencies' Allocation Factor once at the onset of a drought and it remains the same until the shortage condition is over. Therefore, wholesale RWS demand is assumed to be static between 2025 and 2029 based on the 2025 projected demand.

To complete UWMP Tables 7-1 and 7-5, reference tables in the Supply Reliability Letter to identify total RWS supplies available to the Wholesale Customers and apply the percent cutback in the corresponding year of the drought sequence using Tables A and B. For example, in Supply Reliability Letter Table 3, in the 5th consecutive year of a drought, the volume available to the Wholesale Customers is 74.5 MGD. To calculate RWS supplies available to your agency in 2025 using table A, locate the row with 74.5 MGD on the table – row 6 – and the column for 2025 – column (g). Then apply the percent cutback to your agency's RWS demand in 2025.

A list of purchase projections by agency are provided in Tables C, D, E, and F. The table also indicates the percent cutback that should be applied based on total RWS supplies available to the Wholesale Customers. Tables C and E use Scenario 1: With Bay-Delta Plan. Tables D and F use Scenario 2: Without Bay-Delta Plan. Tables C and D use 2020 as the base year and Tables E and F use 2025 as the base year.

BAWSCA understands that agencies are updating projected demands for their 2020 UWMPs and that projected RWS purchases may change from what was previously provided. Additionally, BAWSCA recognizes that not all Member Agencies will choose the same scenario for their UWMP supply reliability tables. For both reasons, projected RWS purchases in each Member Agency's 2020 UWMP may not add up to total Wholesale demands in the SFPUC's 2020 UWMP. This is consistent with direction given by the Department of Water Resources, which encourages suppliers use the UWMP tables to represent what they believe to be the most likely supply reliability scenario and to characterize the five-consecutive year drought in a manner that is best suited for understanding and managing their water service reliability and individual agency level of risk tolerance.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table C: Scenario 1: With Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2020)

	2020 (184 MGD)		**2021** (157.5 MGD)		**2022** (132.5 MGD)		**2023** (74.5 MGD)		**2024** (74.5 MGD)		**2025** (74.5 MGD)	
Agency	Actual Purchases	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.87	0.0%	9.44	0.0%	9.46	-5.9%	9.46	-47%	9.46	-47%	9.46	-47%
Brisbane/GVMID	0.64	0.0%	0.62	0.0%	0.65	-5.9%	0.65	-47%	0.65	-47%	0.65	-47%
Burlingame	3.48	0.0%	3.34	0.0%	3.35	-5.9%	3.35	-47%	3.35	-47%	3.35	-47%
Coastside	1.02	0.0%	1.54	0.0%	1.23	-5.9%	1.23	-47%	1.23	-47%	1.23	-47%
CalWater Total	29.00	0.0%	29.66	0.0%	29.81	-5.9%	29.81	-47%	29.81	-47%	29.81	-47%
Daly City	3.97	0.0%	4.00	0.0%	4.01	-5.9%	4.01	-47%	4.01	-47%	4.01	-47%
East Palo Alto	1.57	0.0%	1.63	0.0%	1.69	-5.9%	1.69	-47%	1.69	-47%	1.69	-47%
Estero	4.34	0.0%	4.48	0.0%	4.51	-5.9%	4.51	-47%	4.51	-47%	4.51	-47%
Hayward	13.92	0.0%	14.47	0.0%	15.12	-5.9%	15.12	-47%	15.12	-47%	15.12	-47%
Hillsborough	2.62	0.0%	2.95	0.0%	3.05	-5.9%	3.05	-47%	3.05	-47%	3.05	-47%
Menlo Park	2.96	0.0%	2.92	0.0%	2.93	-5.9%	2.93	-47%	2.93	-47%	2.93	-47%
Mid-Peninsula	2.66	0.0%	2.65	0.0%	2.80	-5.9%	2.80	-47%	2.80	-47%	2.80	-47%
Millbrae	1.90	0.0%	1.95	0.0%	2.15	-5.9%	2.15	-47%	2.15	-47%	2.15	-47%
Milpitas	5.92	0.0%	5.88	0.0%	5.34	-5.9%	5.34	-47%	5.34	-47%	5.34	-47%
Mountain View	7.67	0.0%	7.80	0.0%	8.05	-5.9%	8.05	-47%	8.05	-47%	8.05	-47%
North Coast	2.37	0.0%	2.58	0.0%	2.66	-5.9%	2.66	-47%	2.66	-47%	2.66	-47%
Palo Alto	9.75	0.0%	9.44	0.0%	9.66	-5.9%	9.66	-47%	9.66	-47%	9.66	-47%
Purissima Hills	1.75	0.0%	1.97	0.0%	2.02	-5.9%	2.02	-47%	2.02	-47%	2.02	-47%
Redwood City	8.76	0.0%	8.72	0.0%	9.07	-5.9%	9.07	-47%	9.07	-47%	9.07	-47%
San Bruno	0.95	0.0%	3.39	0.0%	3.40	-5.9%	3.40	-47%	3.40	-47%	3.40	-47%
San José	4.26	0.0%	4.31	0.0%	4.51	-5.9%	4.51	-47%	4.51	-47%	4.51	-47%
Santa Clara	3.27	0.0%	3.29	0.0%	3.50	-5.9%	3.50	-47%	3.50	-47%	3.50	-47%
Stanford	1.43	0.0%	1.40	0.0%	1.54	-5.9%	1.54	-47%	1.54	-47%	1.54	-47%
Sunnyvale	9.33	0.0%	9.35	0.0%	9.45	-5.9%	9.45	-47%	9.45	-47%	9.45	-47%
Westborough	0.82	0.0%	0.84	0.0%	0.81	-5.9%	0.81	-47%	0.81	-47%	0.81	-47%
Wholesale Total	**132.2**	**132.2†**	**138.6**	**138.6†**	**140.8**	**132.5†**	**140.8**	**74.5†**	**140.8**	**74.5†**	**140.8**	**74.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table D: Scenario 2: Without Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2020)

	2020 (184 MGD)		**2021** (157.5 MGD)		**2022** (132.5 MGD)		**2023** (132.5 MGD)		**2024** (132.5 MGD)		**2025** (132.5 MGD)	
Agency	Actual Purchases	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.87	0.0%	9.44	0.0%	9.46	-5.9%	9.46	-5.9%	9.46	-5.9%	9.46	-5.9%
Brisbane/GVMID	0.64	0.0%	0.62	0.0%	0.65	-5.9%	0.65	-5.9%	0.65	-5.9%	0.65	-5.9%
Burlingame	3.48	0.0%	3.34	0.0%	3.35	-5.9%	3.35	-5.9%	3.35	-5.9%	3.35	-5.9%
Coastside	1.02	0.0%	1.54	0.0%	1.23	-5.9%	1.23	-5.9%	1.23	-5.9%	1.23	-5.9%
CalWater Total	29.00	0.0%	29.66	0.0%	29.81	-5.9%	29.81	-5.9%	29.81	-5.9%	29.81	-5.9%
Daly City	3.97	0.0%	4.00	0.0%	4.01	-5.9%	4.01	-5.9%	4.01	-5.9%	4.01	-5.9%
East Palo Alto	1.57	0.0%	1.63	0.0%	1.69	-5.9%	1.69	-5.9%	1.69	-5.9%	1.69	-5.9%
Estero	4.34	0.0%	4.48	0.0%	4.51	-5.9%	4.51	-5.9%	4.51	-5.9%	4.51	-5.9%
Hayward	13.92	0.0%	14.47	0.0%	15.12	-5.9%	15.12	-5.9%	15.12	-5.9%	15.12	-5.9%
Hillsborough	2.62	0.0%	2.95	0.0%	3.05	-5.9%	3.05	-5.9%	3.05	-5.9%	3.05	-5.9%
Menlo Park	2.96	0.0%	2.92	0.0%	2.93	-5.9%	2.93	-5.9%	2.93	-5.9%	2.93	-5.9%
Mid-Peninsula	2.66	0.0%	2.65	0.0%	2.80	-5.9%	2.80	-5.9%	2.80	-5.9%	2.80	-5.9%
Millbrae	1.90	0.0%	1.95	0.0%	2.15	-5.9%	2.15	-5.9%	2.15	-5.9%	2.15	-5.9%
Milpitas	5.92	0.0%	5.88	0.0%	5.34	-5.9%	5.34	-5.9%	5.34	-5.9%	5.34	-5.9%
Mountain View	7.67	0.0%	7.80	0.0%	8.05	-5.9%	8.05	-5.9%	8.05	-5.9%	8.05	-5.9%
North Coast	2.37	0.0%	2.58	0.0%	2.66	-5.9%	2.66	-5.9%	2.66	-5.9%	2.66	-5.9%
Palo Alto	9.75	0.0%	9.44	0.0%	9.66	-5.9%	9.66	-5.9%	9.66	-5.9%	9.66	-5.9%
Purissima Hills	1.75	0.0%	1.97	0.0%	2.02	-5.9%	2.02	-5.9%	2.02	-5.9%	2.02	-5.9%
Redwood City	8.76	0.0%	8.72	0.0%	9.07	-5.9%	9.07	-5.9%	9.07	-5.9%	9.07	-5.9%
San Bruno	0.95	0.0%	3.39	0.0%	3.40	-5.9%	3.40	-5.9%	3.40	-5.9%	3.40	-5.9%
San José	4.26	0.0%	4.31	0.0%	4.51	-5.9%	4.51	-5.9%	4.51	-5.9%	4.51	-5.9%
Santa Clara	3.27	0.0%	3.29	0.0%	3.50	-5.9%	3.50	-5.9%	3.50	-5.9%	3.50	-5.9%
Stanford	1.43	0.0%	1.40	0.0%	1.54	-5.9%	1.54	-5.9%	1.54	-5.9%	1.54	-5.9%
Sunnyvale	9.33	0.0%	9.35	0.0%	9.45	-5.9%	9.45	-5.9%	9.45	-5.9%	9.45	-5.9%
Westborough	0.82	0.0%	0.84	0.0%	0.81	-5.9%	0.81	-5.9%	0.81	-5.9%	0.81	-5.9%
Wholesale Total	**132.2**	**132.2†**	**138.6**	**138.6†**	**140.8**	**132.5†**	**140.8**	**132.5†**	**140.8**	**132.5†**	**140.8**	**132.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table E: Scenario 1: With Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2025)

	2025 (184 MGD)		**2026** (82.8 MGD)		**2027** (74.5 MGD)		**2028** (74.5 MGD)		**2029** (74.5 MGD)	
Agency	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.68	0%	7.68	-43.3%	7.68	-49%	7.68	-49%	7.68	-49%
Brisbane/GVMID	0.89	0%	0.89	-43.3%	0.89	-49%	0.89	-49%	0.89	-49%
Burlingame	4.33	0%	4.33	-43.3%	4.33	-49%	4.33	-49%	4.33	-49%
Coastside	1.40	0%	1.40	-43.3%	1.40	-49%	1.40	-49%	1.40	-49%
CalWater Total	29.99	0%	29.99	-43.3%	29.99	-49%	29.99	-49%	29.99	-49%
Daly City	3.57	0%	3.57	-43.3%	3.57	-49%	3.57	-49%	3.57	-49%
East Palo Alto	1.88	0%	1.88	-43.3%	1.88	-49%	1.88	-49%	1.88	-49%
Estero	4.07	0%	4.07	-43.3%	4.07	-49%	4.07	-49%	4.07	-49%
Hayward	17.86	0%	17.86	-43.3%	17.86	-49%	17.86	-49%	17.86	-49%
Hillsborough	3.26	0%	3.26	-43.3%	3.26	-49%	3.26	-49%	3.26	-49%
Menlo Park	3.55	0%	3.55	-43.3%	3.55	-49%	3.55	-49%	3.55	-49%
Mid-Peninsula	2.86	0%	2.86	-43.3%	2.86	-49%	2.86	-49%	2.86	-49%
Millbrae	2.29	0%	2.29	-43.3%	2.29	-49%	2.29	-49%	2.29	-49%
Milpitas	6.59	0%	6.59	-43.3%	6.59	-49%	6.59	-49%	6.59	-49%
Mountain View	8.60	0%	8.60	-43.3%	8.60	-49%	8.60	-49%	8.60	-49%
North Coast	2.34	0%	2.34	-43.3%	2.34	-49%	2.34	-49%	2.34	-49%
Palo Alto	10.06	0%	10.06	-43.3%	10.06	-49%	10.06	-49%	10.06	-49%
Purissima Hills	2.09	0%	2.09	-43.3%	2.09	-49%	2.09	-49%	2.09	-49%
Redwood City	8.46	0%	8.46	-43.3%	8.46	-49%	8.46	-49%	8.46	-49%
San Bruno	3.24	0%	3.24	-43.3%	3.24	-49%	3.24	-49%	3.24	-49%
San José	4.50	0%	4.50	-43.3%	4.50	-49%	4.50	-49%	4.50	-49%
Santa Clara	4.50	0%	4.50	-43.3%	4.50	-49%	4.50	-49%	4.50	-49%
Stanford	2.01	0%	2.01	-43.3%	2.01	-49%	2.01	-49%	2.01	-49%
Sunnyvale	9.16	0%	9.16	-43.3%	9.16	-49%	9.16	-49%	9.16	-49%
Westborough	0.86	0%	0.86	-43.3%	0.86	-49%	0.86	-49%	0.86	-49%
Wholesale Total	**146.0**	**146.0†**	**146.0**	**82.8†**	**146.0**	**74.5†**	**146.0**	**74.5†**	**146.0**	**74.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table F: Scenario 2: Without Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2025)

	2025 (184 MGD)		**2026** (157.5 MGD)		**2027** (157.5 MGD)		**2028** (157.5 MGD)		**2029** (132.5 MGD)	
Agency	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.68	0.0%	7.68	0.0%	7.68	0.0%	7.68	0.0%	7.68	-9.2%
Brisbane/GVMID	0.89	0.0%	0.89	0.0%	0.89	0.0%	0.89	0.0%	0.89	-9.2%
Burlingame	4.33	0.0%	4.33	0.0%	4.33	0.0%	4.33	0.0%	4.33	-9.2%
Coastside	1.40	0.0%	1.40	0.0%	1.40	0.0%	1.40	0.0%	1.40	-9.2%
CalWater Total	29.99	0.0%	29.99	0.0%	29.99	0.0%	29.99	0.0%	29.99	-9.2%
Daly City	3.57	0.0%	3.57	0.0%	3.57	0.0%	3.57	0.0%	3.57	-9.2%
East Palo Alto	1.88	0.0%	1.88	0.0%	1.88	0.0%	1.88	0.0%	1.88	-9.2%
Estero	4.07	0.0%	4.07	0.0%	4.07	0.0%	4.07	0.0%	4.07	-9.2%
Hayward	17.86	0.0%	17.86	0.0%	17.86	0.0%	17.86	0.0%	17.86	-9.2%
Hillsborough	3.26	0.0%	3.26	0.0%	3.26	0.0%	3.26	0.0%	3.26	-9.2%
Menlo Park	3.55	0.0%	3.55	0.0%	3.55	0.0%	3.55	0.0%	3.55	-9.2%
Mid-Peninsula	2.86	0.0%	2.86	0.0%	2.86	0.0%	2.86	0.0%	2.86	-9.2%
Millbrae	2.29	0.0%	2.29	0.0%	2.29	0.0%	2.29	0.0%	2.29	-9.2%
Milpitas	6.59	0.0%	6.59	0.0%	6.59	0.0%	6.59	0.0%	6.59	-9.2%
Mountain View	8.60	0.0%	8.60	0.0%	8.60	0.0%	8.60	0.0%	8.60	-9.2%
North Coast	2.34	0.0%	2.34	0.0%	2.34	0.0%	2.34	0.0%	2.34	-9.2%
Palo Alto	10.06	0.0%	10.06	0.0%	10.06	0.0%	10.06	0.0%	10.06	-9.2%
Purissima Hills	2.09	0.0%	2.09	0.0%	2.09	0.0%	2.09	0.0%	2.09	-9.2%
Redwood City	8.46	0.0%	8.46	0.0%	8.46	0.0%	8.46	0.0%	8.46	-9.2%
San Bruno	3.24	0.0%	3.24	0.0%	3.24	0.0%	3.24	0.0%	3.24	-9.2%
San José	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	-9.2%
Santa Clara	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	-9.2%
Stanford	2.01	0.0%	2.01	0.0%	2.01	0.0%	2.01	0.0%	2.01	-9.2%
Sunnyvale	9.16	0.0%	9.16	0.0%	9.16	0.0%	9.16	0.0%	9.16	-9.2%
Westborough	0.86	0.0%	0.86	0.0%	0.86	0.0%	0.86	0.0%	0.86	-9.2%
Wholesale Total	**146.0**	**146.0†**	**146.0**	**146.4†**	**146.0**	**146.8†**	**146.0**	**147.1†**	**146.0**	**132.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

UWMP Table 7-4

Supply Reliability Letter Tables 7 and 8 will help your agency complete UWMP Table 7-4. Table G below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Table 7-4. The table assumes (1) the Tier 2 Plan will be used to allocate supplies available to the Wholesale Customers when average Wholesale Customers' RWS shortages are greater than 10 and up to 20 percent, and (2) an equal percent reduction will be shared across all Wholesale Customers when average Wholesale Customers' RWS shortages are 10 percent or less or greater than 20 percent.

Table G: Drought Cutbacks Based on Projected Demands Under All Water Supply Availability Conditions

	(a)	(b)	(c)	(d)	(e)	(f)
(1)	Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
(2)	Supply Available to the Wholesale Customers	% Cutback on Wholesale RWS Purchases				
		2025	**2030**	**2035**	**2040**	**2045**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	-3.2%
(4)	132.5 MGD	-9.3%	-10.4%	Tier 2 Avg. -14%*	Tier 2 Avg. -16%*	Tier 2 Avg. -19%*
(5)	82.8 MGD	-43.3%	-44.0%	-45.5%	-47.0%	-49.1%
(6)	74.5 MGD	-49.0%	-49.6%	-51.0%	-52.3%	-54.2%

* Calculated average. Individual agency cutbacks are calculated in Table H.

Table G, column (a) lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative projected wholesale RWS purchases for 2025, 2030, 2035, 2040, and 2045.

Tables H, I, J and K provide additional detail by agency for each of the four supply availability conditions listed in Table G. To complete UWMP Table 7-4, reference Table 7 or 8 (depending on which Bay-Delta Plan scenario you choose) in the Supply Reliability Letter to identify total RWS supplies available to the Wholesale Customers and apply the percent cutback in the corresponding year using Table G or input the volumetric drought allocation using Tables H, I, J and K below.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table H: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 157.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2035**	**2040**	**2045**
ACWD	7.68	7.68	7.68	7.68	8.82
Brisbane/GVMID	0.89	0.89	0.88	0.89	0.87
Burlingame	4.33	4.40	4.47	4.58	4.54
Coastside	1.40	1.38	1.36	1.33	1.28
CalWater Total	29.99	29.74	29.81	30.27	29.71
Daly City	3.57	3.52	3.49	3.46	3.32
East Palo Alto	1.88	1.95	2.10	2.49	2.80
Estero	4.07	4.11	4.18	4.23	4.24
Hayward	17.86	18.68	19.75	20.82	21.43
Hillsborough	3.26	3.25	3.26	3.26	3.15
Menlo Park	3.55	3.68	3.87	4.06	4.15
Mid-Peninsula	2.86	2.84	2.88	2.89	2.83
Millbrae	2.29	2.50	2.45	2.82	3.10
Milpitas	6.59	6.75	7.03	7.27	7.29
Mountain View	8.60	8.90	9.20	9.51	9.61
North Coast	2.34	2.33	2.34	2.34	2.27
Palo Alto	10.06	10.15	10.28	10.51	10.44
Purissima Hills	2.09	2.09	2.12	2.13	2.08
Redwood City	8.46	8.49	8.64	8.74	8.62
San Bruno	3.24	3.22	3.20	3.20	3.11
San José	4.50	4.50	4.50	4.50	4.35
Santa Clara	4.50	4.50	4.50	4.50	4.35
Stanford	2.01	2.18	2.35	2.53	2.61
Sunnyvale	9.16	9.30	10.70	11.44	11.71
Westborough	0.86	0.85	0.85	0.84	0.82
Wholesale Total	**146.0**	**147.9**	**151.9**	**156.3**	**157.5**

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table I: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 132.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2035**	**2040**	**2045**
ACWD	6.97	6.88	6.91	6.91	8.20
Brisbane/GVMID	0.81	0.79	0.73	0.73	0.72
Burlingame	3.93	3.94	3.96	3.89	3.80
Coastside	1.27	1.24	1.22	1.20	1.19
CalWater Total	27.21	26.65	26.46	25.69	24.69
Daly City	3.24	3.15	3.04	3.01	2.98
East Palo Alto	1.70	1.75	1.97	2.30	2.62
Estero	3.69	3.68	3.76	3.87	3.77
Hayward	16.20	16.74	17.32	17.69	18.07
Hillsborough	2.96	2.92	2.90	2.75	2.56
Menlo Park	3.22	3.30	3.37	3.33	3.26
Mid-Peninsula	2.59	2.54	2.59	2.62	2.54
Millbrae	2.07	2.24	2.16	2.32	2.45
Milpitas	5.98	6.05	6.25	6.31	6.35
Mountain View	7.80	7.97	8.28	8.49	8.34
North Coast	2.12	2.09	2.11	2.11	2.11
Palo Alto	9.13	9.09	9.26	9.46	9.71
Purissima Hills	1.89	1.87	1.42	1.38	1.32
Redwood City	7.67	7.61	7.89	7.70	7.49
San Bruno	2.94	2.88	2.56	2.51	2.45
San José	4.08	4.03	3.03	2.91	2.76
Santa Clara	4.08	4.03	3.03	2.91	2.76
Stanford	1.82	1.95	2.06	2.13	2.16
Sunnyvale	8.31	8.33	9.46	9.51	9.43
Westborough	0.78	0.76	0.76	0.76	0.76
Wholesale Total	**132.5**	**132.5**	**132.5**	**132.5**	**132.5**

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table J: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 82.8 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2035**	**2040**	**2045**
ACWD	4.36	4.30	4.19	4.07	4.64
Brisbane/GVMID	0.51	0.50	0.48	0.47	0.45
Burlingame	2.45	2.46	2.44	2.43	2.39
Coastside	0.79	0.77	0.74	0.71	0.68
CalWater Total	17.00	16.65	16.25	16.03	15.62
Daly City	2.02	1.97	1.90	1.83	1.75
East Palo Alto	1.06	1.09	1.14	1.32	1.47
Estero	2.31	2.30	2.28	2.24	2.23
Hayward	10.13	10.46	10.77	11.03	11.26
Hillsborough	1.85	1.82	1.78	1.73	1.66
Menlo Park	2.01	2.06	2.11	2.15	2.18
Mid-Peninsula	1.62	1.59	1.57	1.53	1.49
Millbrae	1.30	1.40	1.34	1.49	1.63
Milpitas	3.74	3.78	3.83	3.85	3.83
Mountain View	4.88	4.98	5.01	5.04	5.05
North Coast	1.33	1.30	1.28	1.24	1.19
Palo Alto	5.71	5.68	5.61	5.57	5.49
Purissima Hills	1.18	1.17	1.15	1.13	1.10
Redwood City	4.80	4.76	4.71	4.63	4.53
San Bruno	1.83	1.80	1.75	1.70	1.63
San José	2.55	2.52	2.45	2.38	2.29
Santa Clara	2.55	2.52	2.45	2.38	2.29
Stanford	1.14	1.22	1.28	1.34	1.37
Sunnyvale	5.19	5.21	5.83	6.06	6.16
Westborough	0.49	0.48	0.46	0.45	0.43
Wholesale Total	**82.8**	**82.8**	**82.8**	**82.8**	**82.8**

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table K: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 74.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2035**	**2040**	**2045**
ACWD	3.92	3.87	3.77	3.66	4.17
Brisbane/GVMID	0.46	0.45	0.43	0.42	0.41
Burlingame	2.21	2.21	2.19	2.18	2.15
Coastside	0.71	0.70	0.67	0.64	0.61
CalWater Total	15.30	14.98	14.62	14.43	14.05
Daly City	1.82	1.77	1.71	1.65	1.57
East Palo Alto	0.96	0.98	1.03	1.19	1.32
Estero	2.08	2.07	2.05	2.02	2.00
Hayward	9.11	9.41	9.69	9.92	10.14
Hillsborough	1.66	1.64	1.60	1.55	1.49
Menlo Park	1.81	1.86	1.90	1.94	1.96
Mid-Peninsula	1.46	1.43	1.41	1.38	1.34
Millbrae	1.17	1.26	1.20	1.34	1.47
Milpitas	3.36	3.40	3.45	3.47	3.45
Mountain View	4.39	4.48	4.51	4.53	4.54
North Coast	1.19	1.17	1.15	1.12	1.07
Palo Alto	5.14	5.11	5.04	5.01	4.94
Purissima Hills	1.06	1.05	1.04	1.02	0.99
Redwood City	4.31	4.28	4.24	4.17	4.08
San Bruno	1.65	1.62	1.57	1.53	1.47
San José	2.30	2.27	2.21	2.14	2.06
Santa Clara	2.30	2.27	2.21	2.14	2.06
Stanford	1.03	1.10	1.15	1.21	1.24
Sunnyvale	4.67	4.69	5.25	5.45	5.54
Westborough	0.44	0.43	0.41	0.40	0.39
Wholesale Total	**74.5**	**74.5**	**74.5**	**74.5**	**74.5**

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

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TO: SFPUC Wholesale Customers

FROM: Steven R. Ritchie, Assistant General Manager, Water

DATE: June 2, 2021

RE: Regional Water System Supply Reliability and UWMP 2020

This memo is in response to various comments from Wholesale Customers we have received regarding the reliability of the Regional Water System supply and San Francisco's 2020 Urban Water Management Plan (UWMP).

As you are all aware, the UWMP makes clear the potential effect of the amendments to the Bay-Delta Water Quality Control Plan adopted by the State Water Resources Control Board on December 12, 2018 should it be implemented. Regional Water System-wide water supply shortages of 40-50% could occur until alternative water supplies are developed to replace those shortfalls. Those shortages could increase dramatically if the State Water Board's proposed Water Quality Certification of the Don Pedro Federal Energy Regulatory Commission (FERC) relicensing were implemented.

We are pursuing several courses of action to remedy this situation as detailed below.

Pursuing a Tuolumne River Voluntary Agreement

The State Water Board included in its action of December 12, 2018 a provision allowing for the development of Voluntary Agreements as an alternative to the adopted Plan. Together with the Modesto and Turlock Irrigation Districts, we have been actively pursuing a Tuolumne River Voluntary Agreement (TRVA) since January 2017. We believe the TRVA is a superior approach to producing benefits for fish with a much more modest effect on our water supply. Unfortunately, it has been a challenge to work with the State on this, but we continue to persist, and of course we are still interested in early implementation of the TRVA.

Evaluating our Drought Planning Scenario in light of climate change

Ever since the drought of 1987-92, we have been using a Drought Planning Scenario with a duration of 8.5 years as a stress test of our Regional Water System supplies. Some stakeholders have criticized this methodology as being too conservative. This fall we anticipate our Commission convening a workshop

London N. Breed
Mayor

Sophie Maxwell
President

Anson Moran
Vice President

Tim Paulson
Commissioner

Ed Harrington
Commissioner

Newsha Ajami
Commissioner

Michael Carlin
Acting
General Manager

including our use of the 8.5-year Drought Planning Scenario, particularly in light of climate change resilience assessment work that we have funded through the Water Research Foundation. We look forward to a valuable discussion with our various stakeholders and the Commission.

Pursuing Alternative Water Supplies

The SFPUC continues to aggressively pursue Alternative Water Supplies to address whatever shortfall may ultimately occur pending the outcome of negotiation and/or litigation. The most extreme degree of Regional Water System supply shortfall is modeled to be 93 million gallons per day under implementation of the Bay-Delta Plan amendments. We are actively pursuing more than a dozen projects, including recycled water for irrigation, purified water for potable use, increased reservoir storage and conveyance, brackish water desalination, and partnerships with other agencies, particularly the Turlock and Modesto Irrigation Districts. Our goal is to have a suite of alternative water supply projects ready for CEQA review by July 1, 2023.

In litigation with the State over the Bay-Delta Plan Amendments

On January 10, 2019, we joined in litigation against the State over the adoption of the Bay-Delta Water Quality Control Plan Amendments on substantive and procedural grounds. The lawsuit was necessary because there is a statute of limitations on CEQA cases of 30 days, and we needed to preserve our legal options in the event that we are unsuccessful in reaching a voluntary agreement for the Tuolumne River. Even then, potential settlement of this litigation is a possibility in the future.

In litigation with the State over the proposed Don Pedro FERC Water Quality Certification

The State Water Board staff raised the stakes on these matters by issuing a Water Quality Certification for the Don Pedro FERC relicensing on January 15, 2021 that goes well beyond the Bay-Delta Plan amendments. The potential impact of the conditions included in the Certification appear to virtually double the water supply impact on our Regional Water System of the Bay-Delta Plan amendments. We requested that the State Water Board reconsider the Certification, including conducting hearings on it, but the State Water Board took no action. As a result, we were left with no choice but to once again file suit against the State. Again, the Certification includes a clause that it could be replaced by a Voluntary Agreement, but that is far from a certainty.

I hope this makes it clear that we are actively pursuing all options to resolve this difficult situation. We remain committed to creating benefits for the Tuolumne River while meeting our Water Supply Level of Service Goals and Objectives for our retail and wholesale customers.

cc.: SFPUC Commissioners
Nicole Sandkulla, CEO/General Manager, BAWSCA

Appendix J: 26 March 2021 SFPUC Commission Special Meeting – Water Workshop Number 3 Water Supply Planning Scenarios SFPUC Staff Presentation Material

Operated by the San Francisco Public Utilities Commission

Water Workshop Number 3
Water Supply Planning Scenarios

March 26, 2021

Introduction

- Ten water supply planning scenarios were run using our HHLSM system modeling tool and the Regional Water System Supply and Demand Worksheet.
- For each scenario the ultimate result is either a surplus or deficit of supply, and each scenario produces different results, demonstrating the effect of the choices that are made.
- The assumptions and results for each scenario will be displayed in this presentation.
- The presentation concludes with a summary table of the bottom-line results for all the scenarios.

The Ten Scenarios

I. Previous Demand Estimates
II. Current Conditions
III. Tuolumne River Voluntary Agreement
IV. Bay-Delta Plan
V. Bay-Delta Plan with Alternative Water Supply Projects
VI. Bay-Delta Plan with Alternative Water Supply Projects and Modified Rationing Policy
VII. Bay-Delta Plan with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought
VIII. Water Quality Certification (401) with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought
IX. NGO scenario 1: Current system, 198 mgd constant demand, Bay-Delta Plan flows
X. NGO Scenario 2: Current system, 223 mgd constant demand, 7 ½ year design drought, Bay-Delta Plan flows

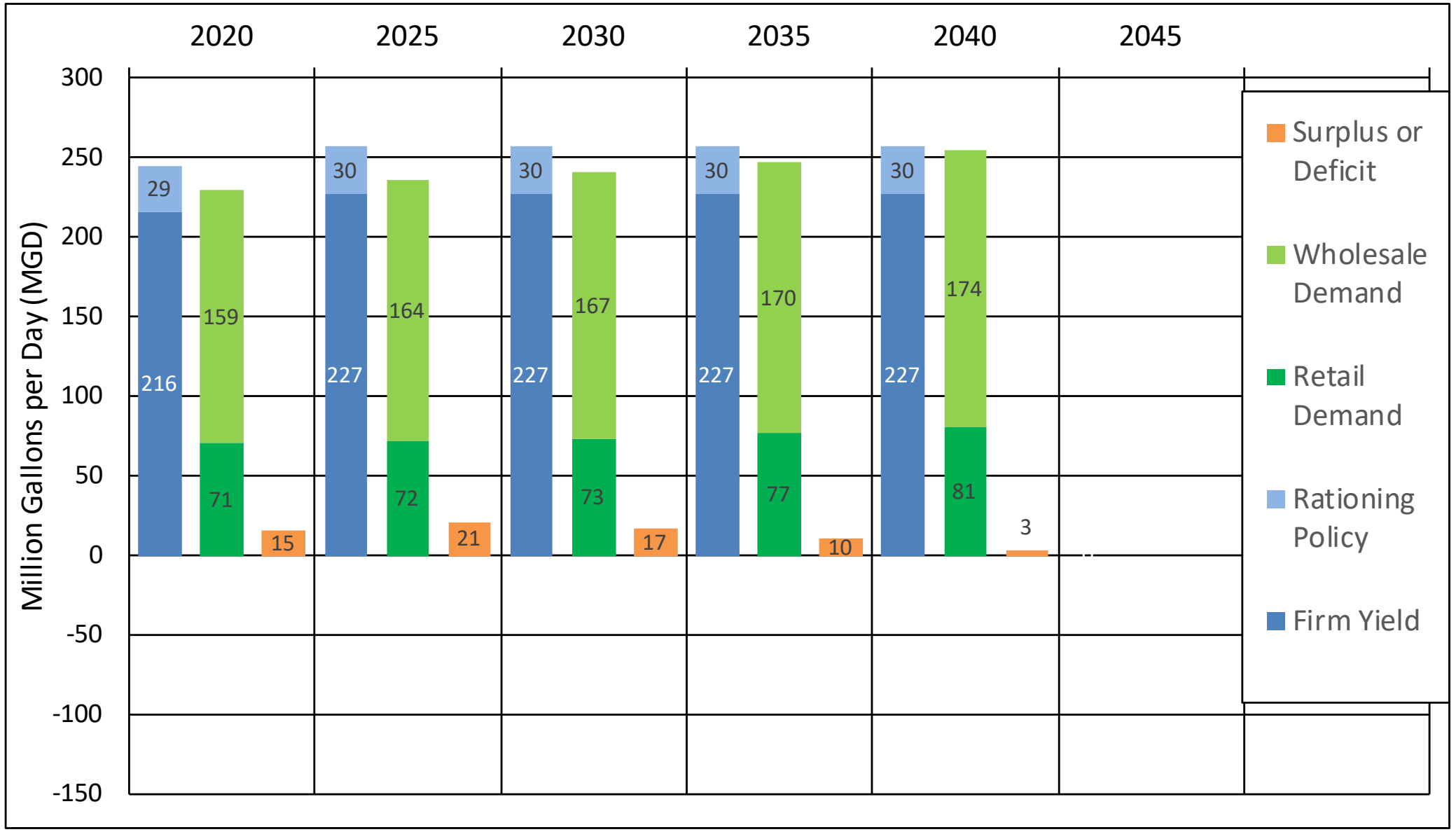
I. Prior Demand Estimates

- Includes retail demand projections from the 2015 Urban Water Management Plan
- Includes 2015 purchase projections from wholesale customers
- Includes current side agreement on flows in the lower Tuolumne River
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	2020	2025	2030	2035	2040	2045
Total Yield:	245	257	257	257	257	NA
RWS Demand:	230	236	241	247	255	NA
Lower Tuolumne Contribution:	NA	NA	NA	NA	NA	NA
Surplus or Deficit:	15	21	17	10	3	NA

I. Prior Demand Estimates



II. Current Conditions

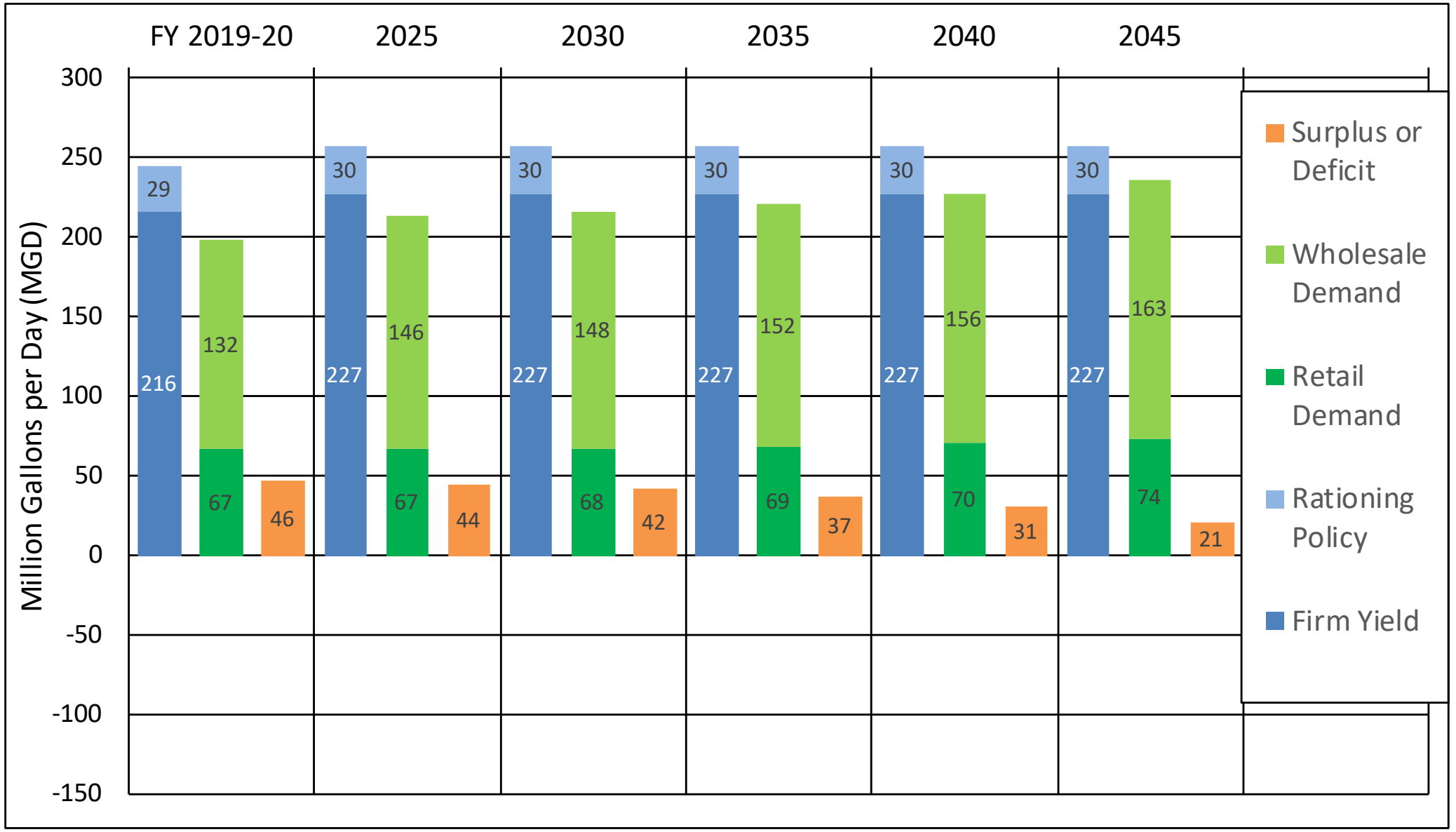
- Includes updated demand projections for anticipated development in retail service area*
- Includes most recent purchase projections from wholesale customers*
- Includes a total of 9 MGD for San Jose and Santa Clara*
- Includes the 1995 side agreement on flows in the lower Tuolumne River
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	245	257	257	257	257	257
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	NA	NA	NA	NA	NA
Surplus or Deficit:	46	44	42	37	31	21

* Base Conditions in later slides

II. Current Conditions



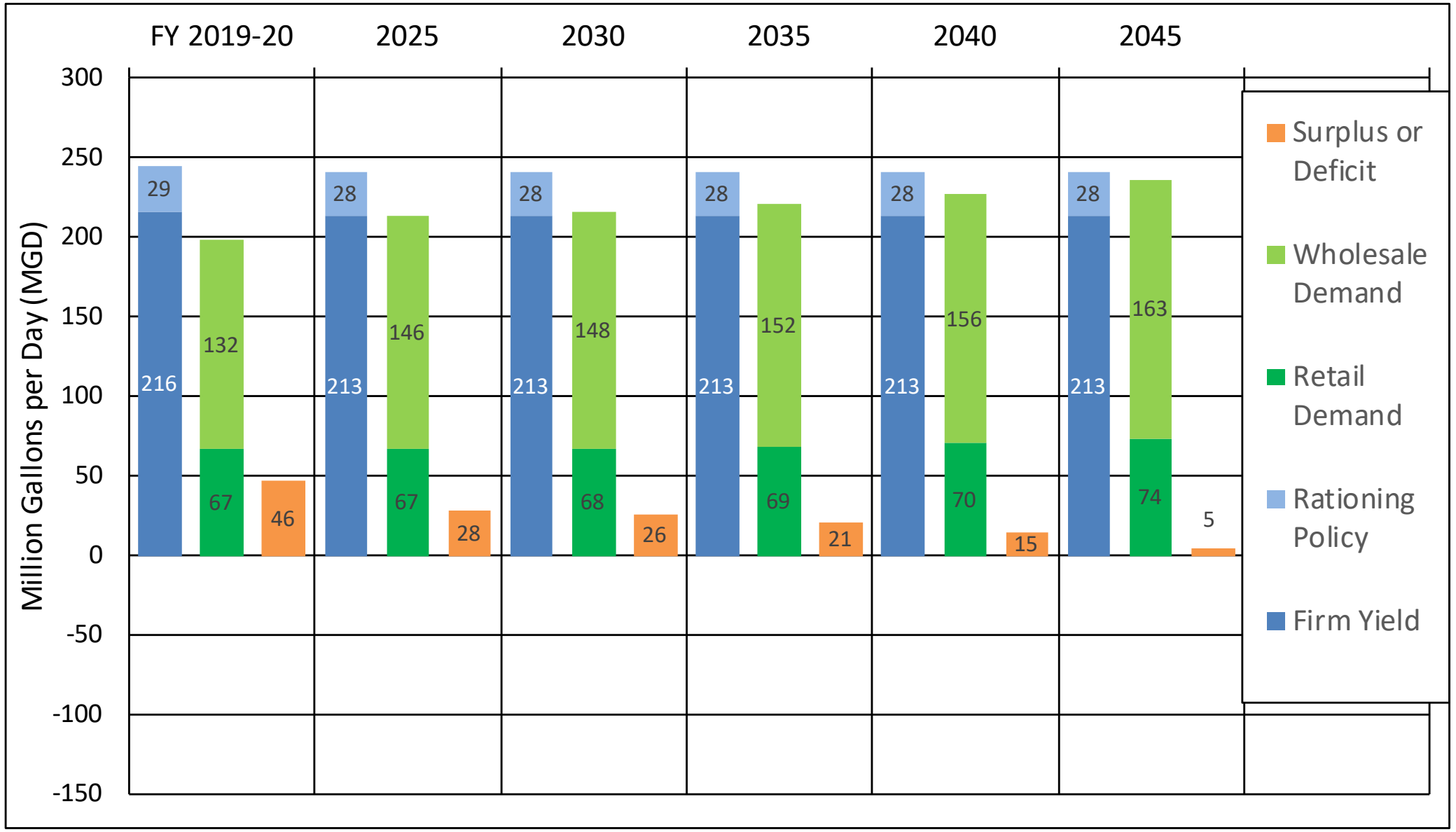
III. Tuolumne River Voluntary Agreement

- Base Conditions
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy
- Includes SFPUC contribution to the TRVA, displayed in the graph as a reduction in Firm Yield
- SFPUC contributions are calculated according to the 4th Agreement and assumes continuation of the 1995 side agreement.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	245	241	241	241	241	241
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	14	14	14	14	14
Surplus or Deficit:	46	28	26	21	15	5

III. Tuolumne River Voluntary Agreement



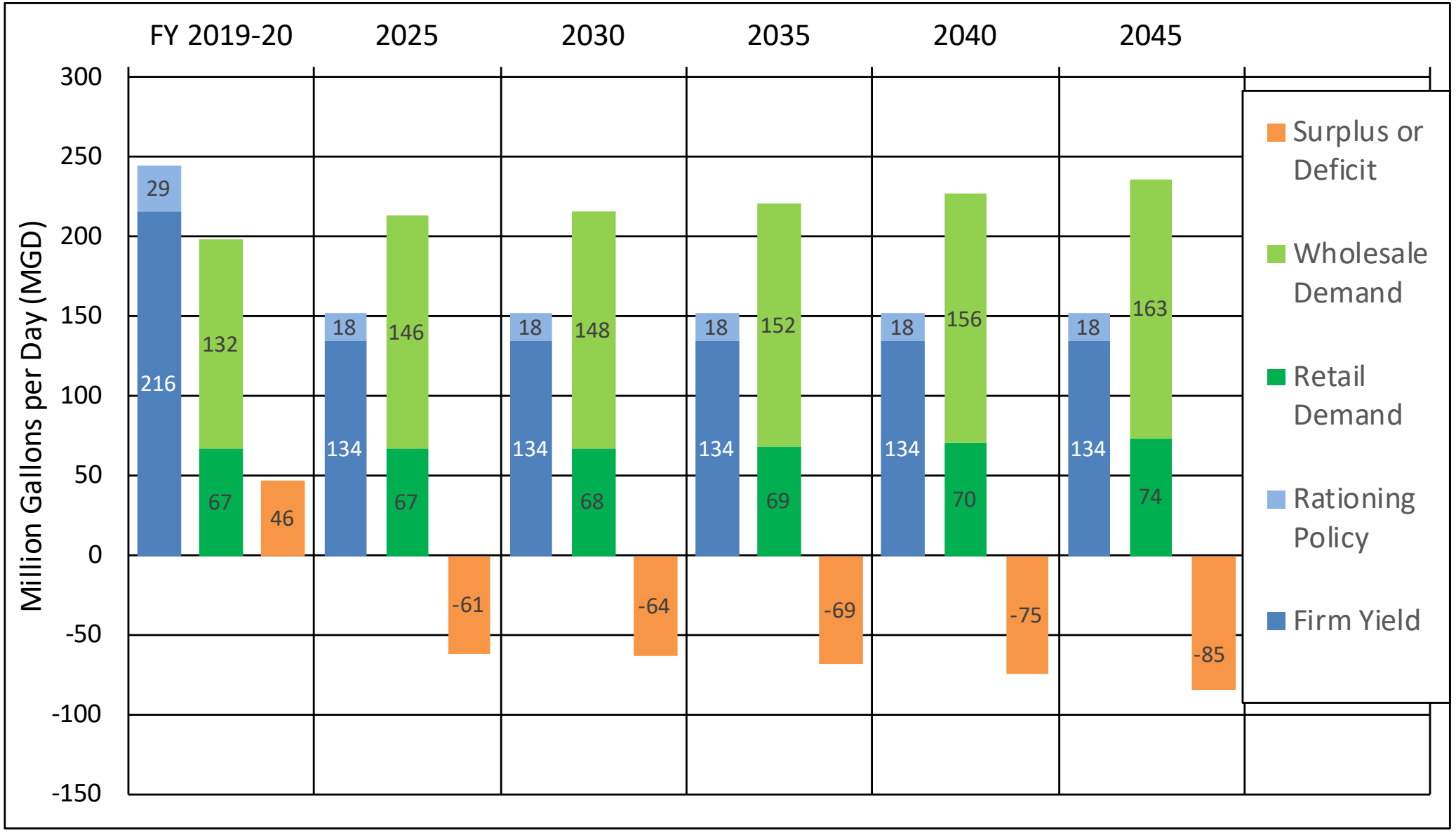
IV. Bay-Delta Plan

- Base Conditions
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy
- Includes SFPUC contribution to the Bay-Delta Plan displayed in the graph as a reduction in Firm Yield, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	245	152	152	152	152	152
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	93	93	93	93	93
Surplus or Deficit:	46	-61	-64	-69	-75	-85

IV. Bay-Delta Plan



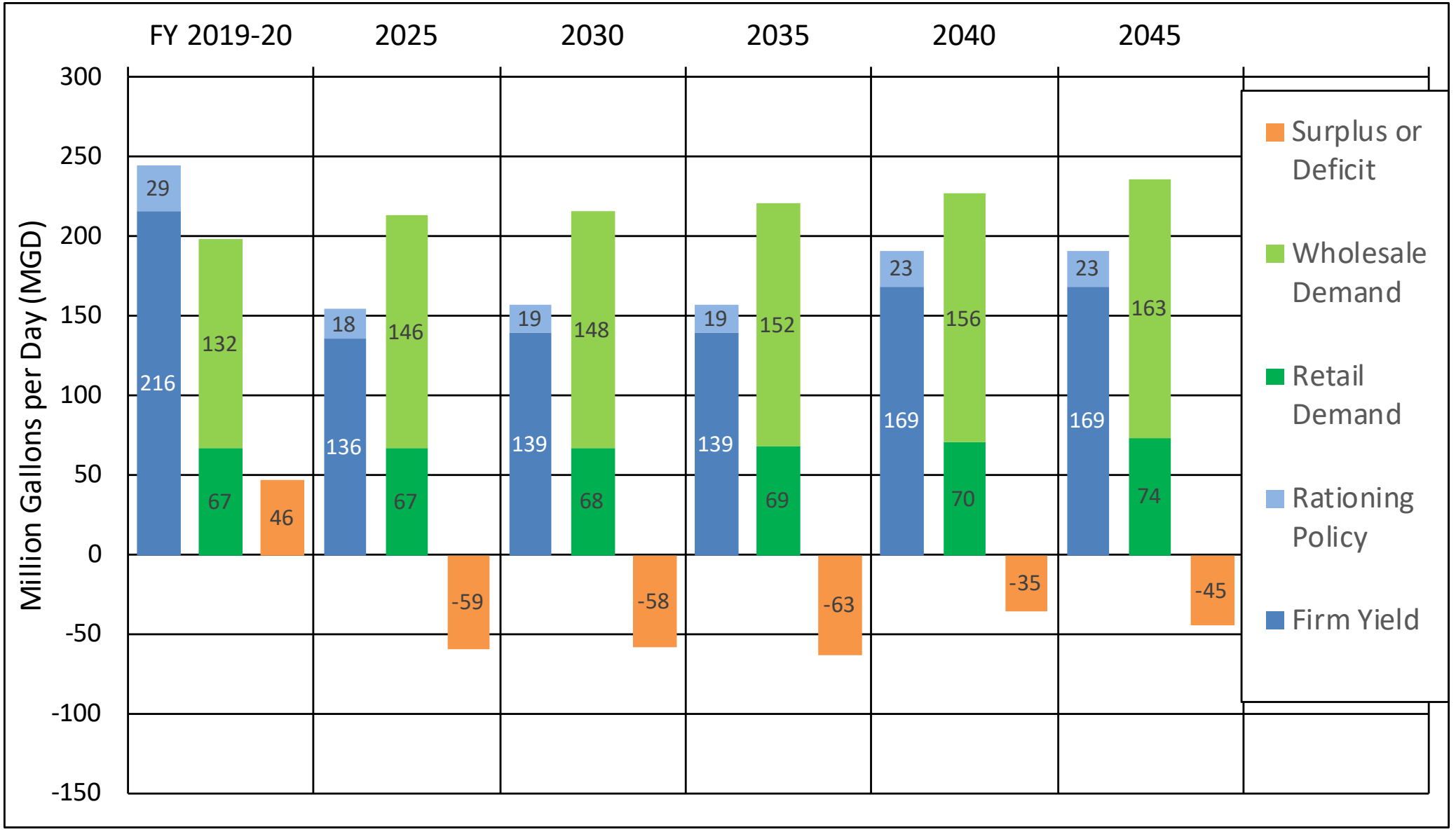
V. Bay-Delta Plan with Alternative Water Supply Projects

- Base Conditions
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy
- Includes SFPUC contribution to the Bay-Delta Plan displayed in the graph as a reduction in Firm Yield, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and continuation of the 1995 side agreement.
- Includes a total of 35 MGD of new water supply projects, which are assumed to be added between 2025 and 2040. The firm yield from the new projects is shown separately in the table to demonstrate the estimated development of the projects over time. The new project yield is also included in the Total Yield shown in the table.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	245	154	158	158	192	192
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	93	93	93	93	93
Alternative Water Supply Projects:	NA	2	5	5	35	35
Surplus or Deficit:	46	-59	-58	-63	-35	-45

V. Bay-Delta Plan with Alternative Water Supply Projects



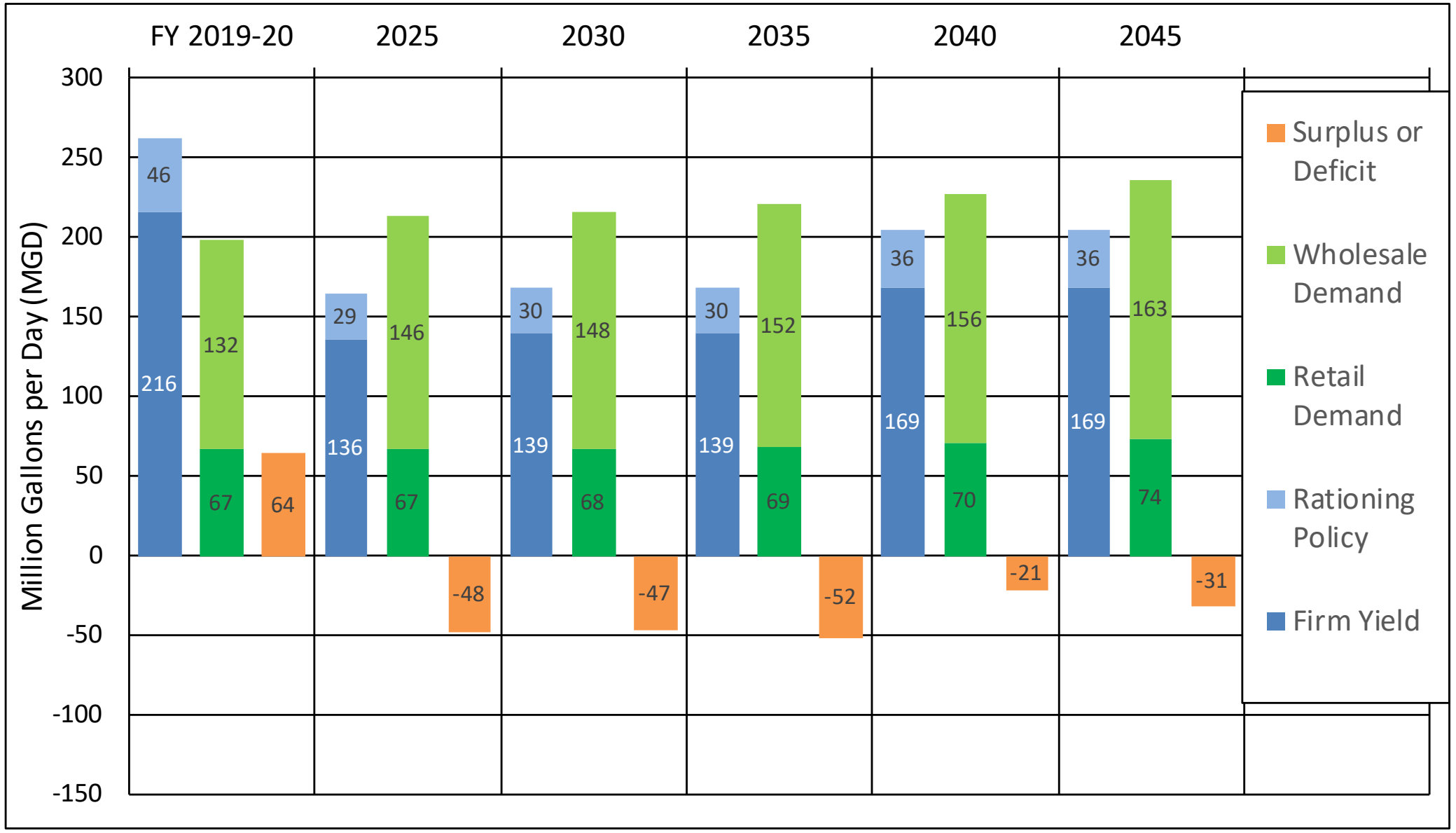
VI. Bay-Delta Plan with Alternative Water Supply Projects and Modified Rationing Policy

- Base Conditions
- Yield values are based on the 8.5-year design drought
- Includes SFPUC contribution to the Bay-Delta Plan displayed in the graph as a reduction in Firm Yield, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.
- Includes a total of 35 MGD of new water supply projects, as described on slide 12 for scenario V
- Includes 7.5 years of rationing at 20% in the 8.5-year design drought sequence

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	262	165	169	169	205	205
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	93	93	93	93	93
Surplus or Deficit:	64	-48	-47	-52	-21	-31

VI. Bay-Delta Plan with Alternative Water Supply Projects and Modified Rationing Policy



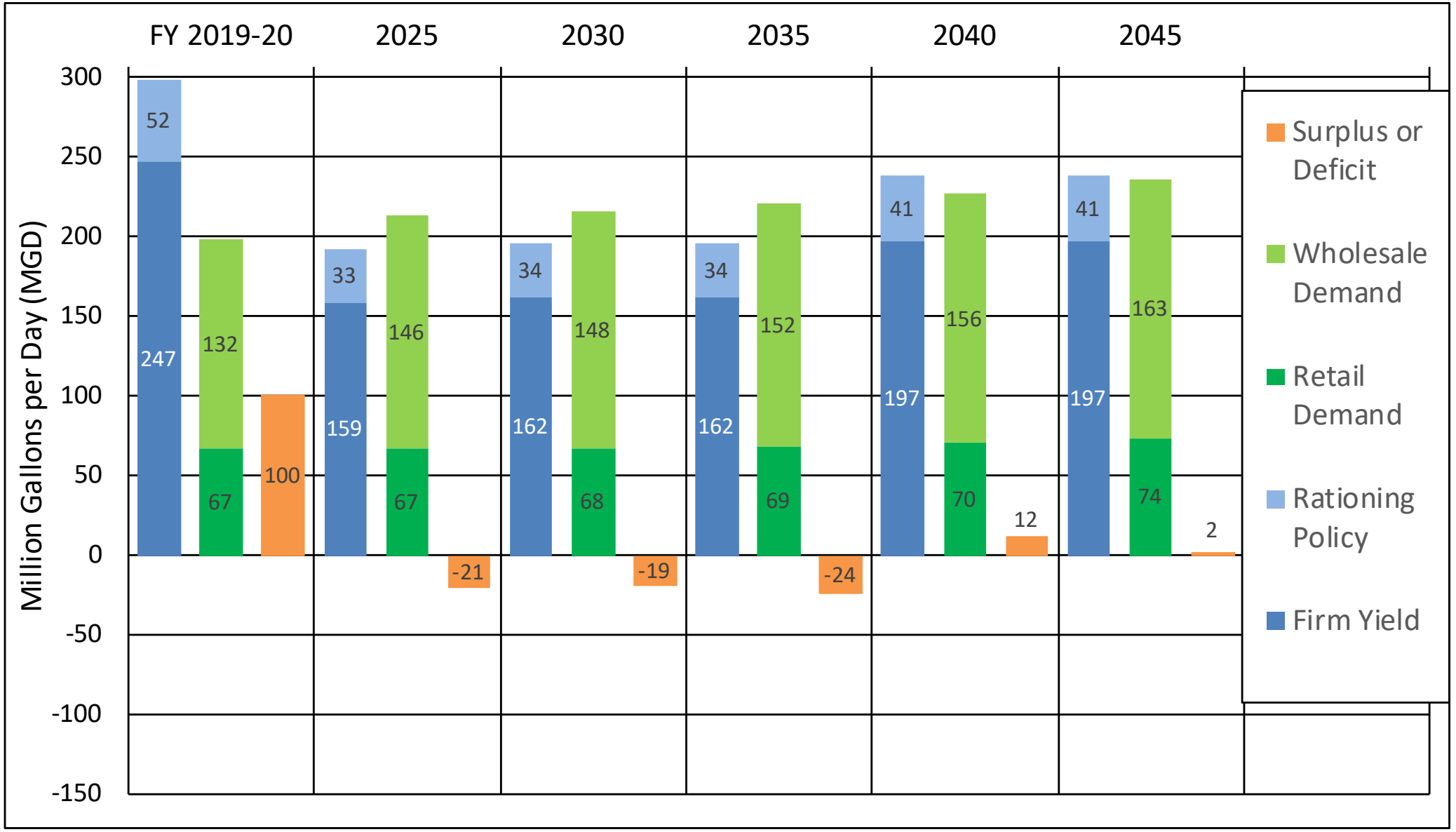
VII. Bay-Delta Plan with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought

- Base Conditions
- Includes SFPUC contribution to the Bay-Delta Plan displayed in the graph as a reduction in Firm Yield, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.
- Includes a total of 35 MGD of new water supply projects, as described on slide 12 for scenario V
- Yield values are estimated using a 7.5-year design drought
- Includes 6.5 years of rationing at 20% in the 7.5-year design drought sequence.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	299	192	196	196	238	238
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	101	101	101	101	101
Surplus or Deficit:	100	-21	-19	-24	12	2

VII. Bay-Delta Plan with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought



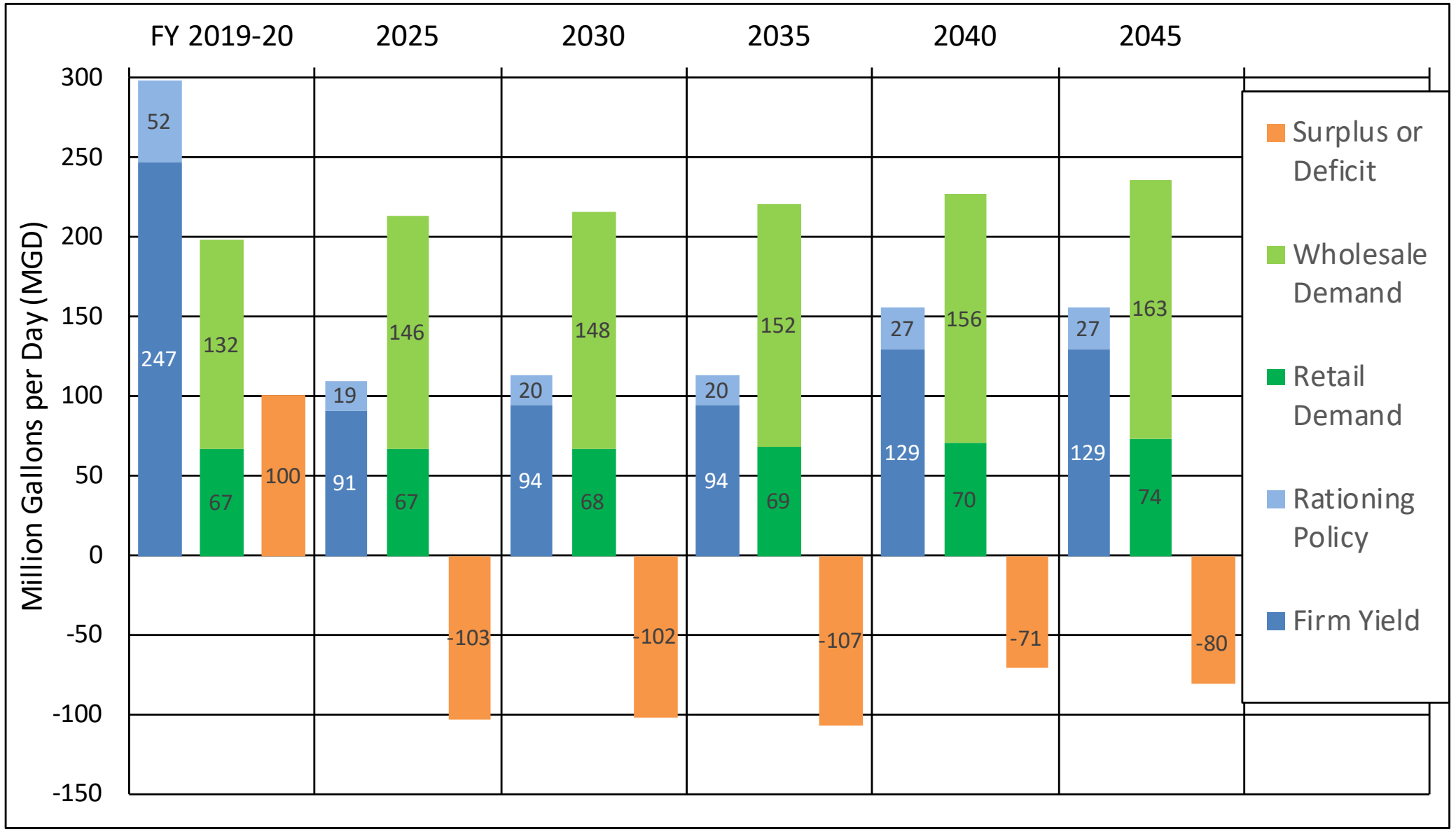
VIII. Water Quality Certification (401) with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought

- Base Conditions
- Includes SFPUC contribution to the Section 401 water quality certification on the FERC license displayed in the graph as a reduction in Firm Yield.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.
- Includes a total of 35 MGD of new water supply projects, as described on slide 12 for scenario V
- Yield values are estimated using a 7.5-year design drought
- Includes 6.5 years of rationing at 20% in the 7.5-year design drought sequence.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	299	110	114	114	156	156
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	169	169	169	169	169
Surplus or Deficit:	100	-103	-102	-107	-71	-80

VIII. Water Quality Certification (401) with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought



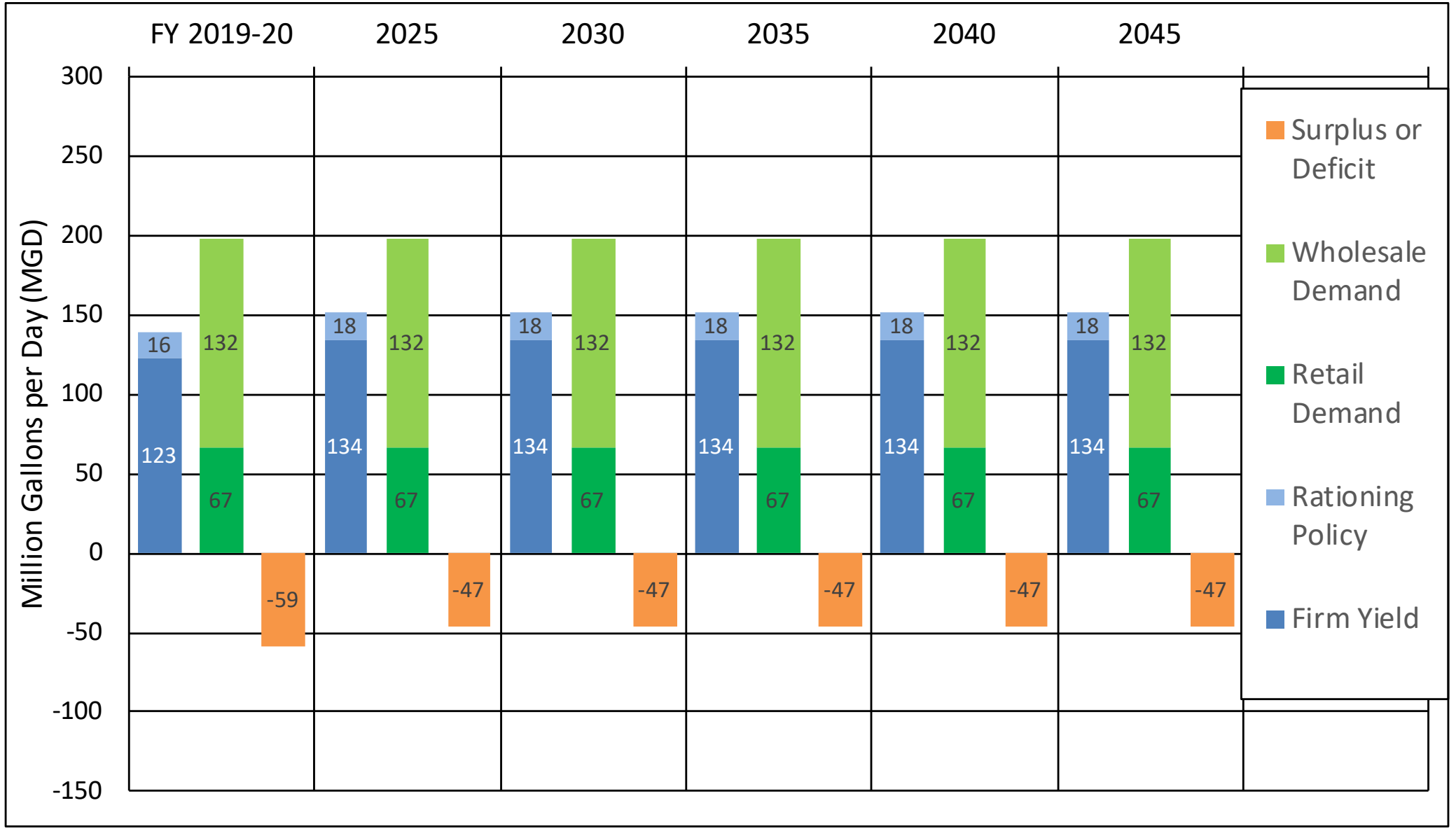
IX. NGO scenario 1: Current system, 198 mgd constant demand, Bay-Delta Plan flows

- Assumes that retail and wholesale demand on the RWS remain at the current level of approximately 198 MGD, and that SFPUC contributions to the Bay-Delta Plan are being made now
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy
- Includes SFPUC contribution to the Bay-Delta Plan, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	139	152	152	152	152	152
RWS Demand:	198	198	198	198	198	198
Lower Tuolumne Contribution:	93	93	93	93	93	93
Surplus or Deficit:	-59	-47	-47	-47	-47	-47

IX. NGO scenario 1: Current system, 198 mgd constant demand, Bay-Delta Plan flows



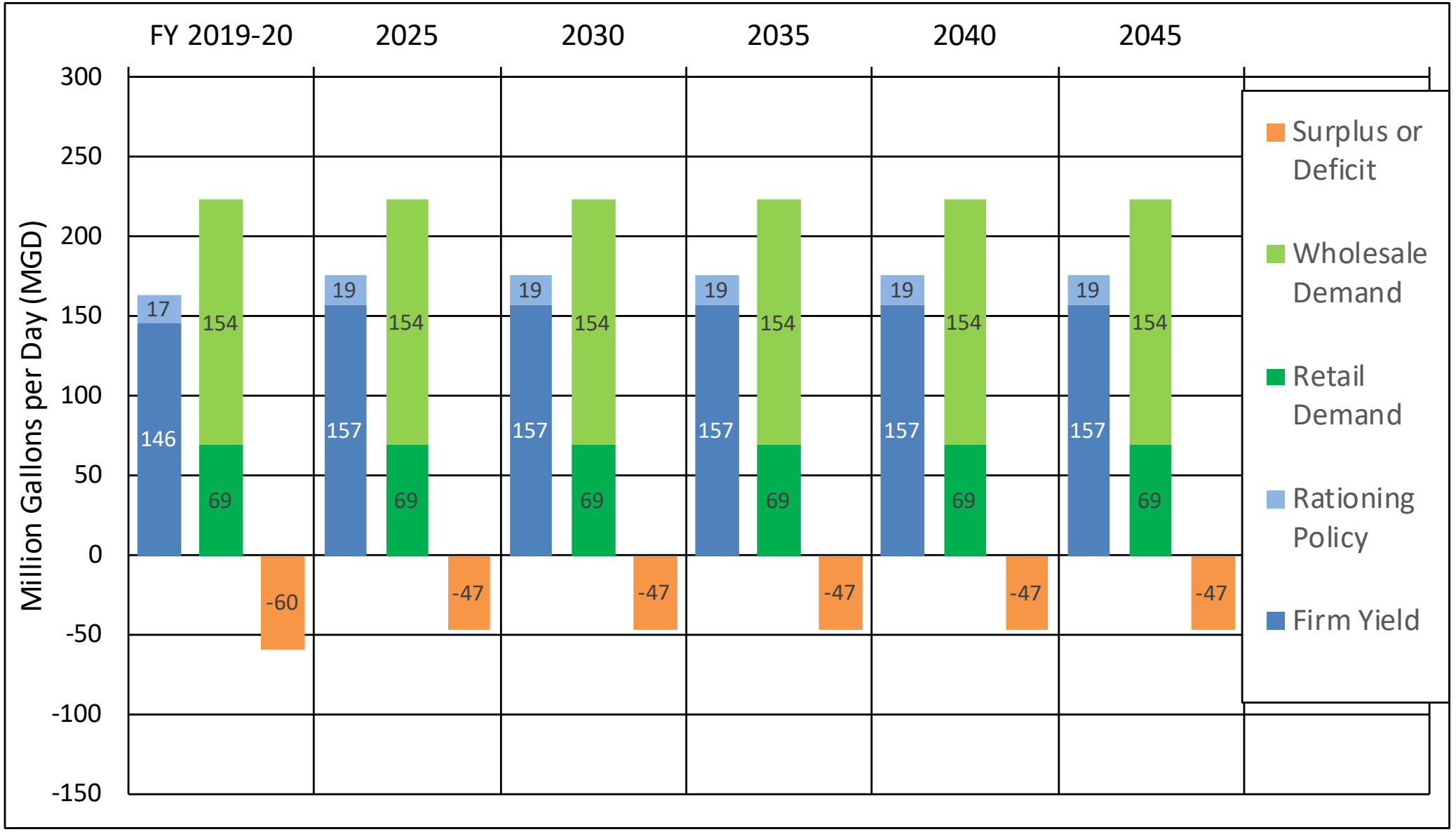
X. NGO scenario 2: Current system, 223 mgd constant demand, 7½ year design drought, Bay-Delta Plan flows

- Includes an assumed demand of 223 MGD for the SFPUC service area in all years
- Includes a total of 9 MGD for San Jose and Santa Clara
- Includes SFPUC contribution to the Bay-Delta Plan, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year. Assumes this contribution begins now.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.
- Yield values are estimated using a 7.5-year design drought and a truncated version of the adopted WSIP rationing policy

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	163	176	176	176	176	176
RWS Demand:	223	223	223	223	223	223
Lower Tuolumne Contribution:	101	101	101	101	101	101
Surplus or Deficit:	-59	-47	-47	-47	-47	-47

X. NGO scenario 2: Current system, 223 mgd constant demand, 7½ year design drought, Bay-Delta Plan flows



SCENARIO SURPLUSES OR DEFICITS

SCENARIOS	FY19-20	2025	2030	2035	2040	2045
I. Previous Demand Estimates	15	21	17	10	3	NA
II. Current Conditions	46	44	42	37	31	21
III. Tuolumne River Voluntary Agreement	46	28	26	21	15	5
IV. Bay-Delta Plan	46	-61	-64	-69	-75	-85
V. Bay-Delta Plan with Alternative Water Supply Projects	46	-59	-58	-63	-35	-45
VI. Bay-Delta Plan with Alternative Water Supply Projects and Modified Rationing Policy	64	-48	-47	-52	-21	-31
VII. Bay-Delta Plan with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design	100	-21	-19	-24	12	2
VIII. Water Quality Certification (401) with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought	100	-103	-102	-107	-71	-80
IX. NGO scenario 1: Current system and 198 mgd constant demand and Bay-Delta Plan flows	-59	-47	-47	-47	-47	-47
X. NGO Scenario 2: Current system, 223 mgd constant demand, 7 ½ year design drought and Bay-Delta Plan	-60	-47	-47	-47	-47	-47

Appendix K: Bay-Delta Plan Correspondence

- Tier 2 Shortage Allocation Methodology, dated June 7, 2021
- Comments on the 2018 Final Draft of the Proposed Amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary and Final Substitute Environmental Document, dated July 27, 2018
- Comments on the Substitute Environmental Document Concerning the Sacramento-San Joaquin Bay Delta Water Quality Control Plan, dated March 17, 2017

CALIFORNIA WATER SERVICE
Water Resource Sustainability Department 1720 North First Street
San Jose, CA 95112

June 7, 2021

Nicole Sandkulla, Chief Executive Officer
Bay Area Water Supply Conservation Agency
155 Bovet Road, Suite 650
San Mateo, CA 94402

Re: Tier 2 Shortage Allocation Methodology

Dear Ms. Sandkulla:

As you know, the State Water Resources Control Board's (SWRCB) 2018 adoption of amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) could significantly affect the future reliability of the SFPUC's water supplies to its wholesale customers. This action, together with the subsequent failure to achieve a Voluntary Agreement between the SWRCB and the impacted parties, has certainly complicated the process of preparing our 2020 updates to the urban water management plans (UWMP) for our three districts receiving supplies from the SFPUC's Regional Water System.

Cal Water appreciates the assistance that the Bay Area Water Supply and Conservation Agency (BAWSCA) has provided to its member agencies by coordinating with the SFPUC on the development and communication of the projected impacts of these potential cutbacks. Given the lack of time to develop an alternative shortage allocation method for distributing limited SFPUC supplies among the wholesale customers, Cal Water plans to adopt supply projections for its 2020 UWMPs based on the equal allocation cutback methodology discussed during the recent UWMP workshops and provided by BAWSCA. However, this letter serves as a formal notice that Cal Water does not agree to the methodology and our actions should not be considered as acceptance of this approach should an actual allocation of limited supplies be necessary in the future.

As you will recall, Cal Water shared an allocation methodology and accompanying tool that we feel could be easily transferable to the BAWSCA service area to create a more equitable allocation of available SFPUC supplies. This methodology is a "needs based" approach that considers factors such as basic health and safety needs, a wholesale customers reliance on SFPUC supplies, and overall efficiency to avoid drastic differences in retail level reliability. This seeks to minimize economic impacts on individual communities and the region.

We believe BAWSCA understands the problematic inequities that would occur if the equal allocation cutback methodology were employed, and we look forward to the discussion of alternative shortage allocation approaches among the Member Agencies to ensure that cutbacks are allocated equitably in the event of a severe drought.

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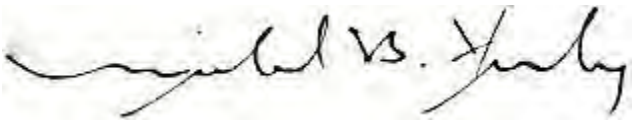
Sincerely,



Michael Hurley
Water Resources Manager

CALIFORNIA WATER SERVICE

July 27, 2018

The Honorable Felicia Marcus, Chair
The Honorable Tam Doduc, Hearing Officer
Ms. Jeanine Townsend, Clerk of the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814

Re: Comments on the 2018 Final Draft of the Proposed Amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary and Final Substitute Environmental Document

Dear Chair Marcus & Board Member Doduc:

California Water Service (Cal Water) is the largest water utility regulated by the California Public Utilities Commission and a proud steward of the environment that strongly supports sustainability efforts to ensure a safe and adequate supply of drinking water. Since 1926, we have provided millions of Californians with safe, reliable, and high-quality water utility service. Today, we serve about two million residents in service areas across the state that covers a vast array of California's footprint from Chico in the north to the Palos Verdes Peninsula in the south.

Our comments today are in addition to the comments Cal Water submitted on March 17, 2017. Cal Water sincerely appreciates the time and effort the State Water Resources Control Board (Board) has put into not only preparing the Supplemental Environmental Document in Support of Potential Changes to the Water Quality Control Plan for the Bay-Delta (SED), but also undertaking an extensive public outreach effort related to the SED. Further, Cal Water understands the need to protect the water quality of the Sacramento-San Joaquin Bay Delta, and we recognize the importance of reliable, high-quality water to our state's health and continued economic growth.

Cal Water is proud to be at the forefront of a number of the state's efforts to ensure that all Californians continue to have safe and dependable potable water supplies. For example, during California's historic drought, Cal Water built upon its industry-leading water conservation

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program, and developed a customer first drought response effort that provided customers with the information and tools they needed to meet the aggressive water use targets established by the Governor and State Water Resources Control Board.

Additionally, Cal Water is one of the only water utilities in California that has supported the establishment of a Safe and Affordable Drinking Water Fund, as championed by Senator Bill Monning in his Senate Bill 623. In our view, efforts like these will do much to protect the health and safety of millions of Californians and to help those who have been under-served or without access to safe drinking water.

We take our responsibility for providing reliable, affordable water supply to our customers and communities very seriously. In light of this responsibility, we must communicate our concerns with the SED. Across our service areas, we rely on a combination of surface water and groundwater. As both a purchaser of wholesale water from various suppliers and a water rights holder, Cal Water has interests in "areas of origin," exports from the Delta, and locally derived supplies. For example, Cal Water relies on locally derived supplies to provide water to approximately 257,000 people in our Bayshore and Bear Gulch service areas, which are in the San Francisco Bay Area. Because of certain restrictions under federal law, a reduction in water supply to the Hetch Hetchy Regional Water System could significantly impact our ability to serve these customers.

As is the case with many water utilities, Cal Water is reliant in many of our service areas on the supplies made available by local wholesale agencies. For example, we utilize significant imported water from our wholesale partners to serve approximately 171,000 people who live in and around the City of Stockton. In those areas where we are unable to rely on groundwater to supplement the water we receive from local wholesalers, any water supply shortages will directly impact us and our ability to serve our customers. This is also true in service areas where the future use of local groundwater supplies may be limited by rules and regulations established pursuant to the Sustainable Groundwater Management Act. Further, as a retail agency within the service area of the Metropolitan Water District of Southern California, we are well aware of the needs for maintaining drinking water quality and reliability that sources from the Bay-Delta system.

We respectfully ask that the Board give due consideration to the very limited flexibility of urban water suppliers to meet their responsibilities in providing safe and reliable service at a reasonable cost. The Board appears to attribute more flexibility and opportunity for enhancing water supplies from other sources and arrangements than are realistically achievable.

We would like to commend the Board's flexibility through its allowance for a range of potential flows rather than rigid, real-time adherence to a specific percent of unimpaired flow. We urge the Board to consider proposals that focus on functional flows combined with habitat

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improvements that meet clearly defined objectives regarding timing, temperature and other specified criteria to improve fish production and the overall environment.

Finally, Cal Water believes that a negotiated solution is in the best interests of all parties. Water agencies have proven on many occasions that they are capable of reaching agreement with regulators and other interested parties concerning far-reaching regulatory programs, including the Bay-Delta. We urge the Water Board to continue to provide the water users the opportunity to work with the regulatory agencies to develop long lasting plans to improve the sustainability of our water system ecosystem and address the needs of all interests.

Cal Water stands committed and ready to work with the Board, parties to the negotiations, and others to reach such a solution that meets the long-term needs of our state. If there is anything we can do to assist you or if you have any questions, please do not hesitate to call on us for support.

Sincerely,

Robert Kuta

Vice President, Engineering

Cc: Marty Kropelnicki, President and Chief Executive Officer, Cal Water
Tim Treloar, VP Water Quality & Chief Utility Operations Officer, Cal Water
Michael Hurley, Water Resource Manager, Cal Water
Nicole Sandkulla, Chief Executive Officer/General Manager, BAWSCA
Scott Moody, District Manager, Stockton East Water District

CALIFORNIA WATER SERVICE
1720 North First Street
San Jose, CA 95112-4598 *Tel:* (408) 367-8200

March 17, 2017

The Honorable Felicia Marcus, Chair
The Honorable Tam Doduc, Hearing Officer
Ms. Jeanine Townsend, Clerk of the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814

Re: Comments on the Substitute Environmental Document Concerning the Sacramento-San Joaquin Bay Delta Water Quality Control Plan

Dear Chair Marcus & Board Member Doduc:

As you know, California Water Service (Cal Water) is the largest water utility regulated by the California Public Utilities Commission (Commission). We serve approximately 2 million Californians through 500,000 individual service connections. Our service areas span the state, from Chico in the north to the Palos Verdes Peninsula in the south.

Cal Water sincerely appreciates the time and effort the State Water Resources Control Board (Board) has put into not only preparing the Substitute Environmental Document in Support of Potential Changes to the Water Quality Control Plan for the Bay-Delta (SED), but also undertaking an extensive public outreach effort related to the SED. Further, Cal Water understands the need to protect the water quality of the Sacramento-San Joaquin Bay Delta, and we recognize the importance of reliable, high-quality water to the state's health and economy.

Across our service areas, we rely on a combination of surface water and groundwater to provide safe, reliable, and high-quality service to our customers. As both a purchaser of wholesale water from various suppliers and a water rights holder, Cal Water has interests in areas of origin, exports from the Delta, and locally derived supplies. For example, Cal Water relies on locally derived supplies to provide water to about 250,000 residents of the San Francisco Bay area, and because of certain restrictions under federal law, a reduction in water supply to the Hetch Hetchy water system could significantly impact our ability to serve our customers.

As is the case with many water utilities, Cal Water is reliant, in many of its service areas, on the supplies made available by local wholesale agencies. For example, we utilize significant amounts of what from our wholesale partners to serve approximately 170,500 people who live

CALIFORNIA WATER SERVICE

in or around the City of Stockton. In those areas where we are unable to rely on groundwater to supplement the water we receive from local wholesalers, any water supply shortages will directly impact our customers. This is also true in those service areas where the future use of local groundwater supplies may be limited by rules and regulations established pursuant to the Sustainable Groundwater Management Act.

You are aware of the concerns addressed by many wholesalers that the proposed changes to the Bay-Delta Water Quality Control Plan would have devastating effects on their ability to meet customer demands and that the SED has some scientific infirmities. Our wholesale partners share these concerns. Given our reliance on wholesale supplies, we urge you to continue to work toward a solution that will not ultimately harm the customers we are committed to serving.

We truly appreciate the Board making the decision to provide a two-month extension to the 120-day public comment period on the SED. With negotiations regarding a potential solution ongoing and in light of the seriousness of the potential negative consequences of the proposal laid out in the SED, Cal Water respectfully requests that the Board consider further extending the comment period. It is our hope that this additional time will increase the likelihood of negotiating parties reaching a sustainable and equitable solution.

Cal Water stands ready to work with the Board, parties to the negotiations, and others to reach such a solution. If there is anything we can do to assist you or if you have any questions, please do not hesitate to get in touch with us.

Sincerely,

Robert Kuta
Vice President, Engineering

Cc: Mr. Scott Moody, General Manager, Stockton East Water District
Mr. Harlan Kelly, General Manager, San Francisco Public Utilities District
Ms. Nicole Sandkulla, CEO, Bay Area Water Supply & Conservation Agency
Mr. Rami Kahlon, Director, Water Division, California Public Utilities Commission

Appendix L: Water Shortage Contingency Plan

Water Shortage Contingency Plan 2020 Update

Bear Gulch District

June 2021

Chapter 1
Introduction

☑ ***CWC § 10640***

(a) Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

(b) Every urban water supplier required to prepare a water shortage contingency plan shall prepare a water shortage contingency plan pursuant to Section 10632. The supplier shall likewise periodically review the water shortage contingency plan as required by paragraph (10) of subdivision (a) of Section 10632 and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

☑ ***CWC § 10632.3***

It is the intent of the Legislature that, upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the board defer to implementation of locally adopted water shortage contingency plans to the extent practicable.

This document describes the water shortage contingency plan (WSCP) for the Bear Gulch District (also referred to herein as the "District"). The WSCP includes the stages of response to a water shortage caused by drought or by supply interruptions caused by infrastructure failure, regulatory mandate, or catastrophic human-caused or natural events. The primary objective of the WSCP is to ensure that the District has in place the necessary resources and management responses needed to protect health and human safety, minimize economic disruption, and preserve environmental and community assets during water supply shortages and interruptions.

Specifically, this Plan includes the following chapters:

Chapter 1 - Introduction

Chapter 2 - Water Supply Reliability Analysis

Chapter 3 - Annual Water Supply and Demand Assessment Procedures

Chapter 4 - Water Shortage Levels

Chapter 5 - Shortage Response Actions

Chapter 6 - Communication Protocols

Chapter 7 - Compliance and Enforcement

Chapter 8 - Legal Authorities

Chapter 9 - Financial Consequences of WSCP

Chapter 10 - Monitoring and Reporting

Chapter 11 - WSCP Refinement Procedures

Chapter 12 - Plan Adoption, Submittal, and Availability

Chapter 2
Water Supply Reliability Analysis

☑ ***CWC § 10632 (a) (1)*** *The analysis of water supply reliability conducted pursuant to Section 10635.*

As described in Chapter 6 of the District Urban Water Management Plan (UWMP), the District relies on purchases from the San Francisco Public Utilities Commission (SFPUC) and surface water from Bear Gulch Reservoir.

Chapter 7 of the District UWMP indicates the potential of future water supply shortages in single-dry and multiple-dry years. This WSCP addresses potential water shortage conditions resulting from such future droughts as well as other causes (e.g., impacted distribution system infrastructure, regulatory-imposed shortage restrictions, catastrophic events, etc.).

Chapter 3
Annual Water Supply and Demand Assessment Procedures

☑ ***CWC § 10632 (a) (2)***

The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:

(A) The written decision-making process that an urban water supplier will use each year to determine its water supply reliability.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

(iii) Existing infrastructure capabilities and plausible constraints.

(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of water supply.

☑ ***CWC § 10632.1***

An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.

☑ ***CWC § 10632.2***

An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan, as identified in subdivision (a) of Section 10632, or reasonable alternative actions, provided that descriptions of the alternative actions are submitted with the annual water shortage assessment report pursuant to Section 10632.1. Nothing in this section prohibits an urban water supplier from taking actions not specified in its water shortage contingency plan, if needed, without having to formally amend its urban water management plan or water shortage contingency plan.

On an annual basis, the District will conduct a Supply-Demand Assessment (SDA) to identify whether there is likely to be a water shortage condition in the coming year. This assessment will be based largely on the water supply assessment provided by the SFPUC. Each element of the annual SDA is described below.

1. Evaluation Criteria

The evaluation criteria that will be used to identify whether the District is likely to experience a water shortage in the coming year include:

a. Purchased Water Availability - Because the District's primary source of potable water supply is from the SFPUC, the evaluation of District supplies for a particular year will be based largely on information provided by the SFPUC or the Bay Area Water Supply and Conservation Agency (BAWSCA). Cal Water will conduct its Annual Assessment as part of a coordinated effort led by BAWSCA. The SFPUC Annual Water Supply and Demand Assessment Procedures are included as Attachment A of this WSCP.

b. Treatment and Distribution System Constraints - An assessment of the probabilities of facility and infrastructure outages and the degree to which they could limit Cal Water's ability to access, convey, or treat adequate supplies, including any planned maintenance or capital improvements over the next year that could affect its ability to provide sufficient supply to meet demands.

c. State Regulatory Conditions - Evaluation of any state-mandated drought or water use restrictions.

These criteria will be assessed by Cal Water staff, including District staff with detailed knowledge of District operations. The data used to support these assessments may include, but is not limited to, supply capacity, supply and pump capacity, firm capacities, tank storage capacity, system demand, and zone demand.

2. Water Supply

As described above, the District obtains its potable supplies from the SFPUC and local surface water. As noted in Chapter 2, the supplies purchased from the SFPUC may be constrained in single-dry year or multiple-dry-year hydrologic conditions. The potential constraints on water supply therefore include these purchased supply limitations and the operational limitations and potential local regulatory conditions identified as evaluation criteria above.

3. Unconstrained Customer Demand

The demand forecast described in Chapter 4 of the District UWMP yields the anticipated unconstrained water demand, i.e. the expected water use in the absence of shortage-caused reductions in water use. During a drought cycle, unconstrained demand typically increases due to higher than normal air temperatures and lower than normal precipitation. The supply reliability analysis and Drought Risk Assessment presented in

Chapter 7 of the District UWMP accounts for this anticipated shift in unconstrained water demand.

The model underlying the demand forecast described in Chapter 4 of the District UWMP has an annual time step. Cal Water has begun developing a short-term demand model with a monthly time step that will be more appropriate for the annual supply-demand assessments.

4. Planned Water Use for Current Year Considering Dry Subsequent Year

Cal Water will evaluate the anticipated supplies for the current year, based in large part on SFPUC's assessment of available supplies. Cal Water will evaluate local surface water supplies assuming that the following year will be dry, as defined above, using the Evaluation Criteria identified above.

5. Infrastructure Considerations

As part of its triennial General Rate Case applications to the California Public Utilities Commission (CPUC), Cal Water prepares a Supply-Demand Analysis (CPUC SD Analysis) for each of its Districts. The CPUC SD Analysis is an inventory of water production and pump assets that provide direct and indirect sources of supply to meet customer demands in accordance with CPUC General Order 103-A and California Code of Regulations (CCR) Title 22 Waterworks Standards. This CPUC SD Analysis is based on a combination of regulatory requirements, professional consultant recommendations, and industry standard practices, including those from the American Water Works Association (AWWA) and American Society of Civil Engineers (ASCE). It identifies specific vulnerabilities in different pressure zones within the system and evaluates the system against performance criteria that meet regulatory requirements and ensure operationally adequate levels of service.

Cal Water plans to extend the District CPUC SD Analysis to perform this analysis on an annual basis. This analysis will guide Cal Water's annual evaluation of operational treatment/distribution constraints that could potentially limit the availability of supplies. This evaluation of supply well operational constraints and treatment and distribution constraints will be completed by March 31 of each year and will assess potential impacts on supply availability. If such constraints are identified, Cal Water will develop a plan to address these constraints, mitigate potential effects, and implement the appropriate water shortage stage of action per Chapter 5, below.

6. Other Factors

As identified under the Evaluation Criteria above, local regulatory conditions could potentially limit the availability of supplies. Therefore, Cal Water will evaluate the development of new regulatory constraints by March 31 of each year and assess their potential impacts on supply availability. If such constraints are identified, Cal Water will develop a plan to address these constraints and mitigate potential effects and implement the appropriate water shortage stage of action per Chapter 5 below.

Consistent with California Water Code (CWC) § 10632.1, Cal Water will perform and submit an SDA to DWR by July 1st of each year beginning in 2022.

Chapter 4
Water Shortage Levels

☑ ***CWC § 10632 (a) (3)***

(A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.

(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross-reference relating its existing categories to the six standard water shortage levels.

Consistent with the requirements of CWC § 10632(a)(3), this WSCP is based on the six water shortage levels (also referred to as "stages") shown in Table 4-1. These shortage stages are intended to address shortage caused by any condition, including the catastrophic interruption of water supplies.

Table 4-1. Water Shortage Contingency Plan Levels (DWR Table 8-1)

Shortage Level	Percent Shortage Range	Shortage Response Actions
1	Up to 10%	Demand reduction (See Table 5-1)
2	Up to 20%	Demand reduction (See Table 5-1)
3	Up to 30%	Demand reduction (See Table 5-1)
4	Up to 40%	Demand reduction (See Table 5-1)
5	Up to 50%	Demand reduction (See Table 5-1)
6	>50%	Demand reduction (See Table 5-1)
NOTES:		

Shortage response actions for each of these stages are identified and discussed in Chapter 5.

Chapter 5
Shortage Response Actions

☑ ***CWC § 10632 (a) (4)***

Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

☑ ***CWC § 10632 (b)***

For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

This chapter describes the response actions Cal Water will take to deal with the shortages associated with each of the six stages enumerated in Chapter 4.

5.1 Demand Reduction

The combinations of demand-reduction actions required to resolve the shortages associated with each of the six drought stages are based on Cal Water's experiences in dealing with past drought-related shortages and also include other actions deemed appropriate to achieve the required demand reductions. In order to evaluate and ensure that the right actions would be implemented with the proper level of intensity, Cal Water employed the Drought Response Tool (DRT), an Excel spreadsheet model developed by EKI Environment and Water, Inc.

The DRT provides a quantitative framework that allows Cal Water to systematically estimate the monthly and cumulative annual demand reductions expected to result from particular combinations of drought response actions and associated implementation rates. Data inputs to the DRT include total production, class-specific water use, population, and assumptions regarding the split between indoor and outdoor water use for each customer class.

For each drought response action, the user specifies:

- The customer class(es) and end use(s) that are affected;

- The percent savings for those end use(s) for each account that implements the action. These are based on evaluations reported in the literature, or where such studies are not available, on best estimates based on Cal Water experience; and
- The percentage of accounts assumed to implement the action, which is presumed to be the result of the intensity level of Cal Water program implementation, including but not limited to marketing and enforcement activities.

Based on the foregoing inputs, the DRT model calculates the resulting monthly savings. Cal Water adjusted the combination of actions and implementation levels to achieve the targeted savings levels at each of the six shortage stages.

In order to evaluate the robustness of the DRT model, Cal Water modeled the actions implemented during the height of the last drought for a subset of its Districts, and found that the modeled water shortage reductions were generally consistent with the responses observed in its Districts. In short, the DRT is a robust, transparent tool to tie a particular set of shortage-response actions to an expected reduction in demand.

For each of the six water shortage stages, the modeling targeted the mid-range of the required demand reduction range, ergo:

- 5% for Stage 1,
- 15% for Stage 2,
- 25% for Stage 3,
- 35% for Stage 4,
- 45% for Stage 5, and
- 55% for Stage 6

The key DRT inputs and outputs for each of the six water shortage stages are reproduced in Attachment B.

Table 5-1 shows the water shortage reduction actions, savings assumptions, and implementation rates that are required for the District to achieve the targeted annual demand reductions for each of the six shortage stages. At each stage, there are two types of demand-reduction actions identified:

- Restrictions on customer water usage; and
- Consumption reduction actions by Cal Water to encourage decreased water usage.

The total demand reductions are governed by a set of user-specified constraints to ensure that usage levels do not endanger health and safety or result in unacceptable economic impacts. The DRT will not permit estimated usage reductions to violate these constraints, regardless of the demand reduction actions selected. For most Cal Water districts, including Bear Gulch, the following default constraints are used:

- A minimum residential indoor per capita daily usage of 25 gallons,
- A maximum residential outdoor usage reduction of 100%,

- A maximum Commercial, industrial, and institutional (CII) indoor usage reduction of 30%, and
- A maximum CII outdoor usage reduction of 100%.

Many actions are implemented across a number of stages, some at increasing implementation levels. Therefore the actions are listed as a row under the first stage at which they are implemented, and the implementation rate is shown under each stage column heading at the right. The unit savings represent a percentage savings of the end uses indicated in the table.

Because of the DRT logic described above, the format of Table 5-1 differs from that of the default DWR table.

Table 5-1. Demand Reduction Actions to Achieve Required Savings (DWR Table 8-2)

Water Shortage Response Action	End Use(s)	End Use Savings	IMPLEMENTATION RATES BY STAGE						Penalty, Charge, or Other Enforcement?
			1	2	3	4	5	6	
Stage 1: Minimal Shortage									
Restrictions									
Landscape - Limit landscape irrigation to specific times	Irrigation	**10%**	50%	N/A	N/A	N/A	N/A	N/A	Yes
Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Leaks	**100%**	10%	20%	25%	50%	50%	75%	Yes
Landscape - Restrict or prohibit runoff from landscape irrigation	Irrigation	**3%**	15%	40%	50%	50%	50%	50%	Yes
Landscape - Prohibit application of potable water to outdoor landscapes within 48 hours of measurable rainfall	Irrigation	**20%**	15%	40%	50%	50%	50%	N/A	Yes
Other - Prohibit use of potable water for washing hard surfaces	Misc. Outdoor	**17%**	15%	40%	50%	50%	50%	50%	Yes
Other - Require shut-off nozzles on hoses for vehicle washing with potable water	Misc. Outdoor	**17%**	50%	50%	50%	50%	50%	50%	
CII - Lodging establishments must offer opt out of linen service	Fixtures & Appliances	**1%**	50%	50%	50%	50%	50%	50%	Yes
CII - Restaurants may only serve water upon request	Fixtures & Appliances	**1%**	50%	50%	50%	50%	50%	50%	Yes

Water Shortage Response Action	End Use(s)	End Use Savings	IMPLEMENTATION RATES BY STAGE						Penalty, Charge, or Other Enforcement?
			1	2	3	4	5	6	
No watering of landscape of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission, the Department of Housing and Community Development, or other state agency	Irrigation	**50%**	0.07%	0.07%	0.07%	0.07%	0.07%	N/A	Yes
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	**50%**	50%	50%	50%	50%	50%	50%	Yes
Consumption Reduction									
Expand Public Information/Media Campaign	All	**0.5%**	50%	50%	50%	50%	50%	75%	No
Water Bill Inserts	All	**1%**	100%	100%	100%	100%	100%	100%	No
Promote online water waste reporting	All	**10%**	0.1%	0.2%	0.2%	0.3%	0.5%	0.5%	No
Expand Rebates or Giveaways of Plumbing Fixtures and Devices	All	**10%**	1%	1%	2%	4%	5%	5%	No
Expand Rebates for Landscape Irrigation Efficiency	All	**10%**	1%	1%	2%	4%	5%	5%	No
Expand CII Water Use Surveys	All CII uses	**5%**	1%	1%	1%	2%	2%	3%	No
Expand Res Water Use Surveys	All Residential Uses	**5%**	1%	1%	1%	2%	2%	3%	No
Stage 2: Moderate Shortage									
Restrictions									

Water Shortage Response Action	End Use(s)	End Use Savings	IMPLEMENTATION RATES BY STAGE						Penalty, Charge, or Other Enforcement?
			1	2	3	4	5	6	
Landscape - Limit landscape irrigation to 1-3 days/week	Irrigation	**15%-79%** [1]		75%	25%	25%	75%	N/A	Yes
Prohibit the use of non-recirculating systems in all new conveyer car wash and commercial laundry systems	Fixtures & Appliances	**50%**		0%	0%	0%	0%	0%	Yes
Prohibit the use of single pass cooling systems in new connections	Cooling	**50%**		0%	0%	0%	20%	20%	Yes
Consumption Reduction									
Water Efficiency Workshops, Public Events	All Residential Uses	**5%**		25%	25%	25%	50%	75%	No
Offer Water Use Surveys	All	**1%**		1%	1%	2%	2%	3%	No
Provide Rebates or Giveaways of Plumbing Fixtures and Devices	All	**10%**		1%	2%	4%	5%	5%	No
Provide Rebates for Landscape Irrigation Efficiency	All	**10%**		1%	2%	4%	5%	5%	No
Stage 3: Severe Shortage									
Restrictions									
Other - Prohibit use of potable water for construction and dust control	Misc. Outdoor	**100%**			100%	1%	1%	1%	Yes
Prohibit use of potable water for street washing	Misc. Outdoor	**100%**			1%	1%	1%	1%	Yes

Water Shortage Response Action	End Use(s)	End Use Savings	IMPLEMENTATION RATES BY STAGE						Penalty, Charge, or Other Enforcement?
			1	2	3	4	5	6	
Landscape - Prohibit irrigation of ornamental turf on public street medians with potable water	Irrigation	**100%**			10%	20%	25%	N/A	Yes
Prohibit Filling Ornamental Lakes or Ponds	Misc. Outdoor	**100%**			1%	1%	1%	1%	Yes
Consumption Reduction									
Home or Mobile Water Use Reports	All	**5%**			10%	25%	25%	50%	No
Decrease Frequency and Length of Line Flushing	Non Revenue Water	**25%**			50%	50%	50%	50%	No
Reduce System Water Loss	Non Revenue Water	**100%**			10%	10%	10%	10%	No
Increase Water Waste Patrols/Enforcement	All	**10%**			1%	3%	5%	5%	No
Implement Drought Rate Structure and Customer Water Budgets (Res)	All Residential Uses	**30%-60%** [2]			40%	30%	30%	30%	Yes
Implement Drought Rate Structure and Customer Water Budgets (CII)	All CII uses	**10%-30%** [3]			40%	30%	30%	50%	Yes
Stage 4: Critical Shortage									
Water Use Restrictions									
Prohibit vehicle washing except with recirculated water or low-volume systems	Misc. Outdoor	**10%**				50%	50%	50%	Yes
Prohibit use of water for recreational purposes such as water parks and the filling of pools	Misc. Outdoor	**100%**				1%	1%	1%	Yes
Consumption Reduction Actions									
Promote / Expand Use of Recycled Water	Irrigation	**100%**				0%	0%	0%	No

Water Shortage Response Action	End Use(s)	End Use Savings	IMPLEMENTATION RATES BY STAGE						Penalty, Charge, or Other Enforcement?
			1	2	3	4	5	6	
Stage 5: Emergency Shortage									
Water Use Restrictions									
Require net zero demand Increase on new water service connections	All	**100%**					0.07%	0.07%	Yes
Prohibit single-pass cooling systems	Cooling	**50%**					20%	20%	Yes
Consumption Reduction Actions									
Require Pool Covers	Misc. Outdoor	**28%**					10%	10%	Yes
Stage 6: Extreme Shortage									
Water Use Restrictions									
Moratorium on new water service connections	All	**100%**						0.07%	Yes
Landscape - Prohibit all landscape irrigation	Irrigation	**100%**						50%	Yes
		Cumulative Annual Savings	**8%**	**16%**	**26%**	**35%**	**43%**	**57%**	

NOTES:
1. Watering restricted to no more than 3 days/wk in Stage 2 and Stage 3; no more than 2 days/wk in Stage 4; no more than 1 day/wk in Stage 5.
2. Residential water budgets of up to 30% for Stage 3, up to 40% for Stage 4; 50% for Stage 5, up to 60% for Stage 6.
3. CII water budgets of up to 10% for Stage 3, up to 20% for Stage 4, up to 30% for Stages 5 and 6.

5.2 Supply Augmentation

As indicated in Table 5-2, Cal Water has not identified any supply augmentation actions to assist in resolving future District water shortages.

Table 5-2. Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*
NOTES:			

5.3 Operational Changes

As identified in Table 5-1, the District will decrease the frequency and length of line flushing under Stage 3 and beyond. The District will also evaluate the potential benefits of altering other maintenance cycles and expediting infrastructure repairs to improve system efficiency, to the extent feasible.

5.4 Mandatory Restrictions

The water shortage response actions included in Table 5-1 include a variety of mandatory customer water use restrictions that will be necessary to achieve the targeted demand reductions for the different shortage stages. The types of restrictions and the manner and degree of enforcement for these restrictions vary by stage, and are discussed in Chapter 7.

5.5 Emergency Response Plan

Cal Water has an Emergency Response Plan (ERP) in place that coordinates the overall response to a disaster.

The ERP addresses the Company's responsibilities in emergencies associated with natural disaster, human-caused emergencies, and technological incidents. It provides a framework for coordination of response and recovery efforts within the Company in cooperation with local, State, and Federal agencies, as well as other public and private organizations. The ERP establishes an emergency organization to direct and control operations during a period of emergency by assigning responsibilities to specific personnel.

The ERP does the following:

- It conforms to the State mandated Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS), and it effectively structures emergency response at all levels in compliance with the Incident Command System (ICS).
- It establishes response policies and procedures, while providing the Company clear guidance related to emergency planning.
- It describes and details procedural steps necessary to protect lives and property.
- It outlines coordination requirements.
- It provides a basis for unified training and response exercises to ensure compliance.

The Bear Gulch District has installed backup power generators at some of its well sites, booster sites, and pump storage sites that can be operated in the event of a system wide power outage. A complete loss of power has never been experienced, but the generators have been used in the past to overcome localized outages.

The District has emergency interties with the City of Redwood City and the City of Menlo Park.

5.6 Seismic Risk Assessment and Mitigation Plan

☑ ***CWC § 10632.5***

(a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

Cal Water's ERP includes information on various hazards and a related fault map overlying the District. The San Mateo County Multi-Jurisdictional Local Hazard Mitigation Plan, which includes additional discussion of area earthquake risk and mitigation, can be found at https://cmo.smcgov.org/multijurisdictional-local-hazard-mitigation-plan.

5.7 Shortage Response Action Effectiveness

Table 5-1 above shows the effectiveness of the specific demand-reduction actions and implementation levels necessary for the District to achieve the targeted savings for each water shortage stage. The bottom row indicates the total annual cumulative savings expected to be reached at each water shortage stage level. Additional details, including anticipated savings on

a month-by-month basis are provided in the DRT model inputs and outputs included in Attachment B.

Chapter 6
Communication Protocols

☑ ***CWC § 10632 (a) (5)***

Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications.

Cal Water intends to escalate communication to customers and stakeholders, as needed, throughout any water shortage situation to help ensure they are aware of current conditions, any water use restrictions that are in effect, and the many ways Cal Water can help them reduce their water use. Cal Water's outreach efforts include multiple channels, including bill messages, bill inserts, direct mail, email, letters, social media, print, radio, music streaming services, TV, over-the-top media, movie theatre advertising, and group presentations.

These efforts will expand on current Cal Water outreach efforts and will be customized to the needs at the time of the shortage to ensure a proper channel mix so that the maximum audience is reached as efficiently as possible.

Chapter 7
Compliance and Enforcement

☑ ***CWC § 10632 (a) (6)*** *For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.*

7.1 Water Use Restrictions

In accordance with Rule 14.1, Cal Water is currently authorized to take the following actions to enforce the water use restrictions:

First Violation: Cal Water shall provide the customer with a written notice of violation.

Second Violation: If Cal Water verifies that the customer has used potable water for non- essential, wasteful uses after having been notified of the first violation, Cal Water shall provide the customer with a second written notice of violation and is authorized to install a flow-restricting device on the customer's service line.

Cal Water has submitted to the California Public Utilities Commission (CPUC) an update to Rule 14.1 and Schedule 14.1, for approval, to align with the restrictions identified in this WSCP. Rule14.1 and Schedule 14.1 are discussed in more detail in Chapter 8. The current versions of Rule 14.1 and Schedule 14.1 can be found on the Cal Water website.

7.2 Non-Essential, Wasteful Uses

In the event that more stringent measures are needed, implementation of Schedule 14.1 would be requested from the CPUC. If implemented, Cal Water is currently authorized to take the following actions when its personnel verify a customer is using potable water for non-essential, wasteful uses.

First Violation: Cal Water shall provide the customer with a written notice of violation. In addition, Cal Water is authorized to take the following actions:

A. If the customer currently receives service through a metered connection, install a real- time water measurement device on the customer's service line and provide the customer with access to information from the device. The cost of the device, including installation and ongoing operating costs, may be billed to the customer, and nonpayment may result in discontinuance of service.

B. If the customer does not currently receive service through a metered connection, install a water meter on the customer's service line, charge the

customer for water use pursuant to Cal Water's metered service tariffs and rules, and install a real-time water measurement device on the customer's service line and provide the customer with access to information from the device. The cost of the device, including installation and ongoing operating costs, may be billed to the customer, and nonpayment may result in discontinuance of service.

Second Violation: If Cal Water verifies that the customer has used potable water for non- essential, wasteful uses after having been notified of the first violation, Cal Water shall provide the customer with a second written notice of violation. In addition to the actions prescribed under the first violation above, Cal Water is authorized to take the following actions:

A. Apply the following waste of water penalties, which are in addition to any other charges authorized by this Schedule or other Cal Water tariffs.
   i. If Stage 1 is in effect, $25
   ii. If Stage 2 is in effect, $50
   iii. If Stage 3 is in effect, $100
   iv. If Stage 4 is in effect, $200
B. At its sole discretion, waive the waste of water penalty if the customer participates in a water use evaluation provided by Cal Water and/or provides documentation to Cal Water proving that a drip irrigation system, micro spray irrigation system, high-efficiency sprinkler system, or properly programmed smart irrigation controller has been installed, after a notice of violation was delivered, and is in use at the customer's service address.

Third Violation: If Cal Water verifies that the customer has used potable water for non-essential, wasteful uses after having been notified of the second violation, Cal Water shall provide the first and second violations above, Cal Water is authorized to take the following actions:

A. A. Apply the following waste of water penalties, which are in addition to any other charges authorized by this Schedule or other Cal Water tariffs.
   i. If Stage 1 is in effect, $50
   ii. If Stage 2 is in effect, $100
   iii. If Stage 3 is in effect, $200
   iv. If Stage 4 is in effect, $400

B. At its sole discretion, waive the waste of water surcharge if the customer participates in a water use evaluation provided by Cal Water and/or provides documentation to Cal Water proving that a drip irrigation system, micro spray irrigation system, high- efficiency sprinkler system, or properly programmed smart irrigation controller has been installed, after notice of violations have been delivered, and is in use at the customer's service address.

Fourth Violation: If Cal Water verifies that the customer has used potable water for non- essential, wasteful uses after having been notified of the third violation, Cal Water shall provide the customer with a fourth written notice of violation. In addition to actions set forth in previous violations prescribed above, Cal Water is authorized to install a flow- restricting device on the customer's service line.

Egregious Violations: Notwithstanding the foregoing framework for penalties, customers who Cal Water has verified are egregiously using potable water for non-essential, wasteful uses are subject to having a flow- restricting device installed on their service line. After providing the customer with one notice of egregious violation, either by direct mail or door hanger, which documents the egregious use of potable water for non-essential, wasteful uses and explains that failure to correct the violation may result in the installation of a flow-restricting device on the customer's service line, Cal Water is authorized to install a flow-restricting device on the customer's service line.

Cal Water plans to submit to the CPUC an update to Schedule 14.1 to align with this WSCP including, but not limited to, consistency with the new six stage shortage level structure.

7.3 Drought Surcharges

Water budgets and associated drought surcharges are included as actions in Table 5-1. Cal Water will implement such actions through the implementation of Schedule 14.1.

Chapter 8
Legal Authorities

☑ ***CWC § 10632 (a) (7)***

(A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

Cal Water is an investor-owned water utility that is regulated by the CPUC. As such, it does not have the authority to adopt resolutions or ordinances. Rule 14.1, as filed with the CPUC, serves as Cal Water's restrictions on non-essential, wasteful uses of potable water. In the event that more stringent measures are required, Cal Water may request the addition of Schedule 14.1 which serves as Cal Water's WSCP and includes staged mandatory reductions and drought surcharges. Cal Water shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency as defined in Section 8558 of the Government Code and to ensure consistency with local resolutions and ordinances.

On April 1, 2016, Cal Water filed its current Schedule 14.1 with the CPUC.[1] The Schedule lays out the staged mandatory reductions and drought surcharges associated with Cal Water's WSCP. This filing is consistent with Resolution W-5034, adopted by the Commission on April 9, 2015, ordering compliance with requirements of the State Water Resources Control Board (SWRCB).

Schedule 14.1 is an extension of Rule 14.1. The compliance and enforcement information presented in Chapter 7 is based on the current versions of both Rule 14.1 and Schedule 14.1, which are based, in part, on the specific SWRCB requirements associated with the Governor's Executive Order B-29-15, which required statewide cutbacks to address the unprecedented 2011-2017 drought, as well as the additional information required pursuant to the CWC.

Cal Water has submitted an update to Rule 14.1 and Schedule 14.1 to the CPUC, for approval, to align with this WSCP.

[1] For reference, the current versions of Rule 14.1 and Schedule 14.1 are included as Attachment C.

In the event of a determination of a water shortage Cal Water shall declare a water shortage emergency in accordance with the Water Code Chapter 3 (commencing with Section 350) of Division 1 and implement the Water Shortage Contingency Plan at the appropriate Stage.

Chapter 9
Financial Consequences of WSCP

☑ ***CWC § 10632 (a) (8)***

A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

In 2008, the CPUC approved the creation of a Water Revenue Adjustment Mechanism (WRAM) and Modified Cost Balancing Accounts (MCBA). The goals of the WRAM and MCBA are to sever the relationship between sales and revenue to remove the disincentive to reduce water use. The WRAM and MCBA are designed to be revenue neutral in order to ensure that both the utility and ratepayers are neither harmed nor benefitted.

In 2020, the CPUC ordered that regulated water utilities may not include the continuation of the WRAM and MCBA in their next general rate case filing but may propose the use of a Monterey-Style Revenue Adjustment Mechanism and Incremental Cost Balancing Account. As such, the WRAM and MCBA will no longer be in place for Cal Water beginning in 2023.

During a water shortage, Cal Water will file for a Drought Memorandum Account, or similar, to track incremental shortage-related expenses to be reviewed by the CPUC for future recovery in rates. Cal Water will also file for a Drought Lost Revenue Memorandum Account, or similar, to track reduced sales to be reviewed by the CPUC for future recovery in rates.

Both the Drought Memorandum Account and Drought Lost Revenue Memorandum Account are mechanisms that have been approved by the CPUC in previous droughts.

Chapter 10
Monitoring and Reporting

☑ ***CWC § 10632 (a) (9)*** *For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.*

During the period 2014-16, in order to effectively respond to the drought, Cal Water realigned its organizational structure to ensure sufficient resources were available to implement its WSCP. The day-to-day implementation was overseen by the Director of Drought Management & Conservation, with the assistance of the Drought Response Project Manager. The Director of Drought Management & Conservation reported to a team of Cal Water's Officers (Steering Committee), including the President & CEO, the Vice President of Corporate Communications & Community Affairs, the Vice President of Customer Service & Information Technology, the Vice President of Operations, and the Vice President of Continuous Improvement.

Reporting to the Director of Drought Management & Conservation was a team of functional leads, each responsible for managing individual portions of Cal Water's Plan. This team included the Director of Customer Service, the Water Conservation Manager, the Manager of Corporate Communications, the Water Supply Manager, and the Government & Community Relations Manager.

Cal Water would implement a similar structure to effectively manage future water shortages.

This structure includes regular meetings with reporting on items such as:

- Aggregate customer demands,
- Customer compliance with water use restrictions,
- Current and projected water supply conditions,
- Customer outreach activities,
- Customer service inquiries, and
- Operations activities (e.g., water flushing activities, leak repairs, etc.).

Chapter 11
WSCP Refinement Procedures

☑ ***CWC § 10632 (a) (10)*** *Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.*

Cal Water's Drought Steering Committee utilizes an adaptive management process to regularly assess and determine adjustments and changes to the implementation of the WSCP. These refinements are implemented by the Director of Drought Management & Conservation (or equivalent) through the team of functional leads.

Chapter 12
Plan Adoption, Submittal, and Availability

☑ ***CWC § 10632 (c)*** *The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.*

The deadline for public comments on the WSCP was June 11, 2021. The final WSCP was formally adopted by Cal Water's Vice President of Customer Service & Chief Citizenship Officer on June 20, 2021. The District UWMP includes a copy of the signed Resolution of Plan Adoption and contains the following:

- Letters sent to and received from various agencies regarding the UWMP and WSCP, and
- Correspondence between Cal Water and participating agencies.

This UWMP and WSCP were submitted to DWR within 30 days of adoption and by the July 1, 2021 deadline. The submittal was done electronically through Water Use Efficiency Data Portal, an online submittal tool. The adopted WSCP was also sent to the California State Library and to the cities and counties listed in Table 10-1 of the District UWMP.

On or about May 10, 2021, an electronic version of the draft 2020 UWMP and WSCP was made available for review on Cal Water's website: https://www.calwater.com/conservation/uwmp.

Attachment A
SFPUC Annual Water Supply and Demand Assessment Procedures

ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

Each year the SFPUC evaluates the amount of total water storage expected to occur throughout the RWS and compares it to expected demands. This annual Water Supply and Demand Assessment (WSDA) is described in the subsections below, which are organized by the sequential steps the SFPUC takes to conduct the assessment each year and reference the relevant California Water Code requirements for a WSDA.[1]

The SFPUC's annual WSDA is a robust planning system that considers a range of input factors unique to the SFPUC's water supplies and system configuration while also providing the flexibility to consider new factors. Traditional surface water supplies from the SFPUC's up country, East Bay, and Peninsula reservoirs are the backbone of the water supply, but the SFPUC extends and protects those supplies in many additional ways by: (1) partnering with the community to help save water through robust conservation programs; (2) minimizing the need for additional water to serve new developments through an onsite water reuse program; (3) recycling wastewater resources to deliver water for large non-potable uses; (4) utilizing local groundwater supplies to supplement surface water supplies; (5) investigating new, alternative water supply options such as purified water and desalination; and (6) investing in innovations that allow for creative solutions to meet diverse needs. These efforts help the SFPUC conserve water and diversify supplies to reduce likelihood of a water shortage condition.

1.1 DEMAND ASSESSMENT [WATER CODE SECTION 10632(A)(2)(B)(I)]

To calculate unconstrained customer demand for the purpose of an annual WSDA, the SFPUC collects information on both the retail and wholesale system demands. Retail customer demand is estimated based on the best available information to date, and typically includes the previous year's demands as well as consideration of current demand use patterns or other conditions impacting demands, such as weather and growth. Each year, in February, the SFPUC receives from BAWSCA a report of estimated Wholesale Customer demand for the upcoming year. BAWSCA typically estimates unconstrained demands for the Wholesale Customers by using total water purchased by those customers in the prior year along with other relevant information. Relatively small demands from the two additional wholesale customers not part of the WSA are estimated based on the best available information to date, and typically includes the previous year's demands as well as consideration of current demand use patterns or other conditions impacting demands, such as weather and growth.

1.2 SUPPLY ASSESSMENT [WATER CODE SECTIONS 10632(A)(2)(B)(II) AND 10632(A)(2)(B)(V)]

The RWS collects water from the Tuolumne River watershed in the Sierra Nevada and from local reservoirs in the Alameda and Peninsula watersheds. The RWS draws an average of 85 percent of its supply from the Tuolumne River watershed. This water feeds into an aqueduct system delivering water 167 miles by gravity to Bay Area reservoirs and customers. The remaining RWS supply is drawn from local surface waters in the Alameda and Peninsula watersheds. The split between these resources varies from year to year depending on the water year hydrology and operational circumstances.

To project and evaluate water supply conditions, the SFPUC uses measurements of precipitation and snowpack in the watersheds above Hetch Hetchy, Cherry, and Eleanor Reservoirs. Snowpack conditions are evaluated regularly by the Cooperative Snow Survey (conducted by the SFPUC in partnership with state and federal agencies) beginning in late January of each year. The SFPUC also estimates snowpack conditions using information from airborne snow observatory (ASO) and other sources. The SFPUC maintains a hydrologic model

[1] California Water Code section 10632(a)(1) requires "*the analysis of water supply reliability conducted pursuant to Section 10635."* Additional information about the SFPUC's water supply reliability analysis can be found in Chapter 7 of the SFPUC's 2020 UWMP.

of the watersheds that uses this information to project expected runoff for the coming year. This process also includes a statistical analysis of additional expected precipitation. In addition to projected runoff, the determination of projected available water supply also takes into account stored water throughout the RWS, water acquired by the SFPUC from non-SFPUC sources, inactive storage, reservoir losses, and allowances for carryover storage.

Additionally, the SFPUC accounts for groundwater provided by the San Francisco Groundwater Supply Project for the in-City retail system and recycled water provided for irrigation at Harding Park, Fleming and Sharp Park Golf Courses.

The RWS relies on precipitation and snowmelt captured and stored in its reservoirs. During droughts, water supply deliveries can exceed inflows, such that water stored in previous years is relied upon to meet demands. Because of the importance of carry-over storage, the SFPUC constantly monitors and evaluates water supply conditions in the RWS. Look-ahead forecasts are updated as a year's hydrology and operations change. Generally, in early winter of any year, SFPUC staff can begin providing a forecast of water supply conditions for the upcoming year based on known and anticipated winter and spring precipitation and snowpack. The predictive power of this forecast improves greatly through the spring. The annual precipitation, snowmelt, and carry-over storage together constitute the SFPUC's reservoir storage condition. Using data for each of these factors, the SFPUC can determine whether the reservoir system will be capable of serving full deliveries to its customers. Section 1.3 describes the system modeling SFPUC conducts

Table 0-1 shows the availability of RWS supplies for retail customers and Wholesale Customers in normal years. Table 0-2 shows the current and projected RWS supply needs to meet retail and wholesale demands based on information and projections presented in the SFPUC's 2020 UWMP.

The SFPUC sells water to 26 of its 28 wholesale customers under the terms of the 25-year contract known as the Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County (WSA) and associated individual water sales contracts with each Wholesale Customer. The WSA carries forward the SFPUC's "Supply Assurance" of 184 million gallons per day (mgd) to the Wholesale Customers. The SFPUC has agreed to deliver water to the Wholesale Customers up to the amount of the Supply Assurance, and this agreement is perpetual and survives the expiration of the WSA. The Supply Assurance is, however, subject to reduction due to water shortage, drought, scheduled RWS maintenance activities, and emergencies. The WSA also describes the temporary limitation on water sales established by the Phased Water System Improvement Plan (WSIP) in 2008. This "Interim Supply Limitation" (ISL) limits water sales from the RWS to an average annual amount of 265 mgd. The WSA allocations the ISL between the SFPUC's retail customers and Wholesale Customers as follows:

- Wholesale supply allocation: 184 mgd
- Retail supply allocation: 81 mgd[2]

Table 0-1. Regional Water System Supply Availability in Normal Years (mgd)

RWS Supply Allocation	Actual	Projected				
	2020	2025	2030	2035	2040	2045
Retail Customers[a, b]	81	81	81	81	81	81
Wholesale Customers[c, d]	184	184	184	184	184	184

[2] Groveland CSD is considered a retail customer of the SFPUC. Thus, RWS supplies to Groveland CSD are accounted for in the retail supply allocation of 81 mgd.

Total RWS Supplies	265	265	265	265	265	265

a Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if these alternative supplies are not available, up to 81 mgd of RWS supply could be used in normal years.

b Groveland CSD is reported as a wholesale customer for the purposes of this 2020 UWMP, but it is considered a retail customer of the SFPUC solely for purposes of allocating RWS supplies between retail and Wholesale Customers. Its demands would be met by the retail supply allocation of 81 mgd.

c Projected Wholesale Customer deliveries are limited to 184 mgd, including the demands of the Cities of San Jose and Santa Clara, which are supplied on a temporary and interruptible basis, with their total supply not exceeding 9 mgd assuming supply is available (decision to be made by end of 2028).

d Cordilleras MWC is not a party to the WSA, and it is not included in the wholesale supply allocation of 184 mgd. The demands of Cordilleras MWC are minor (projected to be less than 0.01 mgd) and are anticipated to be met with RWS supplies through 2045.

Table 0-2. Regional Water System Supply Utilized in Normal Years (mgd)

RWS Supply Allocation	Actual	Projected				
	2020	2025	2030	2035	2040	2045
Retail Customers[a, b]	66.5	67.2	67.5	68.6	70.5	73.7
Wholesale Customers[c, d]	132.1	146.0	147.9	151.9	156.3	162.8
Total RWS Supplies	198.6	213.2	215.4	220.5	226.8	236.5

a Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if these alternative supplies are not available, up to 81 mgd of RWS supply could be used in normal years.

b Groveland CSD is reported as a wholesale customer for the purposes of this 2020 UWMP, but it is considered a retail customer of the SFPUC solely for purposes of allocating RWS supplies between retail and Wholesale Customers. Its demands would be met by the retail supply allocation of 81 mgd.

c Projected Wholesale Customer deliveries are limited to 184 mgd, including the demands of the Cities of San Jose and Santa Clara, which are supplied on a temporary and interruptible basis, with their total supply not exceeding 9 mgd assuming supply is available (decision to be made by end of 2028).

d Cordilleras MWC is not a party to the WSA, and it is not included in the wholesale supply allocation of 184 mgd. The demands of Cordilleras MWC are minor (projected to be less than 0.01 mgd) and are anticipated to be met with RWS supplies through 2045.

1.3 INFRASTRUCTURE CONSIDERATIONS [WATER CODE SECTION 10632(A)(2)(B)(III)]

On an ongoing basis, the SFPUC's Hetch Hetchy Water and Power, Water Supply and Treatment Division, and Hydrology and Water Systems group conduct analyses of the RWS that incorporate planned facility outages and multiple levels of projected system demands to evaluate and plan for potential water delivery constraints. These groups meet quarterly to share plans and coordinate how facility outages, changes in service area demand, wet or dry weather, and other variables shape the operating plans each year. Facility outages due to maintenance or upgrades are coordinated in an adaptive manner to respond to changes as they occur. For new water supplies or new capital projects related to supply distribution, impacts on the system are evaluated extensively prior to initiation of any changes. Results from these modeling efforts are considered in the annual WSDA.

1.4 SYSTEM MODELING [WATER CODE SECTION 10632(A)(2)(B)(IV)]

To proactively plan for conditions that would result in a shortage of water supplies, the SFPUC models conditions using a hypothetical drought that is more severe than what the RWS has historically experienced. This drought sequence is referred to as the "design drought" and serves as the basis for planning and modeling of future scenarios. The design drought consists of an 8.5-year sequence of dry conditions.

In applying its water supply planning methodology, the SFPUC performs an initial model simulation of the system for the design drought sequence and then reviews the ability of the system to deliver water to the service area through the entire design drought sequence. If the projected water supply runs out before the end of the design drought sequence in the initial model run, system-wide water supply rationing is added and the scenario is re-run. This process continues iteratively until a model simulation of the system is achieved in which the water supply in storage at the end of the design drought sequence is brought to the system "dead pool," where no additional storage is available for delivery (currently simulated as 96,775 acre-feet). Drawing system storage down to the dead pool without going below it indicates that water supply delivery, including the adjusted amount of rationing, is maintained through the design drought sequence.

Estimated rationing levels and corresponding storage threshold values can then be used to simulate the operation of the system through the historical record of hydrology, or to evaluate system water supply conditions during an ongoing drought. While the design drought sequence does not occur in the historical hydrology, the rationing and storage threshold values that are adjusted to allow a system configuration to maintain water delivery through the design drought sequence can be used to evaluate system performance in the historical record, or as a comparison for real-time system conditions. Through use of this planning method, the SFPUC can simulate a response to declining water supply in storage that is appropriate for the system conditions being evaluated.

The SFPUC plans its water deliveries using indicators for water supply rationing that are developed through analysis with the design drought sequence. As a result, the SFPUC system operations are designed to provide sufficient carry-over water in SFPUC reservoirs to continue delivering water, although at reduced levels, during multiple-year droughts.

1.5 DECISION-MAKING PROCESS [WATER CODE SECTION 10632(A)(2)(A)]

Regardless of the expectation of shortage conditions, as part of the normal course of business, the SFPUC provides a water supply condition update to its executive team every two weeks throughout the year. The SFPUC also provides water supply estimates to its Wholesale Customers on a monthly basis beginning February 1. A Wholesale Customer Annual Meeting is held in the last week of February at which the SFPUC makes a presentation on current water supply conditions and forecasts. The last snow survey of the season typically occurs within the first week of April, followed by a runoff forecast to determine total system storage expected as of July 1. By the middle of April, the SFPUC sends a formal letter to the Wholesale Customers summarizing the water supply availability for the coming year.

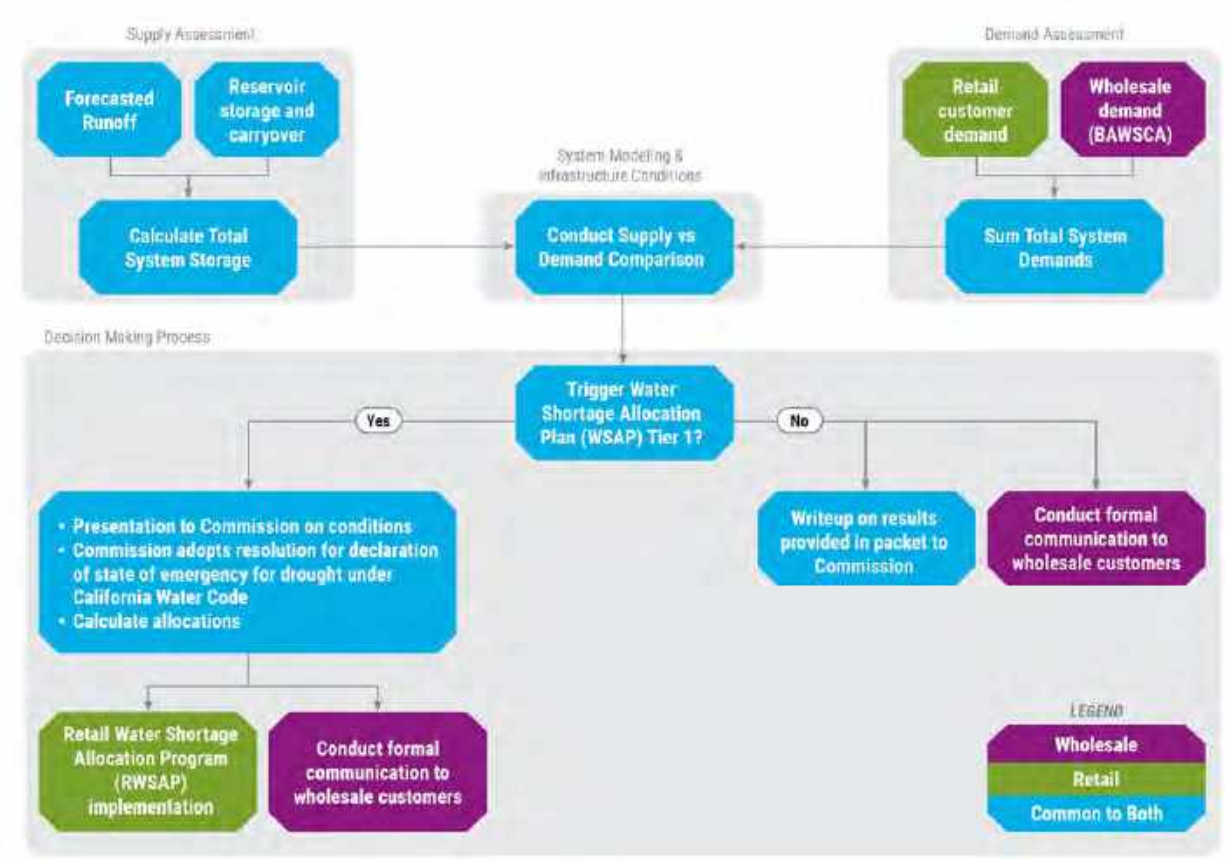
If the RWS appears incapable of meeting system-wide demand due to drought, the SFPUC is expected to declare a water shortage by March 31 of that drought year. The General Manager, or designee, is responsible for declaring such a shortage. A presentation would be made to the Commission as part of the General Manager's report, showing conditions of precipitation to date, snowpack, and storage levels with more information as necessary depending on the particulars of the supply forecast. Depending on the level of shortage, the Commission may adopt a resolution declaring a water shortage emergency under the California Water Code, or lesser actions such as a call for voluntary conservation efforts.

Prior to the initiation of any water delivery reductions to its retail customers, whether it be initial implementation of delivery reductions or implementing a different water shortage level, the SFPUC will outline a drought response plan to address the following: the water supply situation; proposed water use reduction objectives; alternatives to water use reductions; methods to calculate water use allocations and adjustments; compliance methodology and enforcement measures; and budget considerations. Details on the expected allocation program are described further in Section 4.1. This drought response plan will be presented

at a regularly scheduled SFPUC Commission meeting and advertised in accordance with the requirements of Section 6066 of the California Government Code.

The overall WSDA process is described visually in the flowchart presented in Figure 0-1.

Figure 0-1: Water Supply and Demand Assessment Process



Attachment B
Key Drought Response Tool Tables and Charts

Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Bear Gulch

Enter Agency Information	
Agency Name	Bear Gulch
Total Population Served	61,480
Conservation Goal (%)	5%
Drought Stage	Stage 1
Number of Residential Accounts	17,134
Number of Commercial, Industrial, and Institutional (CII) Accounts	1,429
Number of Dedicated Irrigation Accounts	0
Baseline Year(s)	2020
Percentage of Residential Indoor Use During Minimum Month (%)	100%
Percentage of Comm-Gov Indoor Use During Minimum Month (%)	81%
Comments	BG

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Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Bear Gulch

Navigation	
USER'S GUIDE	Download and read the guide before using this Tool
1 - HOME	Enter agency information
2 - INPUT BASELINE YEAR WATER USE	Enter Baseline Year production and use
3 - BASELINE YEAR WATER USE PROFILE	Review and confirm entered information
4 - DROUGHT RESPONSE ACTIONS	Select Drought Response Actions and input estimated water savings and implementation rates.
5 - ESTIMATED WATER SAVINGS	Review estimated water production and compare estimated savings to conservation target.
6 - DROUGHT RESPONSE TRACKING	Track production and water savings against the conservation target.

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Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Bear Gulch

For questions about this tool or for additional information, contact:

Anona Dutton, P.G., C.Hg.
adutton@ekiconsult.com
(650) 292-9100

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Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

2 - Input Baseline Year (2020) Water Use

Bear Gulch

Input Baseline Year (2020) Production and Water Use

Units: (mg)

Select the units to input monthly production and use data. Enter the total monthly potable water production for the Baseline Year. Next, enter monthly water use data by sector for the Baseline Year. If you bill on a bi-monthly basis, divide your billing data between the months that the billing cycle includes. If your single-family and multi-family accounts are tracked separately, enter the combined water use for both sectors in the Residential Water Use column. If your commercial, industrial, and institutional (CII) accounts are tracked separately, enter the combined water use for each sector in the CII Water Use column. Your non-revenue water use is calculated by subtracting your monthly residential, CII, and dedicated irrigation water uses from your monthly production. Your monthly residential gallons per capita per day (R-GPCD) is calculated by dividing your monthly residential water use by your population entered in Worksheet 1 - Home.

Date	Total Production (mg)	Residential Water Use (mg)	COM-GOV Water Use (mg)	Industrial Water Use (mg)	Non-Revenue Water Use (mg)	Total R-GPCD	Comments
October	433	381	47	1	4	200	
November	339	311	42	1	-15	168	
December	189	240	37	1	-89	126	
January	150	114	28	0	9	60	
February	182	115	30	0	37	67	
March	259	198	35	0	26	104	
April	260	194	28	0	38	105	
May	425	246	29	0	149	129	
June	468	376	41	1	51	204	
July	494	457	50	1	-13	240	
August	549	460	48	1	40	242	
September	468	414	43	1	10	225	

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Home | Input Baseline Year Water Use | **Baseline Year Water Use Profile** | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

3 - Baseline Year (2020) Water Use Profile

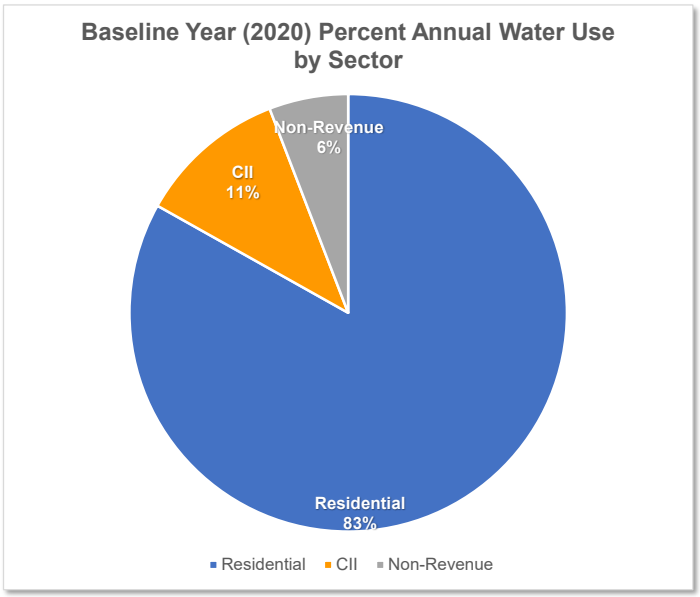
Bear Gulch

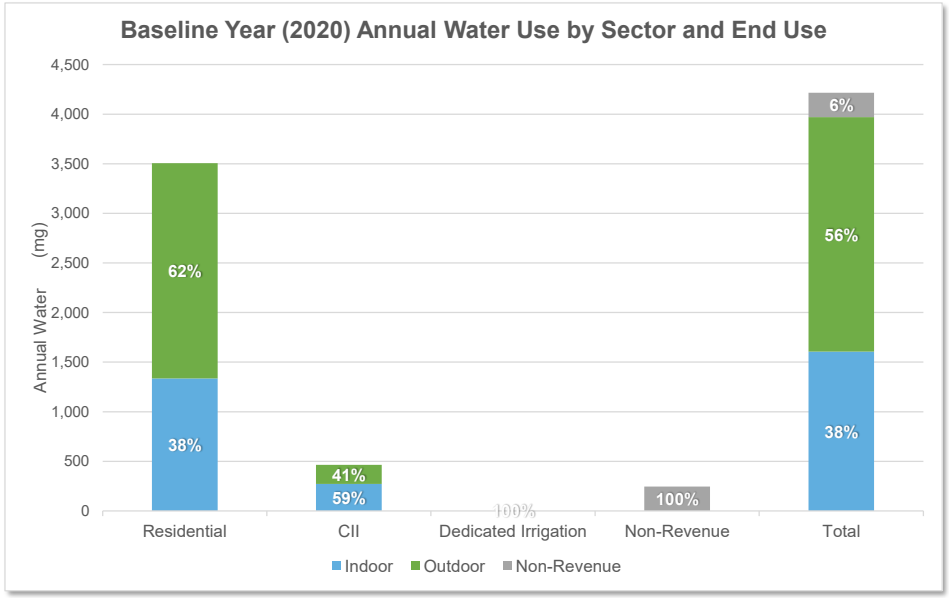
Baseline Year (2020) Annual Water Use Summary

Units: (mg)

A summary of your Baseline Year water use by sector and major end use category is shown below. Select the units in which your production and use data are displayed.

Water Use	Total Production (mg)	Water Use (mg)				Comments
		Residential	CII	Dedicated Irrigation	Non-Revenue	
Total	4,217	3,506	464	0	247	
Total Indoor	1,607	1,335	272	--	--	
Total Outdoor	2,363	2,171	193	0	--	
Total Non-Revenue	247	--	--	--	247	
Total Indoor %	38%	38%	59%	0%	--	
Total Outdoor %	56%	62%	41%	100%	--	
Total Non-Revenue %	6%	--	--	--	100%	





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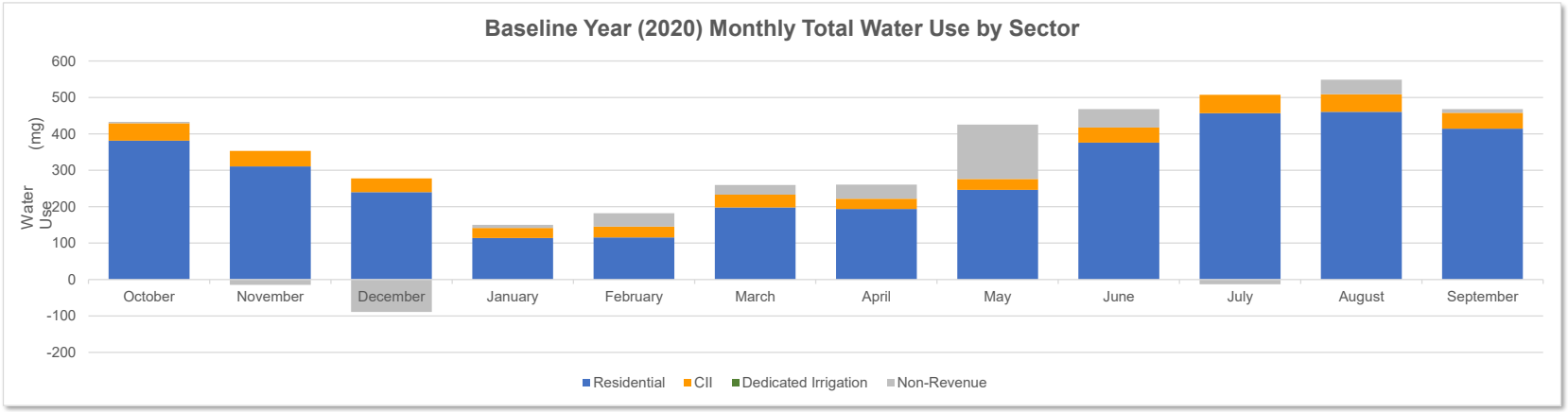
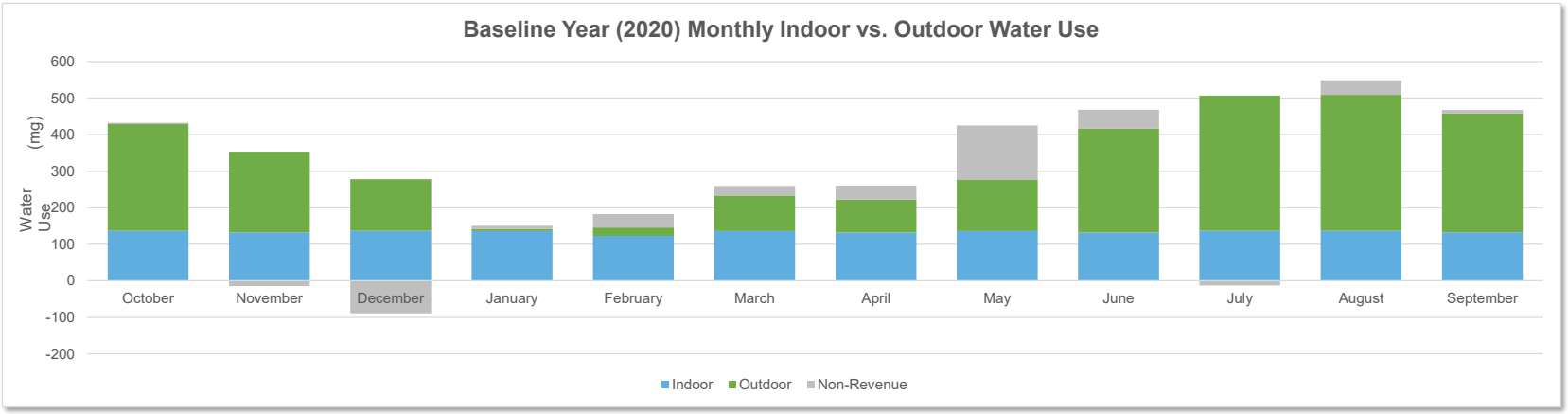
Home | Input Baseline Year Water Use | **Baseline Year Water Use Profile** | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

3 - Baseline Year (2020) Water Use Profile

Bear Gulch





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Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | **Estimated Water Savings** | Drought Response Tracking

5 - Estimated Water Savings - Stage 1

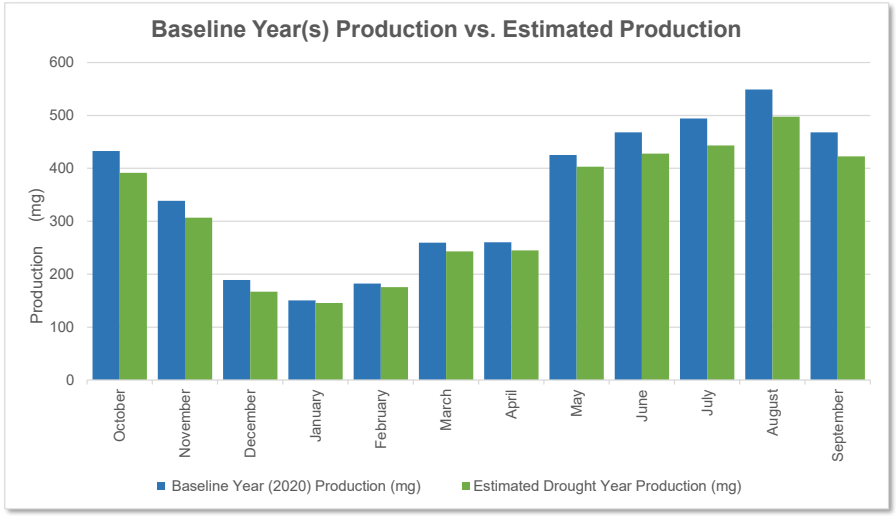
Bear Gulch

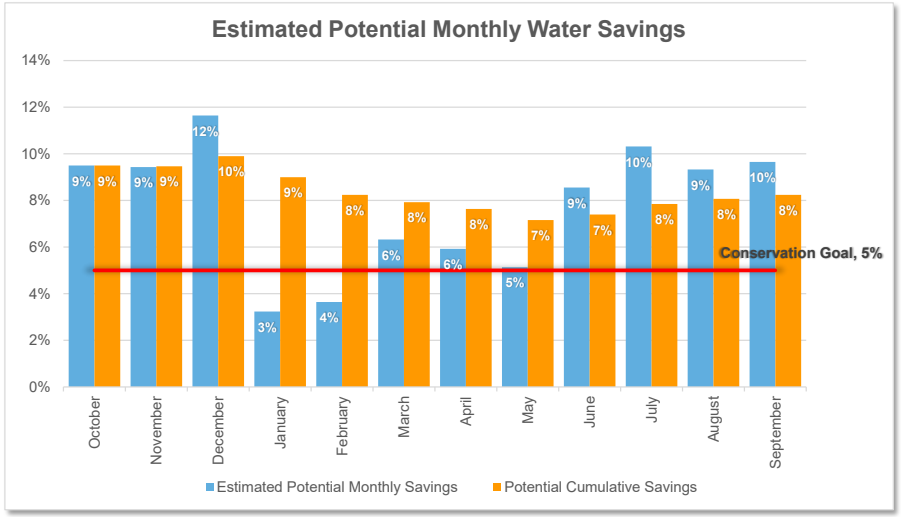
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2020) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
October	433	391	9%	9%	5%	
November	339	307	9%	9%	5%	
December	189	167	12%	10%	5%	
January	150	145	3%	9%	5%	
February	182	176	4%	8%	5%	
March	259	243	6%	8%	5%	
April	260	245	6%	8%	5%	
May	425	403	5%	7%	5%	
June	468	428	9%	7%	5%	
July	494	443	10%	8%	5%	
August	549	498	9%	8%	5%	
September	468	423	10%	8%	5%	





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Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Bear Gulch

Enter Agency Information	
Agency Name	Bear Gulch
Total Population Served	61,480
Conservation Goal (%)	15%
Drought Stage	Stage 2
Number of Residential Accounts	17,134
Number of Commercial, Industrial, and Institutional (CII) Accounts	1,429
Number of Dedicated Irrigation Accounts	0
Baseline Year(s)	2020
Percentage of Residential Indoor Use During Minimum Month (%)	100%
Percentage of Comm-Gov Indoor Use During Minimum Month (%)	81%
Comments	BG

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Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | **Estimated Water Savings** | Drought Response Tracking

5 - Estimated Water Savings - Stage 2

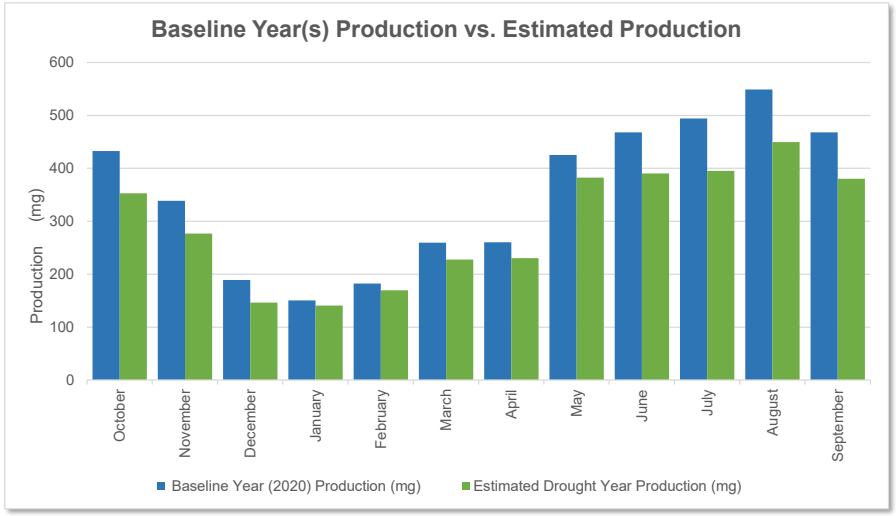
Bear Gulch

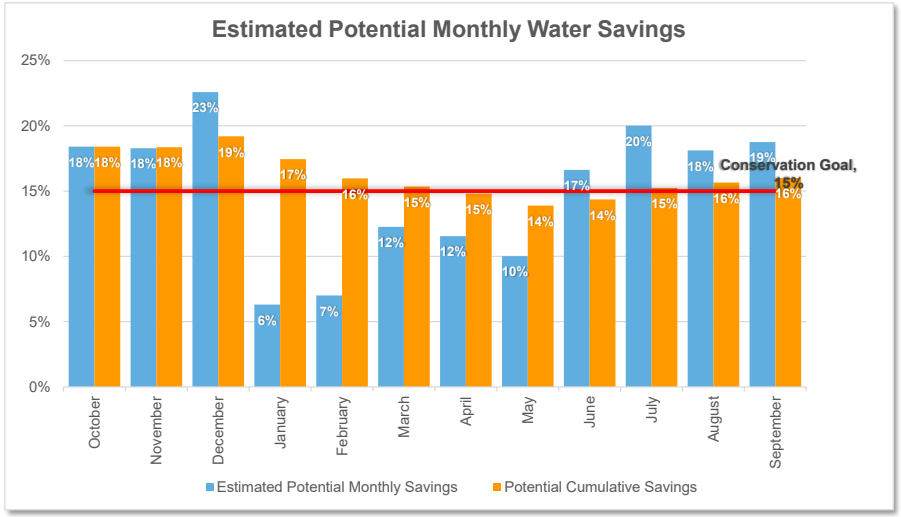
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2020) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
October	433	353	18%	18%	15%	
November	339	277	18%	18%	15%	
December	189	146	23%	19%	15%	
January	150	141	6%	17%	15%	
February	182	169	7%	16%	15%	
March	259	228	12%	15%	15%	
April	260	230	12%	15%	15%	
May	425	383	10%	14%	15%	
June	468	390	17%	14%	15%	
July	494	395	20%	15%	15%	
August	549	449	18%	16%	15%	
September	468	380	19%	16%	15%	





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Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Bear Gulch

Enter Agency Information	
Agency Name	Bear Gulch
Total Population Served	61,480
Conservation Goal (%)	25%
Drought Stage	Stage 3
Number of Residential Accounts	17,134
Number of Commercial, Industrial, and Institutional (CII) Accounts	1,429
Number of Dedicated Irrigation Accounts	0
Baseline Year(s)	2020
Percentage of Residential Indoor Use During Minimum Month (%)	100%
Percentage of Comm-Gov Indoor Use During Minimum Month (%)	81%
Comments	BG

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Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

5 - Estimated Water Savings - Stage 3

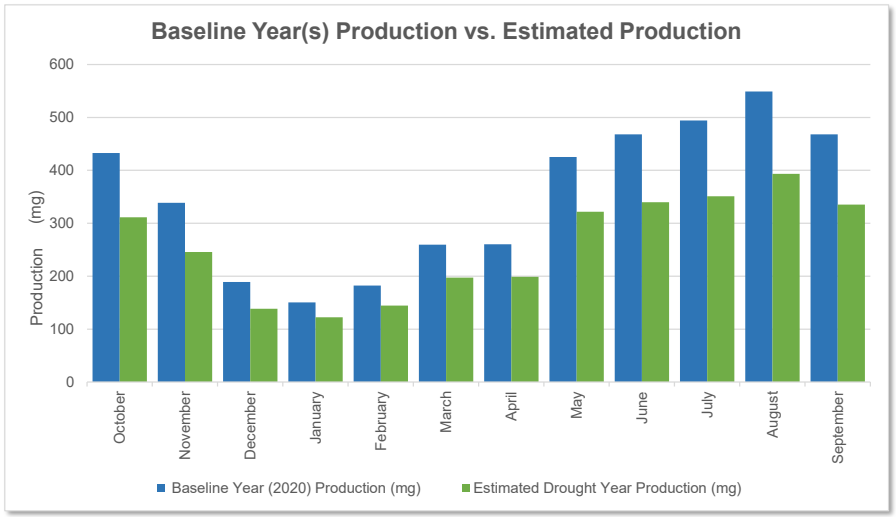
Bear Gulch

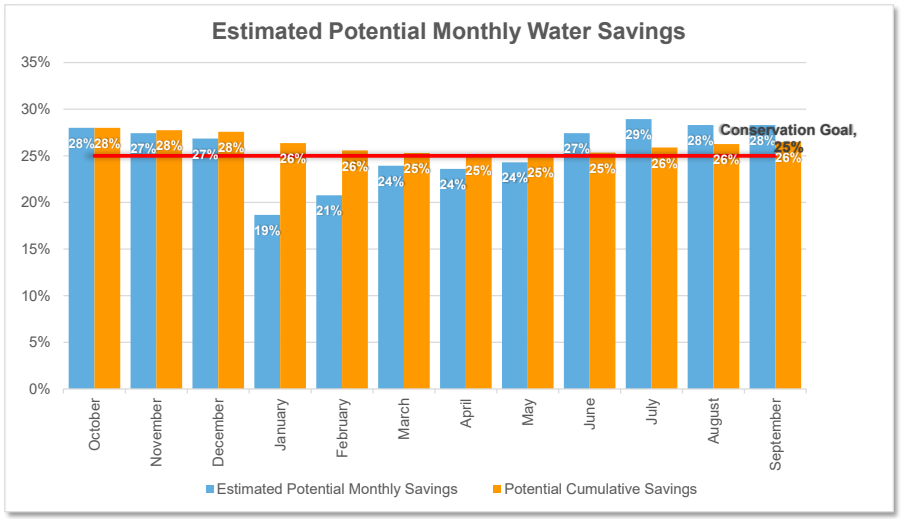
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2020) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
October	433	311	28%	28%	25%	
November	339	246	27%	28%	25%	
December	189	138	27%	28%	25%	
January	150	122	19%	26%	25%	
February	182	144	21%	26%	25%	
March	259	197	24%	25%	25%	
April	260	199	24%	25%	25%	
May	425	322	24%	25%	25%	
June	468	340	27%	25%	25%	
July	494	351	29%	26%	25%	
August	549	393	28%	26%	25%	
September	468	335	28%	26%	25%	





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Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Bear Gulch

Enter Agency Information	
Agency Name	Bear Gulch
Total Population Served	61,480
Conservation Goal (%)	35%
Drought Stage	Stage 4
Number of Residential Accounts	17,134
Number of Commercial, Industrial, and Institutional (CII) Accounts	1,429
Number of Dedicated Irrigation Accounts	0
Baseline Year(s)	2020
Percentage of Residential Indoor Use During Minimum Month (%)	100%
Percentage of Comm-Gov Indoor Use During Minimum Month (%)	81%
Comments	BG

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Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

5 - Estimated Water Savings - Stage 4

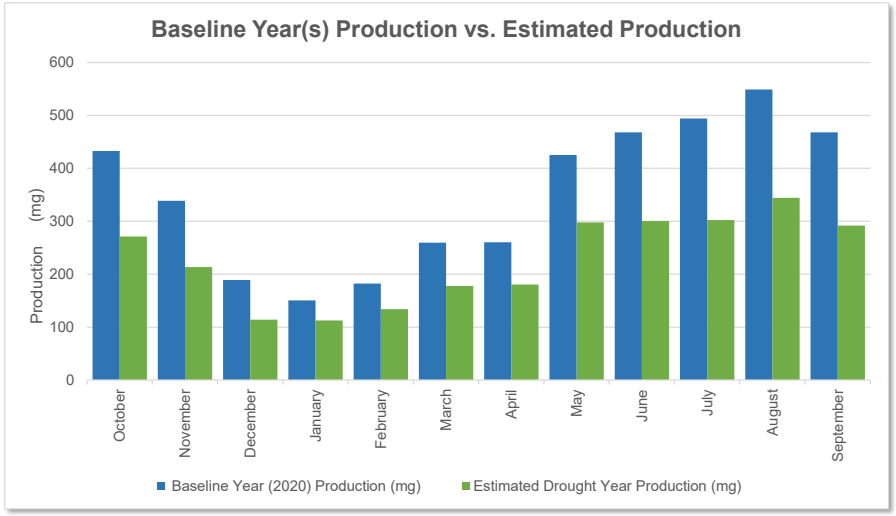
Bear Gulch

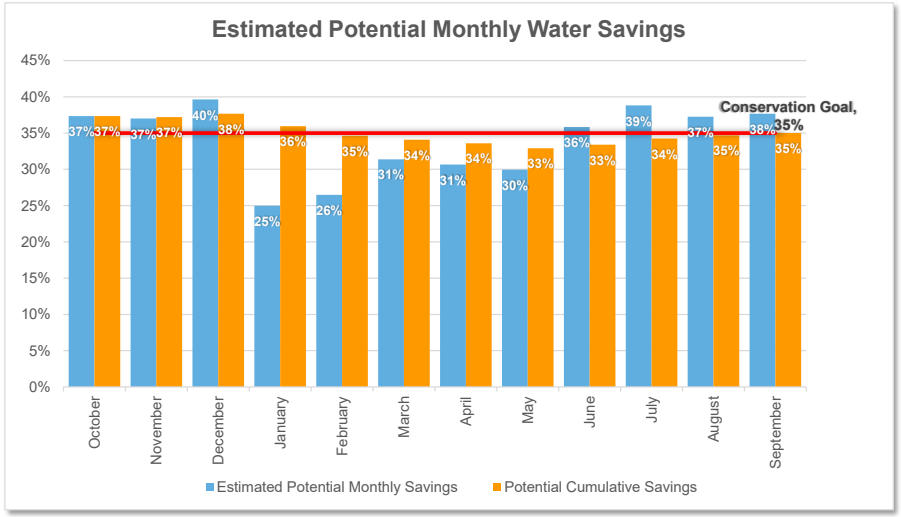
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2020) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
October	433	271	37%	37%	35%	
November	339	213	37%	37%	35%	
December	189	114	40%	38%	35%	
January	150	113	25%	36%	35%	
February	182	134	26%	35%	35%	
March	259	178	31%	34%	35%	
April	260	181	31%	34%	35%	
May	425	298	30%	33%	35%	
June	468	300	36%	33%	35%	
July	494	302	39%	34%	35%	
August	549	344	37%	35%	35%	
September	468	292	38%	35%	35%	





Drought Response Tool
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Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Bear Gulch

Enter Agency Information	
Agency Name	Bear Gulch
Total Population Served	61,480
Conservation Goal (%)	45%
Drought Stage	Stage 5
Number of Residential Accounts	17,134
Number of Commercial, Industrial, and Institutional (CII) Accounts	1,429
Number of Dedicated Irrigation Accounts	0
Baseline Year(s)	2020
Percentage of Residential Indoor Use During Minimum Month (%)	100%
Percentage of Comm-Gov Indoor Use During Minimum Month (%)	81%
Comments	BG

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Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | **Estimated Water Savings** | Drought Response Tracking

5 - Estimated Water Savings - Stage 5

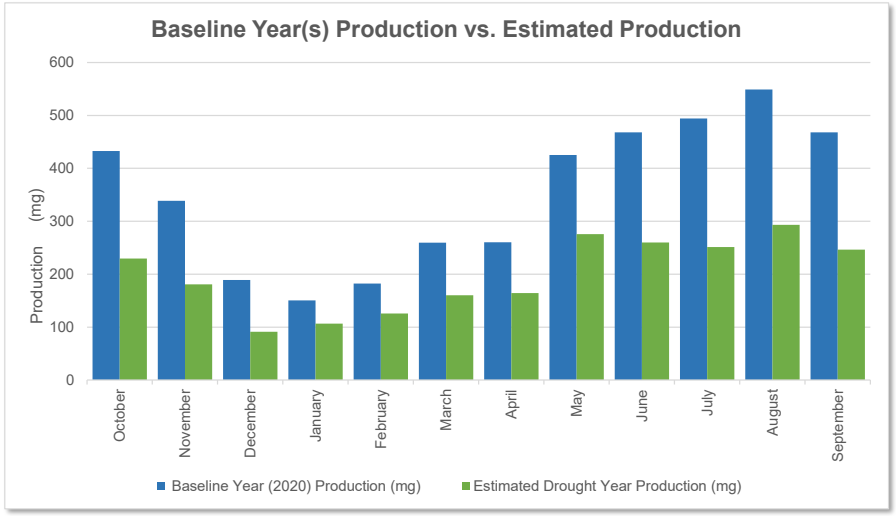
Bear Gulch

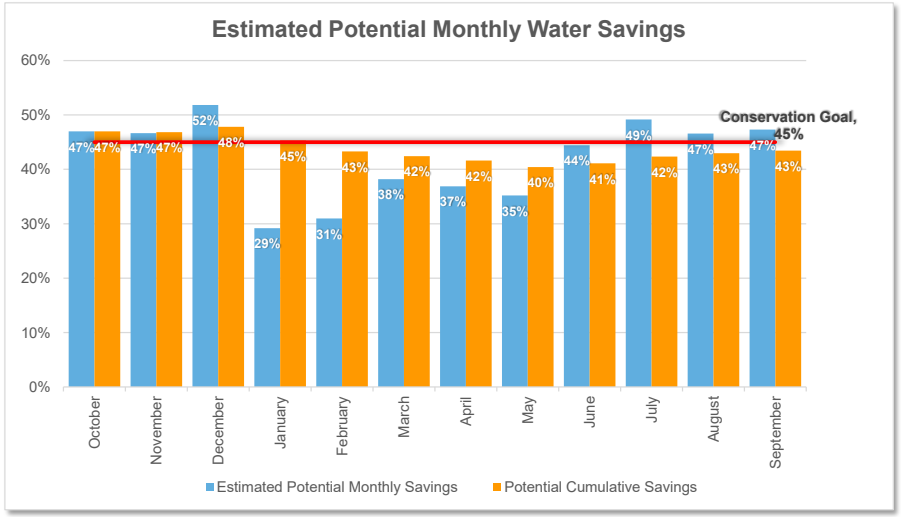
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2020) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
October	433	229	47%	47%	45%	
November	339	181	47%	47%	45%	
December	189	91	52%	48%	45%	
January	150	106	29%	45%	45%	
February	182	126	31%	43%	45%	
March	259	160	38%	42%	45%	
April	260	164	37%	42%	45%	
May	425	275	35%	40%	45%	
June	468	260	44%	41%	45%	
July	494	251	49%	42%	45%	
August	549	293	47%	43%	45%	
September	468	247	47%	43%	45%	





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Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Bear Gulch

Enter Agency Information	
Agency Name	Bear Gulch
Total Population Served	61,480
Conservation Goal (%)	55%
Drought Stage	Stage 6
Number of Residential Accounts	17,134
Number of Commercial, Industrial, and Institutional (CII) Accounts	1,429
Number of Dedicated Irrigation Accounts	0
Baseline Year(s)	2020
Percentage of Residential Indoor Use During Minimum Month (%)	100%
Percentage of Comm-Gov Indoor Use During Minimum Month (%)	81%
Comments	BG

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Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

5 - Estimated Water Savings - Stage 6

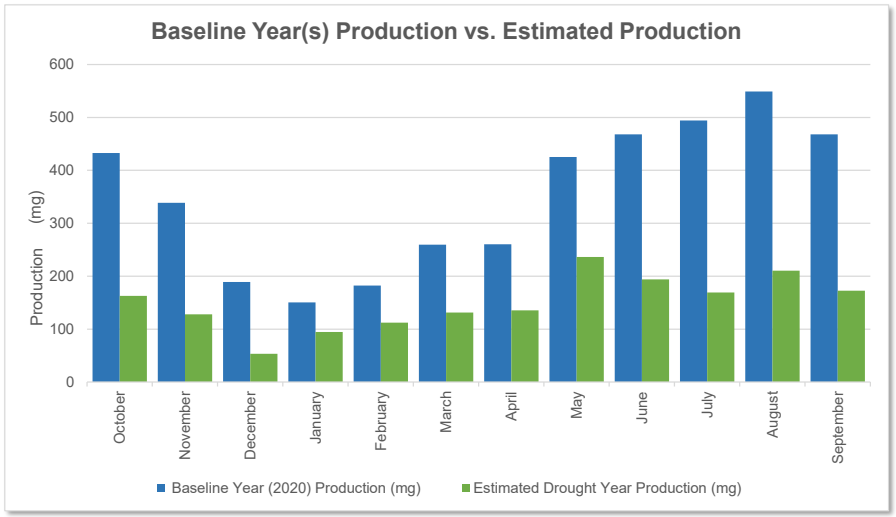
Bear Gulch

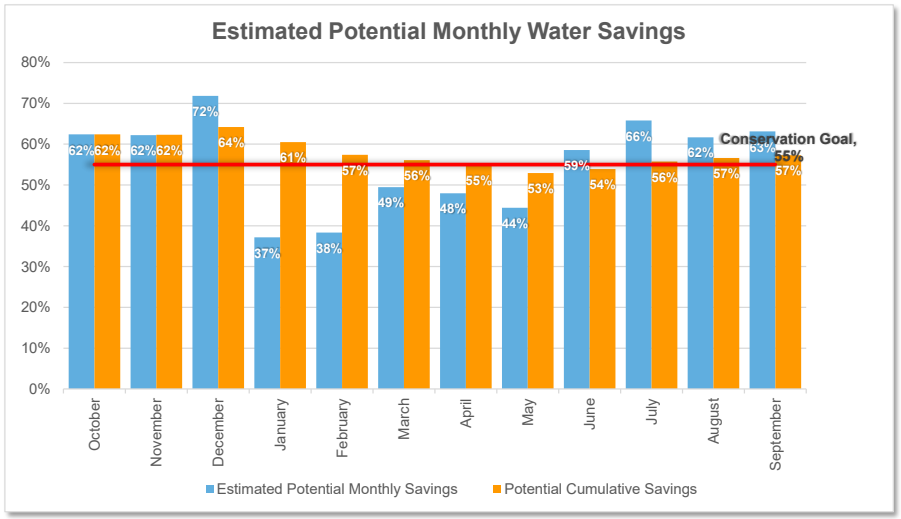
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2020) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
October	433	163	62%	62%	55%	
November	339	128	62%	62%	55%	
December	189	53	72%	64%	55%	
January	150	94	37%	61%	55%	
February	182	112	38%	57%	55%	
March	259	131	49%	56%	55%	
April	260	136	48%	55%	55%	
May	425	236	44%	53%	55%	
June	468	194	59%	54%	55%	
July	494	169	66%	56%	55%	
August	549	210	62%	57%	55%	
September	468	173	63%	57%	55%	





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Attachment C
CPUC Rule and Schedule 14.1

Rule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 1) (T)

A. APPLICABILITY (N)

1. This schedule applies to all of California Water Service's regulated ratemaking areas in California, as well as Grand Oaks Water.

B. GENERAL INFORMATION

1. All expenses incurred by utility to implement Rule 14.1, and Schedule 14.1, and requirements of the California State Water Resources Control Board ("Water Board") that have not been considered in a General Rate Case or other proceeding shall be accumulated by Cal Water in a separate memorandum account, authorized in Resolution W-4976, for disposition as directed or authorized from time to time by the Commission.
2. To the extent that a Stage of Mandatory Water Use Restrictions in Schedule 14.1 has been activated, and a provision in this Rule is inconsistent with the activated Stage in Schedule 14.1, the provisions of Schedule 14.1 apply.

C. DEFINITIONS

For the purposes of this Rule, the following terms have the meanings set forth in this section.

1. "Commercial nursery" means the use of land, buildings or structures for the growing and/or storing of flowers, fruit trees, ornamental trees, vegetable plants, shrubs, trees and similar vegetation for the purpose of transplanting, for use as stock or grafting, and includes the retail sale or wholesale distribution of such items directly from the premises/lot.
2. "Drip irrigation system" means a non-spray, low-pressure, and low volume irrigation system utilizing emission devices with a precipitation or flow rate measured in gallons per hour (GPH), designed to slowly apply small volumes of water at or near the root zone of plants or other landscaping.
3. "Flow rate" means the rate at which water flows through pipes, valves, and emission devices, measured in gallons per minute (GPM), gallons per hour (GPH), inches per hour (IPH), hundred cubic feet (Ccf), or cubic feet per second (CFS).
4. "Flow-restricting device" means valves, orifices, or other devices that reduce the flow of potable water through a service line, which are capable of passing a minimum of 3 Ccf per person, per month, based upon the U.S. Census calculation of the average number of people in a household in the area.
5. "High-efficiency sprinkler systems" means an irrigation system with emission devices, such as sprinkler heads or nozzles, with a precipitation or flow rate no greater than one IPH.
6. "Irrigation" means the application of potable water by artificial means to landscape.
7. "Irrigation system" means the components of a system meant to apply water to an area for the purpose of irrigation, including, but not limited to, piping, fittings, sprinkler heads or nozzles, drip tubing, valves, and control wiring.
8. "Landscape" means all of the outdoor planting areas, turf areas, and water features at a particular location.
9. "Measureable rainfall" means any amount of precipitation of more than one-tenth of an inch (0.1").
10. "Micro spray irrigation system" means a low-pressure, low-volume irrigation system utilizing emission devices that spray, mist, sprinkle, or drip with a precipitation or flow rate measured in GPH, designed to slowly apply small volumes of water to a specific area. (N)

(continued)

Rule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN (continued)

(T)

C. DEFINITIONS (Continued) (N)

11. "Ornamental landscape" means shrubs, bushes, flowers, ground cover, turf, lawns, and grass planted for the purpose of improving the aesthetic appearance of property, but does not include crops or other agricultural products or special landscape areas. |

12. "Ornamental turf" means a ground cover surface of grass that can be mowed and is planted for the purpose of improving the aesthetic appearance of the property, but does not include crops or other agricultural products or special landscape areas. |

13. "Plumbing fixture" means a receptacle or device that is connected to a water supply system, including, but not limited to, pipes, toilets, urinals, showerheads, faucets, washing machines, water heaters, tubs, and dishwashers. |

14. "Potable water" means water supplied by Cal Water which conforms to the federal and state standards for human consumption. |

15. "Properly programmed" means a smart irrigation controller that has been programmed according to the manufacturer's instructions and site-specific conditions. |

16. "Real-time water measurement device" means a device or system that provides regularly updated electronic information regarding the customer's water use. |

17. "Runoff" means water which is not absorbed by the soil or landscape to which it is applied and flows from the landscape onto other areas. |

18. "Smart irrigation controller" means an automatic device used to remotely control valves that operate an irrigation system that has been tested by an American National Standards Institute accredited third-party certifying body or laboratory in accordance with the Environmental Protection Agency's WaterSense program (or an analogous successor program), and certified by such body or laboratory as meeting the performance and efficiency requirements of such program, or the more stringent performance and efficiency requirements of another similar program. |

19. "Special landscape area" means an area of the landscape dedicated solely to edible plants and areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing surface. |

20. "Turf" means a ground cover surface of grass that can be mowed. |

21. "Water feature" means a design element where open, artificially supplied water performs an aesthetic or recreation feature, including, but not limited to, ponds, lakes, waterfalls, fountains, and streams. |

22. "Water use evaluation" means an evaluation of the efficiency of indoor water-using devices, including, but not limited to, measurement of flow rates for all existing showerheads, faucets, and toilets, inspection for leaks, and providing written recommendations to improve the efficiency of the indoor water-using fixtures and devices and/or an evaluation of the performance of an irrigation system, including, but not limited to, inspection for leaks, reporting of overspray or runoff, and providing written recommendations to improve the performance of the irrigation system. (N)

(continued)

This tariff has been approved by the California Public Utilities Commission.

Revised — Cal. P.U.C. Sheet No. xxxxx -W
Canceling — Cal. P.U.C. Sheet No. 10204 -W

Rule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 3) (T)

D. ENFORCEMENT (N)

Each Stage of this Rule establishes certain restrictions on the use of potable water. Violating the restrictions set forth in a particular Stage while it is in effect is declared a non-essential, wasteful use of potable water. Subject to the schedule and conditions outlined below, Cal Water is authorized to install a flow-restricting device on the service line of any customer when its personnel verify a customer is using potable water for non-essential, wasteful uses. No person shall have any right or claim in law or in equity, against Cal Water because of, or as a result of, any matter or thing done or threatened to be done pursuant to the restrictions on using potable water for non-essential, wasteful uses.

1. FIRST VIOLATION: Cal Water shall provide the customer with a written notice of violation.

2. SECOND VIOLATION: If Cal Water verifies that the customer has used potable water for non-essential, wasteful uses after having been notified of the first violation, Cal Water shall provide the customer with a second written notice of violation and is authorized to install a flow-restricting device on the customer's service line. Cal Water shall not be held liable for any injuries, damages, and/or consequences arising from the installation of a flow restricting device.

3. NOTICES OF VIOLATION:

   A. Written notices of violation provided to customers pursuant to this Rule shall document the verified violation and alert the customer to the fact that future violations of the restricted uses of potable water may result in the installation of a flow-restricting device on the customer's service line or the discontinuation of the customer's service.

   B. If Cal Water elects to install a flow-restricting device on a customer's service line, the written notice of violation shall explain that a flow-restricting device has or will be installed on the customer's service line, document the steps the customer must take in order for the flow-restricting device to be removed, and explain that after the flow-restricting device is removed, it may be reinstalled, without further notice, if the customer is again verified by Cal Water's personnel to be using potable water for non-essential, wasteful uses.

4. FLOW RESTRICTING DEVICE CONDITIONS: The installation of a flow-restricting devide on a customer's service line is subject to the following conditions:

   a. The device shall be capable of providing the premise with a minimum of 3 Ccf per person, per month, based upon the U.S. Census calculation of the average number of people in a household in the area.

   b. The device may only be removed by Cal Water, and only after a minimum three-day period has elapsed.

   c. Any tampering with the device may result in the discontinuation of the customer's water service and the customer being charged for any damage to Cal Water's equipment or facilities and any required service visits. (N)

(continued)

This tariff has been approved by the California Public Utilities Commission.

New — Cal. P.U.C. Sheet No. xxxxx -W

Canceling — Cal. P.U.C. Sheet No. 10205 -W

Rule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 4) (T)

D. ENFORCEMENT (Continued) (N)

d. After the removal of the device, if Cal Water verifies that the customer is using potable water for non-essential, wasteful uses, Cal Water may install another flow-restricting device without prior notice. This device may remain in place until water supply conditions warrant its removal. If, despite the installation of the device, Cal Water verifies that the customer is using potable water for non-essential and, unauthorized wasteful uses, then Cal Water may discontinue the customer's water service, as provided in its Rule No. 11.

5. FLOW-RESTRICTING DEVICE REMOVAL CHARGES: The charge to customers for removal of a flow-restricting device installed pursuant to this Rule is $100 during normal business hours, and $150 for the device to be removed outside of normal business hours.

E. WASTEFUL USES OF WATER

Except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency, customers are prohibited, at all times, from using potable water for the following actions, as each is declared a non-essential, wasteful use of water:

1. Use of potable water through a broken or defective plumbing fixture or irrigation system when Cal Water has notified the customer in writing to repair the broken or defective plumbing fixture or irrigation system, and the customer has failed to effect such repairs within seven (7) business days of receipt of such notice;
2. The application of potable water to landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures;
3. The use of a hose that dispenses potable water to wash vehicles, including cars, trucks, buses, boats, aircraft, and trailers, whether motorized or not, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use.

F. MANDATORY STAGED RESTRICTIONS OF WATER USE

1. ADOPTION OF STAGED MANDATORY RESTRICTIONS: Cal Water may implement the following staged mandatory restrictions of water use, after notifying the Director of the Commission's Division of Water and Audits (DWA), by a Tier 1 advice letter in both hard-copy and emailed formats, of Cal Water's intent to implement a particular stage, if:
   a. Water supplies are projected to be insufficient to meet normal customer demand by Cal Water; or
   b. A water supply shortage or threatened shortage exists; or
   c. Water supplies are curtailed by a wholesale water supplier; or
   d. Directed to do so under a duly adopted emergency regulation by the Commission or other authorized government agencies. (N)

(continued)

This tariff has been approved by the California Public Utilities Commission.

New — Cal. P.U.C. Sheet No. _____

Canceling — Cal. P.U.C. Sheet No. _____

Rule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 5)

F. MANDATORY STAGED RESTRICTIONS OF WATER USE (Continued)

2. PUBLIC NOTICE: Thirty (30) days prior to implementing a mandatory staged reduction in water use in this Rule, Cal Water shall notify its customer of the requirements of the particular stage implemented by Cal Water by bill insert, direct mailing, email, or bill message directing the customer to additional information on Cal Water's website.

3. STAGE 1 WATER SHORTAGE: A Stage 1 Water Shortage occurs when Cal Water, the Commission, a wholesale water supplier, or other authorized government agency determines that measures are needed to reduce water consumption by customers served by public water suppliers. In addition to the prohibitions outlined in **Section E**, the following restrictions may be imposed by Cal Water, except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency:

   a. Outdoor Irrigation Restrictions (Stage 1)

      i. Irrigating ornamental landscapes with potable water is limited to no more than **three (3) days** per week, on a schedule established and posted by Cal Water on its website or otherwise provided to customers by bill message, bill insert, direct mail, or email, or as follows:

         1. Customers with even-numbered addresses may irrigate on Saturdays, Tuesdays, and Thursdays.

         2. Customers with odd-numbered addresses may irrigate on Sundays, Wednesdays, and Fridays.

         3. Customers without a street address may irrigate on Saturdays, Tuesdays, and Thursdays.

         4. Notwithstanding the foregoing restrictions, irrigation of special landscape areas or commercial nurseries may occur as needed, provided that the customer who wishes to irrigate a special landscape area or commercial nursery presents Cal Water with a plan to achieve water use reductions commensurate with those that would be achieved by complying with foregoing restrictions.

         5. Notwithstanding the foregoing restrictions, when a city, county, or other local public agency in one of Cal Water's service areas duly adopts restrictions on the number of days or hours of the day that customers may irrigate which are different than those adopted by Cal Water, Cal Water may enforce the city, county, or other local public agency's restrictions.

      ii. Irrigating ornamental landscape with potable water is prohibited during the hours between **8:00 a.m. and 6:00 p.m**.

      iii. The foregoing restrictions do **not** apply to:

         1. Landscape irrigation zones that exclusively use drip irrigation systems and/or micro spray irrigation system; (N)

(continued)

Rule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 6)

F. MANDATORY STAGED RESTRICTIONS OF WATER USE (Continued)

[Stage 1 (cont.)]

2. Irrigating ornamental landscapes with the use of a hand-held bucket or similar container, with a continuously monitored hose which is fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored, or for the express purpose of adjusting or repairing an irrigation system.

b. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing fixture(s) or irrigation system(s) must be repaired within **five (5) business days** of written notification by Cal Water, unless other arrangements are made with Cal Water.

c. **Prohibited** Uses of Water: Customers are prohibited from using potable water for the following actions:

i. The application of potable water to driveways and sidewalks;

ii. The use of potable water in a water feature, except where the water is part of a recirculating system;

iii. The application of potable water to outdoor landscapes during and within forty-eight (48) hours after measurable rainfall.

d. Other duly adopted restrictions on the use potable water as prescribed from time to time by the Commission or other authorized government agencies are incorporated herein by reference.

4. STAGE 2 WATER SHORTAGE: A Stage 2 Water Shortage occurs when the Stage 1 Water Shortage restrictions are deemed insufficient to achieve identified water use goals established by Cal Water, the Commission, a wholesale water supplier, or other authorized government agency. In addition to the prohibited wasteful water use practices listed in Section D, the following restrictions may be imposed by Cal Water, except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency. Differences from or additions to the previous Stage are underlined.

a. Outdoor Irrigation Restrictions (Stage 2)

i. Irrigating ornamental landscapes with potable water is limited to no more than **three (3) days** per week, on a schedule established and posted by Cal Water on its website or otherwise provided to customers by bill message, bill insert, direct mail, or email, or as follows:

1. Customers with even-numbered addresses may irrigate on Saturdays, Tuesdays, and Thursdays.

2. Customers with odd-numbered addresses may irrigate on Sundays, Wednesdays, and Fridays. (N)

(continued)

Rule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 7)

F. MANDATORY STAGED RESTRICTIONS OF WATER USE (Continued)

[Stage 2 (cont.)]

3. Customers without a street address may irrigate on Saturdays, Tuesdays, and Thursdays.

4. Notwithstanding the foregoing restrictions, irrigation of special landscape areas or commercial nurseries may occur as needed, provided that the customer who wishes to irrigate a special landscape area or commercial nursery presents Cal Water with a plan to achieve water use reductions commensurate with those that would be achieved by complying with foregoing restrictions.

5. Notwithstanding the foregoing restrictions, when a city, county, or other public agency in one of Cal Water's service areas duly adopts restrictions on the number of days or hours of the day that customers may irrigate which are different than those adopted by Cal Water, Cal Water may enforce the city, county, or other local public agency's restrictions.

ii. Irrigating ornamental landscape with potable water is prohibited during the hours between **8:00 a.m. and 6:00 p.m.**

iii. The foregoing restrictions do **not** apply to:

1. Landscape irrigation zones that exclusively use drip irrigation systems and/or micro spray irrigation system;

2. Irrigating ornamental landscapes with the use of a hand-held bucket or similar container, a continuously monitored hose which is fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored, or for the express purpose of adjusting or repairing an irrigation system.

b. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing fixture(s) or irrigation system(s) must be repaired within **three (3) business days** of written notification by Cal Water, unless other arrangements are made with Cal Water.

c. **Prohibited** Uses of Water: Customers are prohibited from using potable water for the following actions:

i. The application of potable water to driveways and sidewalks;

ii. The use of potable water in a water feature, except where the water is part of a recirculating system;

iii. The application of potable water to outdoor landscapes during and within forty-eight (48) hours after measurable rainfall;

iv. The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased; (N)

(continued)

This tariff has been approved by the California Public Utilities Commission.

Rule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 8)

F. MANDATORY STAGED RESTRICTIONS OF WATER USE (Continued)

[Stage 2 (cont.)]

v. Irrigation of ornamental landscape on public street medians;

vi. Irrigation outside of newly constructed homes and buildings with potable water in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.

d. Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guest room using clear and easily understood language.

e. Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds with potable water is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to the implementation of any staged mandatory restrictions of water use as described in this Rule.

f. Other duly adopted restrictions on the use of potable water as prescribed from time to time by the Commission or other authorized government agencies are incorporated herein by reference.

5. STAGE 3 WATER SHORTAGE: A Stage 3 Water Shortage occurs when the Stage 2 Water Shortage restrictions are deemed insufficient to achieve identified water use goals established by Cal Water, the Commission, a wholesale water supplier, or other authorized government agency. In addition to the prohibited wasteful water use practices listed in Section D, the following restrictions may be imposed by Cal Water, except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency. Differences from or additions to the previous Stages are underlined.

a. Outdoor Irrigation Restrictions

i. Irrigating ornamental landscapes with potable water is limited to no more than **two (2) days** per week, on a schedule established and posted by Cal Water on its website or otherwise provided to customers by bill message, bill insert, direct mail, or email, or as follows:

1. Customers with even-numbered addresses may irrigate on Saturdays and Tuesdays (previous Stages allowed Thursdays as well).
2. Customers with odd-numbered addresses may irrigate on Sundays and Wednesdays (previous Stages allowed Fridays as well).
3. Customers without a street address may irrigate on Saturdays and Tuesdays (previous Stages allowed Thursdays as well). (N)

(continued)

This tariff has been approved by the California Public Utilities Commission.

New — Cal. P.U.C. Sheet No. _____

Canceling — Cal. P.U.C. Sheet No. _____

Rule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 9)

F. MANDATORY STAGED RESTRICTIONS OF WATER USE (Continued)

[Stage 3 (cont.)]

4. Notwithstanding the foregoing restrictions, irrigation of special landscape areas or commercial nurseries may occur as needed, provided that the customer who wishes to irrigate a special landscape area or commercial nursery presents Cal Water with a plan to achieve water use reductions commensurate with those that would be achieved by complying with foregoing restrictions.

5. Notwithstanding the foregoing restrictions, when a city, county, or other local public agency in one of Cal Water's service areas duly adopts restrictions on the number of days or hours of the day that customers may irrigate which are different than those adopted by Cal Water, Cal Water may enforce the city, county, or other local public agency's restrictions.

ii. Irrigating ornamental landscape with potable water is prohibited during the hours between **8:00 a.m. and 6:00 p.m.**

iii. The foregoing restrictions do **not** apply to:

1. Landscape irrigation zones that exclusively use drip irrigation systems and/or micro spray irrigation system;

2. Irrigating ornamental landscapes with the use of a hand-held bucket or similar container, a continuously monitored hose which is fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored, or for the express purpose of adjusting or repairing an irrigation system.

b. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing fixtures and/or irrigation system must be repaired within **two (2) business days** of written notification by Cal Water, unless other arrangements are made with Cal Water.

c. **Prohibited** Uses of Water: Customers are prohibited from using potable water for the following actions:

i. The application of potable water to driveways and sidewalks;

ii. The use of potable water in a water feature, except where the water is part of a recirculating system;

iii. The application of potable water to outdoor landscapes during and within forty-eight (48) hours after measurable rainfall;

iv. The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased;

v. Irrigation of ornamental turf on public street medians;

vi. Irrigation outside of newly constructed homes and buildings with potable water in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.

vii. Use of potable water for street cleaning with trucks, except for initial wash-down for construction purposes (if street sweeping is not feasible); (N)

(continued)

This tariff has been approved by the California Public Utilities Commission.

New — Cal. P.U.C. Sheet No. _____

Canceling — Cal. P.U.C. Sheet No. _____

Rule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 10)

F. MANDATORY STAGED RESTRICTIONS OF WATER USE (Continued)

[Stage 3 (cont.)]

viii. Use of potable water for construction purposes, such as consolidation of backfill, dust control, or other uses unless no other source of water or other method can be used.

d. Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guest room using clear and easily understood language.

e. Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds with potable water is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to the implementation of any staged mandatory restrictions of water use as described in this Rule.

f. Other duly adopted restrictions on the use of potable water as prescribed from time to time by the Commission or other authorized government agencies are incorporated herein by reference.

6. STAGE 4 WATER SHORTAGE: A Stage 4 Water Shortage occurs when the Stage 3 Water Shortage restrictions are deemed insufficient to achieve identified water use goals established by Cal Water, the Commission, a wholesale water supplier, or other authorized government agency. In addition to the prohibited wasteful water use practices listed in Section D, the following restrictions may be imposed by Cal Water, except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency. Differences from or additions to the previous Stage are underlined.

a. Irrigating ornamental landscape with potable water is prohibited, except when a hand-held bucket or a similar container, or a continuously monitored hose which is fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored is used to maintain vegetation, including trees and shrubs.

b. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing fixtures or irrigation system must be repaired within **one (1) business day** of written notification by Cal Water, unless other arrangements are made with Cal Water.

Prohibited Uses of Water: Customers are prohibited from using potable water for the following actions:

i. The application of potable water to driveways and sidewalks;

ii. The use of potable water in a water feature, except where the water is part of a recirculating system;

iii. The application of potable water to outdoor landscapes during and within forty-eight (48) hours after measurable rainfall; (N)

(continued)

Rule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 11)

F. MANDATORY STAGED RESTRICTIONS OF WATER USE (Continued)

[Stage 4 (cont.)]

iv. The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased;

[Note that items previously identified as (v) and (vi) in Stage 3 have been eliminated.]

v. Use of potable water for street cleaning with trucks (the previous Stage allowed certain exceptions);

vi. Use of potable water for construction purposes, such as consolidation of backfill, dust control, or other uses (the previous Stage allowed certain exceptions).

c. Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guest room using clear and easily understood language.

d. Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds with potable water is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to the implementation of any staged mandatory restrictions of water use as described in this Rule.

f. Other duly adopted restrictions on the use of utility-supplied potable water as prescribed from time to time by the Commission or other authorized government agencies, commissions, or officials are incorporated herein by reference.

G. ADOPTION OF STAGED MANDATORY WATER USE REDUCTIONS (for Schedule 14.1)

1. ADDITION OF SCHEDULE 14.1: If, in the opinion of Cal Water, more stringent water conservation measures are required due to supply conditions or government directive, Cal Water may request the addition of a Schedule No. 14.1 – Staged Mandatory Water Use Reductions, via a Tier 2 advice letter.

   A. Cal Water may not activate Schedule No. 14.1 until it has been authorized to do so by the California Public Utilities Commission, as delegated to its Division of Water and Audits.

   B. A Schedule No. 14.1 that has been authorized by the California Public Utilities Commission shall remain dormant until triggered by specific conditions detailed in the Schedule 14.1 tariff and Cal Water has requested and received authorization for activating a stage by the California Public Utilities Commission. (N)

(continued)

This tariff has been approved by the California Public Utilities Commission.

New

Canceling

Cal. P.U.C. Sheet No. _____

Cal. P.U.C. Sheet No. _____

Rule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 12)

G. ADOPTION OF STAGED MANDATORY WATER USE REDUCTIONS (for Schedule 14.1) (continued)

c. Notice of the Tier 2 advice letter and associated public participation hearing, if required, shall be provided to customers through a bill insert or a direct mailing, as set forth in Subsection 5 (Public Notice) below.

d. Cal Water shall comply with all requirements of Sections 350-358 of the California Water Code.

e. The Tier 2 advice letter requesting the addition of a Schedule No. 14.1 shall include, but not be limited to:

i. A proposed Schedule No. 14.1 tariff, which shall include but not be limited to:

1. Applicability,
2. Territory applicable to,
3. A detailed description of each stage of water budgets (the number of stages requested for a ratemaking area may vary depending on the specifics of the water shortage event),
4. A detailed description of the trigger(s) that activates each stage of water budgets,
5. A detailed description of each water use restriction for each stage of water budgets,
6. Water use violation levels, written warning levels, associated fines, if applicable, and exception procedures,
7. Conditions for installation of a flow restrictor,
8. Charges for removal of flow restrictors, and
9. Special conditions

ii. Justification for, and documentation and calculations in support of the water budgets.

2. Conditions for Activating Schedule No. 14.1: Cal Water may file a Tier 1 advice letter to request activation of a particular stage of its Schedule No. 14.1 tariff if:

a. Cal Water, the California Public Utilities Commission, wholesale water supplier, or other government agency declares an emergency requiring mandatory water budgets, mandatory water rationing, or mandatory water allocations; or

b. A government agency declares a state of emergency in response to severe drought conditions, earthquake or other catastrophic event that severely reduces Cal Water's water supply; or

c. Cal Water is unable to achieve water conservation targets set by itself; or

d. Water conservation targets set by itself or a governing agency are insufficient; or

e. Cal Water chooses to subsequently activate a different stage of its Schedule No. 14.1 tariff.

(continued)

This tariff has been approved by the California Public Utilities Commission.

New — Cal. P.U.C. Sheet No.

Canceling — Cal. P.U.C. Sheet No.

Rule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 13)

G. ADOPTION OF STAGED MANDATORY WATER USE REDUCTIONS (for Schedule 14.1) (continued)

a. Include, but not be limited to, a justification for activating the particular stage of mandatory water use reductions, as well as the period during which the particular stage will be in effect.

b. Be accompanied by the customer notification measures detailed in sub-section 5 (Public Notice) below.

4. De-Activating Schedule No. 14.1: When Schedule No. 14.1 is activated and Cal Water determines that water supplies are again sufficient to meet normal demands, and mandatory water use reductions are no longer necessary, Cal Water shall seek the approval of the California Public Utilities Commission, via a Tier 1 advice letter, to de-activate the particular stage of mandatory water use reductions that had been authorized.

5. Public Notice

a. When Cal Water requests the addition of a Schedule 14.1 – Staged Mandatory Water Use Reductions Tariff, via a Tier 2 advice letter, it shall provide notice of the Tier 2 advice letter and associated public hearing provided to customers through bill inserts or direct mailing, and it shall comply with all requirements of Sections 350-358 of the California Water Code (CWC), including but not limited to the following:

i. In order to be in compliance with both the General Order 96-B and CWC, notice shall be provided via both newspaper and bill insert/direct mailing.

ii. One notice shall be provided for each advice letter filed, that includes both notice of the filing of the Tier 2 advice letter as well as the details of the public hearing (date, time, place, etc.).

iii. The public meeting shall be held after the Tier 2 advice letter is filed, and before the Commission authorizes the addition of Schedule 14.1 to the tariff except in cases of emergency water shortages approved by DWA.

iv. Cal Water shall consult with Division of Water and Audits staff prior to filing advice letter, in order to determine details of public meeting.

b. In the event that Schedule No. 14.1- Staged Mandatory Water Use Reductions Tariff is triggered, and Cal Water requests activation through the filing of a Tier 1 advice letter, Cal Water shall notify its customers and provide each customer with a summary of Schedule No. 14.1 by means of bill insert or direct mailing. Notification shall take place prior to imposing any penalties associated with this plan. If activation of Schedule No. 14.1 occurs one year or more since the public hearing associated with adding Schedule 14.1 to its tariffs, then Cal Water shall conduct a public hearing pursuant to California Water Code Section 351 prior to activating a stage of its Mandatory Water Use Reduction Tariff.

c. During the period that a stage of Schedule No. 14.1 is activated, Cal Water shall provide customers with updates in at least every other bill, regarding its water supply status and the results of customers' conservation efforts. (N)

[end]

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Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES

A. APPLICABILITY

1. This schedule applies to all of California Water Service's regulated ratemaking areas in California, as well as Grand Oaks Water.

B. GENERAL INFORMATION

1. All expenses incurred by California Water Service to implement Rule 14.1, and Schedule 14.1, and requirements of the California State Water Resources Control Board ("Water Board") that have not been considered in a General Rate Case or other proceeding shall be accumulated by Cal Water in a separate memorandum account, authorized in Resolution W-4976, for disposition as directed or authorized from time to time by the Commission.
2. All monies collected by Cal Water through waste of water penalties established in this schedule shall be recorded in the appropriate memorandum account and used to offset the expenses described in Section 1 above.
3. Except in the case of Grand Oaks, all monies collected by Cal Water through drought surcharges, as established by the Mandatory Water Budgets found in Schedule 14.1, shall be recorded in the appropriate Water Revenue Adjustment Mechanism ("WRAM") account and used to offset under-collected revenues.
4. To the extent that any provision in this Schedule is inconsistent with Rule 14.1, the provisions of this Schedule apply. (D)
5. On April 1, 2015, the Governor of the State of California issued Executive Order B-29-15 due to severe drought conditions. The Executive Order, among other requirements, directs the State Water Resources Control Board ("Water Board") to impose restrictions on urban water suppliers like Cal Water to achieve a statewide 25% reduction in potable urban usage, as compared with the amount used in 2013, through February 2016. (L) (D)

   Urban water suppliers must develop rate structures and other pricing mechanisms, such as surcharges and penalties, to achieve 25% water conservation. (L)
6. On May 5, 2015, the Water Board issued an Emergency Regulation by Resolution No. 2015-0032 due to continuing drought conditions with specific water use reductions, by service area, and prohibitions on how end-use customers can use potable water. On May 7, 2015, the California Public Utilities Commission ("Commission") issued Resolution W-5041 ordering compliance with the mandates of the Governor and the Water Board. (L)
7. On November 13, 2015, the Governor of the State of California issued Executive Order B-36-15 that directed the Water Board to, if drought conditions persist through January 2016, extend until October 31, 2016 restrictions to achieve a statewide reduction in potable usage. (N)
8. On February 2, 2016, the Water Board adopted an extended and revised Emergency Regulation due to continuing drought conditions. On February 11, 2016, the Commission issued Resolution W-5082 ordering compliance with the mandates of the Governor and the Water Board. (N)

C. DEFINITIONS

For the purposes of this Schedule, the following terms have the meanings set forth in this section.
(These are the same as in Rule 14.1, unless otherwise specified.)

1. "Commercial nursery" means the use of land, buildings or structures for the growing and/or storing of flowers, fruit trees, ornamental trees, vegetable plants, shrubs, trees and similar vegetation for the purpose of transplanting, for use as stock or grafting, and includes the retail sale or wholesale distribution of such items directly from the premises/lot.

(continued)

CALIFORNIA WATER SERVICE COMPANY
1720 North First Street, San Jose, CA 95112
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Schedule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES

C. DEFINITIONS (Continued)

2. "Drip irrigation system" means a non-spray, low-pressure, and low volume irrigation system utilizing emission devices with a precipitation or flow rate measured in gallons per hour (GPH), designed to slowly apply small volumes of water at or near the root zone of plants or other landscaping.
3. "Flow rate" means the rate at which water flows through pipes, valves, and emission devices, measured in gallons per minute (GPM), gallons per hour (GPH), inches per hour (IPH), hundred cubic feet (Ccf), or cubic feet per second (CFS).
4. "Flow-restricting device" means valves, orifices, or other devices that reduce the flow of potable water through a service line, which are capable of passing a minimum of 3 Ccf per person, per month, based upon the U.S. Census calculation of the average number of people in a household in the area.
5. "High-efficiency sprinkler systems" means an irrigation system with emission devices, such as sprinkler heads or nozzles, with a precipitation or flow rate no greater than one IPH.
6. "Irrigation" means the application of potable water by artificial means to landscape.
7. "Irrigation system" means the components of a system meant to apply water to an area for the purpose of irrigation, including, but not limited to, piping, fittings, sprinkler heads or nozzles, drip tubing, valves, and control wiring.
8. "Landscape" means all of the outdoor planting areas, turf areas, and water features at a particular location.
9. "Measureable rainfall" means any amount of precipitation of more than one-tenth of an inch (0.1").
10. "Micro spray irrigation system" means a low-pressure, low-volume irrigation system utilizing emission devices that spray, mist, sprinkle, or drip with a precipitation or flow rate measured in GPH, designed to slowly apply small volumes of water to a specific area.
11. "Ornamental landscape" means shrubs, bushes, flowers, ground cover, turf, lawns, and grass planted for the purpose of improving the aesthetic appearance of property, but does not include crops or other agricultural products or special landscape areas.
12. "Ornamental turf" means a ground cover surface of grass that can be mowed and is planted for the purpose of improving the aesthetic appearance of the property, but does not include crops or other agricultural products or special landscape areas.
13. "Plumbing fixture" means a receptacle or device that is connected to a water supply system, including, but not limited to, pipes, toilets, urinals, showerheads, faucets, washing machines, water heaters, tubs, and dishwashers.
14. "Potable water" means water supplied by Cal Water which conforms to the federal and state standards for human consumption.
15. "Properly programmed" means a smart irrigation controller that has been programmed according to the manufacturer's instructions and site-specific conditions.
16. "Real-time water measurement device" means a device or system that provides regularly updated electronic information regarding the customer's water use.
17. "Runoff" means water which is not absorbed by the soil or landscape to which it is applied and flows from the landscape onto other areas.
18. "Smart irrigation controller" means an automatic device used to remotely control valves that operate an irrigation system that has been tested by an American National Standards Institute accredited third-party certifying body or (N)

(continued)

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Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

C. DEFINITIONS (Continued)

laboratory in accordance with the Environmental Protection Agency's WaterSense program (or an analogous successor program), and certified by such body or laboratory as meeting the performance and efficiency requirements of such program, or the more stringent performance and efficiency requirements of another similar program.

19. "Special landscape area" means an area of the landscape dedicated solely to edible plants and areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing surface.
20. "Turf" means a ground cover surface of grass that can be mowed.
21. "Water feature" means a design element where open, artificially supplied water performs an aesthetic or recreation feature, including, but not limited to, ponds, lakes, waterfalls, fountains, and streams.
22. "Water use evaluation" means an evaluation of the efficiency of indoor water-using devices, including, but not limited to, measurement of flow rates for all existing showerheads, faucets, and toilets, inspection for leaks, and providing written recommendations to improve the efficiency of the indoor water-using fixtures and devices and/or an evaluation of the performance of an irrigation system, including, but not limited to, inspection for leaks, reporting of overspray or runoff, and providing written recommendations to improve the performance of the irrigation system.

D. WASTE OF WATER PENALTIES

Each Stage of this Schedule establishes certain restrictions on the use of potable water. Violating the restrictions set forth in a particular Stage while it is in effect is declared a non-essential, wasteful use of potable water. Cal Water is authorized to take the following actions when its personnel verify a customer is using potable water for non-essential, wasteful uses. No person shall have any right or claim in law or in equity, against Cal Water because of, or as a result of, any matter or thing done or threatened to be done pursuant to the restrictions on using potable water for non-essential, wasteful uses.

Note: When a Stage in this Schedule has been activated, Section D in this Schedule supersedes Section D (Enforcement) in Rule 14.1.

1. **FIRST VIOLATION:** Cal Water shall provide the customer with a written notice of violation. In addition, Cal Water is authorized to take the following actions:
   a. If the customer currently receives service through a metered connection, install a real-time water measurement device on the customer's service line and provide the customer with access to information from the device. The cost of the device, including installation and ongoing operating costs, may be billed to the customer, and nonpayment may result in discontinuance of service. (C)
   b. If the customer does not currently receive service through a metered connection, install a water meter on the customer's service line, charge the customer for water use pursuant to Cal Water's metered service tariffs and rules, and install a real-time water measurement device on the customer's service line and provide the customer with access to information from the device. The cost of the device, including installation and ongoing operating costs, may be billed to the customer, and nonpayment may result in discontinuance of service. (C)
2. **SECOND VIOLATION:** If Cal Water verifies that the customer has used potable water for non-essential, wasteful uses after having been notified of the first violation, Cal Water shall provide the customer with a second written notice of violation. In addition to the actions prescribed under the first violation above, Cal Water is authorized to take the following actions:
   a. Apply the following waste of water penalties, which are in addition to any other charges authorized by this Schedule or other Cal Water tariffs.
      i. If Stage 1 is in effect, $25 (Stage 1 is detailed below in Section E).
      ii. If Stage 2 is in effect, $50 (Stage 2 is detailed below in Section F).

(continued)

Schedule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

D. WASTE OF WATER PENALTIES (Continued)

iii. If Stage 3 is in effect, $100 (Stage 3 is detailed below in Section G).
iv. If Stage 4 is in effect, $200 (Stage 4 is detailed below in Section H).

b. At its sole discretion, waive the waste of water penalty if the customer participates in a water use evaluation provided by Cal Water and/or provides documentation to Cal Water proving that a drip irrigation system, micro spray irrigation system, high-efficiency sprinkler system, or properly programmed smart irrigation controller has been installed, after a notice of violation was delivered, and is in use at the customer's service address.

3. THIRD VIOLATION: If Cal Water verifies that the customer has used potable water for non-essential, wasteful uses after having been notified of the second violation, Cal Water shall provide the customer with a third written notice of violation. In addition to the actions prescribed under the first and second violation above, Cal Water is authorized to take the following actions:

a. Apply the following waste of water penalties, which are in addition to any other charges authorized by this Schedule or other Cal Water tariffs.
i. If Stage 1 is in effect, $50 (Stage 1 is detailed below in Section E).
ii. If Stage 2 is in effect, $100 (Stage 2 is detailed below in Section F).
iii. If Stage 3 is in effect, $200 (Stage 3 is detailed below in Section G).
iv. If Stage 4 is in effect, $400 (Stage 4 is detailed below in Section H).

b. At its sole discretion, waive the waste of water surcharge if the customer participates in a water use evaluation provided by Cal Water and/or provides documentation to Cal Water proving that a drip irrigation system, micro spray irrigation system, high-efficiency sprinkler system, or properly programmed smart irrigation controller has been installed, after notice of violations have been delivered, and is in use at the customer's service address.

4. FOURTH VIOLATION: If Cal Water verifies that the customer has used potable water for non-essential, wasteful uses after having been notified of the third violation, Cal Water shall provide the customer with a fourth written notice of violation. In addition to actions set forth in previous violations prescribed above, Cal Water is authorized to install a flow-restricting device on the customer's service line. Cal Water shall not be held liable for any injuries, damages, and/or consequences arising from the installation of a flow restricting device.

5. EGREGIOUS VIOLATIONS: Notwithstanding the foregoing framework for penalties, customers who Cal Water has verified are egregiously using potable water for non-essential, wasteful uses are subject to having a flow-restricting device installed on their service line. After providing the customer with one notice of egregious violation, either by direct mail or door hanger, which documents the egregious use of potable water for non-essential, wasteful uses and explains that failure to correct the violation may result in the installation of a flow-restricting device on the customer's service line, Cal Water is authorized to install a flow-restricting device on the customer's service line. Cal Water shall not be held liable for any injuries, damages, and/or consequences arising from the installation of a flow restricting device.

6. NOTICES OF VIOLATION:

a. Unless otherwise specified, written notices of violation provided to customers pursuant to this Schedule shall document the verified violation and alert the customer to the fact that future violations of the restricted uses of potable water may result in a real-time water measurement device being installed on the customer's service line at the customers expense, waste of water surcharges being applied to the customer's bill, the installation of a flow-restricting device on the customer's service line, or the discontinuation of the customer's service. (N)

(continued)

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Schedule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

D. WASTE OF WATER PENALTIES (Continued)

b. If Cal Water elects to install a flow-restricting device on a customer's service line, the written notice shall document the steps the customer must take in order for the flow-restricting device to be removed, and shall explain that after the flow-restricting device is removed, it may be reinstalled, without further notice, if the customer is again verified by Cal Water to be using potable water for non-essential, wasteful uses.

7. FLOW RESTRICTING DEVICE CONDITIONS: The installation of a flow-restricting device on a customer's service line is subject to the following conditions:

a. The device shall be capable of providing the premise with a minimum of 3 Ccf per person, per month, based upon the U.S. Census calculation of the average number of people in a household in the area.

b. The device may only be removed by Cal Water, and only after a minimum three-day period has elapsed.

c. Any tampering with the device may result in the discontinuation of the customer's water service and the customer being charged for any damage to Cal Water's equipment or facilities and any required service visits.

d. After the removal of the device, if Cal Water's personnel verify that the customer is using potable water for non-essential, wasteful uses, Cal Water may install another flow-restricting device without prior notice. This device shall remain in place until water supply conditions warrant its removal. If, despite the installation of the device, Cal Water's personnel verifies that the customer is using potable water for non-essential, wasteful uses, then Cal Water may discontinue the customer's water service, as provided in its Rule No. 11.

8. FLOW-RESTRICTING DEVICE REMOVAL CHARGES: The charge to customers for removal of a flow-restricting device installed pursuant to this Schedule is $100 during normal business hours, and $150 for the device to be removed outside of normal business hours.

E. STAGE ONE WATER USE RESTRICTIONS

1. WASTEFUL USES OF WATER (STAGE 1)

The following restrictions may be imposed by Cal Water, except where necessary to address an immediate health or safety need, or to comply with a term or condition in a permit issued by a state or federal agency:

a. Outdoor Irrigation Restrictions (Stage 1)

i. Irrigating ornamental landscapes with potable water is limited to no more than **three (3) days per week,** on a schedule established and posted by Cal Water on its website or otherwise provided to customers by bill message, bill insert, direct mail, or email, or as follows:

1. Customers with even-numbered addresses may irrigate on Saturdays, Tuesdays, and Thursdays.
2. Customers with odd-numbered addresses may irrigate on Sundays, Wednesdays, and Fridays.
3. Customers without a street address may irrigate on Saturdays, Tuesdays, and Thursdays. (N)

(continued)

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Schedule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

E. STAGE ONE WATER USE RESTRICTIONS (Continued)

4. Notwithstanding the foregoing restrictions, irrigation of special landscape areas or commercial nurseries may occur as needed, provided that the customer who wishes to irrigate a special landscape area or commercial nursery presents Cal Water with a plan to achieve water use reductions commensurate with those that would be achieved by complying with foregoing restrictions.
5. Notwithstanding the foregoing restrictions, when a city, county, or other local public agency in one of Cal Water's service areas duly adopts restrictions on the number of days or hours of the day that customers may irrigate that are different than those adopted by Cal Water, Cal Water may enforce the city, county, or other local public agency's restrictions.

ii. Irrigating ornamental landscape with potable water is prohibited during the hours between **8:00 a.m. and 6:00 p.m.**

iii. The foregoing restrictions do **not** apply to:
1. Landscape irrigation zones that exclusively use drip irrigation systems and/or micro spray irrigation system;
2. Irrigating ornamental landscapes with the use of a hand-held bucket or similar container, with a continuously monitored hose which is fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored, or for the express purpose of adjusting or repairing an irrigation system.

b. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing fixtures and/or irrigation system must be repaired within **five (5) business days** of written notification by Cal Water, unless other arrangements are made with Cal Water.

c. Prohibited Uses of Water: Customers are prohibited from using potable water for the following actions:
i. The application of potable water to landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures;
ii. The use of a hose that dispenses potable water to wash vehicles, including cars, trucks, buses, boats, aircraft, and trailers, whether motorized or not, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use.
iii. The application of potable water to driveways and sidewalks;
iv. The use of potable water in a water feature, except where the water is part of a recirculating system;
v. The application of potable water to outdoor landscapes during and within forty-eight (48) hours after measurable rainfall (see Definitions);
vi. The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased;
vii. Irrigation of ornamental turf on public street medians with potable water;
viii. Irrigation outside of newly constructed homes and buildings with potable water in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.

d. Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guest room using clear and easily understood language. (N)

(continued)

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Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

E. STAGE ONE WATER USE RESTRICTIONS (Continued)

[Stage 1 (cont.)]

e. Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds with potable water is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to the implementation of any staged mandatory restrictions of water use as described in this Schedule.

f. Other duly adopted restrictions on the use of potable water as prescribed from time to time by the Commission or other authorized government agencies are incorporated herein by reference.

F. STAGE TWO WATER USE RESTRICTIONS

1. MANDATORY WATER BUDGETS AND BANKING (STAGE 2)

As described in greater detail below, the Water Board has mandated reductions in potable urban usage, as compared with the amount used in 2013, in each of Cal Water's service areas. Water suppliers must develop rate structures and other pricing mechanisms, such as surcharges and penalties, to achieve these mandated reductions (T)

a. **Mandatory Reduction Percentages**: The Water Board has established increasing levels of required water reduction for each service areas based upon the residential per capita per day use (R-GPCD) in that service area for the three summer months of July through September 2014. The Water Board's approach considers the relative per capita water usage in each service area and requires that those areas with high per-capita use achieve proportionally greater reductions than those with low use. The Water Board has also allowed for adjustments to these required water reductions based on specific criteria.

Each month, the Water Board determines whether a service area has met its mandatory reduction percentage by calculating cumulative savings in the service area since June 2015, and comparing those with the amount of water used during the same months in 2013. (T)

b. **Customer Water Budgets:** Each customer with metered potable water service (residential and non-residential customers) will receive an individualized "Water Budget" for each billing period. (T)

i. The Water Budget will be based on the units of water (CCF) that customer used in the same billing period in 2013, minus the Mandatory Reduction Percentage established by the Water Board for that customer's service area. (T) A customer's Water Budget will vary according to their monthly water usage in 2013. (C) Cal Water shall notify its customers of any changes to the Mandatory Reduction Percentage by the Water Board through bill inserts or direct mailings prior to applying the changed percentage in the requirements in this Schedule, consistent with the "Update" process described in Section F.1.d.(iv) of this Schedule. Cal Water shall also include the current Mandatory Reduction Percentage in effect for each service area on its website. (C)

ii. If a customer was not in his or her current location in 2013, the average monthly consumption will be used as a starting budget. If customers have a unique situation and the average budget is not appropriate, they can file an appeal to have their Water Budget increased. Cal Water may also modify the starting budget to reflect suitable use. (T)

iii. The Water Budget for the following billing period will appear on each customer's water bill. (T) Customers will also be able to find their Water Budgets, and their individual water use history dating back to 2013, by going to usage.calwater.com (do not include "www"), and entering their account number, street (or house) number, and ZIP code. (T)

(D)

(continued)

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Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

F. STAGE TWO WATER USE RESTRICTIONS (continued) (T)

1. MANDATORY WATER BUDGETS AND BANKING (STAGE 2) (continued) (T)

c. **Minimum Water Budgets**: A minimum monthly amount of water that protects the health and safety of customers will be established for each service area as a Minimum Water Budget for single-family residential customers.

i. No single-family residential customer will have a water budget that is below the threshold of the monthly Minimum Water Budget, even if applying the Mandatory Reduction Percentage to that customer's 2013 usage would result in a lower amount.

ii. The Minimum Water Budget for each service area is identified in **Appendix A**. (For areas with bi-monthly billing and bi-monthly water budgets, the Minimum Water Budget in Appendix A should be doubled for the billing period.)

d. **Drought Surcharges**: If a customer uses more units of potable water (CCF) than their Water Budget in a billing period, that customer's water bill may reflect an additional "Drought Surcharge" for each unit of water over the Water Budget, depending on the amount of excess usage (according to usage tiers described below). (T) (C)

i. **Tier A and Tier B Excess Water Usage:** Excess water usage above a customer's Water Budget may fall into one or both of two tiers – Tier A and Tier B. The amount of usage in Tiers A and B varies by service area, and depends upon whether an area has met its Mandatory Reduction Percentage on a cumulative basis.

For the purposes of Drought Surcharges, each service area will fall into one of two categories – those in compliance with the Mandatory Reduction Percentage, and those not in compliance. There are two sample tables in the last section of this Schedule (**Section I**). The first sample table identifies the Tier A and B usage amounts for those service areas that are in compliance with their Mandatory Reduction Percentage, as of the date specified in **Appendix A**. The second sample table identifies the Tier A and B usage amounts for those service areas that are not in compliance with their Mandatory Reduction Percentage, as of the date specified in **Appendix A**. (C)

ii. **Current Surcharges and Tiers: Appendix A** to this schedule provides the Drought Surcharge rate per unit of water and the excess water usage in Tiers A and B that are currently in effect for each service area. (T) (C)

At this time, Drought Surcharges only apply to excess water usage that falls within "Tier B." Excess water usage in Tier A constitutes a "courtesy" tier to which Drought Surcharges are not applied. As stated below under Water Banking, however, all excess water usage will be applied against a customer's "banked" water amounts, regardless of whether the usage falls within Tier A or Tier B. (C)

Customers will continue to pay the normal tariffed rates for potable water, in addition to any applicable Drought Surcharges. Cal Water retains the right to increase the surcharges if there are changes to the rates in the future. (T) (T)

iii. **Current Compliance Status of Service Area**: **Appendix B** to this schedule provides the Mandatory Reduction Percentage adopted by the Water Board for each area, and the actual cumulative savings for each area, **as of the date specified in Appendix A.** ***Drought Surcharges will be applied based on Tier A and B excess water usage beginning with the first day of each billing period that starts on or after March 31, 2016.*** (C)

iv. **Updates**: An increase in the excess usage designated in Tier A, an increase in Customer Water Budgets, or a decrease in Drought Surcharge rates, are "less restrictive" tariff changes that may be implemented via a Tier 1 advice letter.

A decrease in the excess usage designated in Tier A, a decrease in Customer Water Budgets, or an increase in Drought Surcharge rates are "more restrictive" tariff changes that shall be implemented by filing a Tier 2 advice letter. Cal Water shall notify its customers, and provide each customer with a summary of the changes by means of a bill insert or direct mailing, prior to the effective date of a more restrictive tariff change.

A service area's compliance status, which determines the amount of excess usage designated for Tiers A and B, shall be updated no more than once every 90 days, or to implement different requirements of the Water Board as needed. (C)

(continued)

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Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

 (T)

F. STAGE TWO WATER USE RESTRICTIONS (continued)

1. MANDATORY WATER BUDGETS AND BANKING (STAGE 2) (continued) (T)

e. **Water Banking**: Customers will be able to "bank" unused units of water from their water budget for use in future billing periods. (L)

i. Should a customer exceed his or her monthly budget, any banked units of water will be applied to the overage before drought surcharges are imposed.

ii. Banked water units can only offset future usage that exceeds a water budget.

f. **Water Budget Appeals:** If specified criteria are met, a customer can file an appeal to have his or her water budget increased.

i. The reasons appeals may be considered include: water use necessary for health and safety; business or economic needs, including process-water requirements; significant long-term savings achieved since 2011; average monthly water use in 2014 that is at least 50% lower than district average; and large animal care (e.g. horse).

ii. All appeals must be submitted online at **www.calwater.com/appeal** or via a written application form (available at **www.calwater.com/appeal** or from our local Customer Center).

iii. Surcharges incurred during the appeal review period may be waived if the review takes an extended period of time.

2. WASTEFUL USES OF WATER (STAGE 2)

Cal Water may continue to impose the restrictions on the wasteful use of water as outlined in Stage One, except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency.

G. STAGE THREE WATER USE RESTRICTIONS

1. MANDATORY WATER BUDGETS AND BANKING (STAGE 3)

Water budgets will be based on a customer's consumption during a historical base period and will include a percentage reduction designed to meet necessary water-use reductions. Cal Water may include provisions such as minimum water budgets to protect the health and safety of customers, and water banking allowing customers additional flexibility with regard to their required reductions.

In addition to the normal rate paid for the unit of water, a drought surcharge will be charged to a customer for each unit of water used over the established water budget for the billing period. Cal Water may implement surcharges up to three (3) times those charged in Stage 2. Cal Water will establish an appeals process for customers that will allow for requests for increased water budgets. (L)

(continued)

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Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

(T)

G. STAGE THREE WATER USE RESTRICTIONS (Continued)

[Stage 3 (cont.)]

2. WASTEFUL USES OF WATER (STAGE 3)

The following restrictions may be imposed by Cal Water, except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency. Differences from or additions to previous Stages are underlined. (The following restrictions are the same as those provided in Stage 3 of Rule 14.1.)

a. Outdoor Irrigation Restrictions (Stage 3)

i. Irrigating ornamental landscapes with potable water is limited to no more than **two (2) days per week,** on a schedule established and posted by Cal Water on its website or otherwise provided to customers by bill message, bill insert, direct mail, or email, or as follows:

1. Customers with even-numbered addresses may irrigate on Saturdays and Tuesdays (previous Stages allowed Thursdays as well).
2. Customers with odd-numbered addresses may irrigate on Sundays and Wednesdays (previous Stages allowed Fridays as well).
3. Customers without a street address may irrigate on Saturdays and Tuesdays (previous Stages allowed Thursdays as well).
4. Notwithstanding the foregoing restrictions, irrigation of special landscape areas or commercial nurseries may occur as needed, provided that the customer who wishes to irrigate a special landscape area or commercial nursery presents Cal Water with a plan to achieve water use reductions commensurate with those that would be achieved by complying with foregoing restrictions.
5. Notwithstanding the foregoing restrictions, when a city, county, or other local public agency in one of Cal Water's service areas duly adopts restrictions on the number of days or hours of the day that customers may irrigate which are different than those adopted by Cal Water, Cal Water may enforce the city, county, or other local public agency's restrictions.

ii. Irrigating ornamental landscape with potable water is prohibited during the hours between **8:00 a.m. and 6:00 p.m.**

iii. The foregoing restrictions do **not** apply to:

1. Landscape irrigation zones that exclusively use drip irrigation systems and/or micro spray irrigation system;
2. Irrigating ornamental landscapes with the use of a hand-held bucket or similar container, a continuously monitored hose which is fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored, or for the express purpose of adjusting or repairing an irrigation system.

b. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing fixtures and/or irrigation system must be repaired within **two (2) business days** of written notification by Cal Water, unless other arrangements are made with Cal Water.

c. **Prohibited** Uses of Water: Customers are prohibited from using potable water for the following actions:

i. The application of potable water to landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures (note: this provision appears under Section E in Rule 14.1);

(continued)

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Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

(T)

G. STAGE THREE WATER USE RESTRICTIONS (Continued)

[Stage 3 (cont.)]

ii. The use of a hose that dispenses potable water to wash vehicles, including cars, trucks, buses, boats, aircraft, and trailers, whether motorized or not, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use (note: this provision appears under Section E in Rule 14.1).

iii. The application of potable water to driveways and sidewalks;

iv. The use of potable water in a water feature, except where the water is part of a recirculating system;

v. The application of potable water to outdoor landscapes during and within forty-eight (48) hours after measurable rainfall;

vi. The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased;

vii. Irrigation of ornamental turf on public street medians with potable water;

viii. Irrigation outside of newly constructed homes and buildings with potable water in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.

ix. Use of potable water for street cleaning with trucks, except for initial wash-down for construction purposes (if street sweeping is not feasible);

x. Use of potable water for construction purposes, such as consolidation of backfill, dust control, or other uses unless no other source of water or other method can be used.

d. Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guest room using clear and easily understood language.

e. Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds with potable water is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to the implementation of any staged mandatory restrictions of water use as described in this Schedule.

f. Other duly adopted restrictions on the use of potable water as prescribed from time to time by the Commission or other authorized government agencies are incorporated herein by reference.

H. STAGE FOUR WATER USE RESTRICTIONS

1. MANDATORY WATER BUDGETS AND BANKING (STAGE 4)

Water budgets will be based on a customer's consumption during a historical base period and will include a percentage reduction designed to meet necessary water-use reductions. Cal Water may include provisions such as minimum water budgets to protect the health and safety of customers, and water banking allowing customers additional flexibility with regard to their required reductions.

In addition to the normal rate paid for the unit of water, a drought surcharge will be charged to a customer for each unit of water used over the established water budget for the billing period. For Stage 4, Cal Water may implement surcharges up to three (3) times those charged in Stage 2. Cal Water may require customer consumption reductions of up to 50%.

Cal Water will establish an appeals process for customers that will allow for requests for increased water budgets.

(continued)

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Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

(T)

H. STAGE FOUR WATER USE RESTRICTIONS (Continued)

[Stage 4 (cont.)]

2. WASTEFUL USES OF WATER (STAGE 4)

The following restrictions may be imposed by Cal Water, except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency. Differences from or additions to previous Stages are underlined. (The following restrictions are the same as those provided in Stage 4 of Rule 14.1.)

a. Irrigating ornamental landscape with potable water is prohibited, except when a hand-held bucket or a similar container, or a continuously monitored hose which is fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored is used to maintain vegetation, including trees and shrubs.

b. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing fixtures or irrigation system must be repaired within **one (1) business day** of written notification by Cal Water, unless other arrangements are made with Cal Water.

c. Prohibited Uses of Water: Customers are prohibited from using potable water for the following actions:

i. The application of potable water to landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures;

ii. The use of a hose that dispenses potable water to wash vehicles, including cars, trucks, buses, boats, aircraft, and trailers, whether motorized or not, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use.

iii. The application of potable water to driveways and sidewalks;

iv. The use of potable water in a water feature, except where the water is part of a recirculating system;

v. The application of potable water to outdoor landscapes during and within forty-eight (48) hours after measurable rainfall;

vi. The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased;

[Note that items previously identified as (ix) and (x) in Stage 3 have been eliminated.]

vii. Use of potable water for street cleaning with trucks (previous Stage allowed certain exceptions);

viii. Use of potable water for construction purposes, such as consolidation of backfill, dust control, or other uses (previous Stages allowed certain exceptions).

d. Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guest room using clear and easily understood language.

e. Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds with potable water is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to the implementation of any staged mandatory restrictions of water use as described in this Schedule.

f. Other duly adopted restrictions on the use of potable water as prescribed from time to time by the Commission or other authorized government agencies are incorporated herein by reference.

(continued)

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Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

 (T)

I. SAMPLE TABLES WITH TIER A AND TIER B EXCESS USAGE AMOUNTS (N)

1. FOR DISTRICTS IN COMPLIANCE WITH MANDATORY REDUCTIONS

For the purposes of applying Drought Surcharges, the sample table below identifies the number of units over a customer's Water Budget (the excess usage) that falls within Tiers A and B in a district whose cumulative savings meet the Water Board's Mandatory Reduction Percentage as of the date identified in **Appendix A**.

For Districts in Compliance with Mandatory Water Reduction Targets

District	Service Area	Tier A - No Surcharges	Tier B - Drought Surcharges Applied			Minimum Water Budget	Rate Support Fund Area
		Units Over Water Budget	Units Over Water Budget	Surcharge per unit (Non-LIRA Customers)	Surcharge per unit (LIRA Customers)	(Ccf per month)	(RSF)
Antelope Valley	Fremont Valley & Lake Hughes	1-6	7+	$4.5200	$2.2600	5	RSF Area
	Lancaster	1-5	6+	$7.1180	$3.5590	5	
	Leona Valley	1-4	5+	$4.5200	$2.2600	5	RSF Area
Bakersfield		1-6	7+	$4.1868	$2.0934	7	
Bayshore	Mid-Peninsula	1-3	4+	$10.0000	$5.0000	6	
	South San Francisco	1-3	4+	$5.6492	$2.8246	6	
Bear Gulch		1-5	6+	$10.0000	$5.0000	6	
Chico		1-6	7+	$3.1314	$1.5657	6	
Dixon		1-3	4+	$7.9402	$3.9701	7	
Dominguez		1-3	4+	$6.9934	$3.4967	7	
East Los Angeles		1-4	5+	$3.7605	$1.8803	9	
Grand Oaks		1-6	7+	$2.1236	$1.0618	5	
Hermosa Redondo		1-3	4+	$9.1586	$4.5793	5	
Kern River Valley		1-3	4+	$4.5200	$2.2600	4	RSF Area
King City		1-4	5+	$6.7536	$3.3768	9	
Livermore		1-4	5+	$7.6194	$3.8097	6	
Los Altos		1-5	6+	$8.1608	$4.0804	6	
Marysville		1-4	5+	$5.1470	$2.5735	6	
Oroville		1-5	6+	$6.1840	$3.0920	6	
Palos Verdes		1-6	7+	$9.5358	$4.7679	6	
Redwood Valley		1-4	5+	$4.5200	$2.2600	4	RSF Area
Salinas		1-3	4+	$5.7776	$2.8888	7	
Selma		1-5	6+	$3.0122	$1.5061	8	
Stockton		1-4	5+	$5.5506	$2.7753	7	
Visalia		1-5	6+	$2.9796	$1.4898	7	
Westlake		1-6	7+	$9.2378	$4.6189	6	
Willows		1-5	6+	$4.1356	$2.0678	6	

(N)

(continued)

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New — Cal. P.U.C. Sheet No. 11040-W
Canceling — Cal. P.U.C. Sheet No.

Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

(T)

I. SAMPLE TABLES WITH TIER A AND TIER B EXCESS USAGE AMOUNTS

(N)

2. FOR DISTRICTS NOT IN COMPLIANCE WITH MANDATORY REDUCTIONS

For the purposes of applying Drought Surcharges, the sample table below identifies the number of units over a customer's Water Budget (the excess usage) that falls within Tiers A and B in a district whose cumulative savings do NOT meet the Water Board's Mandatory Reduction Percentage as of the date identified in **Appendix A**.

For Districts not in Compliance with Mandatory Water Reduction Targets

District	Service Area	Tier A - No Surcharges	Tier B - Drought Surcharges Applied			Minimum Water Budget	Rate Support Fund Area
		Units Over Water Budget	Units Over Water Budget	Surcharge per unit (Non-LIRA Customers)	Surcharge per unit (LIRA Customers)	(CCF per month)	(RSF)
Antelope Valley	Fremont Valley & Lake Hughes	1	2+	$4.5200	$2.2600	5	RSF Area
	Lancaster	1	2+	$7.1180	$3.5590	5	
	Leona Valley	1	2+	$4.5200	$2.2600	5	RSF Area
Bakersfield		1	2+	$4.1868	$2.0934	7	
Bayshore	Mid-Peninsula	1	2+	$10.0000	$5.0000	6	
	South San Francisco	1	2+	$5.6492	$2.8246	6	
Bear Gulch		1	2+	$10.0000	$5.0000	6	
Chico		1	2+	$3.1314	$1.5657	6	
Dixon		1	2+	$7.9402	$3.9701	7	
Dominguez		1	2+	$6.9934	$3.4967	7	
East Los Angeles		1	2+	$3.7605	$1.8803	9	
Grand Oaks		1	2+	$2.1236	$1.0618	5	
Hermosa Redondo		1	2+	$9.1586	$4.5793	5	
Kern River Valley		1	2+	$4.5200	$2.2600	4	RSF Area
King City		1	2+	$6.7536	$3.3768	9	
Livermore		1	2+	$7.6194	$3.8097	6	
Los Altos		1	2+	$8.1608	$4.0804	6	
Marysville		1	2+	$5.1470	$2.5735	6	
Oroville		1	2+	$6.1840	$3.0920	6	
Palos Verdes		1	2+	$9.5358	$4.7679	6	
Redwood Valley		1	2+	$4.5200	$2.2600	4	RSF Area
Salinas		1	2+	$5.7776	$2.8888	7	
Selma		1	2+	$3.0122	$1.5061	8	
Stockton		1	2+	$5.5506	$2.7753	7	
Visalia		1	2+	$2.9796	$1.4898	7	
Westlake		1	2+	$9.2378	$4.6189	6	
Willows		1	2+	$4.1356	$2.0678	6	

(N)

(continued)

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Revised Cal. P.U.C. Sheet No. 11119-W
Canceling Cal. P.U.C. Sheet No. 11039-W

Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

APPENDIX A to Schedule 14.1 - *NOT IN EFFECT* (C)

Drought Surcharge Tiers (applies to all metered customers of potable water) (C)

District	Service Area	In Compliance with Mandatory Reduction? As of 2/1/16	Tier A - No Surcharges	Tier B - Drought Surcharges Applied			Minimum Water Budget	Rate Support Fund Area
			Units Over Water Budget	Units Over Water Budget	Surcharge per unit (Non-LIRA Customers)	Surcharge per unit (LIRA Customers)	(CCF per month)	(RSF)
Antelope Valley	Fremont Val. /Lake Hughes		1-6	7+	$4.5200	$2.2600	5	RSF Area
	Lancaster		1-5	6+	$7.1180	$3.5590	5	
	Leona Valley		1-4	5+	$4.5200	$2.2600	5	RSF Area
Bakersfield			1-6	7+	$4.1868	$2.0934	7	
Bayshore	Mid-Peninsula		1-3	4+	$10.0000	$5.0000	6	
	South San Francisco		1-3	4+	$5.6492	$2.8246	6	
Bear Gulch			1-5	6+	$10.0000	$5.0000	6	
Chico			1-6	7+	$3.1314	$1.5657	6	
Dixon			1-3	4+	$7.9402	$3.9701	7	
Dominguez			1-3	4+	$6.9934	$3.4967	7	
East Los Angeles			1-4	5+	$3.7605	$1.8803	9	
Grand Oaks			1-6	7+	$2.1236	$1.0618	5	
Hermosa Redondo		**No**	1	2+	$9.1586	$4.5793	5	
Kern River Valley		**No**	1	2+	$4.5200	$2.2600	4	RSF Area
King City			1-4	5+	$6.7536	$3.3768	9	
Livermore			1-4	5+	$7.6194	$3.8097	6	
Los Altos			1-5	6+	$8.1608	$4.0804	6	
Marysville			1-4	5+	$5.1470	$2.5735	6	
Oroville			1-5	6+	$6.1840	$3.0920	6	
Palos Verdes		**No**	1	2+	$9.5358	$4.7679	6	
Redwood Valley (all)			1-4	5+	$4.5200	$2.2600	4	RSF Area
Salinas			1-3	4+	$5.7776	$2.8888	7	
Selma			1-5	6+	$3.0122	$1.5061	8	
Stockton			1-4	5+	$5.5506	$2.7753	7	
Visalia		**No**	1	2+	$2.9796	$1.4898	7	
Westlake		**No**	1	2+	$9.2378	$4.6189	6	
Willows			1-5	6+	$4.1356	$2.0678	6	

(a) The Drought Surcharge is equal to two (2) times the highest residential tier rate with a $10.00 maximum EXCEPT:
The Drought Surcharge in Rate Support Fund (RSF) areas is equal to $4.52.
The Drought Surcharge for districts with a 10% or less water reduction requirement is equal to the highest residential tier rate.

(b) The Drought Surcharge for LIRA customers is 50% of the Drought Surcharge for Non-LIRA customers.

(c) The Minimum Water Budget is set at 55 gpcd (gallons per capita per day) multiplied by the number of people per household for the area according to the U.S. Census.

(d) A district is determined to be in compliance if it has met or is within one percent of its Mandatory Reduction requirement.

(continued)

This tariff was approved by the CPUC.
An original stamped version is
available upon request.

Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

Page 16 (T)

APPENDIX B to Schedule 14.1 (T)

CUMULATIVE WATER SAVED COMPARED TO MANDATORY REDUCTIONS (C)

Urban Water Supplier	Cumulative Percentage Saved	Water Board's Target Percentage	In Compliance?
	Jun. 2015 to Jan. 2016 (as compared to 2013) *	Mandatory Reduction *	As of Feb. 1, 2016 **
California Water Service Company Antelope Valley	47.8%	36%	
California Water Service Company Bakersfield	31.1%	32%	
California Water Service Company Bear Gulch	35.0%	36%	
California Water Service Company Chico District	38.3%	32%	
California Water Service Company Dixon, City of	30.2%	28%	
California Water Service Company Dominguez	16.8%	16%	
California Water Service Company East Los Angeles	15.5%	8%	
California Water Service Company Hermosa Redondo	18.3%	20%	No
California Water Service Company Kern River Valley	20.1%	28%	No
California Water Service Company King City	21.8%	12%	
California Water Service Company Livermore	39.9%	24%	
California Water Service Company Los Altos/Suburban	38.1%	32%	
California Water Service Company Marysville	26.2%	24%	
California Water Service Company Mid Penninsula	26.6%	16%	
California Water Service Company Oroville	28.5%	28%	
California Water Service Company Palos Verdes	28.9%	36%	No
California Water Service Company Redwood Valley	31.7%	16%	
California Water Service Company Salinas District	24.9%	16%	
California Water Service Company Selma	39.0%	32%	
California Water Service Company South San Francisco	20.8%	8%	
California Water Service Company Stockton	22.6%	20%	
California Water Service Company Visalia	25.6%	32%	No
California Water Service Company Westlake	33.5%	36%	No
California Water Service Company Willows	30.1%	28%	

(C)

* The figures in Appendix B are from the State Water Resources Control Board's website at:
http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/docs/2016feb/suppliercompliance_022516.pdf (C)

(D)

** A district is determined to be in compliance if it has met or is within one percent of its Mandatory Reduction requirement. (N)

[end]

Appendix M: Conservation Master Plan

CONSERVATION MASTER PLAN 2021 – 2025

April 2021

Bear Gulch District

California Water Service

Prepared by M.Cubed

Table of Contents

List of Acronyms iii

1 Introduction 1

1.1 Master Plan Scope and Objectives 1

1.2 Relationship to GRC and UWMP 1

1.3 Relationship to Water Shortage Contingency Plan 2

1.4 Report Organization 2

2 District Overview 3

3 Conservation Goals and Progress 6

3.1 Conservation Program Activity and Water Savings 6

3.2 Plumbing Codes and Water Use Efficiency Standards 6

3.3 Compliance with State Urban Water Use Target 8

3.4 Compliance with CPUC Conservation Goals 9

3.5 Making Water Conservation a California Way of Life 10

4 Water Conservation Program 13

4.1 Conservation Program Drivers 13

4.2 Customer Conservation Programs 14

4.2.1 Plumbing Fixture Replacement 14

4.2.2 Irrigation Equipment/Landscape Upgrades 15

4.2.3 Customer Assistance 15

4.2.4 Summary of Customer Programs 16

4.3 School Education and Public Information Programs 16

4.4 Water System Efficiency 17

4.4.1 System Water Loss Management 17

4.4.2 Metering and Pricing 17

4.5 Conservation Partnerships 18

5 Conservation Budget 18

6 Performance Metrics 22

7 Program Monitoring and Reporting 22

List of Acronyms

AB	Assembly Bill
AF	Acre-feet (one AF equals 325,851 gallons)
AMI	Advanced metering infrastructure
AMR	Automatic meter reading
AWE	Alliance for Water Efficiency
BCR	Benefit Cost Ratio
BMP	Best Management Practice
CalWEP	California Water Efficiency Partnership
CII	Commercial, industrial, and institutional
CPUC	California Public Utilities Commission
CUWCC	California Urban Water Conservation Council
EO	Executive Order
GPCD	Gallons per capita per day
GPF	Gallons per flush
GPM	Gallons per minute
GRC	General Rate Case
HET	High efficiency toilet
HEU	High efficiency urinal
HEW	High efficiency clothes washer
IOU	Investor-owned utility
MaP	Maximum performance toilet testing program
MGD	Million gallons per day
MOU	Memorandum of Understanding Regarding Urban Water Conservation in California
SB	Senate Bill
SB X7-7	Senate Bill X7-7 Water Conservation Act of 2009
ULFT	Ultra low flow toilet
UWMP	Urban Water Management Plan
WF	Water Factor
WSCP	Water Shortage Contingency Plan

1 Introduction

1.1 Master Plan Scope and Objectives

Cal Water is committed to helping its customers use water efficiently and has developed a range of water conservation programs to support this goal. To ensure that it is providing the right mix of programs in a cost-effective manner, Cal Water routinely conducts comprehensive conservation program analysis and planning. This is done on a five-year cycle in tandem with the Urban Water Management Plan (UWMP). The results of this planning for the Bear Gulch District are summarized in this report, which covers the period 2021 to 2025.

The main purposes of this Conservation Master Plan are to:

- Serve as a broad guidance document that helps inform annual conservation activities, such as program levels, staffing, and budget needs both internally and for stakeholders.
- Summarize the mix of conservation measures that Cal Water plans to implement going forward, including the estimated water savings, costs, and effects on water demand.
- Explain the evaluation process and factors considered in selecting conservation measures.
- Provide an update to the 2016-20 Conservation Master Plan as part of a five-year review cycle to assess program performance and identify the need for any adjustments; and
- Ensure Cal Water districts are positioned to comply with the state's Making Water Conservation a California Way of Life regulations.

1.2 Relationship to GRC and UWMP

Cal Water's operations are regulated by the California Public Utilities Commission (CPUC), which approves the budgets and rates for each Cal Water district every three years in a General Rate Case (GRC) proceeding. The district's conservation programs and expenditures are part of the GRC proceeding. The last GRC covered the three-year period 2020-22 and a new GRC covering the period 2023-25 is presently underway. The conservation programs and budgets for 2021 in this plan reflect those authorized in the last GRC while those recommended for 2023-25 reflect programs and budgets being proposed by Cal Water in the current GRC.

This plan is an update to the Conservation Master Plan Cal Water completed in 2016 covering the period 2016-20. It constitutes the primary source of information on historical and proposed implementation of conservation programs reported in the Bear Gulch District's 2020 UWMP. A copy of this plan is provided as an appendix to the UWMP.

1.3 Relationship to Water Shortage Contingency Plan

The Water Conservation Master Plan is distinct from Cal Water's Water Shortage Contingency Plan (WSCP), which is also part of each district's UWMP. While the main purpose of the WSCP is to provide a blue-print for responding to water shortage emergencies caused by drought or other events resulting in temporary disruption to water supplies, the goal of the Water Conservation Master Plan is to provide a blue-print for providing education, assistance, and incentives to help customers use water efficiently all the time. Regardless of drought, water in California is an increasingly scarce resource. Investing in water use efficiency has repeatedly been shown to be a cost-effective way to ensure adequate supply of water for the future. While the conservation programs Cal Water implements are critically important during periods of water shortage, their primary purpose is to help make sure Cal Water can reliably serve customer water needs far into the future.

1.4 Report Organization

The remainder of this report is organized as follows:

- Section 2 provides a brief overview of the District, including the communities it serves, its sources of water supply, and its customer water demands.
- Section 3 discusses Cal Water's conservation goals and accomplishments, in particular with respect to the Water Conservation Act of 2009, CPUC conservation requirements, and the state's pending Making Water Conservation a California Way of Life regulations.
- Section 4 describes the conservation programs Cal Water currently offers to its customers and discusses new programs Cal Water intends to offer.
- Section 5 presents the water savings, costs, and benefits expected from the recommended conservation programs.
- Section 6 discusses metrics used to assess program performance.
- Section 7 addresses program monitoring and future updates to the Conservation Master Plan.

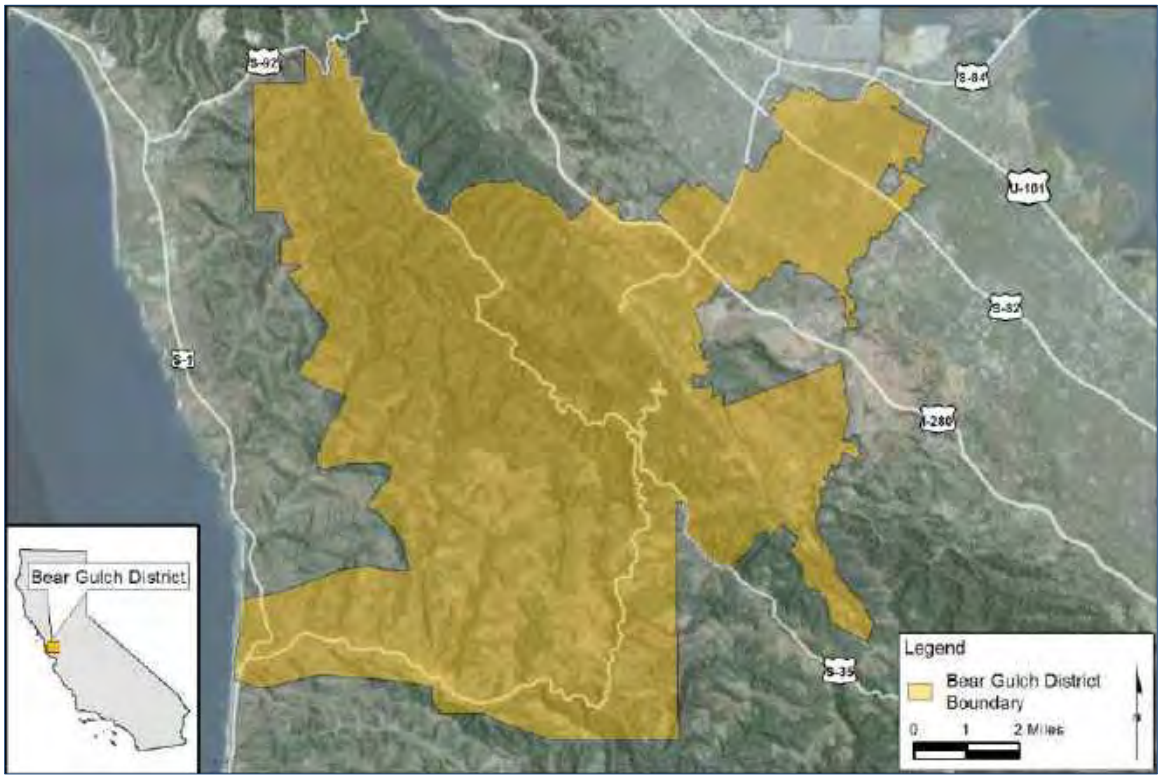
2 District Overview

District Quick Facts:

- Communities Served: Atherton, Portola Valley, Woodside, parts of Menlo Park, unincorporated portions of San Mateo County
- Population served in 2020: 60,814
- Residential Customers: 92% of total services and 89% of total use
- Sources of Supply: 95% imported, 5% local surface water
- Average Annual Water Deliveries Last Five Years: 12,000 AF
- Average Per Capita Water Use Last Five Years: 171 GPCD

The Bear Gulch District serves the communities of Atherton, Portola Valley, Woodside, portions of Menlo Park, and adjacent unincorporated portions of San Mateo County including: West Menlo Park, Ladera, North Fair Oaks, and Menlo Oaks. The system is bordered on the north by Redwood City; on the east by Palo Alto, Stanford University, and unincorporated Santa Clara County; and on the south and west by unincorporated San Mateo County. A map of the service area boundaries is shown in Figure 1.

Figure 1. Bear Gulch District Service Area Boundaries



Cal Water estimates the service area population was 60,814 in 2020. Service area population has been growing at an annual rate of less than one percent for the past 15 years. Between 2016 and 2020, the District's population increased at an average rate of 0.3 percent per year.

The District delivers a combination of local surface water and imported water purchased from the City and County of San Francisco (SFPUC). Approximately 95 percent is purchased from SFPUC and 5 percent is produced from the District's reservoir and treatment plant in Atherton.

The District delivers water to residential, commercial, industrial, and governmental customers. Residential customers account for 92 percent of water services in the District. The share of services in 2020 by customer category is shown in Figure 2. The share of total water sales by customer category over the period 2016-2020 is shown in Figure 3. Residential customers accounted for 87 percent of water use over this period.

Annual demand has averaged 12,000 acre-feet (AF) over the five-year period 2016-2020. Total annual demands and sources of water supply since 1980 are shown in Figure 4.

Figure 2. Share of Services in 2020 by Customer Category

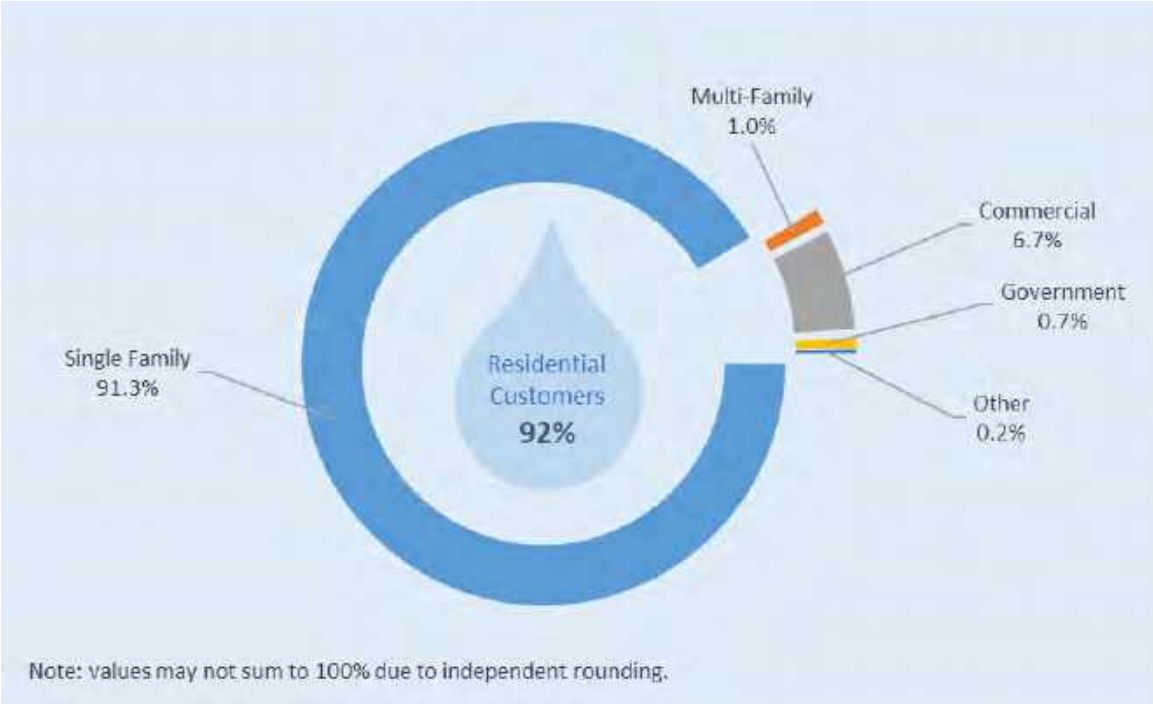


Figure 3. Share of Water Sales by Customer Category: 2016-2020

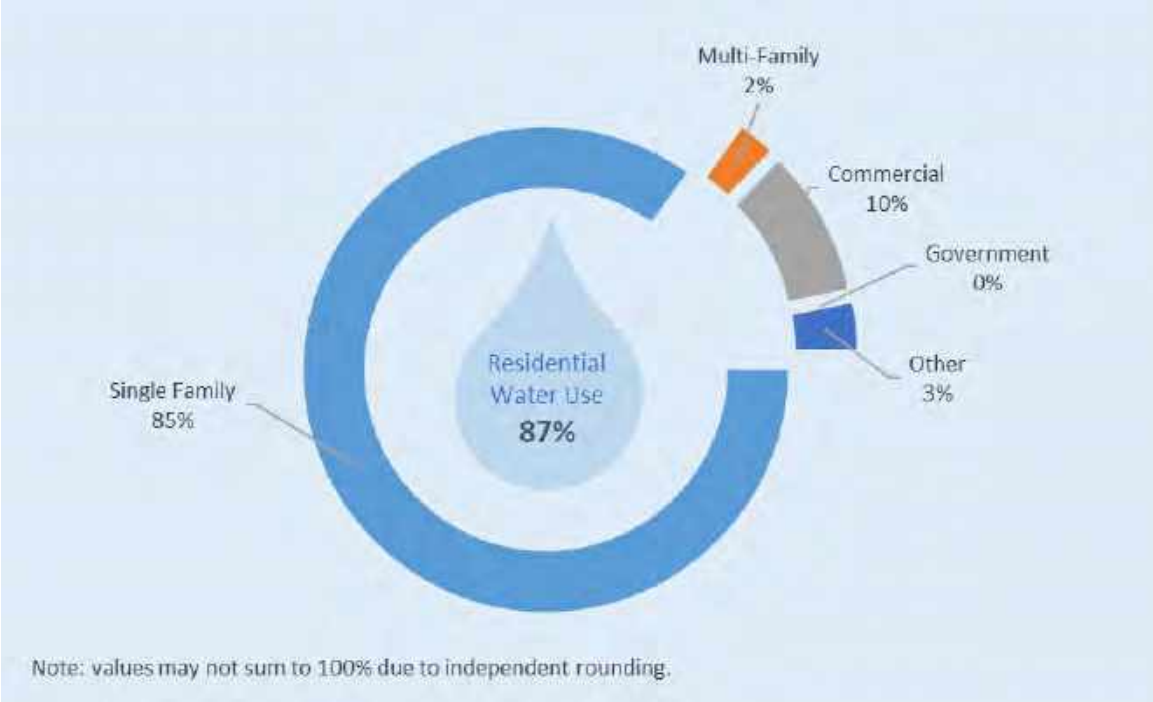
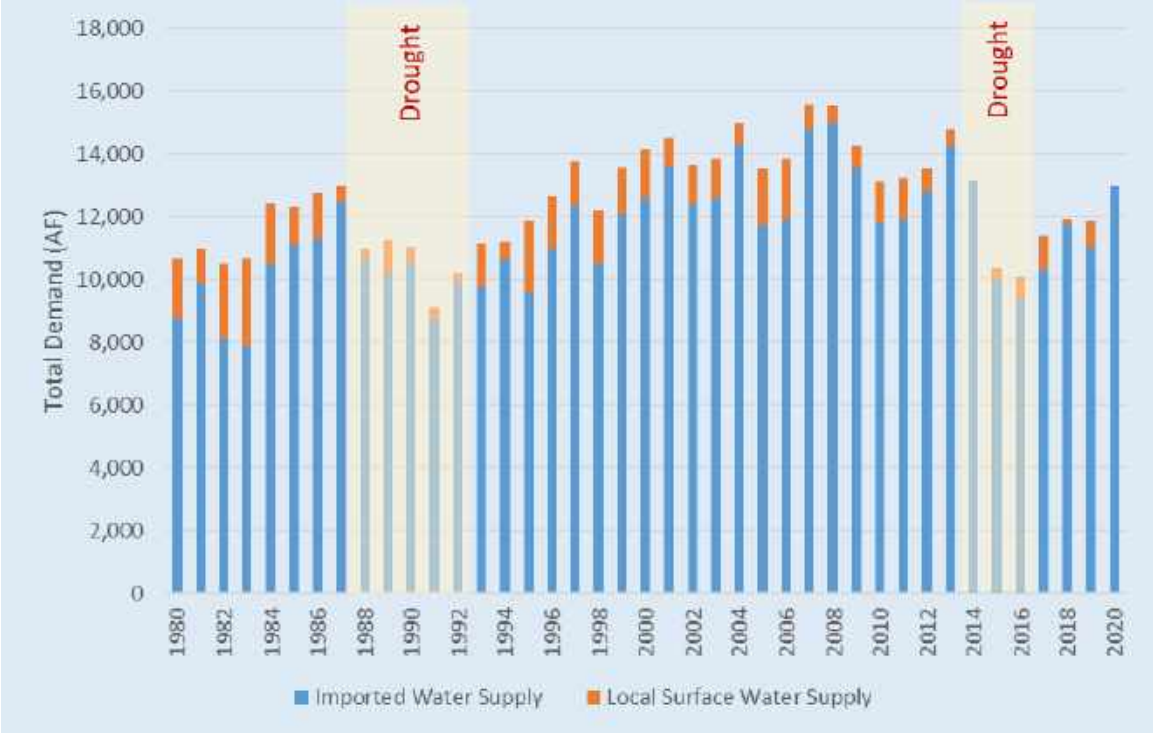


Figure 4. Total Demand and Sources of Supply: 1980 - 2020



3 Conservation Goals and Progress

In this section, conservation goals and progress for the Bear Gulch District are presented.

3.1 Conservation Program Activity and Water Savings

Cal Water uses the Alliance for Water Efficiency's Water Conservation Tracking Tool to track program activity and estimate water savings. Conservation program activity for 2016-20 is shown in Table 1. This activity is expected to generate water savings of 96 AF/year and cumulative lifetime savings of 1,440 AF.

Table 1. Conservation Program Activity and Water Savings: 2016-20

1. Plumbing Fixture Replacement	2016 – 2020 Total Activity
Toilets & Urinals (number distributed)	1,933
Clothes Washers (number distributed)	325
Consv. Kits (number distributed)	238
2. Irrigation Equip./Landscape Upgrades	
Smart Controllers (number distributed)	422
Nozzles & Spray Bodies (number distributed)	1,206
Turf Replacement (sq ft removed)	52,850
3. Residential Customer Assistance	
Surveys/Audits (homes receiving)	60
4. Non-Residential Customer Assistance	
Surveys/Audits (sites receiving)	5
Large Landscape Reports (sites receiving)	78
Average Annual Water Savings (AF)	**96**
Cumulative Lifetime Water Savings (AF)	**1,440**

3.2 Plumbing Codes and Water Use Efficiency Standards

Cal Water's conservation programs are operated within the context of existing plumbing codes and water use efficiency standards that are designed to improve the future water use efficiency of major water using appliances and fixtures, such as toilets and clothes washers, as well as water used outdoor for landscaping. Cal Water estimates that plumbing codes and water use efficiency standards will cumulatively save more than 7,800 AF in the District over the next 25 years. The primary drivers for the expected water savings are as follows:

- AB 715, enacted in 2007, requires that any toilet or urinal sold or installed in California on or after January 1, 2014 cannot have a flush rating exceeding 1.28 and 0.5 gallons per flush, respectively. AB 715 superseded the state's previous standards for toilet and urinal water use set in 1991 of 1.6 and 1.0 gallons per flush, respectively. On April 8, 2015, in response to the Governor's Emergency Drought Response Executive Order (EO B-29-15), the California Energy Commission approved new standards for urinals requiring that they not use more than 0.125 gallons per flush, 75% less than the standard set by AB 715.

- Water use standards for residential and commercial clothes washers and dishwashers are established by the U.S. Department of Energy through its authority under the federal Energy Policy and Conservation Act. Water use efficiency is summarized by the water factor for the appliance which measures the gallons of water used per cycle per cubic foot of capacity. A typical top-loading residential clothes washer manufactured in the 1990s had a water factor of around 12. In 2015, the allowable water factor for top- and front-loading residential clothes was reduced to 8.4 and 4.7, respectively. In 2018, the water factor standard for top-loading residential clothes washers was reduced to 6.5. In 2010 the allowable water factor for top- and front-loading commercial clothes washers was reduced to 8.5 and 5.5, respectively. The maximum water factor for Energy Star compliant top- and front-loading washers is 3.7 and 4.3, respectively. An Energy Star compliant washer uses about two-thirds less water per cycle than washers manufactured in the 1990s. There also are federal dishwasher efficiency standards. The maximum water use for standard and compact sized dishwashers is 5.0 and 3.5 gallons per cycle, respectively.

- New construction and renovations in California are subject to CalGreen Code requirements. CalGreen includes prescriptive indoor provisions for maximum water consumption of plumbing fixtures and fittings in new and renovated properties. CalGreen also allows for an optional performance path to compliance, which requires an overall aggregate 20% reduction in indoor water use from a calculated baseline using a set of worksheets provided with the CalGreen guidelines.

- SB 407, enacted in 2009, mandates that existing buildings in California come up to current state plumbing fixture standards. This law establishes requirements that residential and commercial property built and available for use on or before January 1, 1994 replace plumbing fixtures that are not water conserving, defined as "noncompliant plumbing fixtures" as follows:

    - any toilet manufactured to use more than 1.6 gallons of water per flush;

    - any urinal manufactured to use more than one gallon of water per flush;

- any showerhead manufactured to have a flow capacity of more than 2.5 gallons of water per minute; and

- any interior faucet that emits more than 2.2 gallons of water per minute.

- For single-family residential property, the SB 407 compliance date was January 1, 2017. For multi-family and commercial property, it was January 1, 2019.

- The law does not include enforcement mechanisms ensuring conversion by these dates. However, it does require retrofit upon resale of property. SB 837, passed in 2011, reinforced this requirement by requiring the transfer disclosure statement include disclosure of compliance with SB 407.

California also has adopted regulations governing future use of water for landscape.

- The California Water Commission approved the State's updated Model Water Efficient Landscape Ordinance (MWELO) in 2015. MWELO or a locally adopted equivalent ordinance limits how much water new and rehabilitated residential and commercial landscapes can use. For residential landscapes, the maximum allowed water allowance (MAWA) is 55% of the amount of water that healthy cool season turf grass would require given the local climate. For commercial landscapes, it is 45%. Variances are allowed for special landscaping, such as play fields and parks, or landscaping irrigated with recycled water.

- CalGreen requires that automatic irrigation controllers for new landscaping installed by a builder be weather- or soil moisture-based controllers that automatically adjust irrigation in response to changes in plant water needs as weather or soil conditions change.

- Starting October 1, 2020, spray sprinkler bodies sold or offered for sale in California are required to use the WaterSense test procedure (Version 1.0, September 21, 2017) and must meet state standards (California Code of Regulations, Title 20, section 1605.3(x)(1)(A)). The new standards establish limits on maximum and average flow rate and minimum outlet pressure. Statewide, the new standards are estimated to save 15 billion gallons of water in the first year the standard is in effect and 152 billion gallons per year at full stock turnover. Consumers are expected to save about $22 per spray sprinkler body over the life of the device through reduced water use.

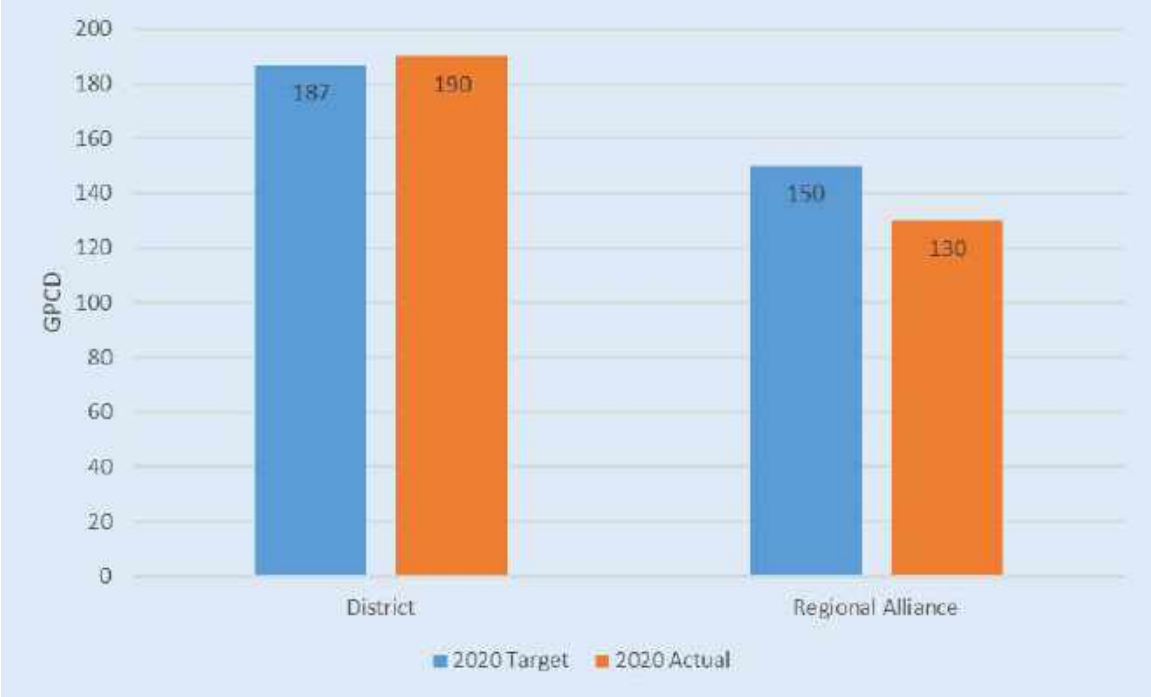
3.3 Compliance with State Urban Water Use Target

The Water Conservation Act of 2009, also known as SB X7-7, mandated a 20% reduction in per capita water use by 2020. Every urban retail water supplier was

required to establish a 2020 per capita water use target based on their historical water use. Water suppliers could also form a Regional Alliance with other retail water suppliers and meet the requirement jointly. The District formed a Regional Alliance with other Cal Water districts in the San Francisco Bay Hydrologic Region. As long as either the District's or the Regional Alliance's 2020 per capita water use is below target, the District will have met the act's requirements.

Figure 5 demonstrates the District's compliance with the Water Conservation Act of 2009. Although 2020 per capita water use was slightly above the District target, water use by the Regional Alliance was well below it. Through the concerted efforts of Cal Water and its customers, District per capita water use is now 24% below its peak reached in the mid-2000s (see Figure 6).

Figure 5. 2020 Target and Actual Per Capita Water Use



3.4 Compliance with CPUC Conservation Goals

In 2008, the California Public Utilities Commission (CPUC) established water conservation goals of 1-2% per year for Class A utilities, which includes California Water Service Company.[1] As shown in Figure 6, the District has met or exceeded these goals every year since they were adopted.

[1] CPUC Decision 08-02-036, dated February 29, 2008.

Figure 6. District Per Capita Water Use Relative to CPUC Conservation Goals

3.5 Making Water Conservation a California Way of Life

The state adopted legislation in 2018 establishing a new framework for setting urban water conservation standards and objectives.[2] This legislation built upon the April 2017 report entitled *Making Water Conservation a California Way of Life, Implementing Executive Order B-37-16*, prepared by state agencies, including the CPUC. The legislation directs the state to establish water use efficiency standards for:

- Residential Indoor Water Use
- Residential Outdoor Water Use
- Dedicated Landscape Meter Water Use
- Utility Distribution System Water Losses

Once adopted, these standards will provide the basis for a new urban water use target, or in the vernacular of the legislation, an aggregate urban water use objective. In one way, the Making Water Conservation a California Way of Life legislation carries on where the Water Conservation Act of 2009 left off – it will establish a new set of water use objectives for retail urban water suppliers. However, there are important

[2] Senate Bill 606 (Hertzberg) and Assembly Bill 1668 (Friedman).

differences. First, whereas the 2009 legislation established a long-term reduction target, under the new regulations, urban water suppliers will report water use relative to the new target annually starting in 2023 and will need to achieve the new target by January 1, 2027. Second, while the 2009 legislation applied to all urban water uses, the new legislation excludes non-residential uses other than water served by dedicated landscape meters from the target setting process. Instead, it requires DWR and the State Water Board to propose best management practices, including water audits and water management plans for non-residential customers above a certain size or volume of use, by October 1, 2021. Third, whereas the 2009 legislation set the same objective for all urban water suppliers (reduce water use by 20%), the new legislation varies the objective based on local conditions and existing levels of water use.[3]

Figure 7 shows the components of an urban water supplier's water use objective. The first four components will be based on the efficiency standards the state sets for indoor and outdoor residential water use, dedicated landscape meter water use, and utility distribution system losses. The fifth component allows for special circumstances, such as a large seasonal population or significant water use for fire protection, while the sixth component provides credit for water recycling. Added together, the six components establish the water suppliers water use objective.

For water suppliers failing to meet their water use objective, the legislation specifies progressive enforcement, as follows:

- Starting November 1, 2023, the State Water Board may issue information orders to obtain information to determine technical assistance needs for compliance (CWC 10609.26(a))

- Starting November 1, 2024, the State Water Board may issue written notices to warn suppliers of violation and request corrective actions by the next annual reporting (CWC 10609.26(b))

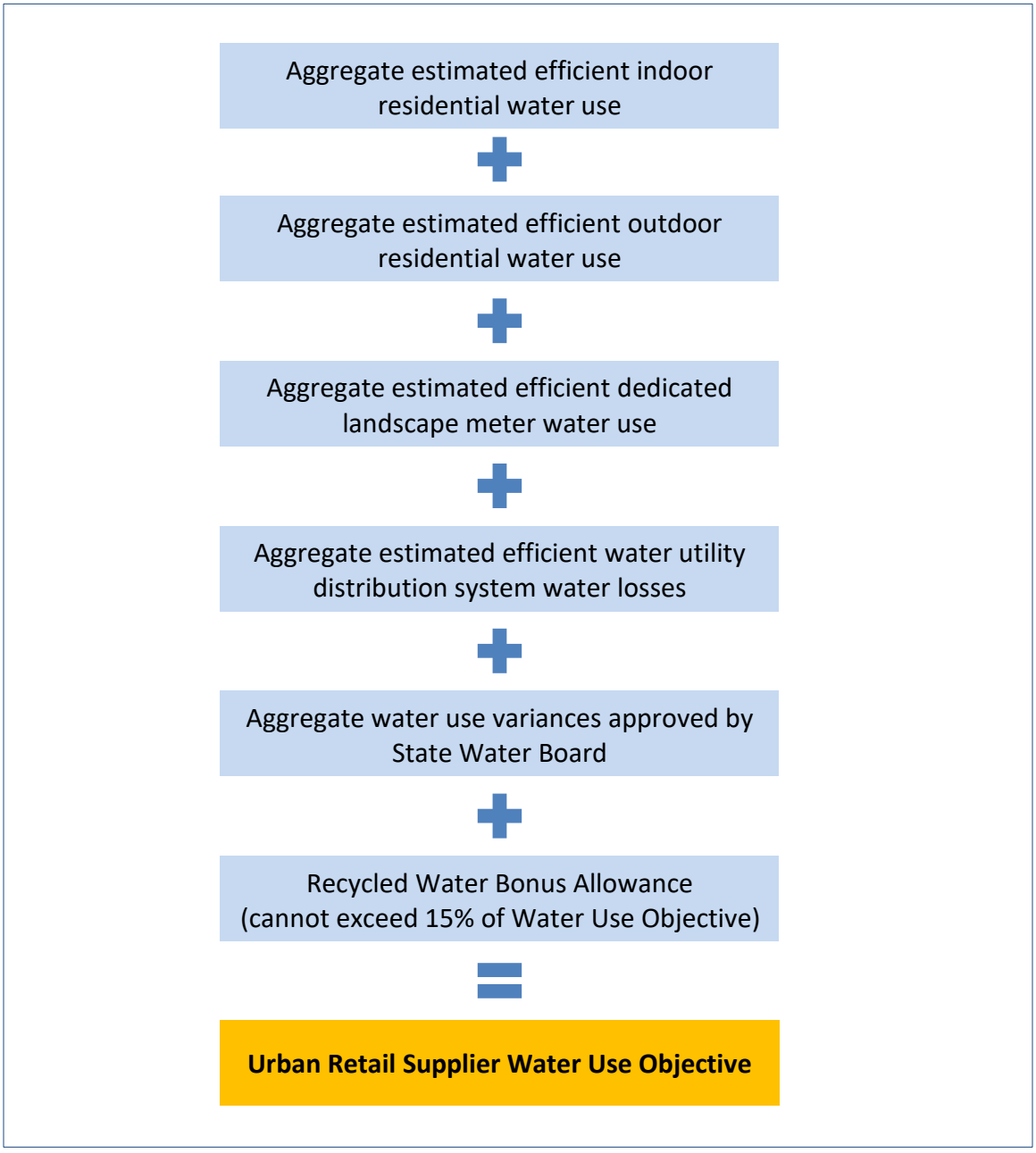
- Starting November 1, 2025, the State Water Board may issue conservation orders that may include referral to DWR for technical assistance and other local enforcement actions, including imposition of civil liability (CWC 10609.26(c)

Cal Water conducted a risk assessment to determine which of its districts may require additional resources to meet the new conservation regulations. The risk assessment considered current and projected level of overall water use, level of indoor residential water use, extent of residential and non-residential landscape area and water use, and

[3] For additional information, see Making Water Conservation a California Way of Life: Primer of 2018 Legislation on Water Conservation and Drought Planning Senate Bill 606 (Hertzberg) and Assembly Bill 1668 (Friedman).

condition of distribution system and level of water loss. Using a scoring system, the assessment ranked each district in terms of its risk of non-compliance with the individual components of the water use objective as well as the aggregate objective. The results of this assessment provided the basis for the conservation program budgets put forward in Cal Water's 2018 and 2021 general rate cases.

Figure 7. Making Water Conservation a California Way of Life Water Use Objective



4 Water Conservation Program

Cal Water centrally administers the conservation programs for its service districts. This creates both constraints and opportunities in terms of program design and implementation. The key constraint is the need to have consistent program offerings across districts. Except under unique circumstances, it is generally not logistically feasible or cost-effective to customize programs for individual districts. Also, if Cal Water offers a program in one district, customers in other districts generally expect it to also be available in their district. This puts a premium on offering a relatively small set of programs that can benefit all Cal Water customers. The advantage of central administration, however, is that it gives Cal Water scale economies and purchasing power that helps it keep program costs down, thereby improving cost-effectiveness.

4.1 Conservation Program Drivers

While Cal Water strives to develop programs that can be deployed in any of its districts, it tailors marketing, customer targeting, and implementation focus based on the needs of each district. In the Bear Gulch District, the main drivers shaping the conservation program are summarized in Table 2.

Table 2. Main Conservation Program Drivers in Bear Gulch District

Driver	Explanation
Supply Reliability	The District depends primarily on imported surface water which may be substantially curtailed during drought periods. Conservation is an important option available to the District for reducing dependence on imported water supply.
Water Supply Cost	The District's dependence on imported surface water results in high water supply cost. Acquiring additional water through conservation in most cases is less costly than purchasing additional imported water.
Residential Water Use	The state's Making Conservation a California Way of Life water use regulations are focused on reducing indoor and outdoor residential water use.
Landscape Water Use	The state's Making Conservation a California Way of Life water use efficiency regulations may require the District to start serving some non-residential landscapes through dedicated landscape meters and annually report water use relative to new landscape water use efficiency standards.

4.2 Customer Conservation Programs

Cal Water's conservation programs are grouped into four categories:

- Plumbing Fixture Replacement
- Irrigation Equipment/Landscape Upgrades
- Residential Customer Assistance
- Non-Residential Customer Assistance

A description of current programs in each of these categories follows. Where rebate amounts are listed, these are current rebate levels. Readers should note that rebate amounts may be adjusted in the future in response to CPUC requirements or changes to program design.

4.2.1 Plumbing Fixture Replacement

High-Efficiency Toilet Replacement – This program replaces old toilets with MaP certified high-efficiency toilets via financial rebates, direct installation, or direct distribution.[4] Current rebate amounts are up to $50/toilet for residential toilet replacement and up to $100/toilet for commercial toilet replacement.

High-Efficiency Urinal Replacement – This program replaces old urinals with high-efficiency urinals meeting the state's 0.125 gallon per flush water use standard via financial rebates and direct installation. While available to all non-residential customers, the program targets sites with higher-than-average bathroom utilization, such as restaurants and office buildings. The current rebate amount is up to $150/urinal.

Clothes Washer Replacement – This program provides a financial rebate to replace an old inefficient clothes washer with a new high-efficiency washer. The program is available to all residential and multi-family customers. The current rebate amount is up to $150/washer.

Residential Conservation Kit Distribution – This program offers residential customers conservation kits featuring a range of water-saving plumbing retrofit devices. The kits are available at no charge and include two high-efficiency showerheads (1.5 gpm), two bathroom faucet aerators (1.0 gpm), one kitchen faucet aerator (1.5 gpd), toilet leak tablets, and an outside multi-function, full-stop hose nozzle.

[4] For information on MaP certified toilets, see: https://www.map-testing.com/

4.2.2 Irrigation Equipment/Landscape Upgrades

Smart Irrigation Controller Installation – This program provides a financial rebate for the installation of a smart irrigation controller that automatically adjusts watering schedule in response to changing weather conditions. The current rebate amount is $125/controller for residential customers and $25/station for commercial customers.

High-Efficiency Sprinkler Nozzle Rebate – This program provides a financial rebate for the installation of high-efficiency sprinkler nozzles. This program is available to all Cal Water customers. The current rebate amount is $5/nozzle.

Large Rotary Nozzle Rebate – This program provides a financial rebate for the installation of high-efficiency large rotary nozzles. This program is available to all Cal Water customers. The current rebate amount is up to $30/nozzle toward the nozzle purchase cost and up to $8/spray body toward installation cost, if installed by a C-27 licensed landscape contractor.

Spray Body with Integrated Pressure Regulation and Check Valve Rebate – This program provides a financial rebate for the installation of high-efficiency spray bodies with integrated pressure regulation. This program is available to all Cal Water customers. The current rebate amount is up to $10/body toward the spray body purchase cost and up to $8/spray body toward installation cost, if installed by a C-27 licensed landscape contractor.

Turf Replacement Rebate – This program provides a financial rebate for replacement of turf with approved drought-tolerant landscaping. Cal Water operated this program in 2015/16 as a drought response measure. The program will be re-started as part of Cal Water's irrigation equipment/landscape upgrade program offerings.

4.2.3 Customer Assistance

Smart Landscape Tune-Up Program – This program provides customers with an irrigation system evaluation and installation of approved efficient irrigation system equipment, such as a smart irrigation controller and high-efficiency sprinkler nozzles. The program also includes irrigation system adjustments and detection and repair of irrigation system leaks. This program is available to all Cal Water customers at no charge.

Residential Customer Portal – Through its residential customer portal, Cal Water provides tailored assistance to each residential customer via customized water-efficiency targets, water savings calculators, and customer-specific recommendations for programs and water-saving tips.

Non-Residential Customer Assistance – Cal Water provides tailored assistance to commercial customers through customized incentives, commercial water surveys, and large landscape water use surveys. The non-residential assistance program helps commercial customers efficiently use water for sanitation/cleaning, heating/cooling, process, and landscape purposes.

4.2.4 Summary of Customer Programs

The customer conservation programs offered to customers in Bear Gulch District are summarized in Table 3 by customer class.

Table 3. Cal Water Conservation Programs Available to Bear Gulch District Customers

Programs (Rebate, Direct Install, and Free Distribution Programs)	Customer Eligibility		
	Single-Family	Multi-Family	Commercial
Plumbing Fixture Replacement			
High-Efficiency Toilet Replacement	✓	✓	✓
High-Efficiency Urinal Replacement			✓
High-Efficiency Clothes Washer Rebate	✓	✓	
Conservation Kits	✓	✓	
Irrigation Equipment/Landscape Upgrades			
Smart Irrigation Controller Rebate	✓	✓	✓
High-Efficiency Sprinkler Nozzle Rebate	✓	✓	✓
Large Rotary Nozzle Rebate		✓	✓
Spray Body Rebate		✓	✓
Turf Replacement Rebate	✓	✓	✓
Customer Assistance			
Smart Landscape Tune-Up Program	✓	✓	✓
Residential Customer Portal	✓		
Non-Residential Customer Assistance		✓	✓

4.3 School Education and Public Information Programs

Public Information Program – Cal Water operates an extensive public information program to provide information to customers on ways to use water efficiently and to market its conservation programs through multiple media outlets, including the Cal Water website, direct mail and bills, digital media, social media, and email.

School Education Program - Cal Water's school education program includes the Cal Water H2O Challenge, a project-based learning competition for grades 4-6, individual student competitions for grades K-12 and general information and learning materials

for students and teachers. Cal Water deploys its school education program in all its districts. Cal Water H2O Challenge is a project-based competition for classrooms, grades 4-6. The program is offered in partnership with DoGoodery, the California Association of Science Educators (CASE), and the WestEd K-12 Alliance. The program aligns with the Common Core State Standards and the Next Generation Science Standards. The Cal Water H2O Challenge offers a unique opportunity for upper elementary teachers to facilitate their students' learning of standards-based content, while developing the core understanding of environmental principles necessary to becoming science-literate citizens.

4.4 Water System Efficiency

4.4.1 System Water Loss Management

As discussed above, reducing distribution system losses is one of the main focuses of the new Making Water Conservation a California Way of Life regulations. In preparation for these new requirements, Cal Water took part in the California Water Loss Technical Assistance Program (TAP) in both 2016 and 2017. Cal Water annually conducts distribution system audits using the American Water Works Association (AWWA) Free Water Audit Software. It has also developed a Water Loss Control Plan and Water Loss Control Policy to guide future water loss management with respect to:

- Meeting CPUC and state water loss standards and regulations
- Improving audit data and validity scores
- Implementing cost-effective water loss control actions

To coordinate and oversee water loss management actions across its multiple districts, Cal Water has added a Water Loss Program Analyst position to its conservation staff.

4.4.2 Metering and Pricing

Cal Water has deployed conservation-oriented rate designs in all its districts since 2008. The CPUC reviews these rate designs every three years as part of a general rate case. Cal Water is continuously seeking ways to improve the efficiency and equity of the rates and charges paid by customers. One example is Cal Water's Customer Assistance Program (CAP), which provides bill discounts to qualifying lower income households.

All service connections in the District are metered. In addition to its use for billing, Cal Water uses meter data in the management of its conservation programs, including using it to analyze water use trends and identify customers that may benefit from Cal Water conservation programs. Cal Water is also piloting automatic meter reading

(AMR) and advanced metering infrastructure (AMI) in several of its districts. Broad adoption of AMI would allow Cal Water in the future to detect and alert households of leaks and other possible problems as well as provide customers with tailored water use information to help them use water more efficiently.

4.5 Conservation Partnerships

Cal Water collaborates with organizations at the local, state, and national level to promote and advance water use efficiency, including as a member of the following organizations and initiatives.

California Water Efficiency Partnership (CalWEP) – CalWEP's mission is to maximize urban water efficiency and conservation throughout California by supporting and integrating innovative technologies and practices; encouraging effective public policies; advancing research, training, and public education; and building collaborative approaches and partnerships. In addition to being a CalWEP member, Cal Water serves on the organization's board of directors.

Alliance for Water Efficiency - The Alliance for Water Efficiency (AWE) is a national non-profit organization dedicated to efficient and sustainable use of water. In addition to being an AWE member, Cal Water uses the AWE Water Conservation Tracking Tool to evaluate conservation programs and track water savings.

EPA WaterSense - As an EPA WaterSense partner, Cal Water has committed to educating its customers about the value of water, water efficiency, and the WaterSense brand. Products and services earning the WaterSense label have been certified to be at least 20 percent more efficient without sacrificing performance.

5 Conservation Budget

The District's recommended conservation budget for the period 2021-2025 is presented in Figure 8.[5] Cal Water used the three-step process shown in Figure 9 to develop the conservation budget. In the first step, a wide range of possible conservation programs are qualitatively screened in terms of their potential savings, implementation feasibility, customer receptivity, and cost. The program screening filters used in this step are listed in Table 4. In the second step, the programs passing through the screen are quantitatively analyzed using the AWE's Water Conservation Tracking Tool. In the third step, a portfolio of programs is developed based on the

[5] This is a composite of the conservation budget the CPUC approved in Cal Water's 2018 general rate case, which covers the period 2020-2022, and the budget Cal Water is proposing in its 2021 general rate case, which covers the period 2023-2025. Depending on the outcome of the general rate case, the adopted 2023-2025 budget may differ from Cal Water's recommended budget.

results of the second step. As discussed earlier, in its two most recent general rate cases Cal Water has further refined the conservation budget based on the results of a risk assessment used to determine which districts may require additional resources to meet the state's new conservation regulations.

Figure 8. Recommend Conservation Budget and Allocation: 2021-2025

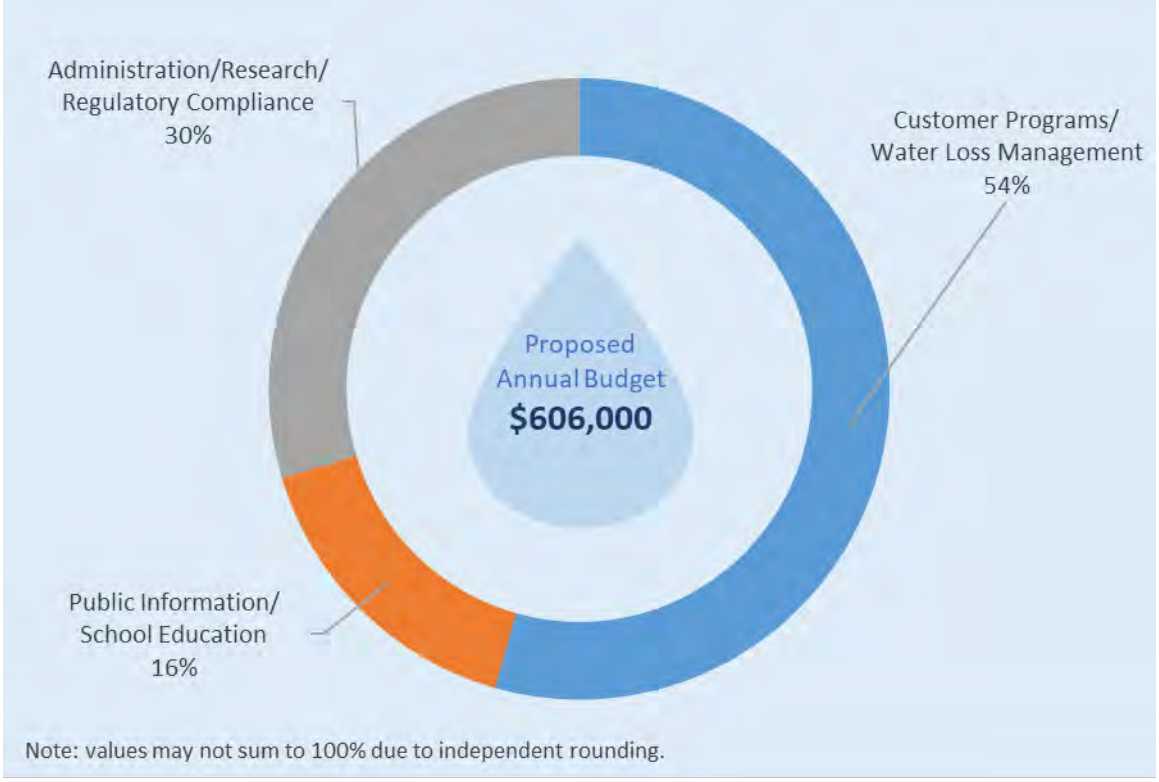


Figure 9. Conservation Program Assessment Method

Table 4. Conservation Measure Qualitative Screening Filters

Filter	Description
Water Savings Potential	The amount of water a measure can potentially save over its lifespan or over a certain period after an action that encourages behavioral change (such as receipt of a home water survey). This filter screens out measures where potential savings are too low to make it worthwhile.
Certainty of Water Savings	The certainty of the water savings estimated in Water Savings Potential. Some measures have high potential but low certainty because they are new and untested or because they rely on uncertain behavioral actions of participants. Other measures have low potential but high certainty. This filter screens out measures that have low expected savings (i.e., measures with high certainty but low potential or measures with high potential but low certainty) or flags these measures as candidates for pilot programs.
Implementation Feasibility	The ease with which a measure can be implemented, such as adequate budget and staff resources to handle outreach and ongoing administrative needs. This filter screens out measures than are considered infeasible to implement.
Customer Receptivity	The degree to which customers are receptive to a measure, such as how easy or difficult it is for a customer to apply for a certain rebate or arrange for a water survey. This filter screens out measures that are unlikely to be favored by customers.
Adaptability	The ease with which a measure can be scaled to react to a changing market (e.g., increasing or decreasing a toilet rebate to ramp up/down the participation rate), or adjusted to accommodate a different market sector (e.g., redesigning the incentives or other parameters of a single-family landscape turf replacement program to target the multi-family or commercial sectors). This filter screens out measures that cannot be readily adapted to changing circumstances of the market.
Cost	The expected cost-effectiveness of the measure relative to other measures. This filter screens out measures that are unlikely to be cost-effective or would crowd out other desirable measures because of its expense.

6 Performance Metrics

Cal Water periodically evaluates program savings potential and cost-effectiveness using the AWE Water Conservation Tracking Tool. Based on the most recent evaluation, the expected water savings and cost-effectiveness of Bear Gulch's conservation program are as follows:

- **Water Savings** – Up to 360 AF/year and cumulatively up to 5,600 AF over the useful life of the measures. Program water savings will help the District comply with new state water conservation regulations.
- **Unit Cost** – $700/AF (rounded to nearest $100), which is less than the District's purchased water cost.
- **Benefit-Cost Ratio** -- 2.9. The District's conservation program is expected to pay back $2.90 in avoided purchased water costs for every dollar of program expenditure.

7 Program Monitoring and Reporting

Cal Water regularly reviews its conservation programs to ensure they are performing as expected. This includes the following:

Program Tracking - Cal Water uses the AWE Water Conservation Tracking tool to track program participation, cost, and water savings. This data helps Cal Water monitor program performance, analyze water use trends, and forecast future water demand.

Research and Evaluation – Cal Water regularly evaluates program performance and undertakes pilot projects to assess the effectiveness of its programs. Examples include:

- Comprehensive statistical evaluations of bathroom retrofit programs operated between 2013 and 2018
- Statistical evaluations of water savings associated with high-efficiency irrigation nozzle replacement, smart irrigation controller installation, and turf replacement programs.
- Development of statistical models of customer program participation that help Cal Water target programs based on household and neighborhood attributes.
- AMR and AMI pilot projects.

Annual Conservation Report – Cal Water annually reports on the conservation program's progress and accomplishments, and posts public reports for each of its districts on its public website (https://www.calwater.com/conservation/water-conservation-reports/).

CPUC Reporting – Cal Water reports to the CPUC annually on the implementation, cost, and performance of its conservation programs.

State Reporting – Starting in 2023, Cal Water will annually report District water use relative to its water use objective as part of the new Making Water Conservation a California Way of Life regulations.

Appendix N: Resolution to Adopt UWMP

CALIFORNIA WATER SERVICE
1720 North First Street
San Jose, CA 95112-4598 *Tel:* (408) 367-8200

June 20, 2021

Julia Ekstrom, PhD
Supervisor, Urban Unit
California Department of Water Resources
Water Use Efficiency Section
P.O. Box 942836
Sacramento, CA 94236-0001

Re: Adoption of the 2020 Urban Water Management Plan and Water Shortage Contingency Plan
California Water Service – Bear Gulch District

Ms. Ekstrom:

This letter serves as notice that California Water Service Company (Cal Water) has formally adopted this 2020 Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) for our Bear Gulch District.

The attached resolution from Cal Water's Board of Directors on September 28, 2005 delegated authority for this approval to, among others, any Vice President. I have approved the attached UWMP and WSCP, which was developed by staff under my supervision in accordance with the Urban Water Management Planning Act contained in the California Water Code, Division 6, Part 2.6.

If you have any questions regarding this UWMP or WSCP, please contact Michael Bolzowski at the above mailing address, by telephone at (408) 367-8338, or by email at mbolzowski@calwater.com.

Sincerely,

Shannon Dean
Vice President, Customer Service and Chief Citizenship Officer

Attachments

cc: Ken Jenkins - Director, Water Resource Sustainability
Dawn Smithson - District Manager, Bear Gulch District

CALIFORNIA WATER SERVICE
1720 North First Street
San Jose, CA 95112-4598 *Tel:* (408) 367-8200

CALIFORNIA WATER SERVICE COMPANY

RESOLVED, that this Board of Directors delegates its authority to approve Urban Water Management Plans as required under the Urban Water Management Planning Act contained in California Water Code 6, Part 2.6 to the President and Chief Executive Officer, any Vice President, the Corporate Secretary and any Assistant Secretary of California Water Service Company.

--oOo--

I, DAN L. STOCKTON, Corporate Secretary of California Water Service Company, a California corporation, do hereby certify that the foregoing is a full, true and correct copy of certain resolution adopted by the Board of Directors of said corporation at a regular meeting of said Board duly called and held September 28, 2005, at which a quorum was present, that all Directors present voted in favor of said resolution, and that said resolution has never been annulled or revoked but is still in full force and effect.

IN WITNESS WHEREOF, I have hereunto signed my name this 7th day of September, 2005.

Dan L. Stockton
Corporate Secretary

Appendix B

Menlo Park Municipal Water, 2020 Urban Water Management Plan

June 2021

2020 Urban Water Management Plan

for Menlo Park Municipal Water

eki environment & water

TABLE OF CONTENTS

1 INTRODUCTION AND OVERVIEW 1
1.1 Background and Purpose 1
1.2 Urban Water Management Planning and the California Water Code 1
1.3 Relationship to Other Planning Efforts 2
1.4 Plan Organization 3
1.5 Demonstration of Consistency with the Delta Plan for Participants in Covered Actions 3
1.6 Lay Description 4
2 PLAN PREPARATION 7
2.1 Compliance with the UWMP Act 7
2.2 Coordination and Outreach 8
2.3 UWMP Structure, Standard Units, and Basis for Reporting 12
3 SYSTEM DESCRIPTION 14
3.1 Service Area Population and Demographics 14
3.2 Land Uses within Service Area 17
3.3 Climate 18
3.4 Water Distribution System 20
4 WATER USE CHARACTERIZATION 26
4.1 Historical and Current Total Water Demand 26
4.2 Projected Total Water Demand 33
4.3 Water Use Sectors Not Included in the Demand Projections 42
4.4 Climate Change Impacts to Demand 42
4.5 Coordinating Water Use Projections 43
4.6 Urban Water Use Objectives 44
5 SBX7-7 BASELINES, TARGETS, AND 2020 COMPLIANCE 47
5.1 Service Area Population 48
5.2 Baseline Water Use 48
5.3 Water Use Targets 49
5.4 2020 Target Compliance 51

6 WATER SUPPLY CHARACTERIZATION 52
6.1 Purchased or Imported Water 52
6.2 Groundwater 58
6.3 Surface Water 64
6.4 Stormwater 64
6.5 Wastewater and Recycled Water 64
6.6 Desalinated Water Opportunities 72
6.7 Water Exchanges and Transfers 73
6.8 Future Water Projects 74
6.9 Summary of Existing and Planned Sources of Water 75
6.10 Special Conditions 81
6.11 Energy Intensity 86
7 WATER SERVICE RELIABILITY AND DROUGHT RISK ASSESSMENT 88
7.1 Water Service Reliability Assessment 88
7.2 Drought Risk Assessment 114
8 WATER SHORTAGE CONTINGENCY PLAN 120
9 DEMAND MANAGEMENT MEASURES 129
9.1 Regional Water Conservation 129
9.2 Agency Water Conservation 131
9.3 Implementation over the Past Five Years 137
9.4 Planned Implementation to Achieve Water Use Targets 137
9.5 Urban Water Use Objectives (Future Requirement) 137
10 PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION 143
10.1 Notification of UWMP and WSCP Preparation 143
10.2 Notification of Public Hearing 143
10.3 Public Hearing and Adoption 144
10.4 Plan Submittal 145
10.5 Public Availability 145
REFERENCES 146

TABLES

Table 2-1 Public Water Systems (DWR Table 2-1)
Table 2-2 Plan Identification (DWR Table 2-2)
Table 2-3 Water Supplier Information Exchange (DWR Table 2-4)
Table 2-4 Notification to Cities and Counties (DWR Table 10-1)
Table 2-5 Supplier Identification (DWR Table 2-3)
Table 3-1 Population - Current and Projected (DWR Table 3-1)
Table 3-2 Employment - Current and Projected
Table 3-3 Demographic and Housing Characteristics
Table 3-4 Average Monthly Climate Characteristics
Table 4-1 Demands for Potable and Non-Potable Water - Actual (DWR Table 4-1)
Table 4-2 Historical and Current Potable Water Demand and Population
Table 4-3 Last Five Years of Water Loss Audit Reporting (DWR Table 4-4)
Table 4-4 Inclusion in Water Use Projections (DWR Table 4-5)
Table 4-5 Projected Total Water Demand and Projected Passive and Active Water Conservation
Table 4-6 Use for Potable and Non-Potable - Projected (DWR Table 4-2)
Table 4-7 Total Water Use (Potable and Non-Potable) (DWR Table 4-3)
Table 4-8 Characteristic Five-Year Water Use
Table 4-9 Current and Projected Residential Per Capita Water Use
Table 5-1 Baselines and Targets Summary (DWR Table 5-1)
Table 5-2 2020 Compliance (DWR Table 5-2)
Table 6-1 Groundwater Volume Pumped (DWR Table 6-1)
Table 6-2 Wastewater Collected Within Area in 2020 (DWR Table 6-2)
Table 6-3 Wastewater Treatment and Discharge Within Service Area in 2020 (DWR Table 6-3)
Table 6-4 Recycled Water Direct Beneficial Uses Within Service Area (DWR Table 6-4)
Table 6-5 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual (DWR Table 6-5)
Table 6-6 Methods to Expand Future Recycled Water Use (DWR Table 6-6)
Table 6-7 Expected Future Water Supply Projects or Programs (DWR Table 6-7)
Table 6-8 Water Supplies - Actual (DWR Table 6-8)
Table 6-9 Water Supplies - Projected (DWR Table 6-9)
Table 6-10 Recommended Energy Intensity - Total Utility Approach (DWR Table O-1B)
Table 7-1 Basis of SFPUC RWS Water Year Data (Reliability Assessment) (DWR Table 7-1)
Table 7-2 Basis of Recycled Water Year Data (Reliability Assessment) (DWR Table 7-1)
Table 7-3 RWS Wholesale Supply Availability During Normal and Dry Years for Based Years 2025 through 2040 (Responds to DWR Table 7-1)
Table 7-4 Normal Year Supply and Demand Comparison (DWR Table 7-2)
Table 7-5 Single Dry Year Supply and Demand Comparison (DWR Table 7-3)
Table 7-6 Multiple Dry Years Supply and Demand Comparison (DWR Table 7-4)
Table 7-7 MPMW Supply Availability During Multiple Dry Years for Base Year 2020

Table 7-8 Five-Year Drought Risk Assessment Tables to Address Water Code 10635(b) (DWR Table 7-5)
Table 8-1 Water Shortage Contingency Plan Levels (DWR Table 8-1)
Table 8-2 Demand Reduction Actions (DWR Table 8-2)
Table 8-3 Supply Augmentation and Other Actions (DWR Table 8-3)
Table 9-1 Summary of DMMs and Implementation over the Past Five Years (2015-2020)

FIGURES

Figure 3-1 Regional Vicinity Map
Figure 3-2 Water Purveyors within the City of Menlo Park
Figure 3-3 Land Use Designations within the MPMW Service Area
Figure 3-4 MPMW Service Area Map
Figure 6-1 Regional Water System
Figure 6-2 Groundwater Basins in the Vicinity of the MPMW Service Area

APPENDICES

Appendix A. Completed UWMP Checklist
Appendix B. UWMP Agency Notification Letters
Appendix C. UWMP Public Notification
Appendix D. Population and Employment Projections
Appendix E. SBx7-7 Compliance Tables
Appendix F. 2020 Current Population Estimate
Appendix G. SFPUC and BAWSCA Common Language for 2020 UWMPs
Appendix H. Letters from MPWD to BAWSCA and SFPUC
Appendix I. SFPUC Regional Water System Supply Reliability and BAWSCA Tier 2 Drought Implementation Scenarios
Appendix J. 26 March 2021 SFPUC Commission Special Meeting – Water Workshop Number 3 Water Supply Planning Scenarios SFPUC Staff Presentation Materials
Appendix K. Water Shortage Contingency Plan
Appendix L. Resolution 6630 Urban Water Management Plan, 2020 Update

ABBREVIATIONS

AB	Assembly Bill
ACWD	Alameda County Water District
AF	acre-foot
AFY	acre-foot per year
AMI	Advanced Metering Infrastructure
AWSP	Alternative Water Supply Planning Program
AWWA	American Water Works Association
BAIRWMP	Bay Area Integrated Regional Water Management Plan
BARR SWAP	Bay Area Regional Reliability Shared Water Access Program
BAWSCA	Bay Area Water Supply and Conservation Agency
BDPLs	Bay Division Pipelines
BG	billion gallon
CA	California
CASGEM	California Statewide Groundwater Elevation Monitoring
ccf	hundred cubic feet
CCR	California Code of Regulations
CCWD	Contra Costa Water District
CEQA	California Environmental Quality Act
CII	commercial, industrial, and institutional
CIP	Capital Improvement Plan
CUWCC	California Urban Water Conservation Council
CWC	California Water Code
DBP	disinfection by-product
DDW	Division of Drinking Water
DMM	Demand Management Measures
DOF	Department of Finance
DRA	Drought Risk Assessment
DSOD	Division of Safety of Dams
DSS	Decision Support System
DWR	California Department of Water Resources
EBMUD	East Bay Municipal Utilities District
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ETo	reference evapotranspiration
ft	foot
FTE	full-time equivalent
FY	fiscal year

GIS	geographic information system
GPCD	gallons per capita per day
gpf	gallons per flush
gpm	gallons per minute
GRP	Groundwater Reliability Partnership
GSP	Groundwater Sustainability Plan
GSR	Groundwater Storage and Recovery
GWMP	groundwater management plan
HET	High-Efficiency Toilet
HOA	homeowner's association
HTWTP	Harry Tracy Water Treatment Plant
IPCC	International Panel on Climate Change
ISG	Individual Supply Guarantee
JPA	Joint Powers Authority
kWh	kilowatt hours
LCSD	Lower Crystal Springs Dam
LOS	level of service
LVE	Los Vaqueros Reservoir Expansion
MCL	Maximum Contaminant Level
MG	million gallons
MGD	million gallons per day
MID	Modesto Irrigation District
MMWD	Marin Municipal Water District
MPMW	Menlo Park Municipal Water
MWELO	Model Water Efficient Landscape Ordinance
PAPMWC	Palo Alto Park Mutual Water Company
R-GPCD	residential gallons per capita per day
RUWMP	Regional Urban Water Management Plan
RWF	Recycled Water Facility
RWQCB	Regional Water Quality Control Board
RWS	Regional Water System
SB	Senate Bill
SCVWD	Santa Clara Valley Water District
SFPUC	San Francisco Public Utilities Commission
SGMA	Sustainable Groundwater Management Act
SHGCC	Sharon Heights Golf and Country Club
SLAC	SLAC National Accelerator Laboratory
SMP	Surface Mining Permit
SVCW	Silicon Valley Clean Water
SVWTP	Sunol Valley Water Treatment Plant
SWAP	Shared Water Access Program

SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
TID	Turlock Irrigation District
TRT	Tuolumne River Trust
U.S.	United States
USD	Union Sanitary District
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UV	ultraviolet
UWMP	Urban Water Management Plan
WBSD	West Bay Sanitary District
WCIP	Water Conservation Implementation Plan
WQD	Water Quality Division
WSA	Water Supply Assessment
WSAP	Water Shortage Allocation Plan
WSCP	Water Shortage Contingency Plan
WSIP	Water System Improvement Program
WWTP	Wastewater Treatment Plant

1 INTRODUCTION AND OVERVIEW

This chapter discusses the importance and uses of this Urban Water Management Plan (UWMP or Plan), the relationship of this Plan to the California Water Code (CWC), the relationship of this Plan to other local and regional planning efforts, and how this Plan is organized and developed in general accordance with the UWMP Guidebook 2020 (Guidebook; DWR, 2021).

1.1 Background and Purpose

Menlo Park Municipal Water (MPMW) serves water to approximately half of the City of Menlo Park (City), which is located along San Francisco Bay in San Mateo County. MPMW delivers water to residential, commercial, industrial, and governmental customers and purchases all of its potable water supplies from the San Francisco Public Utilities Commission (SFPUC). As of December 2020, MPMW serves 4,296 connections within its service area.

This UWMP is a foundational document and source of information about MPMW's historical and projected water demands, water supplies, supply reliability and potential vulnerabilities, water shortage contingency planning, and demand management programs. Among other things, it is used as:

- A long-range planning document for water supply and system planning; and
- A source for data on population, housing, water demands, water supplies, and capital improvement projects used in:
    - Regional water resource management plans prepared by wholesale water suppliers and other regional planning authorities (as applicable),
    - General Plans prepared by cities and counties, and
    - Statewide and broad regional water resource plans prepared by the California Department of Water Resources (DWR), the State Water Resources Control Board (State Board), or other state agencies.

MPMW's last UWMP was completed in 2016, referred to herein as the "2015 UWMP" (City of Menlo Park, 2016a). This Plan is an update to the 2015 UWMP and carries forward information that remains current and is relevant to this Plan, and provides additional information as required by amendments to the UWMP Act (CWC §10610 – 10657). Although this Plan is an update to the 2015 UWMP, it was developed to be a self-contained, stand-alone document and does not require readers to reference information contained in previous updates.

1.2 Urban Water Management Planning and the California Water Code

The UWMP Act requires urban water suppliers to prepare an UWMP every five years and to submit this plan to the DWR, the California State Library, and any city or county within which the supplier provides water supplies. All urban water suppliers, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet annually are required to prepare an UWMP (CWC §10617).

The UWMP Act was enacted in 1983. Over the years it has been amended in response to water resource challenges and planning imperatives confronting California. A significant amendment was made in 2009

as a result of the governor's call for a statewide 20 percent reduction in urban water use by 2020, referred to as "20x2020," the Water Conservation Act of 2009, and "SB X7-7." This amendment required urban retail water suppliers to establish water use targets for 2015 and 2020 that would result in statewide water savings of 20 percent by 2020. Beginning in 2016, urban retail water suppliers were required to comply with the water conservation requirements in SB X7-7 in order to be eligible for state water grants or loans. Chapter 5 of this plan contains the data and calculations used to determine compliance with these requirements.

A subsequent substantial revision to the UWMP Act was made in 2018 through a pair of bills (i.e., Assembly Bill 1668 and Senate Bill 606), referred to as "Making Water Conservation a California Way of Life" or the "2018 Water Conservation Legislation." These changes include, among other things, additional requirements for Water Shortage Contingency Plans (WSCPs), expansion of dry year supply reliability assessments to a five-year drought period, establishment of annual drought risk assessment procedures and reporting, and new conservation targets referred to as "annual water use objectives," which will require retailers to continue to reduce water use beyond the 2020 SB X7-7 targets.

As applicable, MPMW's 2020 UWMP reflects the following significant revisions to the UWMP Act that have been made since 2015.

- ***Five Consecutive Dry-Year Water Reliability Assessment***. The Legislature modified the dry-year water reliability planning from a "multiyear" time period to a "drought lasting five consecutive water years" designation.
- ***Drought Risk Assessment***. The Drought Risk Assessment (DRA) requires a supplier to assess water supply reliability over a five-year period from 2021 to 2025 that examines water supplies, water uses, and the resulting water supply reliability under a reasonable prediction for five consecutive dry years.
- ***Energy Analysis.*** UWMPs are now required to include water system energy usage information that can be readily obtained.
- ***Seismic Risk***. The Water Code now requires suppliers to specifically address seismic risk to various water system facilities and to have a mitigation plan.
- ***Water Shortage Contingency Plan***. In 2018, the Legislature modified the UWMP laws to require a WSCP with specific elements as explained in Appendix K.
- ***Lay Description***. The Legislature included a new statutory requirement for suppliers to include a lay description of the fundamental determinations of the UWMP, especially regarding water service reliability, challenges ahead, and strategies for managing reliability risks.

The UWMP Act contains numerous other requirements that an UWMP must satisfy. Appendix A to this Plan lists each of these requirements and where in the Plan they are addressed.

1.3 Relationship to Other Planning Efforts

This Plan provides information specific to water management and planning by MPMW. However, water management does not happen in isolation; there are other planning processes that integrate with the UWMP to accomplish urban planning. Some of these relevant planning documents include relevant city

and county General Plans, Water Master Plans, Recycled Water Master Plans, integrated resource plans, Integrated Regional Water Management Plans, and others.

This Plan is informed by and helps to inform these other planning efforts. In particular, this Plan was prepared in close coordination with the City of Menlo Park's Community Development Department (Planning) and the Public Works Department (Engineering). Primary coordination was achieved through City staff's participation in two UWMP workshops (held on 1 December 2020 and 16 February 2021). At these workshops, key information regarding the 2020 UWMP content was presented and City representatives were provided the opportunity to review, comment, and present additional information.

1.4 Plan Organization

The organization of this Plan follows the same sequence as outlined in the Guidebook (DWR, 2021).

Chapter 1 - Introduction and Overview

Chapter 2 - Plan Preparation

Chapter 3 - System Description

Chapter 4 - Water Use Characterization

Chapter 5 - SBx7-7 Baselines, Targets, and 2020 Compliance

Chapter 6 - Water Supply Characterization

Chapter 7 - Water Service Reliability and Drought Risk Assessment

Chapter 8 - Water Shortage Contingency Plan

Chapter 9 - Demand Management Measures

Chapter 10 - Plan Adoption, Submittal, and Implementation

In addition to these ten chapters, this Plan includes a number of appendices providing supporting documentation and supplemental information. Pursuant to CWC §10644(a)(2), this Plan utilizes the standardized forms, tables, and displays developed by DWR for the reporting of water use and supply information required by the UWMP Act. This Plan also includes additional tables, figures, and maps to augment the set developed by DWR, as appropriate. The table headers indicate if the table is part of DWR's standardized set of submittal tables.

1.5 Demonstration of Consistency with the Delta Plan for Participants in Covered Actions

The Sacramento-San Joaquin Delta Reform Act of 2009 (Delta Reform Act) (Water Code § 85000 et seq), established the coequal goals for the Sacramento-San Joaquin Delta (Delta) of "providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem." The Delta Reform Act also includes a state policy to reduce reliance on the Delta in meeting California's future water supply needs through a statewide strategy of investing in improved regional supplies, conservation, and water use efficiency.

In addition to establishing the coequal goals, the Delta Reform Act created the Delta Stewardship Council, which is tasked with furthering the state's coequal goals for the Delta through development of a Delta

Plan. Delta Stewardship Council released the Delta Plan in 2013, which adopted 14 recommendations to achieve the coequal goals of water supply and reliability.

Although not required by the UWMP Act, in the Guidebook (DWR, 2021), DWR recommends that all suppliers that are participating in, or may participate in, receiving water from a proposed project that is considered a "covered action" under the Delta Plan—such as a (1) multiyear water transfer; (2) conveyance facility; or (3) new diversion that involves transferring water through, exporting water from, or using water in the Delta —provide information in their UWMP to demonstrate consistency with the Delta Plan policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (California Code of Regulations, Title 23, Section 5003). The SFPUC, MPMW's wholesale agency, has made a legal determination that this requirement does not apply to their water sources.[1]

1.6 Lay Description

☑ ***CWC § 10630.5***

Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.

This Urban Water Management Plan (UWMP or Plan) is prepared for Menlo Park Municipal Water (MPMW), which serves drinking water to approximately 4,296 accounts within the City of Menlo Park. This UWMP serves as a foundational planning document and includes descriptions of historical and projected water demands and water supplies and reliability over a 20-year planning horizon. This document also describes the actions MPMW is taking to promote water conservation, both by the agency itself and by its customers (referred to as "demand management measures") and includes a plan to address potential water supply shortages such as drought or other impacts to supply availability (the "Water Shortage Contingency Plan"). This UWMP is updated every five years in accordance with state requirements under the Urban Water Management Planning Act and amendments (Division 6 Part 2.6 of the California Water Code [CWC] §10610 – 10656). Past plans developed for MPMW are available on the California Department of Water Resources (DWR) Water Use Efficiency Data Portal website: https://wuedata.water.ca.gov/. This document includes ten chapters, which are summarized below.

Chapter 1 – Introduction and Overview

This chapter presents the background and purpose of the UWMP, identifies the Plan organization, and provides this lay description overview of the document. For suppliers that receives water from a "covered action" under the Delta Plan, this section also discusses and demonstrates consistency with Delta Plan Policy WR P1. MPMW, however, does not receive water from a "covered action" under the Delta Plan, and thus this discussion is not applicable.

[1] Email from BAWSCA, dated 9 February 2021.

Chapter 2 - Plan Preparation

This chapter discusses key structural aspects related to the preparation of the UWMP, and describes the coordination and outreach conducted as part of the preparation of the Plan, including coordination with local agencies (i.e., the San Francisco Public Utilities Commission [SFPUC], members of the Bay Area Water Supply and Conservation Agency [BAWSCA], the West Bay Sanitary District [WBSD]) and the public.

Chapter 3 - System Description

This chapter provides a description of MPMW's water system and service area, including information related to the climate, demographics, and the water distribution system. The MPMW service area is located within a region characterized by a Mediterranean climate with cool, wet winters and warm, dry summers. The majority of precipitation falls during winter and spring, averaging 15 inches of rainfall annually. MPMW currently serves a population of approximately 18,276. Population is projected to increase steadily through 2040. Significant new development is envisioned in the General Plan within MPMW's service area. MPMW distributes water purchased from the SFPUC to its three pressure zones via five SFPUC service connections (turnouts). MPMW operates one emergency supply well as well as 13 interties with adjacent water systems.

Chapter 4 - Water Use Characterization

This chapter provides a description and quantifies MPMW's current and projected demands through the year 2040. MPMW provides drinking water (also referred to as "potable water") to customers. Water demands refer not only to the water used by customers, but also includes the water used as part of the system maintenance and operation, as well as unavoidable losses inherent in the operation of a water distribution system. MPMW water demand was 1,021 million gallons (MG) on average between 2016 and 2020. Taking into account historical water use, expected population increase and other growth, climatic variability, and other assumptions, water demand within MPMW is projected to increase to 1,483 MG by 2040, a change of 41% compared to the 2016-2020 average.

Chapter 5 - SBx7-7 Baselines, Targets, and 2020 Compliance

In this chapter, MPMW demonstrates compliance with its per capita water use target for the year 2020. The Water Conservation Act of 2009 (Senate Bill X7-7) was enacted in November 2009 and requires the state of California to achieve a 20 percent reduction in urban per capita water use by December 31, 2020. In order to achieve this, each urban retail water supplier was required to establish water use targets for 2015 and 2020 using methodologies established by DWR. MPMW is in compliance with its 2020 water use target of 204 gallons per capita per day (GPCD), having reduced its water use in 2020 to 160 GPCD.

Chapter 6 - Water Supply Characterization

This chapter presents an analysis of MPMW's water supplies, as well as an estimate of water-related energy consumption. The intent of this chapter is to present a comprehensive overview of MPMW's water supplies, estimate the volume of available supplies over the 20-year planning horizon, and assess the sufficiency of supplies to meet projected demands under "normal" hydrologic conditions.

The sole source of potable water supply for MPMW is purchased water from the SFPUC. MPMW has a contractual supply of 4.456 million gallons per day (MGD), or approximately 1,630 MG per year. Water supply for MPMW is expected to be sufficient during normal years to meet the projected water demand through 2040. MPMW has been working with West Bay Sanitary District (WBSD), the recycled water purveyor for MPMW's service area, to develop recycled water. Recycled water is currently used for

irrigation at the Sharon Heights Golf and Country Club. Another similar recycled water project in the Bayfront area is undergoing planning.

Calculation and reporting of water system energy intensity is a new requirement for the 2020 UWMPs. Energy intensity is defined as the net energy used for water treatment, conveyance, and distribution for all water entering the distribution system, less the amount of energy produced within the water system itself. The energy intensity for MPMW is estimated to be 349 kilowatt hours per MG of water (kWh/MG).

Chapter 7 - Water Service Reliability and Drought Risk Assessment

This chapter assesses the reliability of MPMW's water supplies, with a specific focus on potential constraints such as water supply availability, water quality, and climate change. The intent of this chapter is to identify any potential constraints that could affect the reliability of MPMW's supply (such as drought conditions) to support MPMW's planning efforts to ensure that it can meet projected demands. Water service reliability is assessed during normal, single dry-year, and multiple dry-year hydrologic conditions.

Based on this analysis, MPMW's supply is expected to be sufficient to meet demands in normal year conditions. However, MPMW is expected to experience significant shortfalls during single dry and multiple dry year conditions as a result of amendments to the Water Quality Control Plan for the San Francisco/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) implementation. Yet, numerous uncertainties remain in the implementation of the Bay-Delta Plan Amendment and the resultant allocation of the available supply between the Wholesale Customers.

Chapter 8 - Water Shortage Contingency Plan

This chapter describes the Water Shortage Contingency Plan (WSCP) for MPMW. The WSCP serves as a standalone document to be engaged in the case of a water shortage event, such as a drought or supply interruption, and defines specific policies and actions that will be implemented at various shortage level scenarios. For example, implementing customer water budgets and surcharges, or restricting landscape irrigation to specific days and/or times. Consistent with DWR requirements, the WSCP includes six levels to address shortage conditions ranging from up to 10% to greater than 50% shortage.

Chapter 9 - Demand Management Measures

This chapter includes descriptions of past and planned conservation programs that MPMW operates within each demand management measure (DMM) category outlined in the UWMP Act, specifically: (1) water waste prevention ordinances, (2) metering, (3) conservation pricing, (4) public education and outreach, (5) distribution system water loss management, (6) water conservation program coordination and staffing support, and (7) "other" DMMs. MPMW has developed a suite of conservation programs and policies, which address each DMM category. Additionally, MPMW participates in water conservation programs offered by BAWSCA. It is estimated that between the years 2016 and 2020, MPMW conserved over 6 MG through implementation of DMMs.

Chapter 10 - Plan Adoption, Submittal, and Implementation

This chapter provides information on a public hearing, the adoption process for the UWMP and the associated WSCP, the adopted UWMP and WSCP submittal process, plan implementation, and the process for amending the adopted UWMP and WSCP. MPMW adopted the UWMP and WSCP during a City Council meeting on 25 May 2021. This UWMP and the WSCP was submitted to DWR within 30 days of adoption and by the 1 July 2021 deadline.

2 PLAN PREPARATION

This chapter discusses the type of Urban Water Management Plan (UWMP or Plan) Menlo Park Municipal Water (MPMW) has prepared and includes information that will apply throughout the Plan. Coordination and outreach during the development of the Plan is also discussed.

2.1 Compliance with the UWMP Act

☑ ***CWC § 10620 (b)***

Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

The 2020 UWMP has been prepared in accordance with the Urban Water Plan Act (UWMP Act), which is defined by the California Water Code (CWC) §10610 - §10657. The UWMP Act requires every urban water supplier that provides water for municipal purposes to more than 3,000 connections, or supplies more than 3,000 acre-feet (AF) of water annually, to adopt and submit a plan every five years to the California Department of Water Resources (DWR). Table 2-1 provides information on MPMW's public water system which services 4,296 connections within its service area and is therefore subject to the requirements of the UWMP Act.

Table 2-1 Public Water Systems (DWR Table 2-1)

Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020 (MG)
CA4110017	City of Menlo Park	4,296	1,069
	TOTAL	4,296	1,069
NOTES: (a) Data provided by MPMW.			

As indicated in Table 2-2, MPMW's 2020 UWMP is an individual Plan. It has been prepared in general accordance with the format suggested in DWR's UWMP Guidebook (Guidebook; DWR, 2021). Text from the UWMP Act has been included in grey boxes at the beginning of relevant sections of this UWMP. The information presented in the respective UWMP sections and the associated text, figures, tables and charts are collectively intended to fulfill the requirements of that sub-section of the UWMP Act. To the extent practicable, supporting documentation has also been provided in Appendices A through N. Other sources for the information contained herein are provided in the references section of the document.

Per CWC §10644(a)(2), selected information for the 2020 UWMP updates must be presented in standardized tables for electronic submittal to DWR. To the extent applicable, text and tables in the main body of the UWMP document have been cross-referenced to the companion DWR tables. The DWR tables

include an optional column for 2045. However, MPMW's data are only reported up through 2040 to be consistent with the General Plan's planning horizon.

Table 2-2 Plan Identification (DWR Table 2-2)

Select Only One	Type of Plan		Name of RUWMP or Regional Alliance *if applicable*
X	Individual UWMP		
		Water Supplier is also a member of a RUWMP	
		Water Supplier is also a member of a Regional Alliance	
	Regional Urban Water Management Plan (RUWMP)		
NOTES:			

2.2 Coordination and Outreach

As described below and in Section 10, this UWMP has been prepared in coordination with the Bay Area Water Supply and Conservation Agency (BAWSCA), the BAWSCA member agencies, the San Francisco Public Utilities Commission (SFPUC), the West Bay Sanitary District (WBSD), the public, and other appropriate entities.

2.2.1 Role of BAWSCA and the UWMP Common Language

Among its other functions, BAWSCA represents MPMW and the 25 other water districts, cities, and utilities, collectively referred to as the "Wholesale Customers", in negotiations and other coordination efforts with the SFPUC. Together with the SFPUC, BAWSCA developed common language for inclusion in each Wholesale Customers' 2020 UWMP regarding the following common issues:

- Description of BAWSCA;
- Regional Water Demand and Conservation Projections;
- Long Term Reliable Water Supply Strategy;
- Making Conservation a Way of California Life Strategic Plan
- Tier One Drought Allocations;
- Tier Two Drought Allocations;
- SFPUC Regional Water System
- Individual Supply Guarantees (ISGs);
- 2028 SFPUC Decisions (formerly 2018 SFPUC Decisions);

- Reliability of the Regional Water System;
- Climate Change;
- SFPUC's Efforts to Develop Alternative Water Supplies
- SFPUC's Decision to use Bay-Delta Plan Scenario in UWMP Submittal Tables;
- Bay Delta Plan Implementation Starting Year;
- SFPUC's Decision to Present Both Modeling Results in its UWMP;
- Rate Impacts of Water Shortages; and
- BAWSCA Conservation Programs.

For clarification purposes, and as shown below, the common language provided by BAWSCA is shown in grey font and has been indented for emphasis; it is otherwise presented unchanged from the original text provide by BAWSCA. As a result, there may be some redundancy in the information presented and the number of times that certain terms are abbreviated or defined. A description of BAWSCA's role generally and related to the 2020 UWMP development process is provided below.

> BAWSCA provides regional water reliability planning and conservation programming for the benefit of its 26 member agencies that purchase wholesale water supplies from the San Francisco Public Utilities Commission (SFPUC). Collectively, the BAWSCA member agencies deliver water to over 1.8 million residents and nearly 40,000 commercial, industrial and institutional accounts in Alameda, San Mateo and Santa Clara Counties.
>
> BAWSCA also represents the collective interests of these wholesale water customers on all significant technical, financial, and policy matters related to the operation and improvement of the SFPUC's Regional Water System (RWS).
>
> BAWSCA's role in the development of the 2020 Urban Water Management Plan (UWMP) updates is to work with its member agencies and the SFPUC to seek consistency among UWMP documents.

2.2.2 Wholesale Coordination

☑ ***CWC § 10631 (h)***

An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).

The SFPUC is a wholesale water supplier to all of the BAWSCA member agencies, and is the only wholesale water supplier to MPMW. As part of the coordination efforts for the 2020 UWMP, and in compliance with CWC §10631(h), BAWSCA prepared water demand projections through 2040 on behalf of MPMW and transmitted MPMW's water demand projections to the SFPUC.

Additionally, as described in more detail in Section 6.11, MPMW has relied upon the water supply reliability projections provided by the SFPUC for the purposes of analyzing the reliability of its SFPUC supplies during normal and dry years through 2040 (see Table 2-3).[2]

Table 2-3 Water Supplier Information Exchange (DWR Table 2-4)

The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.
Wholesale Water Supplier Name
San Francisco Public Utilities Commission
NOTES:

2.2.3 Agency Coordination

☑ ***CWC § 10620 (d) (2)***

Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

As a member of BAWSCA and the BAWSCA Water Management Representative Committee, MPMW has coordinated closely with BAWSCA and its 25 other member agencies throughout the update of MPMW's UWMP. Between 12 February 2021 and 9 April 2021, MPMW attended a series of five webinars on supply reliability hosted by BAWSCA. During the webinar, BAWSCA and the member agencies reviewed the water supply reliability projections provided by the SFPUC, as well as the updated dry year supply allocations described in Section 7. MPMW also attends monthly water management meetings with BAWSCA and its member agencies that, among other topics, include discussion of items pertinent to the preparation of the 2020 UWMPs.

MPMW has also been supporting West Bay Sanitary District (WBSD), the wastewater agency serving MPMW's service area, to provide recycled water and assess potential recycled water supplies for the MPMW service area. The ongoing recycled water projects led by WBSD in coordination with MPMW are discussed in Section 6.

In addition, MPMW notified local and regional water retailers and public agencies of MPMW's intent to prepare the 2020 UWMP and Water Shortage Contingency Plan (WSCP), as well as the associated public hearing. A total of 68 recipients from 33 agencies and groups received notices as listed in Table 2-4 and

[2] Information provided by the SFPUC and BAWSCA are included in Appendix G.

Appendix B, including the SFPUC, BAWSCA, each BAWSCA member agency, and San Mateo County. Sample copies of the notices are provided in Appendix B.

Table 2-4 Notification to Cities and Counties (DWR Table 10-1)

City Name	60 Day Notice	Notice of Public Hearing
City of Menlo Park	X	X
County Name	**60 Day Notice**	**Notice of Public Hearing**
San Mateo County	X	X
Other Agency Name	**60 Day Notice**	**Notice of Public Hearing**
Note (a)	X	X

NOTES:
(a) See Appendix B for the full list of cities and agencies that MPMW provided notification to.

2.2.4 Public Participation

☑ ***CWC § 10642***

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

The City established and maintains a website in support of the 2020 UWMP update process[3]. The website provides background information regarding UWMPs and includes information on key 2020 UWMP preparation activities, including the 13 April 2021 City Council Study Session, availability of the Public Review Draft 2020 UWMP and WSCP, and the 25 May 2021 Public Hearing to adopt the 2020 UWMP and WSCP. A copy of the Public Review Draft 2020 UWMP and WSCP was posted on this website for public review on 26 April 2021. Notices were also sent to MPMW customers via water bills.

On 7 May 2021 and 14 May 2021, MPMW published a notice in the *Redwood City Tribune* informing the public that the 2020 UWMP and WSCP would be available for public review on the City's website, consistent with requirements of California Government Code 6066[4]. The notice also informed the public that the 2020 UWMP and WSCP public hearing would be held via teleconference on 25 May 2021. Copies of the newspaper announcements are included in Appendix C.

2.3 UWMP Structure, Standard Units, and Basis for Reporting

Per CWC §10644(a)(2), selected information for the 2020 UWMP updates must be presented in standardized tables for electronic submittal to DWR. As such, tables in the UWMP document follows DWR required format and have been cross-referenced to DWR table numbers.

[3] Menlo Park Municipal Water 2020 UWMP Website: https://www.menlopark.org/150/Urban-Water-Management-Plan.

[4] Government Code section 6066. Publication of notice pursuant to this section shall be once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such publication dates, are sufficient. The period of notice commences upon the first day of publication and terminates at the end of the fourteenth day, including therein the first day.

Per the Guidebook, the UWMP preparer is requested to complete a checklist of specific UWMP requirements to assist DWR's review of the submitted UWMP. The completed checklist is included in Appendix A.

Information presented in this UWMP is reported on a calendar year basis. The unit of measure for reporting water volumes is million gallons (MG) and is maintained consistently throughout the UWMP, unless otherwise noted (see Table 2-5).

Further, consistent with the Guidebook, the terms "water use", "water consumption", and "water demand" are used interchangeably in this UWMP.

Table 2-5 Supplier Identification (DWR Table 2-3)

Type of Supplier	
	Supplier is a wholesaler
X	Supplier is a retailer
Fiscal or Calendar Year	
X	UWMP Tables are in calendar years
	UWMP Tables are in fiscal years
If using fiscal years provide month and date that the fiscal year begins (mm/dd)	
Units of measure used in UWMP	
Unit	MG
NOTES:	

3 SYSTEM DESCRIPTION

☑ ***CWC § 10631 (a)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

Describe the service area of the supplier, including current and projected population, climate, and other social, economic, and demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available. The description shall include the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

Menlo Park Municipal Water (MPMW) serves approximately half of the City of Menlo Park (City), which is located along San Francisco Bay in San Mateo County, between the cities of Redwood City, Palo Alto, and East Palo Alto (Figure 3-1). Other purveyors within City limits include the California Water Service Company (Cal Water), which serves the Bear Gulch District; the O'Connor Tract Co-operative Water Company, which serves a small area of the City using groundwater production wells; and the Palo Alto Park Mutual Water Company, which serves fewer than ten homes using groundwater production wells within the eastern portion of the City. Figure 3-2 shows MPMW's service area and the approximate service area extents of the other water purveyors within the City.

MPMW is a member of Bay Area Water Supply and Conservation Agency (BAWSCA) and purchases all of its potable water from the San Francisco Public Utilities Commission (SFPUC). MPMW is governed by the City Council and run by the City's Public Works Department. Water distribution, water conservation and maintenance of water quality are MPMW's main water resource functions, as water purchased from the SFPUC does not require further treatment.

As required by the Urban Water Management Planning Act (UWMP Act), specific information about MPMW's service area, population, and climate is provided below. A brief description of MPMW's potable water distribution system is also included herein.

3.1 Service Area Population and Demographics

MPMW's water distribution system provides water retail service to approximately half of the City's population through approximately 4,296 connections. The current and projected population and employment data from 2020 through 2040 within the MPMW service area are shown in Table 3-1 and, Table 3-2 and the associated charts.

3.1.1 Future Population Growth

MPMW's service area is largely built-out and population growth is attributed primarily to redevelopment projects within the existing urban footprint. The City's General Plan sets the framework for development. As with the 2015 UWMP, this Plan estimates future population based on the expected growth associated with the buildout of the previous General Plan and the additional growth created through the 2016

General Plan update (i.e., ConnectMenlo) (City of Menlo Park, 1994 and 2016). The projections have been updated by the City's Planning Division to account for frontloading of development between 2020 and 2025, as indicated by their review of the approved and pending projects[5].

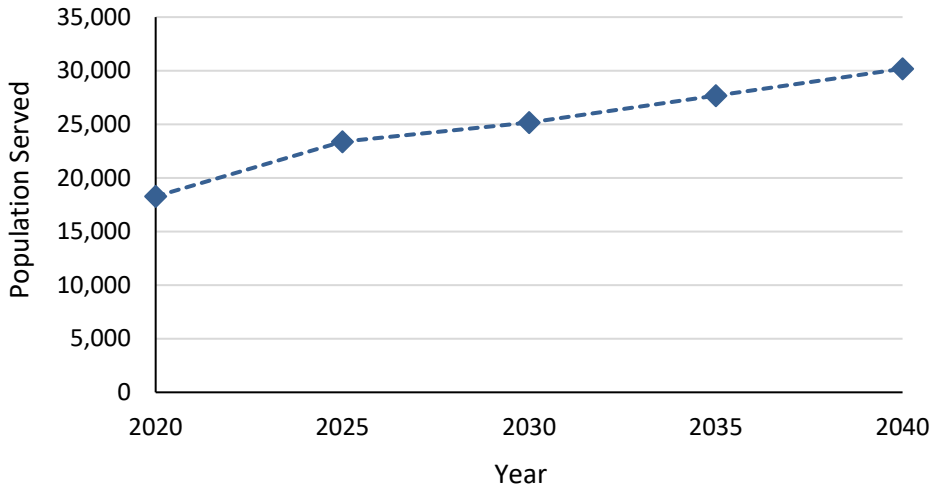
The total population within the MPMW service area is projected to be 30,184 by 2040. More than 40% of the increase is expected to take place within the next five years (2020 to 2025).

Table 3-1 Population - Current and Projected (DWR Table 3-1)

Population Served	2020	2025	2030	2035	2040	2045*(opt)*
	18,276	23,383	25,166	27,675	30,184	--

NOTES:
(a) Historical and current population data are further documented in Table 4-2.
(b) Data provided by the City (see Appendix D).

Chart 3-1 Current and Projected Population



3.1.2 Future Employment Growth

MPMW also supplies water to its commercial, industrial, and institutional (CII) customers, which were collectively estimated to provide 23,574 jobs within the MPMW service area in 2020 (see Table 3-2). Based

[5] Population and employment projections were estimated by the City's Planning Division, as documented in Appendix D.

on the previous General Plan, the ConnectMenlo update, and the City's approved and pending projects, the number of jobs within the MPMW service area is anticipated to grow to 37,311 in 2040[5], an increase of 58% relative to 2020.

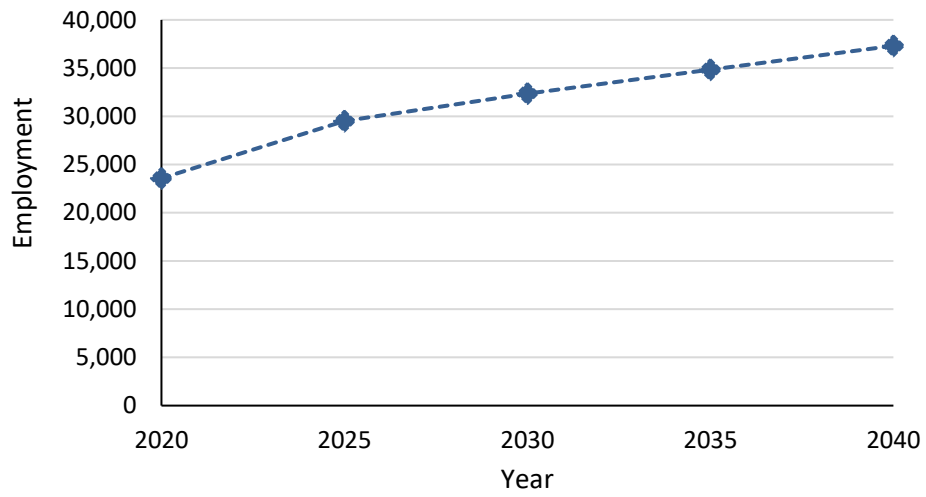
The anticipated job growth through 2040 is a combined effect of growth in the commercial sector and a decline in the industrial sector. Specifically, commercial jobs are expected to increase by 14,529 while industrial jobs are expected to decrease by 792 between 2020 and 2040. Additional details are provided in Appendix D.

Table 3-2 Employment - Current and Projected

Service Area Employment	2020	2025	2030	2035	2040	2045*(opt)*
	23,574	29,511	32,356	34,834	37,311	--

NOTES:
(a) Projected employment growth was provided by the City's Planning Division in October 2020 (see Appendix D).

Chart 3-2 Current and Projected Employment



3.1.3 Other Social, Economic, and Demographic Factors

Demographics for the City are summarized in Table 3-3 as they may affect water management and planning. The same data are also provided for the whole State of California as comparison. The City has a similar age and race structure to the State as a whole. Educational attainment and median household income in the City are much higher than for the State, and percent of population below the poverty level is comparatively lower.

Table 3-3 Demographic and Housing Characteristics

Demographics (a)	City of Menlo Park	California
Age and Sex		
Persons under 5 years	7.6%	6.0%
Persons under 18 years	24.9%	22.5%
Persons 65 years and older	14.0%	14.8%
Female persons	50.3%	50.3%
Race and Hispanic Origin		
White alone	67.2%	71.9%
Black or African American alone	4.5%	6.5%
American Indian and Alaska Native alone	0.7%	1.6%
Asian alone	15.0%	15.5%
Native Hawaiian and Other Pacific Islander alone	2.0%	0.5%
Two or More Races	5.0%	4.0%
Hispanic or Latino	15.5%	39.4%
White alone, not Hispanic or Latino	58.2%	36.5%
Families & Living Arrangements		
Persons per household	2.78	2.95
Living in same house 1 year ago, percent of persons age 1 year+	82.6%	87.1%
Language other than English spoken at home, age 5 years+	32.8%	44.2%
Education		
High school graduate or higher, persons age 25 years+	94.0%	83.3%
Bachelor's degree or higher, persons age 25 years+	69.6%	33.9%
Income & Poverty		
Median Household Income (2019 dollars)	$160,784	$75,235
Per capita income in past 12 months (2019 dollars)	$85,710	$36,955
Persons in poverty	7.6%	11.8%

NOTES:
(a) Demographic data per the U.S. Census Bureau QuickFacts website, https://www.census.gov/quickfacts/fact/table/menloparkcitycalifornia,CA/PST045219, accessed March 2021.

3.2 Land Uses within Service Area

General Plans are required by State law to guide land use and development within cities (California Government Code Section 65030.1). The Land Use and Circulation Elements are the central components of the General Plan as they frame the type and scale of potential development that may occur over a 20-year time horizon and informs associated transportation and water demand issues. Beginning in 2014, the

City initiated an effort to update the Land Use and Circulation Elements. This process, which is also known as ConnectMenlo, culminated in the adoption of the updated General Plan in 2016.

As reflected in the General Plan Land Use Element (City of Menlo Park, 2016b), the majority of the City's land use is residential (55%), while the remaining 45% is split among other uses, notably Bayfront Innovation Area (15%), Parks and Recreation (10%), and Commercial (7%). MPMW's service area is in the northeastern and southwestern portions of the City, covering approximately half of the City's area. Land uses within the MPMW service area generally consists of a mix of residential, commercial, light industrial uses (Figure 3-3).

The major land use changes included in the updated General Plan is the new development north of Highway 101 in the Bayfront Area (former M-2 Zoning Area), which is served by MPMW.[6] The maximum potential net increase from the Bayfront Area development includes approximately:

- 2.3 million non-residential square feet, including offices, life-sciences buildings, and other commercial uses;
- 400 hotel rooms;
- 4,500 multi-family residential units;
- Two transit centers; and
- Up to 61 acres of landscaped open space.

The future population, employment, and water demand projections presented in Sections 3 and 4 reflect buildout of the General Plan, including the additional allowable development associated with ConnectMenlo and other major development projects within the MPMW service area.

3.3 Climate

The MPMW service area is located within a region characterized by a Mediterranean climate with cool, wet winters and warm, dry summers. As shown in Table 3-4, rainfall in the area averages 15.2 inches per year and is generally confined to the wet season from late October to early May. The average reference evapotranspiration (ETo) for the region is 44 inches per year. The ETo is a standard measurement related to the water demand by plants in a specific region. Because the average annual ETo is approximately 30 inches more than the average annual precipitation, and because 90% of the annual precipitation occurs between the months of November and April, growing turf or other plantings in this region requires a significant amount of irrigation during the dry season. This irrigation demand contributes to the overall and observed seasonal variation in water demand throughout the MPMW service area.

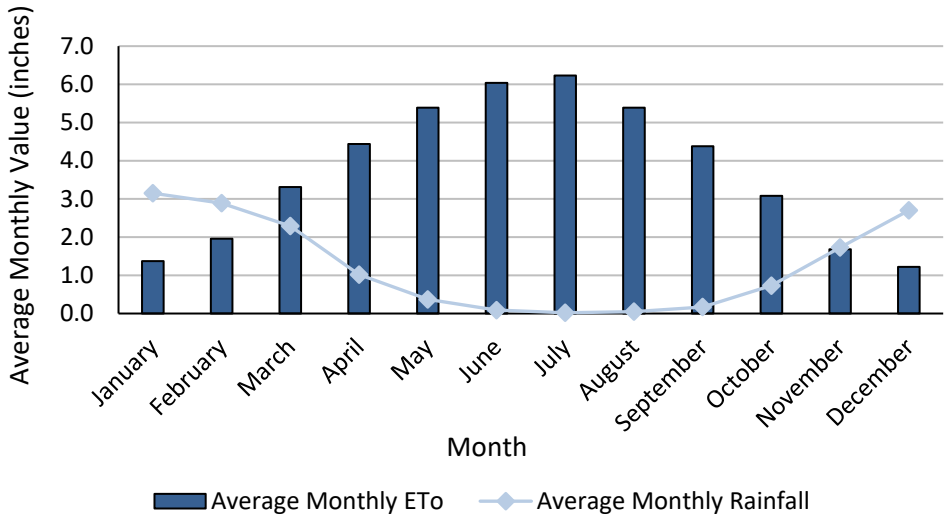
[6] A portion of the M-2 Area bounded by Highway 101, Marsh Road, and the Dumbarton Rail is served by California Water Service Company. The land use changes associated with ConnectMenlo in this area would generally reflect the same uses and intensity that is permitted under the current regulations.

Table 3-4 Average Monthly Climate Characteristics

Month	Average Temperature		Standard Average ETo (inches)	Average Rainfall (inches)
	Min (°F)	Max (°F)		
January	38.5	57.4	1.4	3.15
February	41.3	61.1	2.0	2.89
March	43.1	64.2	3.3	2.29
April	44.7	68.4	4.4	1.02
May	48.5	72.9	5.4	0.37
June	52.5	77.4	6.0	0.09
July	54.9	78.4	6.2	0.02
August	54.8	78.4	5.4	0.05
September	52.6	78.3	4.4	0.17
October	48.0	73.0	3.1	0.73
November	42.6	64.3	1.7	1.73
December	38.2	57.8	1.2	2.70
Annual	**46.6**	**69.3**	**44**	**15.2**

NOTES:
(a) Temperature and precipitation data are from the Western Regional Climate Center for Station #046646 PALO ALTO from 1 September 1953 to 4 June 2016.
(b) Reference evapotranspiration data for Union City station #171 are from the Department of Water Resources, California Irrigation Management Information System.

Chart 3-4 Average Monthly Climatic Conditions



3.4 Water Distribution System

As illustrated in Figure 3-4, MPMW's potable water distribution system is split into three different pressure zones, which are described below.

- The Lower Zone is generally located north and east of El Camino Real and serves residential, small commercial, and light industrial land uses. The lower zone includes the Belle Haven neighborhood, commercial and light industrial in the Bayfront Area, as well as portions of the Bay Road and Willows neighborhoods. It also includes the business parks between Willow Road and University Avenue north of O'Brien Drive.
- The High Pressure Zone is located in northern Menlo Park between Highway 101 and Bayfront Expressway, north of Chilco Street, and serves multi-family residential, commercial and light industrial, and a mobile home park outside the City's northern-most boundary. The High Pressure Zone is hydraulically disconnected from the other zones.
- The Upper Zone is located in the southwest portion of Menlo Park near Interstate 280 and is geographically and hydraulically disconnected from the other pressure zones. It primarily serves the residential Sharon Heights neighborhood and business parks along Sand Hill Road.

There are 31 MPMW customers located along Euclid Avenue (25 connections) and O'Brien Drive (six connections) that receive water from the City of East Palo Alto's water distribution system that are billed by MPMW. MPMW compensates City of East Palo Alto for water used by these customers and their water use is not included as part of MPMW's demand.

Water from the SFPUC's Regional Water System (RWS) enters MPMW's distribution system through five service connections (turnouts). The High Pressure Zone and the Upper Zone each have one turnout, and the Lower Zone has three turnouts. MPMW has two water storage tanks, which have capacities of 2 million gallons (MG) and 3.5 MG[7], and act together to serve the Upper Zone. A MPMW pump station conveys water from the upper zone turnout to supplement demands and to fill the storage tanks.

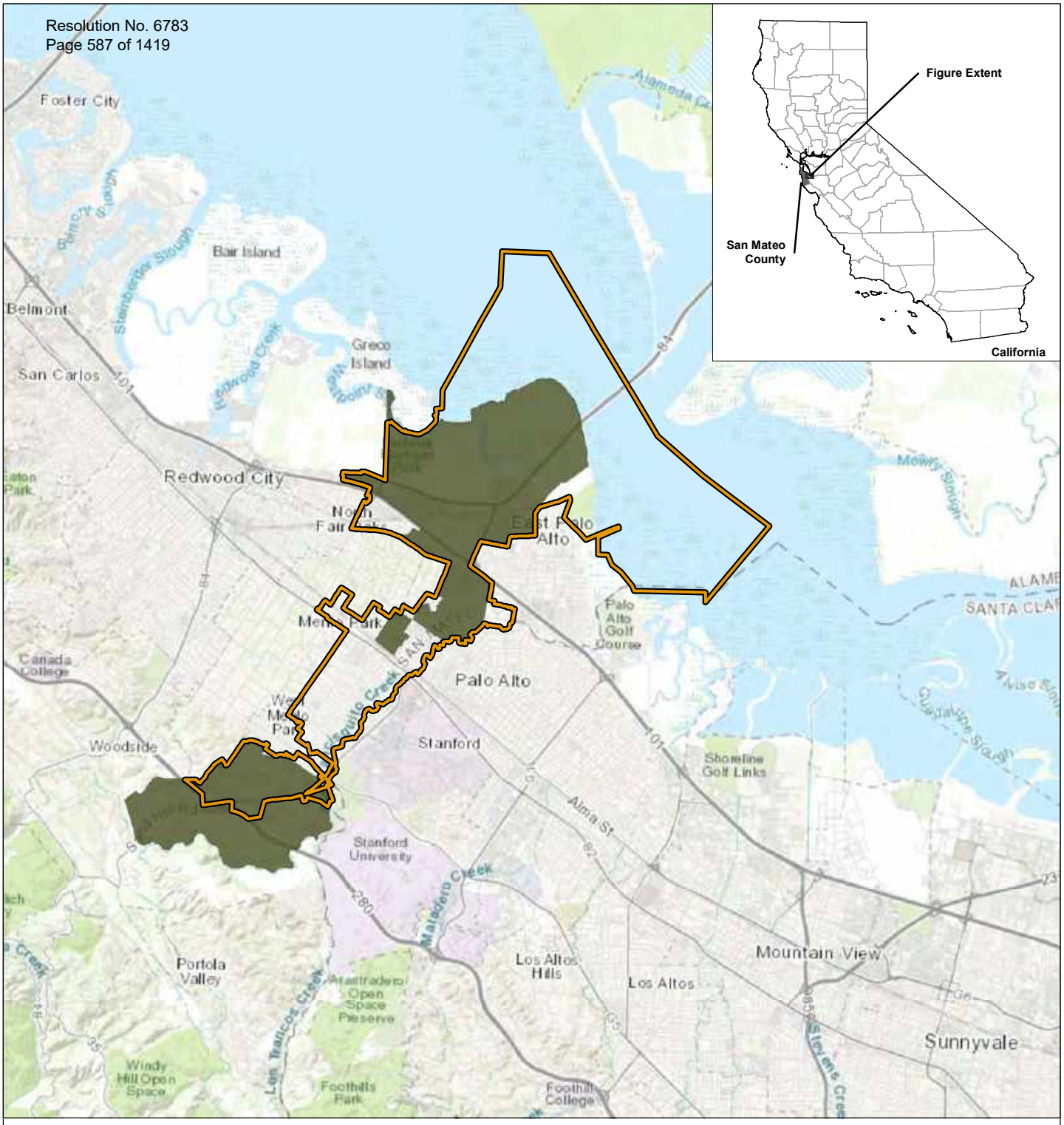
MPMW has 13 emergency interties with four adjacent water suppliers. Three connections (one metered) are with the Cal Water's Bear Gulch system; a metered connection with the O'Connor Tract Co-operative Water Company; a connection with the City of Redwood City; and eight interties with the City of East Palo Alto.

MPMW has one emergency groundwater well at the City's Corporation Yard located at 333 Burgess Drive. MPMW is in the midst of working with the State Water Resources Control Board (SWRCB) to permit the "Corp Yard Well" which can provide up to 1,500 gallons per minute (gpm) of back-up supply to the Lower Zone. MPMW plans to design and construct an additional one or two emergency wells in order to achieve another 1,500 gpm (for a total supply capacity of 3,000 gpm) as part of the Emergency Water

[7] An evaluation of MPMW's water system was documented in a Water System Evaluation Report (Metcalf and Eddy, 2000). Hydraulic modeling was performed to evaluate alternative projects to improve distribution system performance. The addition of a tank and pump station in the Upper Zone was evaluated to meet fire protection and emergency storage requirements. Construction of a 3.5 MG of storage and separate inlet and outlet structures for the storage tanks was implemented in 1997.

Storage/Supply Project. MPMW is also investigating locations for a future underground reservoir to serve the Lower and Higher Pressure Zones.

MPMW updated its Water System Master Plan in 2018. The Water System Master Plan identifies strategies for cost-effectively meeting MPMW's distribution system infrastructure needs for the next 25 years through year 2040; recommends capital expenditures for the system totaling $90.31 million; furnishes important guidance to enhance renewal and replacement strategies, operational and water quality practices; and provides a framework for diversifying MPMW's water supply. The 2018 Water System Master Plan can be viewed at menlopark.org/watersystemmasterplan.



Legend

- Menlo Park City Limit
- MPMW Service Area

Abbreviations

MPMW = Menlo Park Municipal Water

Notes

1. All locations are approximate.

Sources

1. Service area data were provided by MPMW on 6 July 2020.
2. World Topographic base map provided by ArcGIS Online.

N

0 2 4
Miles

Regional Vicinity Map

Menlo Park Municipal Water
2020 Urban Water Management Plan
Menlo Park, CA
June 2021
EKI C00050.00

Figure 3-1

eki environment & water

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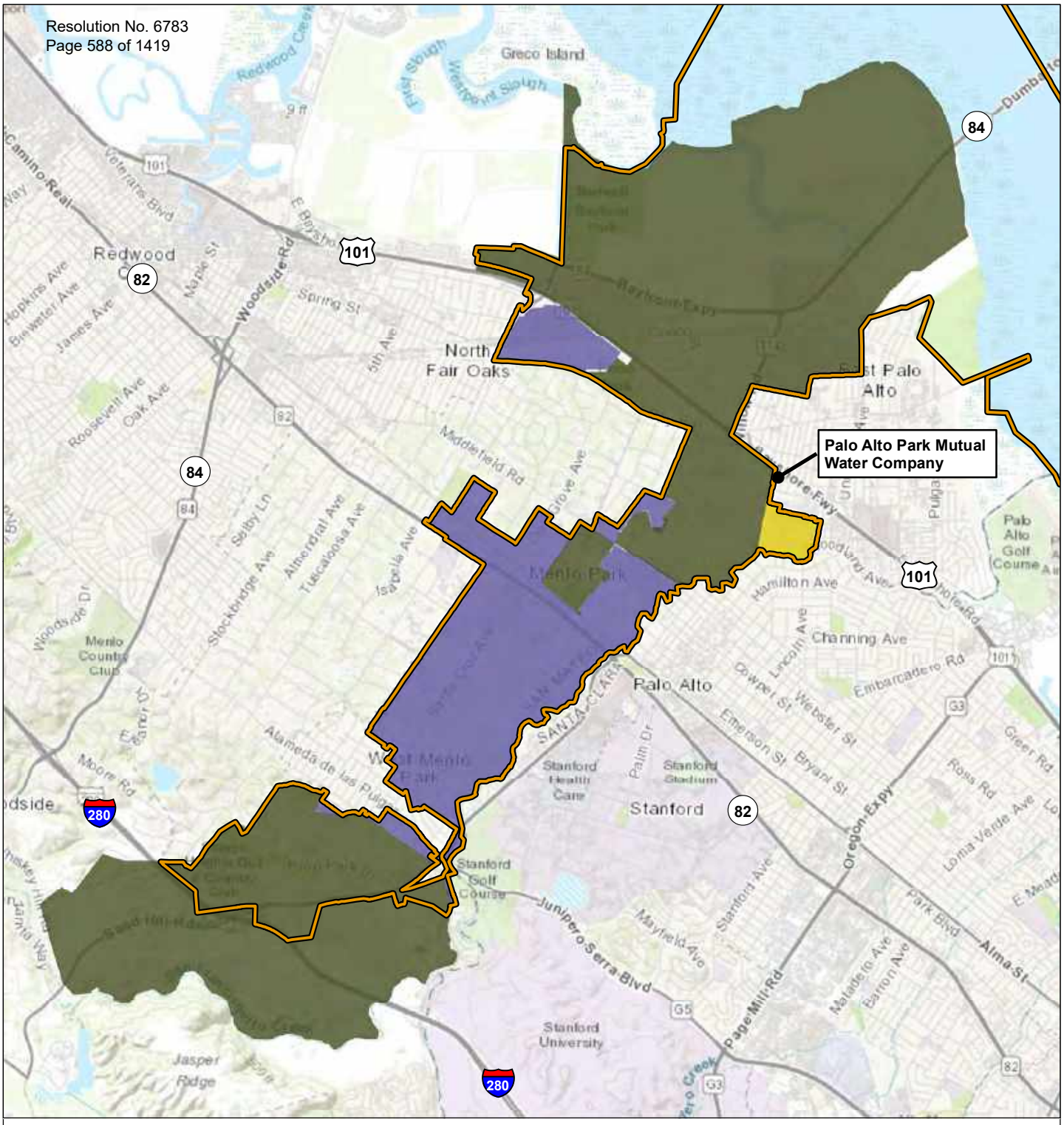


Legend

Service Areas

- MPMW
- California Water Service Company
- O'Connor Tract Co-operative Water Company
- Menlo Park City Limit

N

0 1 2
Miles

Abbreviations

MPMW = Menlo Park Municipal Water

Notes

1. All locations are approximate.

Sources

1. Service area data were provided by MPMW on 6 July 2020.
2. Basemap provided by ArcGIS.

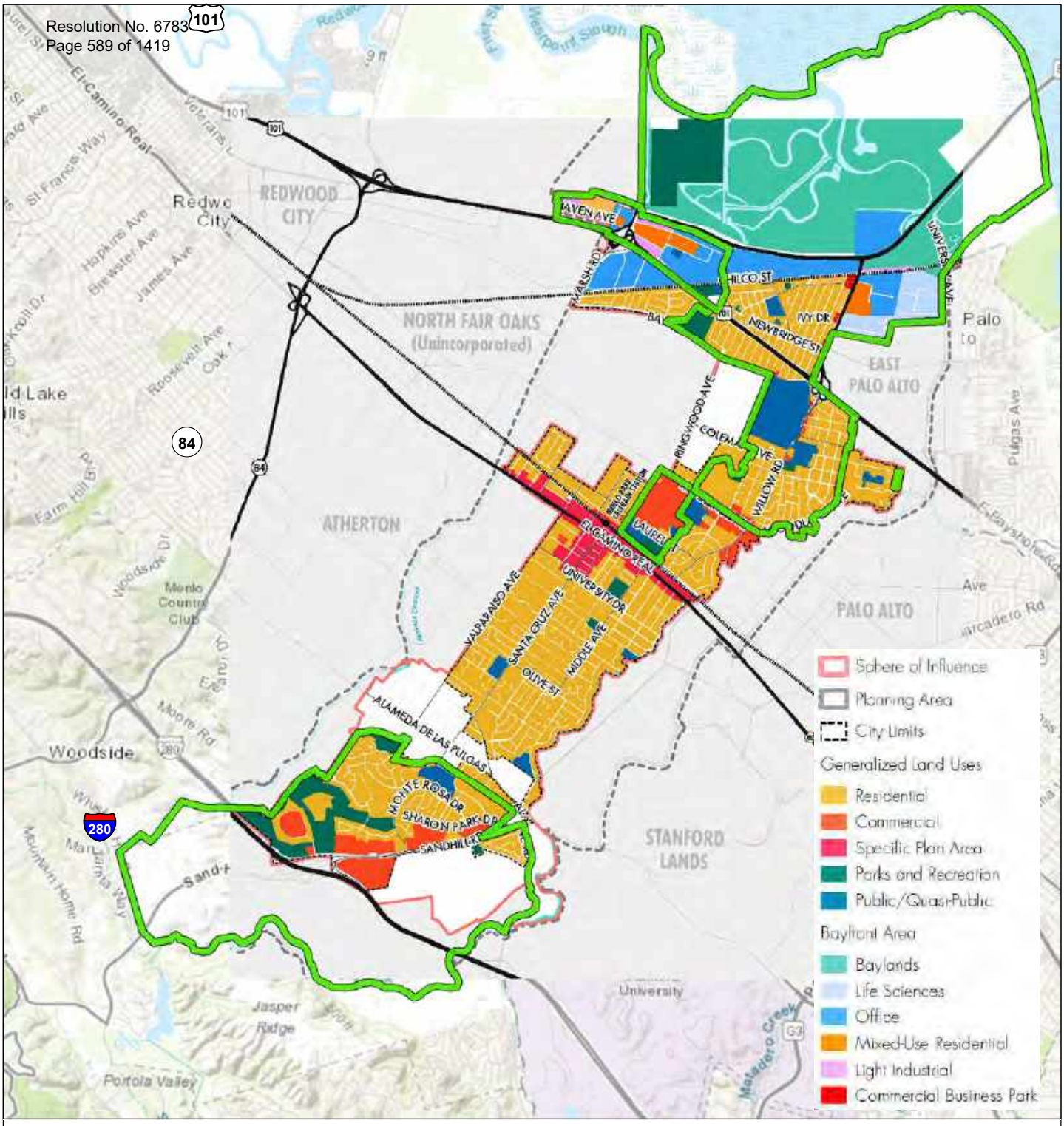
Water Purveyors within the City of Menlo Park

Menlo Park Municipal Water
2020 Urban Water Management Plan
Menlo Park, CA
June 2021
EKI C00050.00

Figure 3-2

eki environment & water

Path: X:\C00050\Maps\2021\06\Fig3-2_WaterPurveyors.mxd



Legend

MPMW Service Areas

N

0 1 2
Miles

Abbreviations

MPMW = Menlo Park Municipal Water

Notes

1. All locations are approximate.

Sources

1. Service area data were provided by MPMW on 6 July 2020.
2. Land use obtained from City's General Plan.
3. Basemap provided by ArcGIS.

Land Use Designations within the MPMW Service Area

Menlo Park Municipal Water
2020 Urban Water Management Plan
Menlo Park, CA
June 2021
EKI C00050.00

Figure 3-3

eki environment & water

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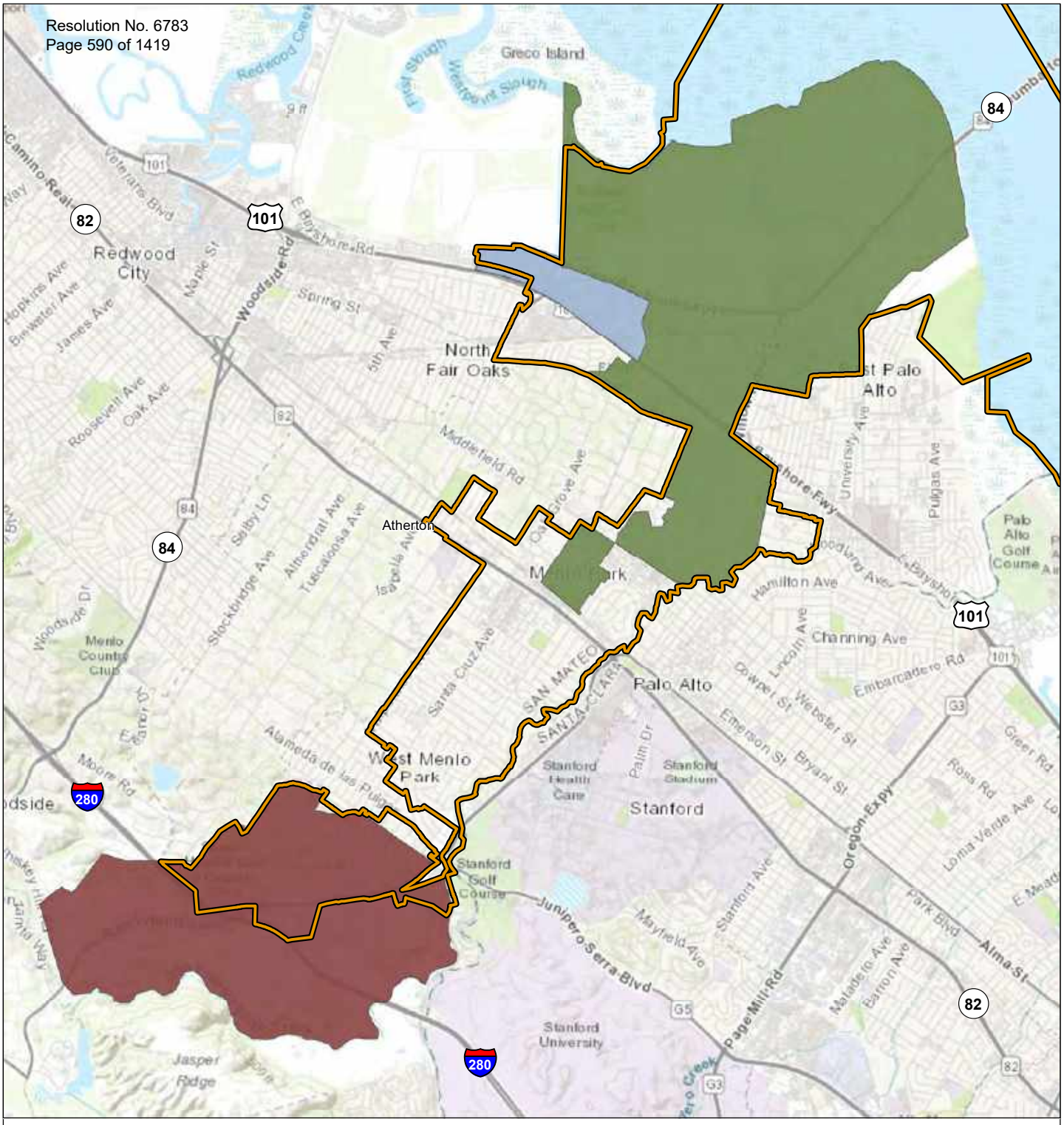

Greco Island
Redwood City
North Fair Oaks
Atherton
Menlo Park
Palo Alto
West Menlo Park
Stanford
Stanford University
Stanford Golf Course
Stanford Health Care
Stanford Stadium
Menlo Country Club
Jasper Ridge
Redwood Creek
First Slough
Westpoint Slough
Camino Real
Woodside Rd
E Bayshore Rd
Spring St
Middlefield Rd
Oak Grove Ave
Alma St
Page Mill Rd
Oregon Expy
Junipero Serra Blvd
Stanford Ave
Mayfield Ave
Embarcadero Rd
Channing Ave
Hamilton Ave
University Ave
Palo Alto Golf Course
Moore Rd
Alameda de las Pulgas
Santa Cruz Ave
Stockbridge Ave
Almendral Ave
Tuscaloosa Ave
Isabella Ave
Selby Ln
Woodside Dr
Roosevelt Ave
Oak Ave
Hopkins Ave
Brewster Ave
James Ave
Maple St
Valparaiso Ave
Palm Dr
Lincoln Ave
Dowpel St
Webster St
Emerson St
Bryant St
Ross Rd
Greer Rd
Loma Verde Ave
Park Blvd
Maladelo Ave
Barron Ave
Pulgas Ave
Middle Ave
Encinal Ave
Valparaiso Ave
Menlo Park Municipal Golf Course
Stanford Shopping Center
Stanford Linear Accelerator Center
Sharon Park
Searsville Lake
Searsville Dam
Corte Madera Creek
Los Trancos Creek
Felt Lake
Huddart Park
Portola Valley
Woodside
Skyline Blvd
Alpine Rd
Sand Hill Rd
Whiskey Hill Rd
Zapata Way
Jasper Ridge Rd
Arastradero Rd
Page Mill Rd
Foothill Expy
Los Altos
Los Altos Hills
Mountain View
Palo Alto Airport
Palo Alto Golf Course
Palo Alto Municipal Golf Course
Stanford

4 WATER USE CHARACTERIZATION

☑ ***CWC § 10631 (d) (1)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(J) Distribution system water loss.

(2) *The water use projections shall be in the same five-year increments described in subdivision (a).*

For the purposes of this Urban Water Management Plan (UWMP or Plan), potable water demand is defined as the volume of potable water that Menlo Park Municipal Water (MPMW) purchases from the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS). Non-potable water demand is defined as the demand for recycled water provided by the West Bay Sanitary District (WBSD) to the MPMW service area, that would otherwise be served by MPMW. Among other things, water demand is dependent on climate, population, industry, and the types of development present in a community. Sections 4.1 and 4.2 describe the historical and projected water demands for the residential, commercial, industrial, institutional, and landscape irrigation sectors within the MPMW service area (water use sectors A through F and J, as described per California Water Code [CWC] §10631(d)(1)(A) though (F) and (J)). As described in Section 4.3, this discussion does not include demands for water use sectors per CWC §10631(d)(1)(G) through (I) as they are not applicable or present within the MPMW service area.

4.1 Historical and Current Total Water Demand

Prior to 2020, all potable water demands within the MPMW service area were met with water purchased from the SFPUC RWS. Starting in July 2020, recycled water became available and was used to meet a portion of the irrigation demand. The historical and current total water demands within the MPMW service area include the water consumed by metered accounts in the service area (“metered water consumption”), unmetered water used for fire services and flushing (“unmetered water consumption”), and the water that is lost within the distribution system (“losses”).

4.1.1 Historical and Current Potable Water Demand

Potable water demand within the MPMW service area is measured using water meters that are installed at each customer account. Records of historical and current water use at each account are maintained by the City of Menlo Park's (City's) Public Works Department. Water demand within the MPMW service area is tracked and reported on a monthly basis for the following sectors:

- Single Family Residential;
- Multi-Family Residential;
- Commercial;
- Industrial;
- Institutional/Governmental;
- Landscape; and
- Other.

Total water demand within the MPMW service area was approximately 1,069 million gallons (MG) in 2020. As can be seen in Table 4-1 and the associated charts, the residential sector accounted for an average of approximately 41% of the total water demand between 2016 and 2020 (i.e., single family residential demands were approximately 31% of the total demand, while multi-family residential demands accounted for the remaining 10%). MPMW has a relatively large commercial, industrial, and institutional (CII) base, which together accounted for approximately 44% of potable water demand for the 2016-2020 period. The one remaining major use type is irrigation, which accounted for 12% of the total water demand on average[8].

There is a slightly increasing trend in potable water demand between 2016 and 2020, which likely reflects commercial development as well as a rebound from the historic drought. Commercial water use increased 56% from 2016 to 2019. Although commercial water use decreased slightly in 2020, it was likely due to temporary impacts from the shelter-in-place orders that were issued during COVID-19. Industrial water use, however, decreased by 37%, which reflects the shift in the City's development focus as discussed in Section 3.2.

[8] Irrigation services include irrigation water use at accounts that have a separate irrigation meter and does not represent all of the outdoor irrigation water use within the MPMW service area.

Table 4-1 Demands for Potable and Non-Potable Water - Actual (DWR Table 4-1)

Use Type	Additional Description *(as needed)*	Level of Treatment When Delivered	Volume				
			2016	2017	2018	2019	2020
Single Family		Drinking Water	277	306	315	309	361
Multi-Family		Drinking Water	95	106	101	97	113
Commercial		Drinking Water	157	179	245	244	203
Industrial		Drinking Water	222	240	140	143	140
Institutional/ Governmental		Drinking Water	42	58	58	67	98
Landscape	Note (b)	Drinking Water	97	116	125	122	139
Losses	Note (c)	Drinking Water	4	-4	120	42	12
Other	Note (d)	Drinking Water	5	2	4	2	3
		TOTAL	898	1,003	1,108	1,028	1,069

NOTES:
(a) Volumes are in units of MG.
(b) Irrigation water use includes water use recorded at dedicated irrigation meters and does not represent all of the outdoor irrigation water use within MPMW.
(c) Losses are further documented in Table 4-3. 2016 to 2019 losses were obtained from the AWWA Water Audit Reports. 2020 water loss was estimated as the difference between production and consumption.
(d) Other water uses include other billed metered consumption (e.g., temporary meters and hydrant), billed unmetered consumption and unbilled consumption which are obtained from the AWWA Water Audit Reports.
(e) Demand data provided by MPMW. Demands did not include accounts that received water from East Palo Alto but were billed by MPMW.
(f) Total water uses may not match the total water supplies reported in Table 6-8. This is because the water losses calculated in AWWA Water Audit Reports and presented here are based on invoices which usually do not start from the first day of the month. However, the supply data in Table 6-8 are based on real-time AMI meter reads and summed by natural month.
(g) Totals may not sum due to rounding.

Chart 4-1A Annual Water Demand by Sector: 2016-2020

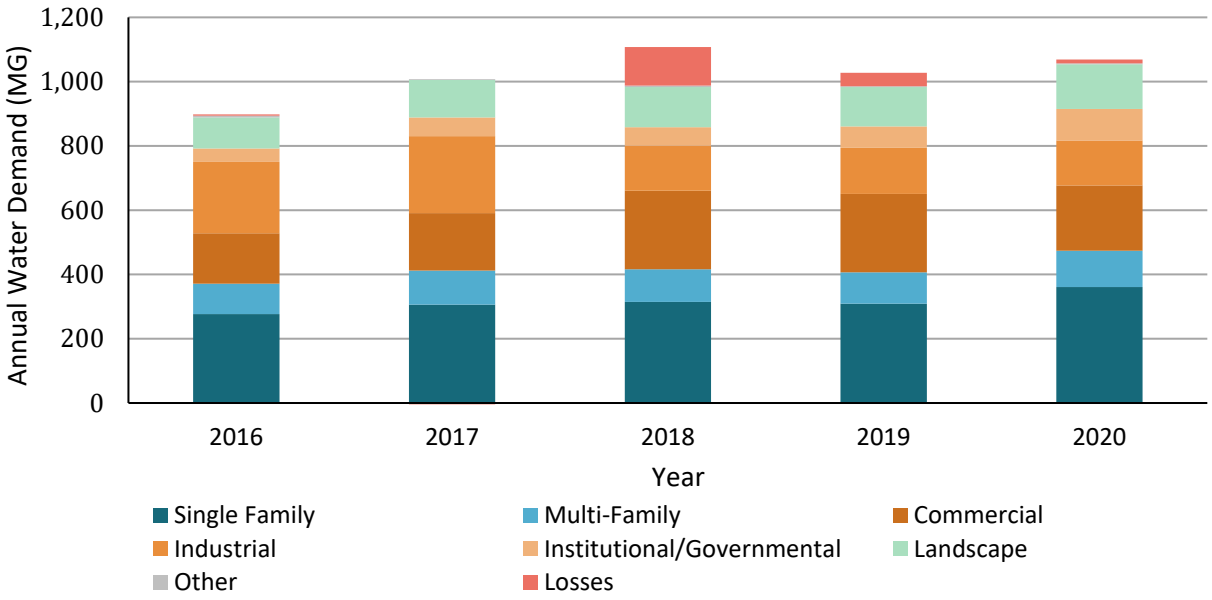


Chart 4-1B Percentage of Total Water Demand by Sector: 2016-2020

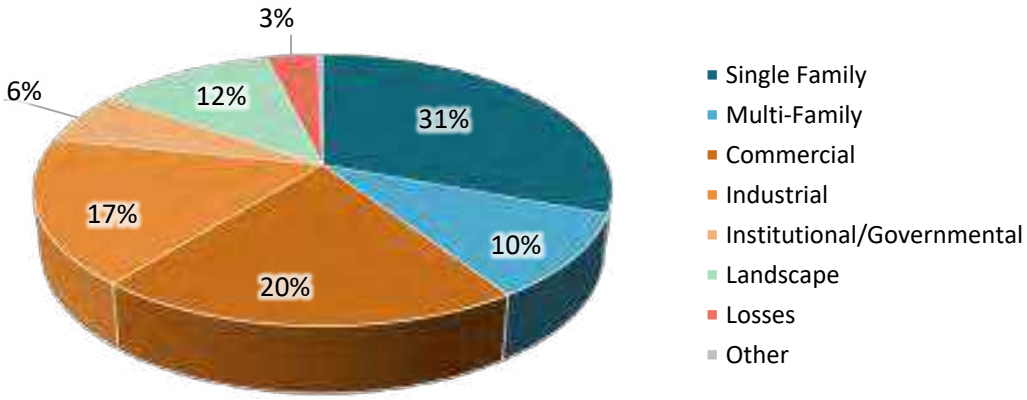


Table 4-2 and the associated charts present historic potable water use on a per capita basis. Per capita water use has shown a decreasing trend during the drought period of 2014 and 2017 as a result of the local water use cutbacks and the mandatory state-wide restrictions. The lowest per capita water use was observed in 2016 at 154 gallons per capita per day (GPCD). Per capita water use since then has shown a rebound to approximately 160 GPCD in 2020.

Table 4-2 Historical and Current Potable Water Demand and Population

Year	Potable Water Demand	Service Area Population	Per Capita Potable Water Use (GPCD)
2010	1,052	14,749	195
2011	1,033	14,829	191
2012	1,079	14,973	197
2013	1,189	15,129	215
2014	1,030	15,157	186
2015	883	15,342	158
2016	898	15,929	154
2017	1,003	16,516	166
2018	1,108	17,102	177
2019	1,028	17,689	159
2020	1,069	18,276	160

NOTES:
(a) Unless otherwise noted, volumes are in units of MG.
(b) 2010 to 2015 data are from the 2015 UWMP.
(c) 2016 to 2020 water demand data are from Table 4-1. 2016 to 2019 population is estimated based on interpolation between 2015 and 2020.
(d) Per capita water use is calculated by dividing the total annual water use by service area population and the number of days in a year.

Chart 4-2A Historical and Current Potable Water Demand and Population

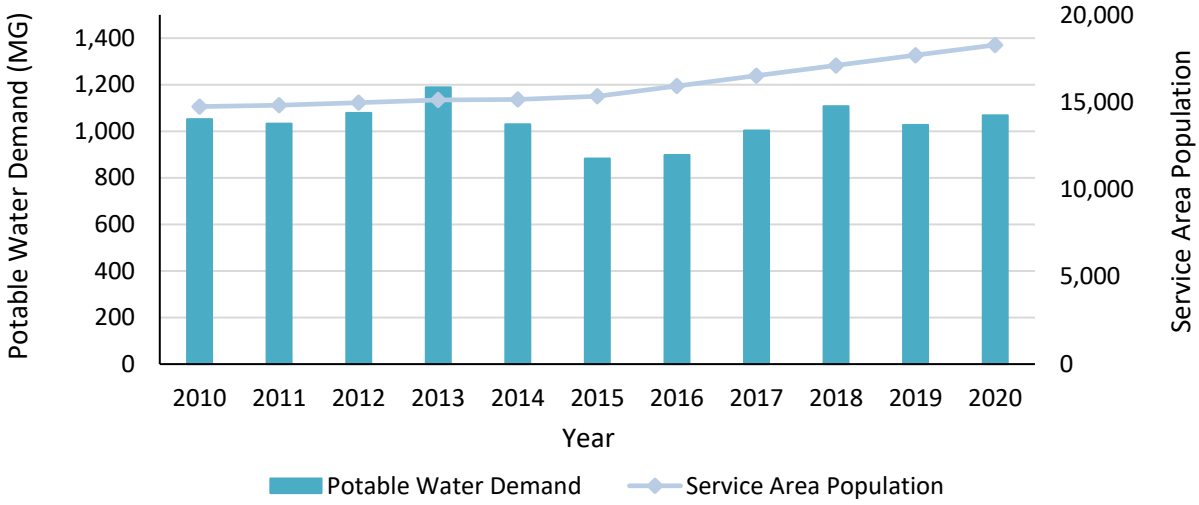
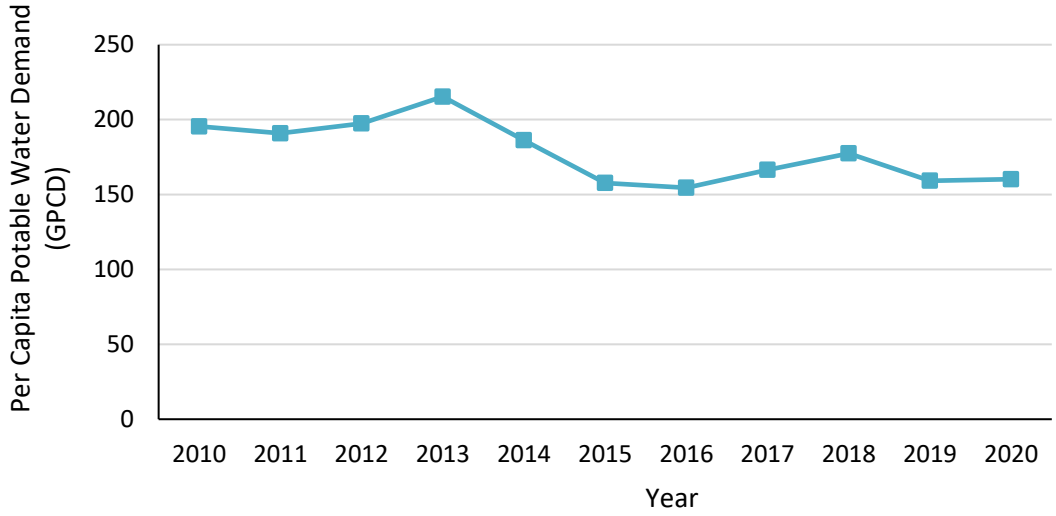


Chart 4-2B Historical and Current Per Capita Potable Water Use



4.1.2 Historical and Current Recycled Water Demand

Historically, no MPMW water demands were met with recycled water supplies. With the completion of the West Bay Sanitation Sanitary District's (WBSD's) Sharon Heights Recycled Water Facility in July 2020, approximately 20 MG of recycled water was used for irrigation at the Sharon Heights Golf and Country Club in 2020. Detailed discussion of recycled water use within the MPMW service area is provided in Section 6.5.

4.1.3 Distribution System Water Loss

☑ ***CWC § 10631 (3)***

(A) The distribution system water loss shall be quantified for each of the five years preceding the plan update, in accordance with rules adopted pursuant to Section 10608.34.

(B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.

(C) In the plan due July 1, 2021, and in each update thereafter, data shall be included to show whether the urban retail water supplier met the distribution loss standards enacted by the board pursuant to Section 10608.34.

Since 2016, urban retail water suppliers have been required under CWC §10608.34 and California Code of Regulations (CCR) § 638.1 et seq to quantify distribution system water losses using the American Water Works Association (AWWA) Water Audit Software (referred to as the "AWWA Water Loss Worksheet"). Water losses within MPMW's potable water distribution system over the last five years were estimated using the AWWA Water Loss Worksheet summarized in Table 4-3. Furthermore, CWC §10631 (3)(c) requires that this UWMP demonstrate whether the distribution loss standards enacted by the State Water Resources Control Board (SWRCB) pursuant to §10608.34 have been met. However, the SWRCB has yet to establish these standards, and thus consistency with these standards cannot be demonstrated herein.

The "Losses" are the sum of "apparent" and "real" losses estimated by the AWWA Water Loss Worksheet analysis. Apparent losses include metering inaccuracies, systematic data handling errors, and unauthorized consumption. Real losses represent water loss attributable to the distribution system and include physical water losses from the pressurized system and storage tanks up to the point of customer consumption.

The "Losses" are a portion of the total differential between water supply and metered water use, and the remaining portion is the "Other-Unbilled Consumption" which includes unbilled water uses such as system flushing and leak repair flushing.

As shown in Table 4-3, the water losses within MPMW were calculated to be variable between 2016 and 2020, ranging from negative 4 MG to a high of 120 MG. The five-year average of water losses was approximately 35 MG, or 3% of the average total water demand. The high variability of water losses during this period and the negative value of water losses in 2017 were likely due to the quality of the billing data and differences in meter reading cycles between the SFPUC supply meters and MPMW's meters. MPMW is anticipating that installation of Advanced Metering Infrastructure will improve billing data quality going forward. Metering of the MPMW distribution system is further discussed in Section 9.2.2.

Table 4-3 Last Five Years of Water Loss Audit Reporting (DWR Table 4-4)

Reporting Period Start Date	Volume of Water Loss
01/2016	4
01/2017	-4
01/2018	120
01/2019	42
01/2020	12
NOTES: (a) Volumes are in units of MG. (b) Water losses are reported on a calendar year basis. 2016 to 2019 losses were obtained from the AWWA Water Audit Reports. 2020 water loss was estimated as the difference between production and consumption.	

4.2 Projected Total Water Demand

Per CWC §10631(d)(1), potable and non-potable water demand projections are discussed in the following sections.

4.2.1 Projected Total Water Demand

In 2020, future water demands for MPMW's service area were projected by Bay Area Water Supply and Conservation Agency (BAWSCA) on behalf of MPMW. Future water demands were projected using the Demand Management Decision Support System Model (DSS Model) and were based on population and employment projections within MPMW's service area. The DSS Model and the associated water demand and conservation projection methodology is documented in detail in the *Regional Water Demand and Conservation Projections Report* (BAWSCA, 2020b). A brief description of BAWSCA's 2020 demand projections is provided below.

> In June 2020, BAWSCA completed the Regional Water Demand and Conservation Projections Report (Demand Study). The goal of the Demand Study was to develop transparent, defensible, and uniform demand and conservation savings projections for each wholesale customer using a common methodology to support both regional and individual agency planning efforts and compliance with the new statewide water efficiency targets required by Assembly Bill (AB) 1668 and Senate Bill (SB) 606.
>
> Through the Demand Study process, BAWSCA and the wholesale customers (1) quantified the total average-year water demand for each BAWSCA member agency through 2045, (2) quantified passive and active conservation water savings potential for each individual wholesale customer through 2045, and (3) identified 24 conservation programs with high water savings potential and/or member agency interest. Implementation of these conservation measures, along with passive conservation, is anticipated to yield an additional 37.3 MGD of water savings by 2045. Based on the revised water demand projections, the identified water conservation savings, increased development and use of other local supplies by the wholesale

customers, and other actions, the collective purchases of the BAWSCA member agencies from the SFPUC are projected to stay below 184 MGD through 2045.

As part of the Demand Study, each wholesale customer was provided with a demand model that can be used to support ongoing demand and conservation planning efforts, including UWMP preparation.

In 2021, as part of the 2020 UWMP update, MPMW's DSS Model was revised to account for several changes since the demand projections were estimated by BAWSCA. The baseline year for projections was updated to 2019, which was the most recent year with full data. Population and employment inputs were revised by the City's Planning Division based on information related to the City's recently approved projects and the current General Plan, as discussed in Section 3.1. Furthermore, assumptions associated with the partial rebound in demands to pre-drought conditions were adjusted to better reflect the observed demand patterns within MPMW in recent years.[9]

Demands are projected through 2040 to be consistent with the General Plan's planning horizon. It is estimated that the total water demand will be approximately 1,483 MG in 2040, inclusive of passive and active conservation savings (Table 4-5). There is a significant increase in demand projected over the next five years (i.e., a 19% increase between 2020 and 2025) which reflects conservative assumptions regarding: (1) a potential rebound from the drought-suppressed water demands, and (2) the accelerated growth between 2020 and 2025 attributable to the City's approved and planned projects, as described in Section 3.1.

As described further in Section 4.2.2, passive and active water conservation savings associated with existing water uses in MPMW's service area have been subtracted from the total water demand projections. The 2021 DSS Model update included conservation measure assumptions consistent with MPMW's planned Demand Management Measures (DMMs) that are described in Chapter 9.

[9] The DSS Model uses a Partial Rebound Scenario which assumes temporary behavioral changes to return to pre-drought norms, but water savings from historical water rate increases and active conservation programs are to be permanent. This scenario is further explained in BAWSCA's report (BAWSCA, 2020a). For MPMW, it is assumed that there will be a 1% rebound in single-family, multi-family, industrial, and irrigation sectors, and a 3% rebound in other sectors between 2019 and 2023.

4.2.2 Water Savings from Codes, Standards, Ordinances, or Transportation and Land Use Plans

☑ ***CWC § 10631 (d) (4)***

(A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.

(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:

(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.

(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.

"Passive conservation" refers to water savings resulting from actions and activities that do not depend on direct financial assistance or educational programs implemented by water suppliers. These savings result primarily from: (1) the natural replacement of existing plumbing fixtures with water-efficient models required under current plumbing code standards,[10] (2) the installation of water-efficient fixtures and equipment in new buildings and retrofits as required under CALGreen Building Code Standards,[11] and (3) inclusion of low-water use landscaping and high-efficiency irrigation systems to minimize outdoor water use in new connections and projects in accordance with the State's Model Water Efficient Landscape Ordinance (MWELO).

"Active conservation" refers to water savings resulting from MPMW's implementation of water conservation programs, education programs, and the offering of financial incentives (e.g., rebates). MPMW's current and planned active conservation programs are discussed in Section 9.

The water demand projections presented herein take into account both passive and active conservation savings, as shown in Table 4-4 and Table 4-5 and associated charts. Passive and active savings within the MPMW service area were estimated in the 2021 DSS Model (BAWSCA, 2020b). By 2040, it is estimated that the total annual water demand would be 1,634 MG, including potable and recycled water, without passive or active conservation savings. Passive conservation is projected to reduce this water demand by 124 MG and active conservation is projected to further reduce the demand by 27 MG. As such, it is estimated that the total annual water demands within MPMW's service area will be approximately 1,483 MG in 2040.

[10] Including the California Energy Commission Title 20 appliance standards for toilets, urinals, faucets, and showerheads – The appliance standards determine what can be sold in California and therefore will impact both new construction and replacement fixtures in existing homes.

[11] Adopted in the City's Municipal Code Chapter 12. All new residential and non-residential construction are required to comply with the mandatory CALGreen Requirements.

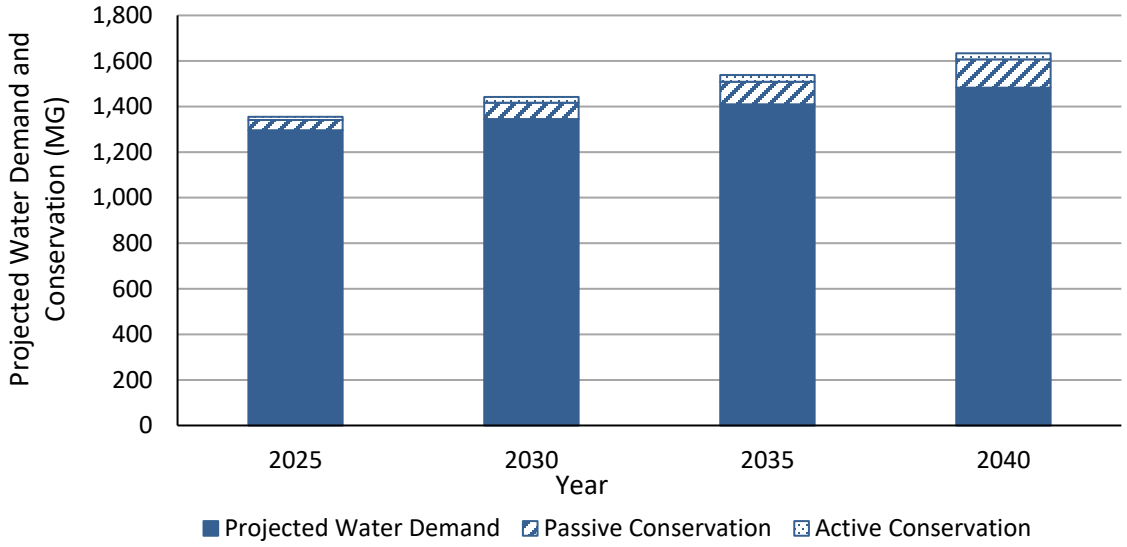
Table 4-4 Inclusion in Water Use Projections (DWR Table 4-5)

Are Future Water Savings Included in Projections?	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, or otherwise are utilized in demand projections are found.	UWMP Section 4.2.2
Are Lower Income Residential Demands Included In Projections?	Yes
NOTES:	

Table 4-5 Projected Total Water Demand and Projected Passive and Active Water Conservation

Water Conservation Type	Projected Total Water Demand				
	2025	2030	2035	2040	2045
Projected Water Demand	1,355	1,442	1,538	1,634	--
Projected Water Conservation					
Passive Conservation	45	72	99	124	--
Active Conservation	14	25	29	27	--
Projected Water Demand after Passive Conservation Savings	1,310	1,370	1,439	1,510	--
Projected Water Demand after Passive and Active Conservation Savings	1,296	1,345	1,410	1,483	--
NOTES: (a) Volumes are in units of MG. (b) Data from the DSS Model.					

Chart 4-5 Projected Water Demand and Conservation



4.2.3 Projected Recycled Water Demand

The Sharon Heights Golf and Country Club is projected to continue receiving approximately 48 MG of recycled water for irrigation from WBSD's Sharon Heights Recycled Water Facility. In addition, it is estimated that the WBSD's Bayfront Project will start supplying approximately 72 MG of recycled water to the City's Bayfront Area starting in 2030. MPMW's recycled water programs are further discussed in Section 6.5. MPMW does not supply other types of non-potable water.

4.2.4 Projected Potable Water Demand

After accounting for the recycled water use, the remaining demand is anticipated to be supplied by potable water from the SFPUC RWS. Projected potable water demand for each water use sector within MPMW's service area is shown in five-year increments through 2040 in Table 4-6. Potable water demand is anticipated to be approximately 1,363 MG in 2040, an increase of 28% compared to 2020. The sectors with the largest growth are multi-family and commercial, demands of which are projected to double by 2040.

MPMW's projected potable and recycled water demands (i.e., "total water use") in five-year increments are summarized in Table 4-7 and associated chart.

Table 4-6 Use for Potable and Non-Potable - Projected (DWR Table 4-2)

Use Type	Additional Description *(as needed)*	Projected Water Use				
		2025	2030	2035	2040	2045 *(opt)*
Single Family		306	299	293	288	--
Multi-Family		158	176	203	230	--
Commercial		346	345	373	401	--
Industrial		134	122	112	102	--
Institutional/ Governmental		98	105	115	126	--
Landscape	Note (b)	95	61	71	85	--
Losses		110	116	122	128	--
Other Potable	Note (c)	1	1	1	2	--
TOTAL		1,248	1,225	1,290	1,363	--

NOTES:
(a) Volumes are in units of MG.
(b) Irrigation water use includes water use recorded at dedicated irrigation meters and does not represent all of the outdoor irrigation water use within MPMW.
(c) Other potable water use includes water used for temporary meters.
(d) The projected water demands include savings from plumbing codes and active conservation efforts that MPMW plans to undertake.

Chart 4-6 Current and Projected Potable Water Demand by Sector

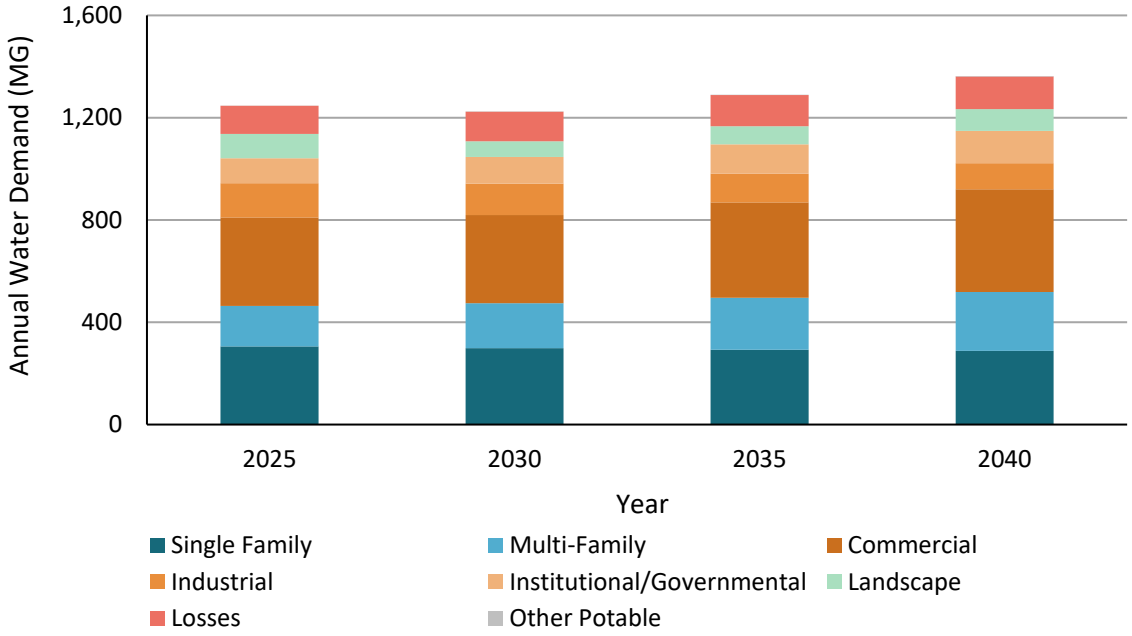
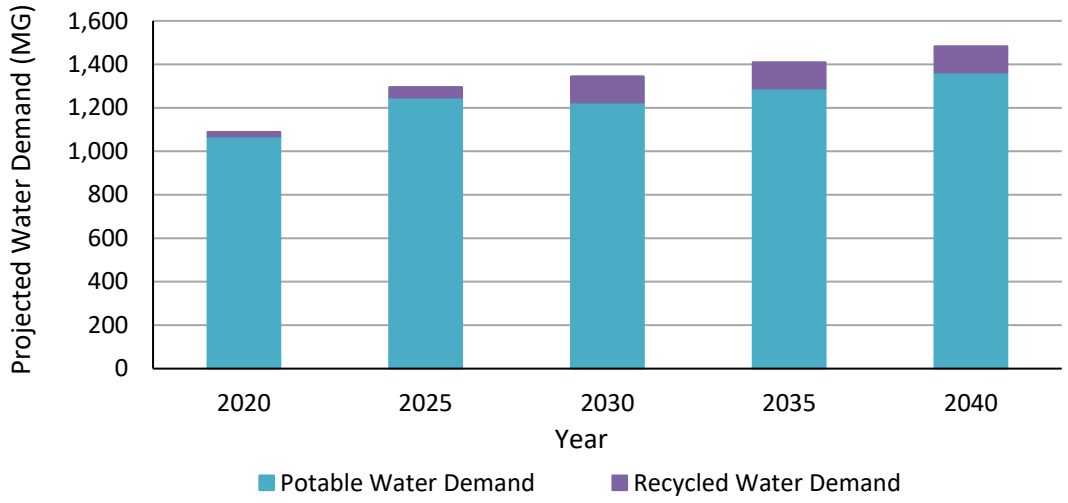


Table 4-7 Total Water Use (Potable and Non-Potable) (DWR Table 4-3)

	2020	2025	2030	2035	2040	2045*(opt)*
Potable Water, Raw, Other Non-potable *From DWR Tables 4-1 and 4-2*	1,069	1,248	1,225	1,290	1,363	--
Recycled Water Demand *From DWR Table 6-4*	20	48	120	120	120	--
Optional Deduction of Recycled Water Put Into Long-Term Storage	--	--	--	--	--	--
TOTAL WATER USE	1,089	1,296	1,345	1,410	1,483	--

NOTES:
(a) Volumes are in units of MG.

Chart 4-7 Current and Projected Total Water Use



4.2.5 Water Use for Lower Income Households

☑ ***CWC § 10631.1***

(a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirements under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

The water demands presented above include projected future water use by lower income households (Table 4-4). Per Health and Safety Code 50079.5, a lower income household is defined as a household with lower than 80% of the City's median income. The 2015-2023 Housing Element (City of Menlo Park, 2015) indicates that in 2012 there were 12,388 housing units within the City and that 41% of these units served residents with less than 80% of the median income adjusted for family size. Water demands associated with these households were included in the total water demand projections described above and shown in Table 4-7.

4.2.6 Characteristic Five-Year Water Use

☑ ***CWC § 10635(b)(3)***

(b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following…

(3) A comparison of the total water supply sources available to the water supplier with ***the total projected water use for the drought period.*** (Emphasis added).

A critical component of the new statutory language in Water Code §10635(b) is the requirement to prepare the five-year Drought Risk Assessment (DRA), which is included in Chapter 7. The five-year DRA can also be used to provide the water service reliability assessment for a drought lasting five years.

As a first step, DWR recommends that the expected gross water use for the next five years without drought conditions (also known as *unconstrained demand*) be estimated. These numbers can then be adjusted to estimate the five-years' cumulative drought effects. MPMW's unconstrained demand is based on the demand projections from the 2021 DSS Model over the next five years, as shown in Table 4-8.

Table 4-8 Characteristic Five-Year Water Use

2021	2022	2023	2024	2025
1,095	1,143	1,192	1,243	1,296
NOTES: (a) Volumes are in units of MG.				

4.3 Water Use Sectors Not Included in the Demand Projections

Historical and projected water demands for the water use sectors described in CWC §10631(d)(1)(G) through (I) and listed below were not included in the water demand calculations because they are not applicable to MPMW:

- Sales to other agencies;
- Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; and
- Agricultural.

4.3.1 Sales to Other Agencies

MPMW does not sell water to other agencies and does not expect to in the future.

4.3.2 Saline Water Intrusion Barriers, Groundwater Recharge, and Conjunctive Use

MPMW does not use water for saline water intrusion barriers and does not currently participate in active groundwater recharge activities or conjunctive use programs.

4.3.3 Agricultural

MPMW does not sell water to agricultural customers and does not expect to in the future.

4.4 Climate Change Impacts to Demand

☑ ***CWC § 10635(b)***

(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.

Hotter and drier weather may lead to an increased demand in landscape irrigation. The DSS Model assesses the sensitivity of MPMW's water demand to weather and then incorporates predicted weather and climate change data into demand projections. Therefore, the demand projections presented above include considerations of climate change.

A description of the weather and climate change data incorporated into the DSS Model is provided in Section 3.6 of the BAWSCA Demand Study (BAWSCA, 2020b). Based on data published by the International Panel on Climate Change (IPCC) and the California's Fourth Climate Change Assessment San Francisco Bay Area Summary Report (Ackerly et al., 2018), a predicted annual mean temperature increase of 1.7°F was incorporated into the DSS Model demand forecast.

4.5 Coordinating Water Use Projections

☑ ***CWC § 10631 (h)***

An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available.

MPMW provides SFPUC with water use projections annually as part of reporting to the BAWSCA Annual Surveys and other BAWSCA-led water demand and supply coordination efforts as dictated by the 2009 Water Supply Agreement. As part of the coordination effort for the 2020 UWMP, and in compliance with CWC §10631(h), MPMW supplied BAWSCA with its water demand projections through 2040 for transmittal to the SFPUC[12].

[12] Email from MPMW to BAWSCA dated 5 January 2021.

4.6 Urban Water Use Objectives

☑ ***CWC § 10609.20***

(a) Each urban retail water supplier shall calculate its urban water use objective no later than January 1, 2024, and by January 1 every year thereafter.

(b) The calculation shall be based on the urban retail water supplier's water use conditions for the previous calendar or fiscal year.

☑ ***CWC § 10609.22***

(a) An urban retail water supplier shall calculate its actual urban water use no later than January 1, 2024, and by January 1 every year thereafter.

(b) The calculation shall be based on the urban retail water supplier's water use for the previous calendar or fiscal year.

☑ ***CWC § 10609.24***

(a) An urban retail water supplier shall submit a report to the department no later than January 1, 2024, and by January 1 every year thereafter. The report shall include all of the following:

(1) The urban water use objective calculated pursuant to Section 10609.20 along with relevant supporting data.

(2) The actual urban water use calculated pursuant to Section 10609.22 along with relevant supporting data.

(3) Documentation of the implementation of the performance measures for CII water use.

(4) A description of the progress made towards meeting the urban water use objective.

(5) The validated water loss audit report conducted pursuant to Section 10608.34.

(b) The department shall post the reports and information on its internet website.

(c) The board may issue an information order or conservation order to, or impose civil liability on, an entity or individual for failure to submit a report required by this section.

Beginning in 2023, urban water retailers will be required to report on "annual water use objectives" by 1 January of each year and to achieve these objectives by 1 January 2027. The annual water use objectives will be calculated based on standards for indoor residential water use, outdoor residential water use, and distribution system water loss. Additionally, it is anticipated that performance-based standards for the commercial, industrial, and institutional sectors, separate from the annual water use objectives, will also be developed by Department of Water Resources (DWR) and be implemented in the future. However, the specific standards that will be used to determine a retailer's annual urban water use objectives are currently under development by DWR, and thus the annual urban water use objectives for MPMW cannot be calculated or estimated. Once the urban water use objectives are released, MPMW will evaluate its historical and current water use compared to the new objectives, and will evaluate the need to adjust its conservation and water loss management measures to meet the new objectives.

The indoor residential water use component of calculating future water use objectives is described in CWC §10609.4.(a), which states "(1) Until January 1, 2025, the standard for indoor residential water use shall be 55 gallons per capita daily. (2) Beginning January 1, 2025, and until January 1, 2030, the standard for indoor residential water use shall be the greater of 52.5 gallons per capita daily or a standard

recommended pursuant to subdivision (b). (3) Beginning January 1, 2030, the standard for indoor residential water use shall be the greater of 50 gallons per capita daily or a standard recommended pursuant to subdivision (b).” Table 4-9 and the associated chart shows an estimate of future per capita residential water use, broken out by estimated indoor and outdoor water use. Based on these estimates, per capita indoor residential potable water use within MPMW is expected to be below the indoor use standards presented in the legislation. However, it should be noted that because standards have not yet been developed for the outdoor water use or water loss components of the future water use objectives, it cannot be known whether projected demands for MPMW will be in compliance with the pending requirements.

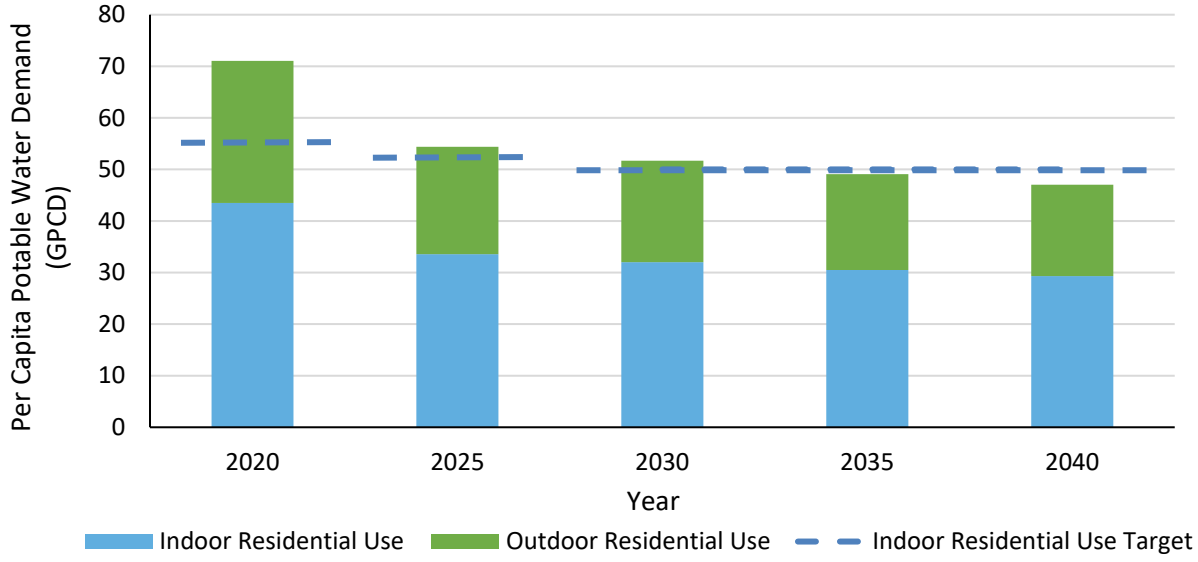
In the past decade, MPMW has made significant strides in reducing its per capita water demand to meet the targets delineated by the Water Conservation Act (see Chapter 5). MPMW plans to continue to implement conservation efforts to meet new legislative requirements. Potable water demand reductions will be achieved through the recycled water projects and implementation of DMMs as discussed in Chapters 6 and 9, respectively. MPMW will continue to monitor per capita water demand to ensure that its compliance targets are being met.

Table 4-9 Current and Projected Residential Per Capita Water Use

Year	Residential Potable Water Demand (MG)	Service Area Population	Per Capita Residential Potable Water Use (GPCD)	Approximate Per Capita Outdoor Residential Potable Water Use (GPCD)	Approximate Per Capita Indoor Residential Potable Water Use (GPCD)	Indoor Residential Water Use Target (GPCD)
2020	474	18,276	71	28	43	55
2025	464	23,383	54	21	34	52.5
2030	475	25,166	52	20	32	50
2035	496	27,675	49	19	30	50
2040	518	30,184	47	18	29	50

NOTES:
(a) Residential demand includes single family and multi-family residential.
(b) Per capita potable water demand is calculated by dividing the annual residential potable water demand by the service area population and the number of days in a year.
(c) Indoor and outdoor residential water use is estimated by the DSS Model.
(d) Urban water retailers will be required to report on "annual water use objectives" starting from 2023. Specific standards are currently under development by DWR.

Chart 4-8 Current and Projected Indoor and Outdoor Residential Per Capita Potable Water Use



5 SBX7-7 BASELINES, TARGETS, AND 2020 COMPLIANCE

☑ ***CWC § 10608.24 (b)***

Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

☑ ***CWC § 10608.28***

(a) An urban retail water supplier may meet its urban water use target within its retail service area, or through mutual agreement, by any of the following:

(1) Through an urban wholesale water supplier.

(2) Through a regional agency authorized to plan and implement water conservation, including, but not limited to, an agency established under the Bay Area Water Supply and Conservation Agency Act (Division 31 (commencing with Section 81300)).

(3) Through a regional water management group as defined in Section 10537.

(4) By an integrated regional water management funding area.

(5) By hydrologic region.

(6) Through other appropriate geographic scales for which computation methods have been developed by the department.

(b) A regional water management group, with the written consent of its member agencies, may undertake any or all planning, reporting, and implementation functions under this chapter for the member agencies that consent to those activities. Any data or reports shall provide information both for the regional water management group and separately for each consenting urban retail water supplier and urban wholesale water supplier.

With the adoption of the Water Conservation Act of 2009, also known as Senate Bill (SB) X7-7, the state is required to reduce urban water use by 20% by the year 2020. Each urban retail water supplier was required to develop a baseline daily per capita water use ("baseline water use") in their 2010 Urban Water Management Plan (UWMP or Plan) and establish per capita water use targets for 2015 and 2020 in order to help the state achieve the 20% reduction.

In support of implementing the requirements of SB X7-7, the California Department of Water Resources (DWR) produced a set of methodologies for developing baseline and compliance water use and targets, which are included in Methodologies for Calculating Baseline and Compliance Urban Per Capita Water, California Department of Water Resources Division of Statewide Integrated Water Management Water Use and Efficiency Branch (Methodologies; DWR, 2016).

Baselines and water use targets for Menlo Park Municipal Water (MPMW) were initially calculated in the 2010 UWMP in response to the Water Conservation Act. Per requirements of the DWR, the 2015 UWMP updated the baseline and water use target calculations using 2010 United States Census (Census) data.

This chapter discusses MPMW's compliance with its 2020 water use target. As part of the compliance reporting for SB X7-7, water suppliers are required to complete and submit a set of standardized verification tables in their 2020 UWMPs. The information in these tables is discussed and summarized in the following subsections, and the complete set of SB X7-7 standardized tables is included in Appendix E.

5.1 Service Area Population

☑ ***CWC § 10608.20 (e)***

An urban retail water supplier shall include in its urban water management plan due in 2010 pursuant to Part 2.6 (commencing with Section 10610) the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.

☑ ***CWC § 10608.20 (g)***

An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).

☑ ***Methodology 2 Service Area Population.***

DWR will examine discrepancy between the actual population estimate and DOF's projections for 2010; if significant discrepancies are discovered, DWR may require some or all suppliers to update their baseline population estimates. (DWR, 2016)

As reported in the 2015 UWMP, MPMW updated its service area population for baseline periods spanning from 1996 through 2010 to meet DWR's requirement of using 2010 Census data. The revised 2010 service area population was 14,749. The population of 14,749 was approximately 46% of the total population of City of Menlo Park (City), according to data published by the Department of Finance (DOF) for 2010 (DOF, 2012). The service area population during the baseline period was estimated based on the assumption that MPMW served the same percentage of City-wide population from 1996 through 2010.

The 2020 population was estimated by the City using the GIS-based method recommended in the Methodologies (DWR, 2016), as documented in Appendix F. Based on MPMW's service area map and the Census data, the 2020 population for the MPMW service area is estimated to be 18,276.

5.2 Baseline Water Use

Water suppliers were required to define a 10- or 15-year base (or baseline) period for water use that was then used to develop their future target per capita water use. Water suppliers were also required to calculate water use over a 5-year baseline period and use that value to determine a minimum required reduction in water use by 2020. Utilizing a 15-year baseline period was only allowed for water suppliers that meet at least 10% of their 2008 measured retail water demand through recycled water; MPMW did not meet this criterion and thus selected a 10-year baseline.

The 10-year baseline water use was calculated using gross per capita water usage data (calculated as total water entering the MPMW water distribution system, including uses by commercial, industrial, and other users, as well as water loses, divided by total population) for the 10-year period between 1 January 1996 and 31 December 2005. The 5-year baseline water use was calculated using per capita water usage data for the 5-year period between 1 January 2006 and 31 December 2010. The 5- and 10-year baseline water uses are shown in Table 5-1 and in Appendix E.

5.3 Water Use Targets

☑ ***CWC § 10608.20 (b)***

An urban retail water supplier shall adopt one of the following methods for determining its urban water use target pursuant to subdivision (a):

(1) Eighty percent of the urban retail water supplier's baseline per capita daily water use.

(2) The per capita daily water use that is estimated using the sum of the following performance standards:

(A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the department's 2016 report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.

(B) For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.

(C) For commercial, industrial, and institutional uses, a 10-percent reduction in water use from the baseline commercial, industrial, and institutional water use by 2020.

(3) Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). If the service area of an urban water supplier includes more than one hydrologic region, the supplier shall apportion its service area to each region based on population or area.

(4) A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31, 2020. In developing urban daily per capita water use targets, the department shall do all of the following:

(A) Consider climatic differences within the state.

(B) Consider population density differences within the state.

(C) Provide flexibility to communities and regions in meeting the targets.

(D) Consider different levels of per capita water use according to plant water needs in different regions.

(E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.

(F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.

☑ ***CWC § 10608.22***

Notwithstanding the method adopted by an urban retail water supplier pursuant to Section 10608.20, an urban retail water supplier's per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use as defined in paragraph (3) of subdivision (b) of Section 10608.12. This section does not apply to an urban retail water supplier with a base daily per capita water use at or below 100 gallons per capita per day.

Water suppliers were required to calculate their 2020 water use targets (Targets) and compare their actual water use in 2020 with the calculated Targets to assess compliance. The Water Conservation Act requires that water suppliers calculate their Targets using one of the following four methods:

- Method 1: Eighty percent of the water supplier's baseline per capita water use;
- Method 2: Per capita daily water use estimated using the sum of performance standards applied to indoor residential use, landscaped area water use, and commercial, industrial, and institutional uses;
- Method 3: Ninety-five percent of the applicable state hydrologic region target as stated in the State's 20x2020 Water Conservation Plan, dated February 2010; or
- Method 4: Total savings subtracted from baseline water use. Savings include metering savings, residential savings, commercial, industrial, and institutional savings, and landscape and water loss savings.

MPMW's 2020 Target was first calculated in its 2010 UWMP using Method 1 and was then recalculated in its 2015 UWMP using updated service area population. The updated 2020 Target was 204 gallons per capita per day (GPCD). Table 5-1 shows MPMW's 5- and 10-year baseline periods, the associated baseline water use in GPCD, and its 2020 target.

Table 5-1 Baselines and Targets Summary (DWR Table 5-1)

Baseline Period	Start Year	End Year	Average Baseline GPCD	Confirmed 2020 Target GPCD
10-15 year	1996	2005	255	204
5 Year	2006	2010	236	
NOTES:				

5.4 2020 Target Compliance

☑ ***CWC § 10608.24 (b)***

Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

☑ ***CWC § 10608.24 (d)***

(1) When determining compliance daily per capita water use, an urban retail water supplier may consider the following factors:

(A) Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.

(B) Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.

(C) Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.

(2) If the urban retail water supplier elects to adjust its estimate of compliance daily per capita water use due to one or more of the factors described in paragraph (1), it shall provide the basis for, and data supporting, the adjustment in the report required by Section 10608.40.

☑ ***CWC § 10608.40***

Urban water retail suppliers shall report to the department on their progress in meeting their urban water use targets as part of their urban water management plans submitted pursuant to Section 10631. The data shall be reported using a standardized form developed pursuant to Section 10608.52.

As shown in Table 3-1 and Table 4-1, MPMW's 2020 service area population was 18,276 and the 2020 water demand was 1,069 million gallons (MG). The per capita water use in 2020 was calculated to be 160 GPCD, approximately 78% of the 2020 Target of 204 GPCD. Per the Methodologies (DWR, 2016), there are several allowable adjustments that can be made to a supplier's 2020 per capita water use calculations as part of evaluating target compliance. However, no adjustments were made to MPMW's 2020 per capita water use calculations. As demonstrated in Table 5-2, MPMW is in compliance with SB X7-7 requirements.

Table 5-2 2020 Compliance (DWR Table 5-2)

2020 GPCD			2020 Confirmed Target GPCD	Did Supplier Achieve Targeted Reduction for 2020?
Actual 2020 GPCD	2020 TOTAL Adjustments	Adjusted 2020 GPCD *(Adjusted if applicable)*		
160	0	160	204	Yes
NOTES:				

6 WATER SUPPLY CHARACTERIZATION

☑ ***CWC § 10631 (b)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).

Menlo Park Municipal Water (MPMW) purchases all of its potable water from the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS) in accordance with the Water Supply Agreement (WSA) between the City and County of San Francisco and Wholesale Customers in Alameda, San Mateo and Santa Clara Counties, that was approved by the SFPUC on 28 April 2009 and amended on 12 February 2019.

To maintain consistency with the Urban Water Management Plans (UWMPs) prepared by the SFPUC and the other Bay Area Water Supply and Conservation Agency (BAWSCA) member agencies, much of the language describing the SFPUC wholesale water supply in the following sections is common language provided by BAWSCA, in coordination with the SFPUC.

6.1 Purchased or Imported Water

This section describes the sources of wholesale water provided by SFPUC, and the process for allocating water between SFPUC, BAWSCA, and wholesale customers.

6.1.1 Description of SFPUC RWS

Approximately 85% of the water supply to the SFPUC RWS originates in the Hetch Hetchy watershed, located in Yosemite National Park, and flows down the Tuolumne River into the Hetch Hetchy Reservoir. Water from the Hetch Hetchy watershed is managed through the Hetch Hetchy Water and Power Project. The remaining 15% of the water supply to the SFPUC RWS originates locally in the Alameda and Peninsula watersheds and is stored in six different reservoirs in Alameda and San Mateo Counties. Details of the various components of the SFPUC RWS are provided below and are shown on Figure 6-1. Information regarding the Hetch Hetchy, Alameda, and Peninsula water systems is sourced from the SFPUC's 2020 UWMP and is provided verbatim below.

6.1.1.1 Water Distribution

> The RWS, shown on Figure 6-1, consists of more than 280 miles of pipelines, 60 miles of tunnels, 11 reservoirs, five pump stations, and two water treatment plants. It includes the Hetch Hetchy Project and the Bay Area water system facilities. The Hetch Hetchy Project is generally composed of the reservoirs, hydroelectric generation and transmission facilities, and water transmission facilities from the Hetch Hetchy Valley west to the Alameda East Portal of the Coast Range Tunnel in Sunol Valley. Water system components of the Hetch Hetchy Project are also referred to as the Hetch Hetchy System. The local Bay Area water system is comprised of two parts—the Alameda System and the Peninsula System—generally consisting of the facilities west of the Alameda East Portal of the Coast Range Tunnel, including the 63,000-acre Alameda and Peninsula watersheds, storage reservoirs, two water treatment plants,

and the distribution system that delivers water to both retail and wholesale customers. The Hetch Hetchy, Alameda, and Peninsula Systems are described in more detail below.

Figure 6-1 Regional Water System

Hetch Hetchy System

In the Hetch Hetchy System, water is diverted from Hetch Hetchy Reservoir into a series of tunnels and aqueducts from the Sierra Nevada to the San Joaquin Pipelines that cross the San Joaquin Valley to the Coast Range Tunnel, which connects to the Alameda System at the Alameda East Portal. Hetch Hetchy System water is disinfected at the Tesla Treatment Facility.

Alameda System

The Alameda System includes two reservoirs, San Antonio Reservoir and Calaveras Reservoir, which collect water from the San Antonio Creek, Upper Alameda Creek, and Arroyo Hondo watersheds in Alameda County. San Antonio Reservoir also receives water from the Hetch Hetchy System. Conveyance facilities in the Alameda System connect the Hetch Hetchy System and Alameda water sources to the Peninsula System. The BDPLs [Bay Division Pipelines] cross the South Bay to the Peninsula System delivering water to customers along the pipeline route. The Sunol Valley Water Treatment Plant (SVWTP) filters and disinfects water supplied from San Antonio Reservoir and Calaveras Reservoir.

Peninsula System

The Peninsula System includes conveyance facilities connecting the BDPLs to the in-City distribution system and to other customers on the Peninsula. Two reservoirs,

Crystal Springs Reservoir and San Andreas Reservoir, collect runoff from the San Mateo Creek watershed. Crystal Springs Reservoir also receives water from the Hetch Hetchy System. A third reservoir, Pilarcitos Reservoir, collects runoff from the Pilarcitos Creek watershed and directly serves one of the Wholesale Customers, the Coastside County Water District (which includes the City of Half Moon Bay), along with delivering water to Crystal Springs and San Andreas Reservoirs. The Harry Tracy Water Treatment Plant (HTWTP) filters and disinfects water supplied from Crystal Springs Reservoir and San Andreas Reservoir before it is delivered to customers on the Peninsula and the in-City distribution system.

6.1.1.2 Water Treatment

The Hetch Hetchy Reservoir is the largest unfiltered water supply on the West Coast, and one of only a few large unfiltered municipal water supplies in the nation. The water originates from well-protected wilderness areas in Yosemite National Park, which flows down the Tuolumne River to Hetch Hetchy Reservoir. This water meets or exceeds all federal and State criteria for watershed protection. Water from Hetch Hetchy Reservoir is protected in pipes and tunnels as it is conveyed to the Bay Area, and requires pH adjustment to control pipeline corrosion and disinfection for bacteria control. Based on the SFPUC's disinfection treatment practice, extensive bacteriological quality monitoring, and high operational standards, the U.S. Environmental Protection Agency (USEPA) and the SWRCB Division of Drinking Water (DDW) determined that the Hetch Hetchy water source meets federal and State drinking water quality requirements without the need for filtration.

A new USEPA regulation took effect in 2012 requiring secondary disinfection for all unfiltered drinking water systems to control the waterborne parasite cryptosporidium. To comply with this regulation, the SFPUC completed construction of a new ultraviolet (UV) treatment facility in 2011. The Tesla Treatment Facility is a key component of the Water System Improvement Program (WSIP) and enhances the high-quality water from the RWS. The facility has a capacity of 315 mgd, making it the third largest UV drinking water disinfection facility in the U.S.

All water derived from sources other than Hetch Hetchy Reservoir is treated at one of two treatment plants: the SVWTP or the HTWTP. The SVWTP primarily treats water from the Alameda System reservoirs and has both a peak capacity and sustainable capacity of 160 mgd. Treatment processes include coagulation, flocculation, sedimentation, filtration, fluoridation, corrosion control treatment, and chloramination. Fluoridation, chloramination, and corrosion control treatment can also be provided for the combined Hetch Hetchy System and SVWTP water at the Sunol Valley Chloramination Facility. The HTWTP treats water from the Peninsula System reservoirs and has a peak capacity of 180 mgd and a sustainable capacity of 140 mgd. Treatment processes include ozonation, coagulation, flocculation, filtration, disinfection, fluoridation, corrosion control treatment, and chloramination. Major upgrades to the SVWTP were completed in 2013 and to the HTWTP in 2015.

6.1.1.3 Water Storage

The majority of the water delivered by the SFPUC is supplied by runoff from the upper Tuolumne River watershed on the western slope of the central Sierra Nevada. Three major reservoirs collect runoff: Hetch Hetchy Reservoir, Lake Lloyd (a.k.a., Cherry

Lake), and Lake Eleanor. A "water bank" in Don Pedro Reservoir is also integrated into system operations.[13] Don Pedro Reservoir, which is jointly owned and operated by Modesto Irrigation District and Turlock Irrigation District (the Districts), is located on the Tuolumne River downstream of the Hetch Hetchy System.

As a by-product of water delivery and water supply management, hydroelectric power is generated by the Hetch Hetchy Water and Power System. Water stored in Hetch Hetchy Reservoir is used for hydroelectric generation and also satisfies instream flow requirements when released downstream. Normally, only Hetch Hetchy Reservoir water supplies are exported to the Bay Area, while releases from Lake Eleanor and Lake Lloyd are used to satisfy instream flow requirements, satisfy Raker Act entitlements to the Districts downstream, and produce hydroelectric power. The Hetch Hetchy Water and Power System includes three major hydroelectric powerhouses along the Tuolumne River—Holm, Kirkwood, and Moccasin—that have a collective generating capacity of nearly 400 megawatts.

Downstream of the Hetchy Hetchy System, the SFPUC utilizes local watersheds in the Bay Area. Crystal Springs, San Andreas, and Pilarcitos Reservoirs, located in San Mateo County, capture local runoff in the Peninsula watershed, and Calaveras and San Antonio Reservoirs, located in Alameda Country, capture local runoff in the Alameda watershed. In addition to capturing local runoff, San Andreas, San Antonio, and Crystal Springs Reservoirs also provide storage for water from the Hetch Hetchy System and, along with Calaveras Reservoir, are an important water supply in the event of an interruption to Hetch Hetchy System deliveries.

Calaveras Reservoir had been operating in recent years at one-third of its capacity due to restrictions imposed by the DWR Division of Safety of Dams (DSOD). The Calaveras Dam Replacement Project, which took place from 2011 to 2019, involved the construction of a new dam downstream of the existing dam. The SFPUC began impounding water behind the new dam in the winter of 2018/2019 and continued the initial fill of the reservoir during the 2019/2020 winter season.

[13] Turlock and Modesto Irrigation Districts have senior water rights to the SFPUC for the Tuolumne River water and are entitled to the first increment of flow in the basin. Water bank provides a credit and debit system which allows the SFPUC to divert water upstream while meeting its obligations to Modesto and Turlock Irrigation Districts. Through this mechanism the SFPUC may pre-deliver the Districts entitlements and credit the water bank so that at other times the SFPUC may retain water upstream while the Districts debit water bank.

Regional Water System Storage Capacity

Reservoir	Storage	
	Acre-Feet (AF)	Billions of Gallons (BG)
Up-Country[a]		
Hetch Hetchy	360,360	117.4
Lake Lloyd[b]	273,300	89.1
Lake Eleanor	27,100	8.8
Subtotal Up-Country	**660,760**	**215.3**
Local		
Calaveras (East Bay)[c]	96,800	31.5
San Antonio (East Bay)	50,500	16.5
Crystal Springs (Peninsula)[d]	69,300	22.6
San Andreas (Peninsula)	19,000	6.2
Pilarcitos (Peninsula)	3,100	1.0
Subtotal Local	**238,700**	**77.8**
Total Regional Water System[e]	**899,460**	**293.1**

a Three other regulating reservoirs are also part of the RWS: Early Intake, Priest, and Moccasin Reservoirs.
b Storage capacity shown includes flashboards, which are structures placed in a spillway to increase the capacity of a reservoir.
c Calaveras Reservoir was constructed with a storage capacity of 96,800 AF. Since December 2001, in response to safety concerns about the seismic stability of the dam and a directive from the Division of Safety of Dams (DSOD), the SFPUC held the maximum water level at approximately 37,800 AF (roughly 40% of its maximum capacity). The construction of a new replacement dam downstream was completed in 2019 to restore the dam's full storage capacity and the dam was continuing to be filled over the 2019/2020 winter season.
d Crystal Springs Reservoir has a maximum storage capacity of 22.6 BG (at 291.8 feet). Based on permit conditions, the reservoir is currently operated at 287.8 feet (4 feet below capacity).
e This includes 63,700 AF in dead storage (i.e., the volume in a reservoir below the lowest controllable level). In addition, the SFPUC may draw against a credit of up to 570,000 AF in storage in a water bank account in Don Pedro Reservoir, for total storage for planning purposes of 1,469,460 AF.

6.1.2 Individual Supply Guarantees

San Francisco has a perpetual commitment (Supply Assurance) to deliver 184 mgd to the 24 permanent Wholesale Customers collectively. San Jose and Santa Clara are not included in the Supply Assurance commitment and each has temporary and interruptible water supply contracts with San Francisco. The Supply Assurance is allocated among the 24 permanent Wholesale Customers through Individual Supply Guarantees (ISG), which represent each Wholesale Customer's allocation of the 184 mgd Supply Assurance.

MPMW's Individual Supply Guarantee (ISG) is 4.456 million gallons per day (MGD), or approximately 1,630 million gallons (MG) per year. Between 2016 and 2020, MPMW purchased between 52% and 66% of its ISG (see Table 6-8).

6.1.3 2028 SFPUC Decisions (formerly 2018 SFPUC Decisions)

Information regarding the 2028 SFPUC Decisions (formerly 2018 SFPUC Decision) was provided by BAWSCA in coordination with SFPUC and is provided verbatim below.

In the 2009 WSA, the SFPUC committed to make three decisions before 2018 that affect water supply development:

- Whether or not to make the cities of San Jose and Santa Clara permanent customers,
- Whether or not to supply the additional unmet supply needs of the Wholesale Customers beyond 2018, and
- Whether or not to increase the wholesale customer Supply Assurance above 184 mgd.

Events since 2009 made it difficult for the SFPUC to conduct the necessary water supply planning and CEQA analysis required to make these three decisions before 2018. Therefore, in the 2018 Amended and Restated WSA, the decisions were deferred for 10 years to 2028.

Additionally, there have been recent changes to instream flow requirements and customer demand projections that have affected water supply planning beyond 2018. As a result, the SFPUC has established an Alternative Water Supply Planning program to evaluate several regional and local water supply options. Through this program, the SFPUC will conduct feasibility studies and develop an Alternative Water Supply Plan by July 2023 to support the continued development of water supplies to meet future needs.

6.2 Groundwater

☑ ***CWC § 10631***

(b) (4) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information:

(A) The current version of any groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720), any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management for basins underlying the urban water supplier's service area.

(B) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For a basin that has not been adjudicated, information as to whether the department has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to coordinate with groundwater sustainability agencies or groundwater management agencies listed in subdivision (c) of Section 10723 to maintain or achieve sustainable groundwater conditions in accordance with a groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720).

(C) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

To date, MPMW has not utilized groundwater as a potable water source (i.e., as described above, the sole source of MPMW's potable water has been wholesale water supplied by the SFPUC RWS) and does not expect to utilize groundwater as a regular source in the future. However, because the Lower Zone and the High Pressure Zone of its distribution system lack emergency storage (see Section 3.4), MPMW anticipates bringing one groundwater well online in spring 2021 and is planning to construct an additional one or two wells to provide up to 3,000 gallons per minute (gpm) of potable and fire supply in these zones. Potential future use of the groundwater supply wells and information related to the local groundwater basin is described in more detail below.

6.2.1 Groundwater Basin Description

MPMW overlies the southern end of the San Mateo Plain Groundwater Subbasin (groundwater basin number 2-009.03; DWR, 2004; or "subbasin") of the Santa Clara Valley Groundwater Basin. The subbasin is not adjudicated, nor has it been found by Department of Water Resources (DWR) to be in a condition of overdraft. As part of the implementation of the Sustainable Groundwater Management Act (SGMA), the subbasin was ranked as a "very low priority" basin under the 2014 California Statewide Groundwater Elevation Monitoring (CASGEM) basin prioritization process and maintained this ranking in DWR's latest basin prioritization effort in 2019. The subbasin is therefore not subject to the requirements of SGMA.

6.2.1.1 Physical Setting

The subbasin is approximately 38,000 acres[14] and is bounded by the Santa Cruz Mountains on the west, San Francisco Bay and the Niles Cone subbasin on the east, the Westside Basin on the north near Burlingame Avenue and Coyote Point, and the San Francisquito Creek and the Santa Clara subbasin to the south. Figure 6-2 shows the subbasin boundary, the surrounding subbasins of the Santa Clara Valley Groundwater Basin, and the location of the MPMW service area within the subbasin.

The subbasin is filled with alluvial fan deposits formed by tributaries to San Francisco Bay that drained across the basin and toward the center of the Bay (RWQCB, 2003; EKI et al., 2018). These alluvial fan deposits are interbedded with thick clay aquitards or confining layers and comprise the main water bearing formations within the subbasin. The major water bearing formation of the subbasin is the Quaternary alluvium, from which all larger yielding wells acquire their water. The Santa Clara Formation underlies the Quaternary alluvium and is the other water bearing formation of the subbasin. In general, the groundwater system is unconfined in the higher elevations, and confined or semiconfined at lower elevations closer to San Francisco Bay.

Groundwater flow in the subbasin is generally from west-southwest to east-northeast, from the edge of the Santa Cruz Mountains to San Francisco Bay. Both the southern and eastern edges of the subbasin are political boundaries that are roughly coincident with County lines, rather than physical hydrogeologic barriers to groundwater flow (Fio and Leighton, 1995; RWQCB 2003; EKI et al., 2018). Depending upon temporally varying streamflow, recharge, and pumping conditions, groundwater flow likely occurs in variable directions across each boundary.

Natural recharge occurs by infiltration of water from streams that enter the valley from the upland areas within the drainage basin, including San Francisquito Creek, San Mateo Creek, and other smaller creeks, and by percolation of precipitation that falls directly on the land surface. Additional recharge occurs as a result of infiltration of applied irrigation water. Subbasin outflows include limited municipal and private well pumping and groundwater outflows across subbasin boundaries.

It is further noted that the United States Geological Survey (USGS) has defined the "San Francisquito Cone" as a unique groundwater subbasin that is roughly coincident with the known lateral extent of the San Francisquito Creek alluvial fan deposits. The San Francisquito Cone subbasin underlies portions of MPMW and East Palo Alto, and overlaps with the southern end of the subbasin (see Figure 6-2). The San Francisquito Cone subbasin has been the subject of several hydrologic and water balance studies. As described in the Final Feasibility of Supplemental Groundwater Resources Development in Menlo Park and East Palo Alto (Todd Engineers, 2005), the San Francisquito Cone subbasin encompasses mountainous bedrock terrain and relatively flat alluvial fan deposits. The geology is composed of the coarse- and fine-grained alluvial deposits of San Francisquito Creek. The groundwater system includes a shallow aquifer, a laterally extensive confining clay layer, and a multi-layered deep aquifer that extends to depths of up to 1,000 feet below ground surface. Storativity values indicate the shallow aquifer is unconfined and the deeper aquifer system is semi-confined. Pumping test and empirical transmissivity and well yield data

[14] Basin area is based on the SGMA 2019 Basin Prioritization results.

indicate that development of a municipal supply wells within the San Francisquito Cone portion of the subbasin is feasible.

6.2.1.2 Groundwater Conditions

Groundwater use in the subbasin has been relatively limited for the last several decades, as the primary water supply source for the overlying population has been imported water from the SFPUC RWS. The only municipal water suppliers within the subbasin that utilize groundwater as a potable supply source are Palo Alto Park Mutual Water Company (PAPMWC), O'Connor Tract Co-operative Water Company (O'Connor Tract CWC), and the City of East Palo Alto. Groundwater is also used for landscape or domestic irrigation purposes. Total groundwater production for water supply within the subbasin is approximately 2,300 acre-feet per year (AFY) as of 2018 (EKI et al., 2018)[15].

Based on limited available groundwater level information, the subbasin is currently in a relatively full and stable condition. However, historical information indicates that during past periods of high groundwater production in the 1850s to 1960s, groundwater levels in the subbasin were significantly lower and negative impacts including seawater intrusion and land subsidence were observed (EKI et al., 2018). A recent renewed interest in groundwater development in the subbasin has increased the need and interest in gaining a better understanding of the subbasin and evaluating the extent to which increased groundwater development can be pursued, while mitigating potential negative impacts. Details on the subbasin groundwater management efforts are described in the section below.

6.2.2 Groundwater Management

As stated above, the subbasin is currently designated by the DWR as a "very low priority" basin and is exempt from complying with SGMA. However, multiple entities overlying the subbasin have expressed interests in maintaining groundwater sustainability and/or established a formal role in the subbasin management.

The San Mateo County conducted a comprehensive groundwater basin assessment in 2018 (EKI et al., 2018). The study provided a more complete understanding of the subbasin hydrogeologic framework and groundwater flow and quality conditions. It also identified potential groundwater management strategies for the subbasin.

Informed by this study, San Mateo County has begun to participate in the CASGEM program. CASGEM is a groundwater elevation monitoring program that was developed by DWR per the requirements of SBx7-6. The objective of CASGEM is to establish a permanent, locally managed program of regular groundwater monitoring to track seasonal and long-term trends in groundwater elevations. The County provided initial notification to DWR of its intent to become the CASGEM Monitoring Entity for the subbasin in 2019. A CASGEM Monitoring Plan including a monitoring network of approximately ten wells throughout the

[15] The groundwater production value stated above excludes East Palo Alto which did not start pumping from its re-activated Gloria Way Well in 2018.

subbasin was developed and submitted for DWR review in 2020. Compliance with CASGEM is an important first step in setting the subbasin up for long-term sustainable management and funding.

There has also been widespread agreement among the overlying cities, water suppliers and other interested parties that cooperative, sustainable groundwater management of the entire subbasin is needed. Several entities have passed resolutions in support of sustainable groundwater management. In particular, the City of Menlo Park (City) adopted Resolution 6239 in 2014. As per this Resolution, the City is committed to: (1) working with other agencies and organizations to better understand the hydrology and geology of the San Francisquito Creek area; and (2) the sustainable management of local groundwater, including conjunctive water management and aggressive conservation, to protect its quality and ensure its availability during droughts and emergency situations.

The subbasin is currently not managed pursuant to any groundwater management plan (GWMP). However, Santa Clara Valley Water District (SCVWD) and the City of East Palo Alto adopted their own GWMPs in 2012 and 2015, respectively. The SCVWD GWMP covers the small far southern portion of the subbasin within Santa Clara County, and was updated in 2016 (SCVWD, 2016) and submitted to DWR as an Alternative to a Groundwater Sustainability Plan (GSP). The East Palo Alto GWMP addresses groundwater conditions within the jurisdictional boundary of the City of East Palo Alto in the southeastern portion of the subbasin (Todd Engineers, 2015). The East Palo Alto GWMP was prepared in accordance with Assembly Bill (AB) 3030 and the amendments to AB 3030 provided by Senate Bill (SB) 1938 and AB 359.

In addition, BAWSCA initiated work with San Mateo County and its member agencies to form the Groundwater Reliability Partnership (GRP) in 2015. The main focus of the GRP was to provide information regarding SGMA and other locally relevant groundwater management efforts to the BAWSCA member agencies and other interested parties. The GRP has not been active since 2018.

6.2.3 Historical Groundwater Use

As discussed above, MPMW has not historically used groundwater as a potable water source (see Table 6-1).

Table 6-1 Groundwater Volume Pumped (DWR Table 6-1)

X	Supplier does not pump groundwater. The supplier will not complete the table below.					
	All or part of the groundwater described below is desalinated.					
Groundwater Type	Location or Basin Name	2016	2017	2018	2019	2020
TOTAL						
NOTES:						

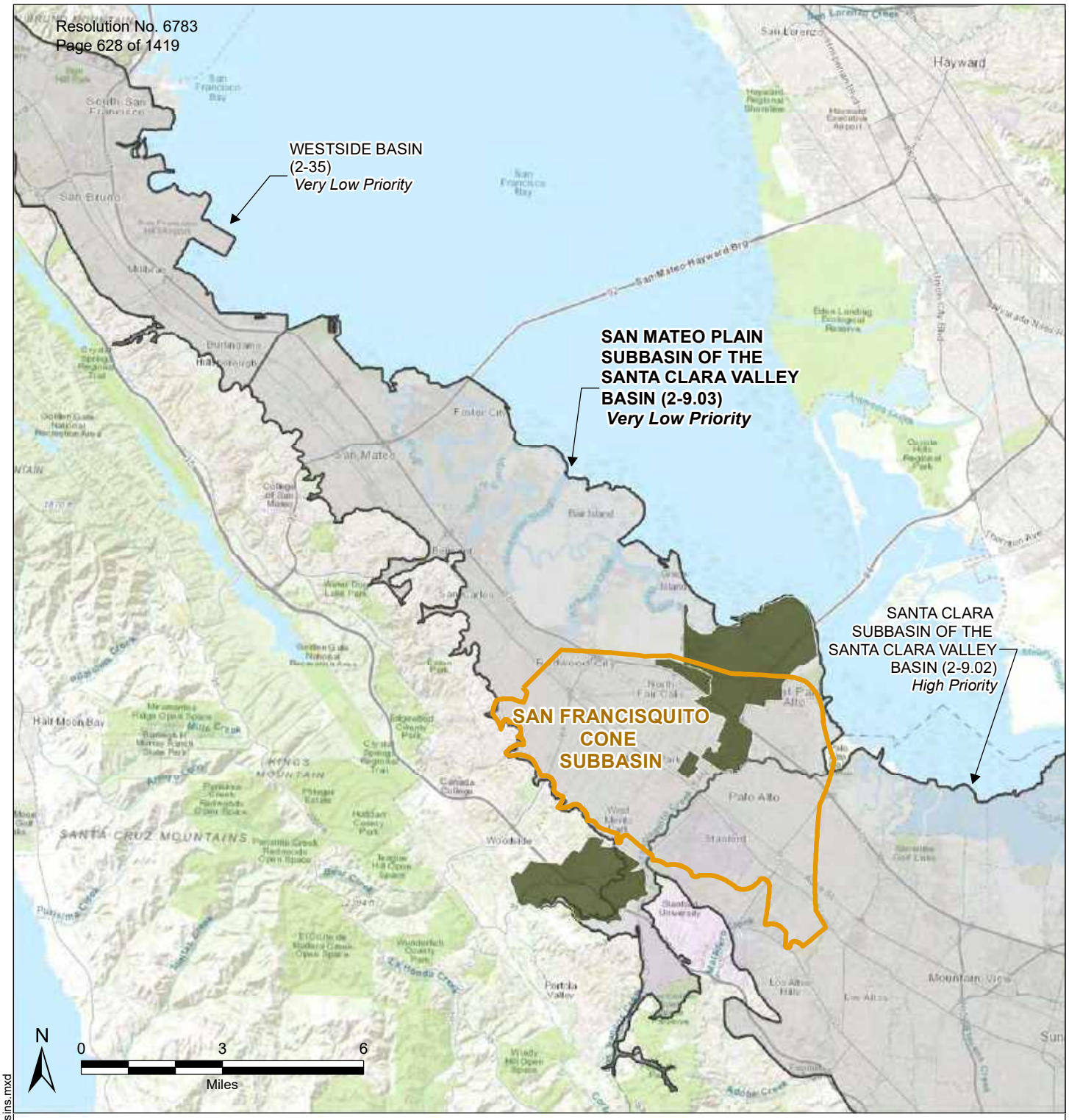
6.2.4 Projected Future Groundwater Use

MPMW purchases all of its potable water from the SFPUC RWS. Groundwater is currently not part of its potable water supply. However, as described previously, MPMW has long recognized the need for emergency storage and/or supply in the distribution system and has been pursuing the Emergency Water Storage/Supply Project for a number of years. After extensive planning, siting, and exploratory drilling efforts, in 2017, the first groundwater well was drilled in the City's Corporation Yard at 333 Burgess Drive. Based on aquifer testing data, the Corporation Yard Well can produce up to 1,500 gpm of emergency/backup supply to the Lower Zone. Construction of the above-grade facilities for the Corporation Yard well was completed in late 2020, and MPMW is in the midst of working with the State Water Resources Control Board (SWRCB) to permit the well.

MPMW plans to construct an additional one or two emergency wells in order to achieve another 1,500 gpm (for a total supply capacity of 3,000 gpm) as part of the Emergency Water Storage/Supply Project. Groundwater is currently not considered as a regular normal or dry year supply for MPMW. The wells are envisioned to serve as a supplemental supply as needed during significant water shortages due to an emergency or drought conditions (see MPMW's Water Shortage Contingency Plan in Appendix K).

MPMW is also investigating locations for a future underground reservoir for the Lower Zone and High Pressure Zone. Extensive information regarding the Emergency Water Storage/Supply Project can be found on the City's website:

https://www.menlopark.org/141/Emergency-water-supply-wellshttps://www.menlopark.org/141/Emergency-water-supply-wells



Legend

- San Francisquito Cone Subbasin
- MPMW Service Area
- DWR Bulletin 118 Groundwater Basin

Abbreviations

CASGEM = California Statewide Groundwater Elevation Monitoring Program
DWR = Department of Water Resources
MPMW = Menlo Park Municipal Water

Notes

1. All locations are approximate.
2. Priority rankings from CASGEM groundwater basin prioritization, May 2020.
3. DWR Bulletin 118 Groundwater Basin Boundaries, Feb 2019.

Sources

1. World Topographic base map provided by ArcGIS Online
2. San Francisquito Cone data provided by Metzger, L. F. 2002. Streamflow gains and losses along San Francisquito Creek and characterization of surface-water and ground-water quality, Southern San Mateo and Northern Santa Clara counties, California, 1996-97. U.S. Geological Survey, Water-Resources Investigations. Report 02-4078.

Groundwater Basins in the Vicinity of the MPMW Service Area

Menlo Park Municipal Water
2020 Urban Water Management Plan
Menlo Park, CA
June 2021
EKI C00050.00

eki environment & water

Figure 6-2

Path: X:\C00050\Maps\2021\06\Fig 6-2_MPMW_GroundwaterBasins.mxd

6.3 Surface Water

Water that is self-supplied to agencies from streams, lakes and reservoirs is considered a surface water supply. Although MPMW's potable water supply is originally derived from surface water, it is categorized as "purchased" water since the water is obtained from the SFPUC RWS. MPMW does not currently, nor does it plan to in the future, use self-supplied surface water as part of its water supply portfolio.

6.4 Stormwater

MPMW does not currently, nor does it plan to in the future, use diverted stormwater as part of its water supply portfolio.

6.5 Wastewater and Recycled Water

☑ ***CWC § 10633***

The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.

Recycling water involves treating wastewater to an acceptable level such that it can be reused for irrigation, cooling, and other non-potable applications. A key benefit of water recycling is its potential to offset the use of potable supplies. The regulatory requirements for recycled water are defined in the California Code of Regulations, Title 22, Article 3 (Title 22) and differ for different uses (e.g. irrigation for food crops, landscape, and recreation). The sections below describe wastewater collection and treatment for the MPMW service area and summarize MPMW's efforts with respect to recycled water planning and use.

6.5.1 Recycled Water Coordination

West Bay Sanitary District (WBSD) provides wastewater collection services to the MPMW service area. WBSD also acts as the recycled water purveyor. As described in Section 2.2.3, MPMW relies on and coordinates with WBSD on the relevant wastewater and recycled water issues.

6.5.2 Wastewater Collection, Treatment, and Disposal

☑ ***CWC § 10633 (a)***

A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

☑ ***CWC § 10633 (b)***

A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

Wastewater in the MPMW service area is collected by WBSD, which also serves other customers within the remainder of Menlo Park, Atherton, sections of East Palo Alto, Portola Valley, Woodside, and unincorporated San Mateo and Santa Clara Counties. The WBSD collection system conveys wastewater through the Menlo Park Pumping Station located at the entrance to Bedwell Bayfront Park to the Silicon Valley Clean Water (SVCW) facilities in Redwood City for treatment and discharge to the San Francisco Bay. The volume of wastewater collected from the MPMW service area in 2020 was approximately 873 MG (Table 6-2).

The SVCW wastewater treatment plant (WWTP) is jointly owned and operated by WBSD and the Cities of Redwood City, Belmont, and San Carlos as a joint powers authority. The SVCW WWTP is located at the northeastern end of Redwood Shores, approximately nine miles from the northeastern boundary of the MPMW service area. The treatment processes at the SVCW WWTP involve the following: primary sedimentation, dual secondary treatment with fixed film reactors and activated sludge, filtration, disinfection using sodium hypochlorite, and dechlorination with sodium bisulfide. Discharge of the advanced secondarily-treated effluent is permitted by the San Francisco Regional Water Quality Control Board (RWQCB).

A limited volume of wastewater is treated within the MPMW service area at the Sharon Heights Recycled Water Facility (RWF; see Table 6-3). The Sharon Heights RWF, located at the Sharon Heights Golf and Country Club (SHGCC), was constructed and managed by WBSD in coordination with MPMW. It is a 0.5 MGD satellite WWTP which produces tertiary-treated recycled water under Title 22 for reuse within MPMW's service area. Wastewater is diverted from WBSD's collection system and pumped into the RWF. The treatment process includes screening, membrane bioreactor, and UV disinfection. In 2020, approximately 63 MG of wastewater was treated at the Sharon Heights RWF, among which 20 MG was recycled and the remaining 43 MG was conveyed to SVCW WWTP for discharge. Recycled water uses are further described in the section below.

Table 6-2 Wastewater Collected Within Area in 2020 (DWR Table 6-2)

	There is no wastewater collection system. The supplier will not complete the table below.
	Percentage of 2020 service area covered by wastewater collection system *(optional)*
	Percentage of 2020 service area population covered by wastewater collection system *(optional)*

Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected from UWMP Service Area 2020	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party? *(optional)*
West Bay Sanitary District	Estimated	873	Silicon Valley Clean Water	Silicon Valley Clean Water Wastewater Treatment Plant	No	
Total Wastewater Collected from Service Area in 2020:		873				

NOTES:
(a) Volumes are in units of MG.
(b) The volume of wastewater collected within the MPMW service area is estimated using information provided by WBSD. These estimates assume that sewer flow from residential units is 200 gallons per day and that sewer flow from non-residential accounts equals the volume of water consumed.
(c) The SVCW WWTP is jointly owned and operated by WBSD and the Cities of Redwood City, Belmont, and San Carlos as a joint powers authority.

Table 6-3 Wastewater Treatment and Discharge Within Service Area in 2020 (DWR Table 6-3)

	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.										
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2020 volumes				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
Recycled Water Facility - Sharon Heights	WBSD wastewater collection system	WBSD wastewater collection system		Other	No	Tertiary	63	43	20	0	0
						Total	63	43	20	0	0

NOTES:
(a) Volumes are in units of MG.
(b) Data provide by WBSD.
(c) Tertiary treated recycled water produced by the Sharon Heights Recycled Water Facility is either delivered to SHGCC for beneficial use or returned to the WBSD wastewater collection system

6.5.3 Recycled Water System Description

☑ ***CWC § 10633 (c)***

A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

MPMW has been working with WBSD, which is the recycled water purveyor, to develop the recycled water system within MPMW's service area. WBSD is responsible for recycled water system operation and maintenance.

Currently, recycled water is only used at the SHGCC which is a 170-acre property located in the Upper Zone of MPMW's service area. The recycled water system consists of the Sharon Heights RWF, a pump station, recycled water distribution pipelines to the golf course irrigation system, and a solids disposal pipeline. In 2020, the satellite WWTP provided 20 MG recycled water to the SHGCC, offsetting demand in potable water purchased from SFPUC. A second phase of the project that could supply approximately 28 MG of recycled water over seven months a year to Stanford Linear Accelerator Center (SLAC) for irrigation and industrial uses such as for cooling towers is in very early planning stages.

Planning for a similar recycled water facility in the Bayfront Area is ongoing. WBSD completed a Bayfront Recycled Water Facilities Plan in May 2019 (Woodard and Curran, 2019). The study included additional market assessment, evaluated potential project alternatives, and identified a recommended project. The recommended project involves construction of a 0.4 MGD treatment facility along with the associated pump stations and distribution systems. WBSD anticipates that the project could deliver up to 72 MG of recycled water for irrigation, cooling towers, and other uses within the Bayfront Area starting around 2030.

6.5.4 Potential, Current, and Projected Recycled Water Uses

☑ ***CWC § 10633 (b)***

A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

☑ ***CWC § 10633 (d)***

A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

☑ ***CWC § 10633 (e)***

The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

Historically there was no recycled water use within MPMW's service area. Starting in July 2020, with the completion of the Sharon Heights Recycled Water Project, recycled water provided by WBSD became available to certain MPMW's customers. The SHGCC used 20 MG of recycled water for irrigation in 2020.

Recycled water use projections for the MPMW service area are shown in Table 6-4, which include projected demands from SHGCC and demands associated with the planned Bayfront Recycled Water Facility. SHGCC's future demand was assumed to remain constant at approximately 48 MG per year. The Bayfront Recycled Water Facility was projected to come online by 2030 and provide approximately 39 MG per year of recycled water for irrigation and 33 MG per year for indoor non-potable uses (Woodard and Curran, 2019). As the SLAC recycled water project is still in its early planning phases, it was not included in Table 6-4.

No recycled water use projections were made in previous UWMPs. As described above, the SHGCC started to use recycled water for irrigation in late 2020. Table 6-5 lists the 2020 actual recycled water use, as reported in Table 6-4.

Table 6-4 Recycled Water Direct Beneficial Uses Within Service Area (DWR Table 6-4)

	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.
Name of Supplier Producing (Treating) the Recycled Water:	West Bay Sanitary District
Name of Supplier Operating the Recycled Water Distribution System:	West Bay Sanitary District
Supplemental Water Added in 2020 (volume)	0
Source of 2020 Supplemental Water	--

Beneficial Use Type	**Potential** Beneficial Uses of Recycled Water (Describe)	Amount of **Potential** Uses of Recycled Water (Quantity)	General Description of 2020 Uses	Level of Treatment	2020	2025	2030	2035	2040	2045 *(opt)*
Landscape irrigation (excludes golf courses)	Irrigation in Bayfront area	39 MG/year	--	Tertiary	0	0	39	39	39	--
Golf course irrigation	Irrigation of 170 acres of golf course at the SHGCC	48 MG/year	Irrigation of 170 acres of golf course at the SHGCC	Tertiary	20	48	48	48	48	--
Commercial use	Indoor non-potable use in Bayfront area	33 MG/year	--	Tertiary	0	0	33	33	33	--
				Total:	20	48	120	120	120	--
				2020 Internal Reuse	0					

NOTES:
(a) Volumes are in units of MG.
(b) The projected demands at Sharon Heights are estimated based on the average of historical demands in 2017 to 2019.
(c) Bayfront recycled water demands are estimated based on information provided by WBSD and in Bayfront Recycled Water Facilities Plan.

Table 6-5 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual (DWR Table 6-5)

	Recycled water was not used in 2015 nor projected for use in 2020. The supplier will not complete the table below.	
Beneficial Use Type	2015 Projection for 2020	2020 Actual Use
Golf course irrigation	0	20
Total	0	20
NOTES: (a) Volumes are in units of MG.		

6.5.5 Actions to Encourage and Optimize Future Recycled Water Use

☑ ***CWC § 10633 (f-g)***

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

As part of the 2016 General Plan Update (i.e., ConnectMenlo), several new zoning district categories, including Office (or "O"), Life Science (or "LS"), and Mixed Use Residential (or "R-MU"), were adopted for consistency with the new Bayfront Area land use designations. The green and sustainable building requirements of these zoning districts include policies that promote recycled water use (see Table 6-6). Specifically, new development in the Bayfront Area is required to be dual plumbed for the internal use of recycled water. In addition, all new buildings 250,000 square feet or more in gross floor area should identify and use an alternate water source for all City approved non-potable applications such as on-site and offsite recycled water, or if recycled water is not feasible, incorporate conservation measures equivalent to the building's non-potable demand. As described in Section 6.5.3, the recycled water use within the MPMW service area is projected to increase by 72 MG per year in 2030, assuming development of the Bayfront Recycled Water Facility.

Table 6-6 Methods to Expand Future Recycled Water Use (DWR Table 6-6)

	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
Section 6.5.5	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Zoning Ordinance	Require new construction in the Bayfront area to incorporate recycled water measures	Ongoing	72
		Total	72

NOTES:
(a) Volumes are in units of MG.
(b) The expected increase in recycled water use is estimated based on the Bayfront Recycled Water Facilities Plan (Woodard & Curran, 2019).

6.6 Desalinated Water Opportunities

☑ ***CWC § 10631 (g)*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

Opportunities to develop desalinated water supplies from ocean water, brackish surface, and brackish groundwater were investigated by BAWSCA as part of Phase II of its Long-Term Reliable Water Supply Strategy (Strategy, see Section 7.1.1.1). According to BAWSCA, there are high costs and intensive permitting requirements associated with desalination. However, it does potentially provide a substantial yield given the limited options for generating significant new water supplies for the region. SFPUC is also exploring desalination as part of its Alternative Water Supply Planning Program (see Section 7.1.1.1).

MPMW does not anticipate opportunities for development of desalinated water supplies within the planning horizon of this UWMP and this water supply is not being considered.

6.7 Water Exchanges and Transfers

☑ ***CWC § 10631 (c)*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

6.7.1 Exchanges and Transfers

There are potential transfer and exchange opportunities within and outside of the SFPUC RWS. MPMW does not presently anticipate the need for water right transfers during normal year conditions. However, should that condition change in the future, it is possible that MPMW could purchase water from another agency or entity either within or outside of the SFPUC RWS.

Within the SFPUC RWS, it is possible to transfer water entitlements and/or banked water among agencies. The Water Shortage Allocation Plan (WSAP) adopted by all BAWSCA agencies and the SFPUC provides the basis for voluntary transfers of water among BAWSCA agencies during periods when mandatory rationing is in effect on the SFPUC RWS (see Section 7.1.1.1). Some BAWSCA agencies have the capacity to rely on groundwater or other sources during dry years and thus may be willing to transfer a portion of their wholesale water entitlement to other BAWSCA agencies in need of supply above their allocations. Securing water from willing sellers outside the SFPUC RWS is a more complex process than transfers within the RWS, which requires both a contract with the seller agency and approval by the SFPUC. BAWSCA has the authority to plan for and acquire supplemental water supplies, and continues to evaluate the feasibility of water transfers as part of its implementation of the Strategy (see Section 7.1.1.1).

6.7.2 Emergency Interties

As discussed in Section 3.4, MPMW has 13 emergency interties with four adjacent water suppliers. Three connections (one metered) are with the Cal Water's system; a metered connection with the O'Connor Tract Co-operative Water Company; a connection with the City of Redwood City; and eight interties with the City of East Palo Alto.

6.8 Future Water Projects

☑ ***CWC § 10631*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

(b) (3) For any planned sources of water supply, a description of the measures that are being undertaken to acquire and develop those water supplies.

(f) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in normal and single-dry water years and for a period of drought lasting five consecutive water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

This section lists the water supply projects that may be undertaken by both the wholesaler SFPUC and MPMW (in coordination with WBSD). The effects of these projects on MPMW's long-term water supply are not all quantifiable at this point in time, therefore not all of them are included as future supplies in Table 6-9. The local projects are also documented in the City's five-year Capital Improvement Plan (CIP), which is an annually-updated, planning document that provides a long-term approach for prioritizing and implementing new projects within the City. The most recent update to the City's CIP is the FY 2020-2025 CIP (City of Menlo Park, 2020).

6.8.1 SFPUC Water Supply Projects

MPMW's wholesaler SFPUC has been implementing its Water System Improvement Plan (WSIP) since it was adopted in 2008. The WSIP includes several water supply projects to address the level of service (LOS) Goals and Objective established in the WSIP and updated in February 2020. SFPUC has also developed an Alternative Water Supply Planning Program to explore other projects that would increase overall water supply resiliency. These programs and future water supply projects are described in Section 7.1.1.1.

6.8.2 Emergency Water Supply Wells

As described in Section 6.2.4, MPMW completed construction of its first emergency groundwater well and anticipates bringing the well online in 2021. An additional one or two emergency wells are being considered as part of the Emergency Water Storage/Supply Project. The total supply capacity is targeted at 3,000 gpm. In addition, MPMW is also investigating locations for a future underground reservoir for the Lower Zone and the High Pressure Zone. Extensive information regarding the Emergency Water Storage/Supply Project can be found on the City's website: www.menlopark.org/emergencywatersupply.

6.8.3 Recycled Water

As described in Section 6.5.3, the Sharon Heights Recycled Water Project will potentially be expanded to connect SLAC. In addition, WBSD has been evaluating the project alternatives of constructing another recycled water facility in the Bayfront Area. A recommended project has been identified, which would deliver an estimated total of 72 MG of recycled water for irrigation, cooling towers, and other uses. The

facility is anticipated to come online by 2030. WBSD is continuing coordination with the City to determine next steps in recycled water planning.

Table 6-7 Expected Future Water Supply Projects or Programs (DWR Table 6-7)

	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
X	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
Section 6.8	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other suppliers?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier
	Y/N	*Supplier Name*				
Sharon Heights Recycled Water Project - Delivery to SLAC	Y	WBSD	--	Unknown	All Year Types	28
Bayfront Recycled Water Project	Y	WBSD	--	2030	All Year Types	72
NOTES: (a) Volumes are in units of MG. (b) The recycled water purveyorship for both projects listed above have been delegated to WBSD. WBSD is responsible for the project development. (c) Expected increase in water supply is estimated based on information presented in the Recycled Water Project - Sharon Heights Mitigated Negative Declaration report (RMC, 2015) and the Bayfront Recycled Water Facilities Plan (Woodard & Curran, 2019). (d) Projects to be constructed by SFPUC are documented in the narrative of this UWMP and in the SFPUC's 2020 UWMP.						

6.9 Summary of Existing and Planned Sources of Water

☑ ***CWC § 10631 (b)*** *Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).*

☑ ***CWC § 10631 (b) (4) (D)*** *A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

MPMW purchases potable water from the SFPUC RWS to meet all of the potable water demands within the service area. In 2020, MPMW received approximately 1,069 MG from the SFPUC. An additional 20 MG

of recycled water was supplied to SHGCC to meet its irrigation demand. MPMW's historical and current supply is presented in Table 6-8.

MPMW plans to continue purchasing wholesale water from the SFPUC RWS. Water supplies from the SFPUC through 2040 are projected to be equivalent to MPMW's ISG of 1,630 MG, which is MPMW's contractual entitlement to SFPUC wholesale water, and which survives in perpetuity. Although MPMW currently owns one groundwater well, groundwater will not normally be distributed to customers unless there is a significant water shortage and normal water supplies are low or unavailable (see the City's Water Shortage Contingency Plan in Appendix K). Therefore, groundwater is not included in the supply projections. MPMW does not anticipate developing additional long-term potable water supplies from other sources in the near future.

In addition to the potable water supply from SFPUC RWS, approximately 48 MG and 72 MG of recycled water are projected to be supplied by the Sharon Heights and Bayfront Recycled Water Facilities per year, respectively. The recycled water supply is reported to the extent that it is needed to meet the recycled water demand identified in Table 6-4. Excess available supplies are not included.

MPMW's total water supply projections are shown in Table 6-9 in five-year increments through 2040.

Table 6-8 Water Supplies - Actual (DWR Table 6-8)

Water Supply	Additional Detail on Water Supply	Actual Volume					Water Quality	Total Right or Safe Yield *(optional)*
		2016	2017	2018	2019	2020		
Potable								
Purchased or Imported Water	SFPUC RWS	847	965	1,069	1,031	1,069	Drinking Water	1,630
Total Potable		847	965	1,069	1,031	1,069		1,630
Non-Potable								
Recycled Water	Sharon Heights Recycled Water Facility	0	0	0	0	20	Recycled Water	--
Total Non-Potable		0	0	0	0	20		--

NOTES:
(a) Volumes are in units of MG.
(b) The annual water supplies are based on SFPUC Eye On Water AMI data. 2018 and 2019 data are adjusted for meter and supply errors based on the AWWA Water Audit Reports.
(c) Total supplies may not match the total water demands reported in Table 4-1. This is because the water losses calculated in AWWA Water Audit Reports and presented in Table 4-1 are based on invoices which usually do not start from the first day of the month. However, the supply data in the above table are based on real-time AMI meter reads and summed by natural month.
(d) MPMW has an ISG of 4.456 MGD, which is approximately 1,630 MG per year.

Chart 6-8 Current and Historical Water Supply

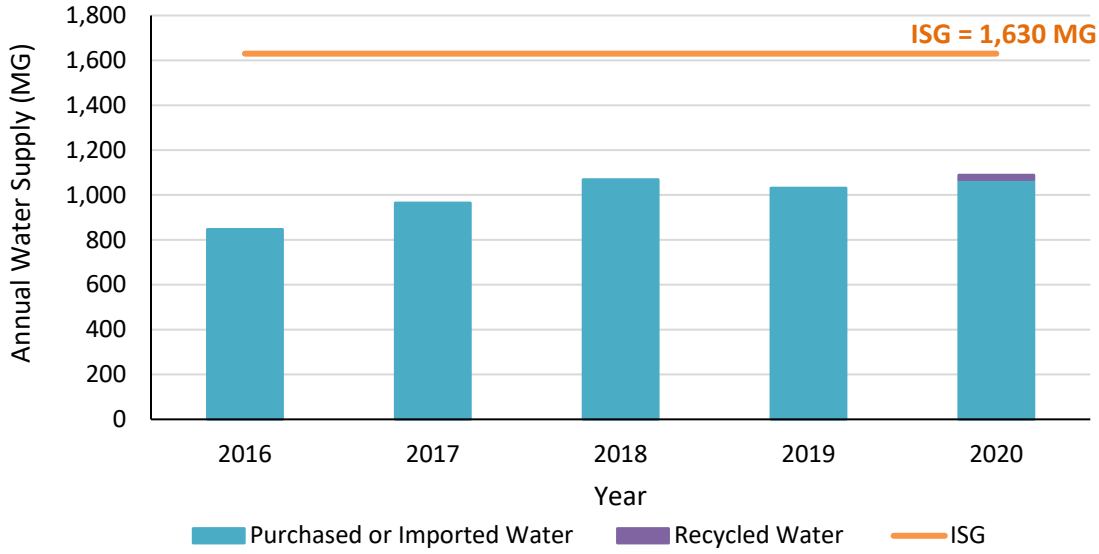
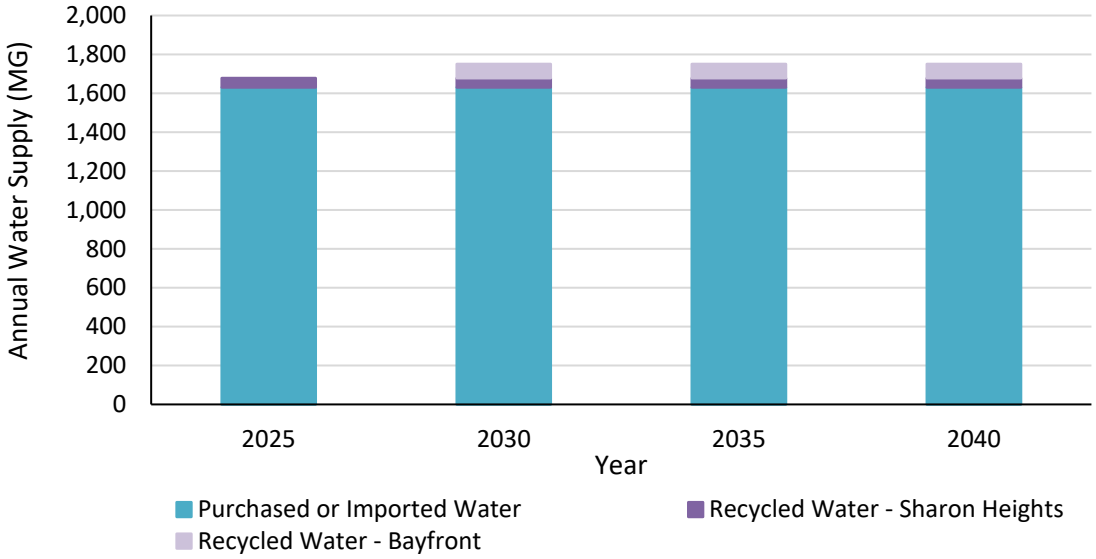


Table 6-9 Water Supplies - Projected (DWR Table 6-9)

Water Supply	Additional Detail on Water Supply	Projected Water Supply									
		2025		2030		2035		2040		2045 *(opt)*	
		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Projected Potable											
Purchased or Imported Water	SFPUC RWS	1,630	--	1,630	--	1,630	--	1,630	--	--	--
Total Potable		1,630	--	1,630	--	1,630	--	1,630	--	--	--
Projected Non-Potable											
Recycled Water	Sharon Heights Recycled Water Facility	48	--	48	--	48	--	48	--	--	--
Recycled Water	Bayfront Recycled Water Facility	0	--	72	--	72	--	72	--	--	--
Total Non-Potable		48	--	120	--	120	--	120	--	--	--

NOTES:
(a) Volumes are in units of MG.
(b) MPMW has an ISG of 4.456 MGD, which is approximately 1,630 MG per year.
(c) The recycled water supply reported herein are reported to the extent that they are needed to meet the recycled water demand in Table 6-4. Excess available supplies are not reported.

Chart 6-9 Projected Water Supply



6.10 Special Conditions

☑ ***CWC § 10635(b)***

(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.

6.10.1 Climate Change Effects

Information regarding the impacts of climate change to the SFPUC RWS supply was provided by BAWSCA in coordination with SFPUC and is provided verbatim below:

> The issue of climate change has become an important factor in water resources planning in California, and is frequently considered in urban water management planning processes, though the extent and precise effects of climate change remain uncertain. There is convincing evidence that increasing concentrations of greenhouse gasses have caused and will continue to cause a rise in temperatures around the world, which will result in a wide range of changes in climate patterns. Moreover, observational data show that a warming trend occurred during the latter part of the 20th century and virtually all projections indicate this will continue through the 21st century. These changes will have a direct effect on water resources in California, and numerous studies have been conducted to determine the potential impacts to water resources. Based on these studies, climate change could result in the following types of water resource impacts, including impacts on the watersheds in the Bay Area:
>
> - Reductions in the average annual snowpack due to a rise in the snowline and a shallower snowpack in the low and medium elevation zones, such as in the Tuolumne River basin, and a shift in snowmelt runoff to earlier in the year;
> - Changes in the timing, annual average, intensity and variability of precipitation, and an increased amount of precipitation falling as rain rather than snow;
> - Long-term changes in watershed vegetation and increased incidence of wildfires that could affect water quality and quantity;
> - Sea level rise and an increase in saltwater intrusion;
> - Increased water temperatures with accompanying potential adverse effects on some fisheries and water quality;
> - Increases in evaporation and concomitant increased irrigation need; and
> - Changes in urban and agricultural water demand.
>
> Both the SFPUC and BAWSCA participated in the 2020 update of the Bay Area Integrated Regional Water Management Plan (BAIRWMP), which includes an assessment of the potential climate change vulnerabilities of the region's water resources and identifies climate change adaptation strategies. In addition, the SFPUC continues to study the effect of climate change on the RWS. These works are summarized below.

6.10.1.1 *Bay Area Integrated Regional Water Management Plan*

Climate change adaptation continues to be an overarching theme for the 2019 BAIRWMP update. As stated in the BAIRWMP, identification of watershed characteristics that could potentially be vulnerable to future climate change is the first step in assessing vulnerabilities of water resources in the Bay Area Region (Region). Vulnerability is defined as the degree to which a system is exposed to, susceptible to, and able to cope with or adjust to, the adverse effects of climate change. A vulnerability assessment was conducted in accordance with the DWR's Climate Change Handbook for Regional Water Planning and using the most current science available for the Region. The vulnerability assessment, summarized in the table below, provides the main water planning categories applicable to the Region and a general overview of the qualitative assessment of each category with respect to anticipated climate change impacts.

Summary of BAIRWMP Climate Change Vulnerability Assessment

Vulnerability Areas	General Overview of Vulnerabilities
Water Demand	**Urban and Agricultural Water Demand** – Changes to hydrology in the Region as a result of climate change could lead to changes in total water demand and use patterns. Increased irrigation (outdoor landscape or agricultural) is anticipated to occur with temperature rise, increased evaporative losses due to warmer temperature, and a longer growing season. Water treatment and distribution systems are most vulnerable to increases in maximum day demand.
Water Supply	**Imported Water** – Imported water derived from the Sierra Nevada sources and Delta diversions provide 66 percent of the water resources available to the Region. Potential impacts on the availability of these sources resulting from climate change directly affect the amount of imported water supply delivered to the Region. **Regional Surface Water** – Although future projections suggest that small changes in total annual precipitation over the Region will not change much, there may be changes to when precipitation occurs with reductions in the spring and more intense rainfall in the winter. **Regional Groundwater** – Changes in local hydrology could affect natural recharge to the local groundwater aquifers and the quantity of groundwater that could be pumped sustainably over the long-term in some areas. Decreased inflow from more flashy or more intense runoff, increased evaporative losses and warmer and shorter winter seasons can alter natural recharge of groundwater. Salinity intrusion into coastal groundwater aquifers due to sea-level rise could interfere

Vulnerability Areas	General Overview of Vulnerabilities
	with local groundwater uses. Furthermore, additional reductions in imported water supplies would lead to less imported water available for managed recharge of local groundwater basins and potentially more groundwater pumping in lieu of imported water availability.
Water Quality	**Imported Water** – For sources derived from the Delta, sea-level rise could result in increases in chloride and bromide (a disinfection by-product (DBP) precursor that is also a component of sea water), potentially requiring changes in treatment for drinking water. Increased temperature could result in an increase in algal blooms, taste and odor events, and a general increase in DBP formation **Regional Surface Water** – Increased temperature could result in lower dissolved oxygen in streams and prolong thermocline stratification in lakes and reservoirs forming anoxic bottom conditions and algal blooms. Decrease in annual precipitation could result in higher concentrations of contaminants in streams during droughts or in association with flushing rain events. Increased wildfire risk and flashier or more intense storms could increase turbidity loads for water treatment. **Regional Groundwater** – Sea-level rise could result in increases in chlorides and bromide for some coastal groundwater basins in the Region. Water quality changes in imported water used for recharge could also impact groundwater quality.
Sea-Level Rise	Sea-level rise is additive to tidal range, storm surges, stream flows, and wind waves, which together will increase the potential for higher total water levels, overtopping, and erosion. Much of the bay shoreline is comprised of low-lying diked baylands which are already vulnerable to flooding. In addition to rising mean sea level, continued subsidence due to tectonic activity will increase the rate of relative sea-level rise. As sea-level rise increases, both the frequency and consequences of coastal storm events, and the cost of damage to the built and natural environment, will increase. Existing coastal armoring (including levees, breakwaters, and other structures) is likely to be insufficient to protect against projected sea-level rise. Crest elevations of structures will have to be raised or structures relocated to reduce hazards from higher total water levels and larger waves.

Vulnerability Areas	General Overview of Vulnerabilities
Flooding	Climate change projections are not sensitive enough to assess localized flooding, but the general expectation is that more intense storms would occur thereby leading to more frequent, longer and deeper flooding. Changes to precipitation regimes may increase flooding. Elevated Bay elevations due to sea-level rise will increase backwater effects exacerbating the effect of fluvial floods and storm drain backwater flooding.
Ecosystem and Habitat	Changes in the seasonal patterns of temperature, precipitation, and fire due to climate change can dramatically alter ecosystems that provide habitats for California's native species. These impacts can result in species loss, increased invasive species ranges, loss of ecosystem functions, and changes in vegetation growing ranges. Reduced rain and changes in the seasonal distribution of rainfall may alter timing of low flows in streams and rivers, which in turn would have consequences for aquatic ecosystems. Changes in rainfall patterns and air temperature may affect water temperatures, potentially affecting coldwater aquatic species. Bay Area ecosystems and habitat provide important ecosystem services, such as: carbon storage, enhanced water supply and quality, flood protection, food and fiber production. Climate change is expected to substantially change several of these services. The region provides substantial aquatic and habitat-related recreational opportunities, including: fishing, wildlife viewing, and wine industry tourism (a significant asset to the region) that may be at risk due to climate change effects.
Hydropower	Currently, several agencies in the Region produce or rely on hydropower produced outside of the Region for a portion of their power needs. As the hydropower is produced in the Sierra, there may be changes in the future in the timing and amount of energy produced due to changes in the timing and amount of runoff as a result of climate change. Some hydropower is also produced within the region and could also be affected by changes in the timing and amount of runoff.

Source: 2019 Bay Area Integrated Regional Water Management Plan (BAIRWMP), Table 16-3.

6.10.1.2 *SFPUC Climate Change Studies*

The SFPUC views assessment of the effects of climate change as an ongoing project requiring regular updating to reflect improvements in climate science, atmospheric/ocean modeling, and human response to the threat of greenhouse gas emissions. Climate change research by the SFPUC began in 2009 and continues to be refined. In its 2012 report "Sensitivity of Upper Tuolumne River Flow to Climate Change Scenarios," the SFPUC assessed the sensitivity of runoff into Hetch Hetchy Reservoir to a range of changes in temperature and precipitation due to climate change. Key conclusions from the report include the following:

- With differing increases in temperature alone, the median annual runoff at Hetch Hetchy would decrease by 0.7-2.1 percent from present-day conditions by 2040 and by 2.6-10.2 percent from present-day by 2100. Adding differing decreases in precipitation on top of temperature increases, the median annual runoff at Hetch Hetchy would decrease by 7.6-8.6 percent from present-day conditions by 2040 and by 24.7-29.4 percent from present-day conditions by 2100.
- In critically dry years, these reductions in annual runoff at Hetch Hetchy would be significantly greater, with runoff decreasing up to 46.5 percent from present day conditions by 2100 utilizing the same climate change scenarios.
- In addition to the total change in runoff, there will be a shift in the annual distribution of runoff. Winter and early spring runoff would increase and late spring and summer runoff would decrease.
- Under all scenarios, snow accumulation would be reduced and snow would melt earlier in the spring, with significant reductions in maximum peak snow water equivalent under most scenarios.

Currently, the SFPUC is conducting a comprehensive assessment of the potential effects of climate change on water supply using a wide range of plausible increases in temperature and changes in precipitation to address the wide uncertainty in climate projections over the planning horizon 2020 to 2070. There are many uncertain factors such as climate change, changing regulations, water quality, growth and economic cycles that may create vulnerabilities for the Regional Water System's ability to meet levels of service. The uncertainties associated with the degree to which these factors will occur and how much risk they present to the water system is difficult to predict, but nonetheless they need to be considered in SFPUC planning. To address this planning challenge, the project uses a vulnerability-based planning approach to explore a range of future conditions to identify vulnerabilities, assess the risks associated with these vulnerabilities that could lead to developing an adaptation plan that is flexible and robust to a wide range of future outcomes.

6.10.2 Regulatory Conditions and Project Development

Emerging regulatory conditions (e.g., issues surrounding the amendments to the Water Quality Control Plan for the San Francisco/Sacramento-San Joaquin Delta Estuary [Bay-Delta Plan Amendment]) may affect planned future projects and the characterization of future water supply availability and analysis. A detailed description of the potential impacts of Bay-Delta Plan Amendment implementation on RWS supply reliability is included in Section 7.1.1.1. MPMW currently does not have any plans to develop new

supply sources. If MPMW does move forward with any plans to develop supply projects, emerging regulatory conditions will be considered, and the associated water supply reliability impacts will be assessed in future UWMP updates.

6.10.3 Other Locally Applicable Criteria

Other locally applicable criteria may affect characterization and availability of an identified water supply (e.g., changes in regional water transfer rules may alter the availability of a water supply that had historically been readily available). Reliability of the RWS supply is further discussed in Section 7.1.1.1. MPMW does not have any current plans to develop new supply sources. If MPMW does move forward with any plans to develop supply projects, locally applicable criteria will be considered, and the associated water supply reliability impacts will be assessed in future UWMP updates.

6.11 Energy Intensity

☑ ***CWC § 10631.2***

(a) In addition to the requirements of Section 10631, an urban water management plan shall include any of the following information that the urban water supplier can readily obtain:
(1) An estimate of the amount of energy used to extract or divert water supplies.
(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.
(3) An estimate of the amount of energy used to treat water supplies.
(4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.
(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.
(6) An estimate of the amount of energy used to place water into or withdraw from storage.
(7) Any other energy-related information the urban water supplier deems appropriate.
(b) The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.
(c) The Legislature finds and declares that energy use is only one factor in water supply planning and shall not be considered independently of other factors.

MPMW used the "Total Utility Approach" defined by DWR in the UWMP Guidebook 2020 to report water-related energy consumption. Calendar year 2019 is selected as the one-year reporting period, and utility bills for the whole year are used as the source for energy consumption data. It is estimated that a total of approximately 359,907 kilowatt hours (kWh) of energy was consumed for operation of water facilities in MPMW's water system in 2019. As the total volume of water entering the system was 1,031 MG, the energy intensity was calculated to be 349 kWh/MG (Table 6-10).

Table 6-10 Recommended Energy Intensity - Total Utility Approach (DWR Table O-1B)

Urban Water Supplier: *MPMW*

Water Delivery Product
Retail Potable Deliveries

Enter Start Date for Reporting Period	1/1/2019	Urban Water Supplier Operational Control		
End Date	12/31/2019			
Is upstream embedded in the values reported?	N	Sum of All Water Management Processes	Non-Consequential Hydropower	
Water Volume Units Used	MG	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process (MG)		*1,031*	*0*	*1,031*
Energy Consumed (kWh)		*359,907*	*0*	*359,907*
Energy Intensity (kWh/MG)		*349.2*	*0.0*	*349.2*

Quantity of Self-Generated Renewable Energy
0 kWh

Data Quality
Metered Data

Data Quality Narrative:
Volume of water data is from the SFPUC AMI meters. Energy usage is for water facilities and is from the City's energy bills.

Narrative:
MPMW utilizes the pump station to convey water from the Upper Zone turnout to supplement demands and to fill the storage tanks.

7 WATER SERVICE RELIABILITY AND DROUGHT RISK ASSESSMENT

☑ ***CWC § 10620 (f)***

An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

☑ ***CWC § 10630.5***

Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.

This chapter assesses the reliability of Menlo Park Municipal Water's (MPMW's) water supplies, with a specific focus on potential constraints, including purchased water supply availability, water quality, and climate change. The intent of this chapter is to identify any potential constraints that could affect the reliability of MPMW's supply during normal, single dry-year, and multiple dry-year hydrologic conditions.

As described in Section 6, all of MPMW's potable water supply is purchased from the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS) and a portion of the irrigation use is served by recycled water. The reliability of the SFPUC RWS is anticipated to vary greatly in different year types. MPMW has relied on SFPUC's RWS supply reliability estimates and the drought allocation structure provided by SFPUC and the Bay Area Water Supply and Conservation Agency (BAWSCA) to estimate available RWS supplies in all year types through 2040. In addition to the long-term water service reliability assessment, this chapter also presents a Drought Risk Assessment (DRA) to evaluate MPMW's supply risks under a severe drought period lasting for the next five consecutive years (i.e., through 2025).

7.1 Water Service Reliability Assessment

The following sections describe MPMW's water service reliability assessment, which presents MPMW's expected water service reliability for a normal year, single dry year, and five consecutive dry years projections in five-year increments between 2025 and 2040.

7.1.1 Service Reliability – Constraints on Water Sources

Several potential constraints have been identified on future supply availability, water quality, and climate change. These constraints are summarized in the following sections.

7.1.1.1 Regional Water System Supply Constraints

☑ ***CWC § 10631 (h)*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).

Detailed information is provided below regarding factors that impact the SFPUC RWS supply reliability. The source for this information is the common language provided by the SFPUC and BAWSCA (see Appendix G).

Level of Service Goals

The SFPUC historically has met demand in its service area in all year types from its watersheds, which consist of:

- Tuolumne River watershed
- Alameda Creek watershed
- San Mateo County watersheds

In general, 85 percent of the supply comes from the Tuolumne River through Hetch Hetchy Reservoir and the remaining 15 percent comes from the local watersheds through the San Antonio, Calaveras, Crystal Springs, Pilarcitos and San Andreas Reservoirs. The adopted Water Supply Improvement Program (WSIP) retains this mix of water supply for all year types.

In 2008, the SFPUC adopted Level of Service (LOS) Goals and Objectives in conjunction with the adoption of WSIP. The SFPUC updated the LOS Goals and Objectives in February 2020. The SFPUC's LOS Goals and Objectives related to water supply are:

Program Goal	System Performance Objective
Water Supply – *meet customer water needs in non-drought and drought periods*	• Meet all state and federal regulations to support the proper operation of the water system and related power facilities. • Meet average annual water demand of 265 mgd from the SFPUC watersheds for retail and Wholesale Customers during non–drought years for system demands consistent with the 2009 Water Supply Agreement. • Meet dry-year delivery needs while limiting rationing to a maximum 20 percent system-wide reduction in water service during extended droughts. • Diversify water supply options during non-drought and drought periods. • Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers.

Bay-Delta Plan Amendment Impacts

Based on information provided by SFPUC and BAWSCA (Appendix G and Appendix I) the adoption of the 2018 Bay-Delta Plan Amendment is anticipated to impact the reliability of the RWS supplies in the future.

In December 2018, the State Water Resources Control Board (SWRCB) adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) to establish water quality objectives to maintain the health of the Bay-Delta ecosystem. The SWRCB is required by law to regularly review this plan. The adopted Bay-Delta Plan Amendment was developed with the stated goal of increasing salmon populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay-Delta. The Bay-Delta Plan Amendment requires the release of 30-50% of the "unimpaired flow"[16] on the three tributaries from February through June in every year type. In SFPUC modeling of the new flow standard, it is assumed that the required release is 40% of unimpaired flow.

If the Bay-Delta Plan Amendment is implemented, the SFPUC will be able to meet the projected water demands presented in this Urban Water Management Plan (UWMP) in normal years but would experience supply shortages in single dry years or multiple

[16] "Unimpaired flow represents the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds." (Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Dec. 12, 2018) p.17, fn. 14, available at https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf.)

dry years. Implementation of the Bay-Delta Plan Amendment will require rationing in all single dry years and multiple dry years. The SFPUC has initiated an Alternative Water Supply Planning Program (AWSP) to ensure that San Francisco can meet its Retail and Wholesale Customer water needs, address projected dry years shortages, and limit rationing to a maximum 20 percent system-wide in accordance with adopted SFPUC policies. This program is in early planning stages and is intended to meet future water supply challenges and vulnerabilities such as environmental flow needs and other regulatory changes; earthquakes, disasters, and emergencies; increases in population and employment; and climate change. As the region faces future challenges – both known and unknown – the SFPUC is considering this suite of diverse non-traditional supplies and leveraging regional partnerships to meet Retail and Wholesale Customer needs through 2045.

The SWRCB has stated that it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, assuming all required approvals are obtained by that time. But implementation of the Plan Amendment is uncertain for multiple reasons.

First, since adoption of the Bay-Delta Plan Amendment, over a dozen lawsuits have been filed in both state and federal courts, challenging the SWRCB's adoption of the Bay-Delta Plan Amendment, including a legal challenge filed by the federal government, at the request of the U.S. Department of Interior, Bureau of Reclamation. This litigation is in the early stages and there have been no dispositive court rulings as of this date.

Second, the Bay-Delta Plan Amendment is not self-implementing and does not automatically allocate responsibility for meeting its new flow requirements to the SFPUC or any other water rights holders. Rather, the Bay-Delta Plan Amendment merely provides a regulatory framework for flow allocation, which must be accomplished by other regulatory and/or adjudicatory proceedings, such as a comprehensive water rights adjudication or, in the case of the Tuolumne River, may be implemented through the water quality certification process set forth in section 401 of the Clean Water Act as part of the Federal Energy Regulatory Commission's licensing proceedings for the Don Pedro and La Grange hydroelectric projects. It is currently unclear when the license amendment process is expected to be completed. This process and the other regulatory and/or adjudicatory proceedings would likely face legal challenges and have lengthy timelines, and quite possibly could result in a different assignment of flow responsibility (and therefore a different water supply impact on the SFPUC).

Third, in recognition of the obstacles to implementation of the Bay-Delta Plan Amendment, the SWRCB Resolution No. 2018-0059 adopting the Bay-Delta Plan Amendment directed staff to help complete a "Delta watershed-wide agreement, including potential flow measures for the Tuolumne River" by March 1, 2019, and to incorporate such agreements as an "alternative" for a future amendment to the Bay-Delta Plan to be presented to the SWRCB "as early as possible after December 1, 2019." In accordance with the SWRCB's instruction, on March 1, 2019, SFPUC, in partnership with other key stakeholders, submitted a proposed project description for the Tuolumne River that could be the basis for a voluntary substitute agreement with the SWRCB ("March 1st Proposed Voluntary Agreement"). On March 26, 2019, the Commission adopted Resolution No. 19-0057 to support the SFPUC's participation in the Voluntary Agreement negotiation process. To date, those negotiations are ongoing

under the California Natural Resources Agency and the leadership of the Newsom administration.[17]

Drought Allocation Methodology

Given the constraints described above, the SFPUC has provided all of the Wholesale Customers with estimates of the RWS reliability in all year types though 2045, as shown in Appendix I. The Tier One Plan describes the method for allocating RWS water between Retail and Wholesale Customers during system-wide shortages of 20% or less. The Tier Two Plan allocates the collective Wholesale Customer share from the Tier One Plan among each of SFPUC's 26 Wholesale Customers.

For the purposes of 2020 UWMP development only, SFPUC and BAWSCA have provided revised methodologies to allocate RWS supplies during projected future single dry and multiple dry years in instances where the projects supply shortfalls are greater than 20%. SFPUC and BAWSCA assumed that Tier One allocations for system-wide shortfalls of 16% to 20% would apply for all shortfalls greater than 20%. BAWSCA provided a revised methodology to allocate RWS supplies to Wholesale Agencies. The inclusion of these revised methodologies, which serve as the preliminary basis for UWMP supply reliability analyses, does not in any way imply an agreement by BAWSCA member agencies as to the exact allocation methodologies.

The Tier One and Tier Two Plans and the drought allocation methodologies used in the 2020 UWMP for shortfalls of greater than 20% are further described below.

Tier One Drought Allocations

In July 2009, San Francisco and its Wholesale Customers in Alameda County, Santa Clara County, and San Mateo County (Wholesale Customers) adopted the Water Supply Agreement (WSA), which includes a Water Shortage Allocation Plan (WSAP) that describes the method for allocating water from the RWS between Retail and Wholesale Customers during system-wide shortages of 20 percent or less. The WSAP, also known as the Tier One Plan, was amended in the 2018 Amended and Restated WSA.

The SFPUC allocates water under the Tier One Plan when it determines that the projected available water supply is up to 20 percent less than projected system-wide water purchases. The following table shows the SFPUC (i.e, Retail Customers) share and the Wholesale Customers' share of the annual water supply available during shortages depending on the level of system-wide reduction in water use that is required. The Wholesale Customers' share will be apportioned among the individual Wholesale Customers based on a separate methodology adopted by the Wholesale Customers, known as the Tier Two Plan, discussed further below.

[17] California Natural Resources Agency, "Voluntary Agreements to Improve Habitat and Flow in the Delta and its Watersheds," available at https://files.resources.ca.gov/voluntary-agreements/.

Level of System-Wide Reduction in Water Use Required	Share of Available Water	
	SFPUC Share	Wholesale Customers Share
5% or less	35.5%	64.5%
6% through 10%	36.0%	64.0%
11% through 15%	37.0%	63.0%
16% through 20%	37.5%	62.5%

> The Tier One Plan allows for voluntary transfers of shortage allocations between the SFPUC and any Wholesale Customer as well as between Wholesale Customers themselves. In addition, water "banked" by a Wholesale Customer, through reductions in usage greater than required, may also be transferred.
>
> As amended in 2018, the Tier One Plan requires Retail Customers to conserve a minimum of 5 percent during droughts. If Retail Customer demands are lower than the Retail Customer allocation (resulting in a "positive allocation" to Retail[18]) then the excess percentage would be re-allocated to the Wholesale Customers' share. The additional water conserved by Retail Customers up to the minimum 5 percent level is deemed to remain in storage for allocation in future successive dry years.
>
> The Tier One Plan will expire at the end of the term of the WSA in 2034, unless mutually extended by San Francisco and the Wholesale Customers.
>
> The Tier One Plan applies only when the SFPUC determines that a system-wide water shortage exists and issues a declaration of a water shortage emergency under California Water Code Section 350. Separate from a declaration of a water shortage emergency, the SFPUC may opt to request voluntary cutbacks from its Retail and Wholesale Customers to achieve necessary water use reductions during drought periods.

As discussed above, the Tier One Plan only applies to system-wide shortages of 20% or less, and there is currently no methodology for sharing available water between SFPUC and Wholesale Customers for system-wide shortages of greater than 20%. SFPUC and BAWSCA assumed that Tier One allocations for System-Wide shortfalls of 16% to 20% would apply for all shortfalls greater than 20% for purposes of the UWMP supply reliability analyses. The analysis included herein does not in any way imply an agreement by BAWSCA member agencies with the assumed application of the Tier One allocations by SFPUC and BAWSCA for shortages of greater than 20%.

Tier Two Drought Allocations

> The Wholesale Customers have negotiated and adopted the Tier Two Plan, referenced above, which allocates the collective Wholesale Customer share from the Tier One Plan

[18] See Water Supply Agreement, Water Shortage Allocation Plan (Attachment H), Section 2.1.

among each of the 26 Wholesale Customers. These Tier Two allocations are based on a formula that takes into account multiple factors for each Wholesale Customer including:

- Individual Supply Guarantee;
- Seasonal use of all available water supplies; and
- Residential per capita use.

The water made available to the Wholesale Customers collectively will be allocated among them in proportion to each Wholesale Customer's Allocation Basis, expressed in millions of gallons per day (MGD), which in turn is the weighted average of two components. The first component is the Wholesale Customer's Individual Supply Guarantee, as stated in the WSA, and is fixed. The second component, the Base/Seasonal Component, is variable and is calculated using the monthly water use for three consecutive years prior to the onset of the drought for each of the Wholesale Customers for all available water supplies. The second component is accorded twice the weight of the first, fixed component in calculating the Allocation Basis. Minor adjustments to the Allocation Basis are then made to ensure a minimum cutback level, a maximum cutback level, and a sufficient supply for certain Wholesale Customers.

The Allocation Basis is used in a fraction, as numerator, over the sum of all Wholesale Customers' Allocation Bases to determine each wholesale customer's Allocation Factor. The final shortage allocation for each Wholesale Customer is determined by multiplying the amount of water available to the Wholesale Customers' collectively under the Tier One Plan, by the Wholesale Customer's Allocation Factor.

The Tier Two Plan requires that the Allocation Factors be calculated by BAWSCA each year in preparation for a potential water shortage emergency. As the Wholesale Customers change their water use characteristics (e.g., increases or decreases in SFPUC purchases and use of other water sources, changes in monthly water use patterns, or changes in residential per capita water use), the Allocation Factor for each Wholesale Customer will also change. However, for long-term planning purposes, each Wholesale Customer shall use as its Allocation Factor, the value identified in the Tier Two Plan when adopted.

Per WSA Section 3.11, the Tier One and Tier Two Plans will be used to allocate water from the Regional Water System between Retail and Wholesale Customers during system-wide shortages of 20% or less. For Regional Water System shortages in excess of 20%, San Francisco shall (a) follow the Tier 1 Shortage Plan allocations up to the 20% reduction, (b) meet and discuss how to implement incremental reductions above 20% with the Wholesale Customers, and (c) make a final determination of allocations above the 20% reduction. After the SFPUC has made the final allocation decision, the Wholesale Customers shall be free to challenge the allocation on any applicable legal or equitable basis. For purposes of the 2020 UWMPs, for San Francisco Regional Water System (RWS) shortages in excess of 20%, the allocations among the Wholesale Customers is assumed to be equivalent among them and to equal the drought cutback to Wholesale Customer by the SFPUC.

The Tier Two Plan, which initially expired in 2018, has been extended by the BAWSCA Board of Directors every year since for one additional calendar year. In November 2020, the BAWSCA Board voted to extend the Tier Two Plan through the end of 2021.

Revised Drought Allocation Plan

As detailed by BAWSCA in multiple memos and workshops (Appendix I), the Tier Two Plan was not designed for RWS shortages greater than 20%.[19] In a memorandum dated 1 March 2021, BAWSCA provided a refined methodology to allocate RWS supplies during projected future single dry and multiple dry years in the instance where the supply shortfalls are greater than 20%. The revised methodology developed by BAWSCA allocates the wholesale RWS supplies as follows:

1. When the average Wholesale Customers' RWS shortages are 10 percent or less, an equal percent reduction will be applied across all agencies. This is consistent with the existing Tier Two requirement of a minimum 10 percent cutback in any Tier Two application scenario.
2. When average Wholesale Customers' shortages are between 10 and 20 percent, the Tier Two Plan will be applied.
3. When the average Wholesale Customers' RWS shortages are greater than 20 percent, an equal percent reduction will be applied across all agencies.

The associated allocations based on the updated BAWSCA methodology are included as Appendix I. While this allocation methodology has been used herein, MPMW notes per BAWSCA's memoranda dated 18 February 2021 (Appendix I)

> "BAWSCA recognizes that this is not an ideal situation or method for allocation of available drought supplies. In the event of actual RWS shortages greater than 20 percent, the Member Agencies would have the opportunity to negotiate and agree upon a more nuanced and equitable approach. Such an approach would likely consider basic health and safety needs, the water needs to support critical institutions such as hospitals, and minimizing economic impacts on individual communities and the region."

As such, this allocation method is only intended to serve as the preliminary basis for the 2020 UWMP supply reliability analysis. The analysis provided herein does not in any way imply an agreement by BAWSCA member agencies as to the exact allocation methodology. BAWSCA member agencies are in discussions about jointly developing an allocation method that would consider additional equity factors in the event that SFPUC is not able to deliver its contractual supply volume, and its cutbacks to the RWS supply exceed 20%.

7.1.1.2 Recycled Water Supply Constraints

Recycled water currently supplies 2% of MPMW's total demand and is anticipated to supply 8% of MPMW's total demand by 2040 (see Chapters 4 and 6). Recycled water is assumed to be a reliable and stable water supply source and is estimated to be available during all hydrologic years at a volume that meets MPMW's projected recycled water demands.

[19] Note that the Tier One Drought Allocations were also not designed for shortages greater than 20%. SFPUC and BAWSCA have assumed for UWMP planning purposes that the Wholesale Share will remain 62.5% for all shortfalls greater than 16%.

7.1.1.3 Water Quality

☑ ***CWC § 10634***

The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Impaired water quality also has the potential to affect water supply reliability. As discussed in Section 6, the majority of the water supply to the SFPUC RWS is from the Hetch Hetchy Reservoir in the Sierra Nevada Mountains. The Hetch Hetchy Reservoir is considered a very high-quality water source due to low total dissolved solid (TDS) concentrations and other factors. Additional water supplies from the Alameda and Peninsula sources come from areas with restricted access to protect the source water quality.

The SFPUC's Water Quality Division (WQD) regularly collects and tests water samples from reservoirs and designated sampling points throughout the RWS to ensure that the SFPUC's water meets or exceeds federal and state drinking water standards. In 2019, the WQD conducted more than 53,650 drinking water tests in the sources and transmission systems. This is in addition to the extensive treatment process control monitoring performed by the SFPUC's certified operators and online instruments. The SFPUC also has online instruments providing continuous water quality monitoring at numerous locations.

Additionally, MPMW routinely collects water quality samples and monitors water quality within its own distribution system. The results of the testing are summarized annually in Water Quality Reports (also known as "Consumer Confidence Reports"), which are available on the City's website: https://www.menlopark.org/waterquality. As can be seen therein, all of the analyzed constituents were detected at concentrations below the Maximum Contaminant Level (MCL) in 2019.

The results of MPMW's and SFPUC's water quality assessments show that SFPUC RWS watersheds have very low levels of contaminants, and that those contaminants that are found at low levels are associated with wildlife and, to a limited extent, human recreation. For the purposes of this UWMP, it is anticipated that this high-quality potable water source will continue to be available to MPMW through the planning horizon ending in the year 2040. Water quality is not expected to impact the reliability of MPMW's supplies.

7.1.1.4 Climate Change

☑ ***CWC § 10631 (b) (1)***

…For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.

Section 6.10.1 provides a summary of the assessments of the applicable climate change on supplies that SFPUC has previously performed and those planned for the near term. The anticipated effects of climate change have been directly factored into MPMW's assessment of its supply reliability. MPMW is actively working with SFPUC and BAWSCA to further quantify and consider future climate change impacts as part of its ongoing supply and operations planning.

7.1.2 Service Reliability - Year Type Characterization

☑ ***CWC § 10631 (b)***

Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following:

☑ ***CWC § 10631 (b)(1)***

A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.

☑ ***CWC § 10635 (a)***

Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

Per the UWMP Guidebook 2020, the water service reliability assessment includes three unique year types:

- A normal hydrologic year represents the water supplies available under normal conditions, this could be an averaged range of years or a single representative year,
- A single dry year represents the lowest available water supply, and
- A five-consecutive year drought represents the driest five-year period in the historical record.

The available SFPUC RWS supplies by year type is provided by BAWSCA and SFPUC in Appendix G and Appendix I and are presented in Table 7-1 and Table 7-3. Data and methods used to develop these dry year supply availabilities are consistent with the UWMP Guidebook 2020 methodology and are described in the sections below.

Table 7-1 Basis of SFPUC RWS Water Year Data (Reliability Assessment) (DWR Table 7-1)

Year Type	Base Year	Available Supplies if Year Type Repeats	
		X	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location: Table 7-3
			Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available	% of Average Supply
Average Year			100%
Single-Dry Year			
Consecutive Dry Years 1st Year			
Consecutive Dry Years 2nd Year			
Consecutive Dry Years 3rd Year			
Consecutive Dry Years 4th Year			
Consecutive Dry Years 5th Year			
NOTES:			

In addition, a portion of MPMW's irrigation use is served by recycled water. As discussed in Section 7.1.1.2, MPMW anticipates that 100% of its recycled water supply will be available during all year types (Table 7-2).

Table 7-2 Basis of Recycled Water Year Data (Reliability Assessment) (DWR Table 7-1)

Year Type	Base Year	Available Supplies if Year Type Repeats		
		---	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____	
		X	Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available		% of Average Supply
Average Year				100%
Single-Dry Year				100%
Consecutive Dry Years 1st Year				100%
Consecutive Dry Years 2nd Year				100%
Consecutive Dry Years 3rd Year				100%
Consecutive Dry Years 4th Year				100%
Consecutive Dry Years 5th Year				100%
NOTES:				

7.1.2.1 SFPUC Supply Modeled RWS Dry Year Supply Availability

As described in SFPUC's 2020 UWMP, SFPUC used the Hetch Hetchy and Local Simulation Model (HHLSM) to estimate SFPUC RWS supply availability for water service reliability assessment and the DRA (Section 7.2). HHLSM simulates supplies over a historical record of hydrology from 1920 through 2017 with a representation of current and planned SFPUC RWS infrastructure and operations.

Water supply shortfalls presented by SFPUC in Appendix I were estimated using SFPUC's design drought methodology. The SFPUC uses a hypothetical 8.5-year design drought that is more severe than what the RWS has historically experienced as the basis for planning and modeling of future scenarios. The design drought consists of the 1987-92 drought, followed by an additional 2.5 years of dry conditions from the hydrologic record that include the 1976-77 drought. The five-consecutive-year dry sequence used for the UWMP represents years 2 through 6 of the design drought. However, the modeling approach assumes water supply rationing each year that is designed to provide sufficient carry-over water in SFPUC reservoirs to continue delivering water, although at reduced levels, during each year of the five-consecutive year drought and the remaining years of the design drought (SFPUC, 2021).

SFPUC provided results for two modeled scenarios, which show significantly different supply reliability projections for the RWS:

1. With full implementation of the Bay-Delta Plan Amendment in 2023
2. Without implementation of the Bay-Delta Plan Amendment

The SFPUC decided to present the water reliability analysis with full implementation of the Bay-Delta Plan Amendment in the SFPUC 2020 UWMP Submittal Tables and provided the following rationale for that decision:

> The adoption of the Bay-Delta Plan Amendment may significantly impact the supply available from the RWS. SFPUC recognizes that the Bay-Delta Plan Amendment has been adopted and that, given that it is now state law, we must plan for a future in which it is fully implemented. SFPUC also acknowledges that the plan is not self-implementing and therefore does not automatically go into effect. SFPUC is currently pursuing a voluntary agreement as well as a lawsuit which would limit implementation of the Plan. With both of these processes occurring on an unknown timeline, SFPUC does not know at this time when the Bay-Delta Plan Amendment is likely to go into effect. As a result, it makes sense to conduct future supply modeling for a scenario that doesn't include implementation of the Bay-Delta Plan Amendment, as that represents a potential supply reliability scenario.
>
> Because of the uncertainty surrounding implementation of the Bay-Delta Plan Amendment, the SFPUC conducted water service reliability assessment that includes: (1) a scenario in which the Bay-Delta Plan Amendment is fully implemented in 2023, and (2) a scenario that considers the SFPUC system's current situation without the Bay-Delta Plan Amendment. The two scenarios provide a bookend for the possible future scenarios regarding RWS supplies. The standardized tables associated with the SFPUC's UWMP contain the future scenario that assumes implementation of the Bay-Delta Plan Amendment starting in 2023.
>
> Although the SWRCB has stated it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, given the current level of uncertainty, it is assumed for the purposes of the SFPUC's draft UWMP that the Bay-Delta Plan Amendment will be fully implemented starting in 2023.

As shown in Appendix I, SFPUC also provided results for each of the modeling scenarios described above assuming demands on the RWS equal to both: (1) the total of projected retail demands and projected Wholesale Customer purchases and (2) a constant water demand of 265 million gallons per day (MGD) from the SFPUC watersheds for retail and Wholesale Customers, consistent with SFPUC's contractual obligation. According to the SFPUC, the modeling based on a demand of 265 MGD was used to "facilitate planning that supports meeting this Level of Service goal and their contractual obligations." Supply modeling results presented in the text of the SFPUC's 2020 UWMP reflect an input of projected retail and Wholesale demands on the RWS.

Consistent with SFPUC's approach and guidance from SFPUC and BAWSCA, MPMW's UWMP presents results for the water service reliability assessment and the DRA (Section 7.2) based on the modeling scenario that assumes full implementation of the Bay Delta Plan Amendment in 2023 and uses projected demands on the RWS. SFPUC modeling results for this scenario showing the total RWS supply available to Wholesale Customers during the characteristic year types can be found in Tables 3a-3g of the SFPUC letter

dated March 30, 2021. These results show total Wholesale RWS supply shortfalls ranging from 36% to 54% of projected purchases during dry years after 2023.

For comparison purposes, results for the scenario without the Bay-Delta Plan Amendment can be found in Tables 4a-4g of the same SFPUC letter. These results indicated that the SFPUC would be able to meet 100% of Wholesale projected purchases during all year types except during the fourth and fifth consecutive dry years for base year 2045 when 15% Wholesale supply shortages are projected.

7.1.2.2 MPMW's Year-Type Characterization

As discussed in Section 6.1.2, in accordance with the SFPUC's perpetual obligation to MPMW's Supply Assurance, MPMW has an Individual Supply Guarantee (ISG) of 4.456 MGD, or 1,630 million gallons (MG) per year. SFPUC is obligated to provide MPMW with up to 100% of MPMW's ISG during normal years.

Using the SFPUC modeling results presented in the SFPUC letter dated March 30, 2021, BAWSCA provided single and five-consecutive dry-year allocations for each agency based on the methodology described in Section 7.1.1.1. As discussed in therein, for the purposes for the 2020 UWMP supply reliability analysis only, Wholesale Agency drought allocations assume an equal percent reduction across all agencies when the average Wholesale Customers' RWS shortages are greater than 20%. These percent reductions for the scenario that assumes the implementation of the Bay-Delta Plan Amendment in 2023 are included in Table E of the BAWSCA updated drought allocation memorandum dated 1 April 2021 (Appendix I). BAWSCA then applied these percent reductions to each agency's projected demands to calculate the drought allocation volumes for base year 2025 through 2045, which are included in Table G2 to K2 of the same memorandum. Results for MPMW are reproduced in Table 7-3 below and are used to calculate the total supplies presented in Table 7-5 and Table 7-6.

Table 7-3 RWS Wholesale Supply Availability During Normal and Dry Years for Based Years 2025 through 2040 (Responds to DWR Table 7-1)

Year Type		2025	2030	2035	2040
Normal Year		1,630	1,630	1,630	1,630
Single Dry Year		829	858	898	942
Multiple Dry Years	First year	829	858	898	942
	Second year	712	734	767	807
	Third year	712	734	767	807
	Fourth year	712	734	767	712
	Fifth year	712	734	704	712

NOTES:
(a) Volumes are in units of MG.
(b) Normal-year water supply is presented as MPMW's ISG (4.456 MGD or approximately 1,630 MG).
(c) Dry-year water supplies are MPMW's drought allocations provided by BAWSCA based on the revised BAWSCA Drought Methodology that assumes equal percent cutbacks across all Wholesale Agencies.
(c) Results reflect scenario with Bay-Delta Plan Amendment implemented in 2023.

7.1.3 Service Reliability - Supply and Demand Assessment

☑ ***CWC § 10635 (a)***

Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

The following sections compare MPMW's projected water demands with projected water supply availability during normal years, single dry years, and multiple dry year periods.

7.1.3.1 Water Service Reliability - Normal Year

Table 7-4 shows the projected supply and demand totals for a normal year. The supply and demand totals are consistent with those in Table 6-9 and Table 4-7, respectively. MPMW is expected to have adequate water supplies during normal years to meet its projected demands through 2040.

Table 7-4 Normal Year Supply and Demand Comparison (DWR Table 7-2)

	2025	2030	2035	2040	2045*(opt)*
Supply totals *From DWR Table 6-9*	1,678	1,750	1,750	1,750	--
Demand totals *From DWR Table 4-3*	1,296	1,345	1,410	1,483	--
Difference	382	405	340	267	--
NOTES: (a) Volumes are in units of MG. (b) Supply and demand include both potable water and recycled water.					

7.1.3.2 Water Service Reliability – Single Dry Year

The reliability of the SFPUC RWS supply is anticipated to vary greatly in different year types. As described above and detailed in Appendix I, MPMW has relied on SFPUC's RWS supply reliability estimates and the drought allocation structure provided by SFPUC and BAWSCA to estimate available RWS supplies in dry year types through 2040. Recycled water supply is expected to be 100% reliable in all year types.

Table 7-5 shows the projected supply and demand totals for the single dry year.

Table 7-5 Single Dry Year Supply and Demand Comparison (DWR Table 7-3)

	2025	2030	2035	2040	2045*(opt)*
Supply totals	877	978	1,018	1,062	--
Demand totals	1,296	1,345	1,410	1,483	--
Difference	(419)	(367)	(392)	(422)	--
NOTES: (a) Volumes are in units of MG. (b) Supply and demand include both potable water and recycled water.					

7.1.3.3 Water Service Reliability – Five Consecutive Dry Years

Based on the supply reliability estimates and allocation structure provided by SFPUC and BAWSCA and the assumed 100% reliability for recycled water supply, Table 7-6 shows the projected supply and demand totals for multiple dry year periods extending five years.

Table 7-6 Multiple Dry Years Supply and Demand Comparison (DWR Table 7-4)

		2025	2030	2035	2040	2045*(opt)*
First year	Supply totals	877	978	1,018	1,062	--
	Demand totals	1,296	1,345	1,410	1,483	--
	Difference	(419)	(367)	(392)	(422)	--
Second year	Supply totals	760	854	887	927	--
	Demand totals	1,296	1,345	1,410	1,483	--
	Difference	(536)	(491)	(523)	(557)	--
Third year	Supply totals	760	854	887	927	--
	Demand totals	1,296	1,345	1,410	1,483	--
	Difference	(536)	(491)	(523)	(557)	--
Fourth year	Supply totals	760	854	887	832	--
	Demand totals	1,296	1,345	1,410	1,483	--
	Difference	(536)	(491)	(523)	(652)	--
Fifth year	Supply totals	760	854	824	832	--
	Demand totals	1,296	1,345	1,410	1,483	--
	Difference	(536)	(491)	(585)	(652)	--

NOTES:
(a) Volumes are in units of MG.
(b) Supply and demand include both potable water and recycled water.

7.1.3.4 Uncertainties in Dry Year Water Supply Projections

As shown in the above tables, significant water supply shortfalls are currently projected in future single and multiple dry years, directly because of the Bay-Delta Plan Amendment implementation. However, numerous uncertainties remain in the implementation of the Bay-Delta Plan Amendment. The water supply projections presented above likely represent a worst-case scenario in which the Bay-Delta Plan Amendment is implemented without the SFPUC and the State Water Resources Control Board (SWRCB) reaching a Voluntary Agreement and do not account for implementation of SFPUC's Alternative Water Supply Program (AWSP), described in more detail below. Under this supply scenario, SFPUC appears not to be able to meet its contractual obligations (i.e., Level of Service goals) and MPMW's forecasted demands during droughts.

As discussed in Section 7.1.2.1, SFPUC also provided water supply reliability projections without the Bay-Delta Plan Amendment (see Appendix I), which likely represents a highly optimistic water supply reliability outcome. These projections indicated that without the Bay-Delta Plan Amendment SFPUC would be able to supply 100% of projected RWS demands in all year types through 2045, except for the 4th and 5th consecutive dry year in 2045, during which 90% of projected RWS demands (85% of the Wholesale demands) would be met. The large disparity in projected water supply reliability between these two scenarios demonstrate the current level uncertainty.

In addition to these two UWMP scenarios, in a March 26, 2021 Special Commission Meeting, SFPUC staff presented HHLSM modeling results for 10 different scenarios, including scenarios with the

implementation of the Tuolumne River Voluntary Agreement (TRVA), with the implementation of the Bay-Delta Plan Amendment and the AWSP, and with the use of a modified rationing policy and a modified design drought (Appendix J). Results for the scenarios with the TRVA and with the AWSP (particularly with a modified rationing policy and design drought) showed significantly improved RWS supply availability compared to the Bay-Delta Plan Amendment scenario shown herein.

The current sources of uncertainty in the dry year water supply projections are summarized below:

- *Implementation of the Bay-Delta Plan Amendment is under negotiation.* The SFPUC is continuing negotiations with the SWRCB on implementation of the Bay-Delta Plan Amendment for water supply cutbacks, particularly during droughts. The SFPUC, in partnership with other key stakeholders, has proposed a voluntary substitute agreement to the Bay-Delta Plan Amendment, the TRVA, that provides a collaborative approach to protect the environment and plan for a reliable and high-quality future potable water supply. This is a dynamic situation and the projected drought cutback allocations may need to be revised before the next (i.e., 2025) UWMP depending on the outcome of ongoing negotiations.
- *Benefits of the AWSP are not accounted for in current supply projections.* As discussed in Section 7.1.3.5 and Appendix I, SFPUC is exploring options to increase its supplies through the AWSP. Implementation of feasible projects developed under the AWSP is not yet reflected in the supply reliability scenarios presented herein and is anticipated to reduce the projected RWS supply shortfalls (Appendix J).
- *SFPUC is considering modifications to its design drought methodology and rationing policy.* Shortening the 8.5-year design drought or modifying the rationing policy to increase rationing in the early years of a drought are anticipated to reduce projected RWS supply shortfalls (Appendix J). On 7 June 2021, MPMW sent a letter to the SFPUC requesting the inclusion of a reduced duration drought scenario, if and when SFPUC's current climate change study merits doing so, as in appendix to SFPUC 2020 UWMP (Appendix H).
- *Methodology for Tier One and Tier Two Wholesale drought allocations have not been established for wholesale shortages greater than 20%.* As discussed in Section 7.1.1.1, the current Tier One and Tier Two Plans are not designed for RWS supply shortages of greater than 20%. For UWMP planning purposes per BAWSCA guidance, the Tier One Wholesale share for a 16% to 20% supply reduction (62.5%) has been applied for reductions greater than 20% and an equal percent reduction has been applied across all Wholesale agencies. BAWSCA member agencies have not formally agreed to adopt this shortage allocation methodology and are in discussions about jointly developing an alternative allocation method that would consider additional equity factors if SFPUC is unable to deliver its contractual supply volume and cutbacks to the RWS supply exceed 20%.
- *RWS demands are subject to change.* The RWS supply availability is dependent upon the system demands. As discussed in Section 7.1.2, the supply scenarios are based on the total projected Wholesale Customer purchases provided by BAWSCA to SFPUC in January 2021. Many BASCWA agencies have refined their projected demands during the UWMP process after these estimates were provided to SFPUC. Furthermore, the RWS demand projections are subject to change in the future based upon future housing needs, increased conservation, and development of additional local supplies.

- *Frequency and duration of cutbacks are also uncertain.* While the projected shortfalls presented in the UWMP appear severe, the actual frequency and duration of such shortfalls are uncertain. Based on the HHLSM simulations provided by BAWSCA for the with Bay-Delta Plan Amendment scenario (Appendix I), rationing is anticipated to be required 20% of years for base year 2025 through 2035, 23% of all years for base year 2040, and 25% of years for base year 2045. In addition to the supply volumes, the above listed uncertainties would also impact the projected frequency and duration of shortfalls.

As such, in addition to evaluating local options to increase supply reliability, MPMW has placed high priority on working with BAWSCA and SFPUC in the upcoming years to better refine the estimates of RWS supply reliability and may amend this UWMP when new information becomes available.

The above uncertainties notwithstanding, BAWSCA's current drought allocation cutbacks will require MPMW to apply its Water Shortage Contingency Plan (WSCP) Stage 5, for water use restrictions up to 50% (see Appendix K) and will affect MPMW's short- and long-term water management decisions. As described further below (Section 7.1.3.5), MPMW is working independently and with the other BAWSCA agencies to identify regional mitigation measures to improve reliability for regional and local water supplies and meet its customers' water needs. If conditions for large drought cutbacks to the RWS persist, MPMW will need to implement additional demand management practices to invoke strict restrictions on potable water use and accelerate efforts to develop alternative supplies of water.

MPMW recommends that users of its 2020 UWMP contact MPMW staff for potential updates about its water supply reliability before using the 2020 UWMP drought cutback projections for their planning projects and referencing the drought.

7.1.3.5 Strategies and Actions to Address Dry Year Supply Shortfalls

Although there remains significant uncertainty in future supply availability, as discussed above, MPMW, SFPUC, and BAWSCA have developed strategies and actions to address the projected dry year supply shortfalls. These efforts are discussed in the following sections.

SFPUC and Other Regional Strategies and Actions

Dry Year Water Supply Projects

The WSIP authorized the SFPUC to undertake a number of water supply projects to meet dry-year demands with no greater than 20% system-wide rationing in any one year. Implementation of these projects is also expected to mitigate impacts of the implementation of the Bay-Delta Plan Amendment. Those projects include the following:

- *Calaveras Dam Replacement Project*. Calaveras Dam is located near a seismically active fault zone and was determined to be seismically vulnerable. To address this vulnerability, the SFPUC constructed a new dam of equal height downstream of the existing dam. Construction on the project occurred between 2011 and July 2019. The SFPUC began impounding water behind the new dam in accordance with California Division of Safety of Dams (DSOD) guidance in the winter of 2018/2019.
- *Alameda Creek Recapture Project*. As a part of the regulatory requirements for future operations of Calaveras Reservoir, the SFPUC must implement bypass

and instream flow schedules for Alameda Creek. The Alameda Creek Recapture Project will recapture a portion of the water system yield lost due to the instream flow releases at Calaveras Reservoir or bypassed around the Alameda Creek Diversion Dam and return this yield to the RWS through facilities in the Sunol Valley. Water that naturally infiltrates from Alameda Creek will be recaptured into an existing quarry pond known as SMP (Surface Mining Permit)-24 Pond F2. The project will be designed to allow the recaptured water to be pumped to the Sunol Valley Water Treatment Plant or to San Antonio Reservoir. Construction of this project will occur from spring 2021 to fall 2022.

- *Lower Crystal Springs Dam Improvements*. The Lower Crystal Springs Dam (LCSD) Improvements were substantially completed in November 2011. The joint San Mateo County/SFPUC Bridge Replacement Project to replace the bridge across the dam was completed in January 2019. A WSIP follow up project to modify the LCSD Stilling Basin for fish habitat and upgrade the fish water release and other valves started in April 2019. While the main improvements to the dam have been completed, environmental permitting issues for reservoir operation remain significant. While the reservoir elevation was lowered due to DSOD restrictions, the habitat for the Fountain Thistle, an endangered plant, followed the lowered reservoir elevation. Raising the reservoir elevation now requires that new plant populations be restored incrementally before the reservoir elevation is raised. The result is that it may be several years before pre-project water storage volumes can be restored.
- *Regional Groundwater Storage and Recovery Project*. The Groundwater Storage and Recovery Project (GSRP) is a strategic partnership between SFPUC and three San Mateo County agencies – Cal Water, the City of Daly City, and the City of San Bruno – to conjunctively operate the south Westside Groundwater Basin. The project sustainably manages groundwater and surface water resources in a way that provides supplies during times of drought. During years of normal or heavy rainfall, the project would provide additional surface water to the partner agencies in San Mateo County in lieu of groundwater pumping. Over time, reduced pumping creates water storage through natural recharge of up to 20 billion gallons of new water supply available during dry years.

  The project's Final Environmental Impact Report was certified in August 2014, and the project also received Commission approval that month. Phase 1 of this project consists of construction of thirteen well sites and is over 99 percent complete. Phase 2 of this project consists of completing construction of the well station at the South San Francisco Main site and some carryover work that has not been completed from Phase 1. Phase 2 design work began in December 2019.
- *2 MGD Dry-year Water Transfer*. In 2012, the dry-year transfer was proposed between the Modesto Irrigation District and the SFPUC. Negotiations were terminated because an agreement could not be reached. Subsequently, the SFPUC had discussions with the Oakdale Irrigation District for a one-year transfer agreement with the SFPUC for 2 MGD (2,240 acre-feet). No progress towards agreement on a transfer was made in 2019, but the irrigation districts recognize SFPUC's continued interest and SFPUC will continue to pursue transfers.

In order to achieve its target of meeting at least 80 percent of its customer demand during droughts with a system demand of 265 MGD, and to mitigate the impacts of the Bay-Delta Plan, the SFPUC must successfully implement the dry-year water supply projects included in the WSIP.

Furthermore, the permitting obligations for the Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements include a combined commitment of 12.8 MGD for instream flows on average. When this is reduced for an assumed Alameda Creek Recapture Project recovery of 9.3 MGD, the net loss of water supply is 3.5 MGD.

Alternative Water Supply Program

As discussed below, BAWSCA has taken steps to ensure that SFPUC develops alternative water supplies:

With the adoption of the Bay-Delta Plan Phase 1 (Bay-Delta Plan) by the State Water Resources Control Board in December of 2018, coupled with the uncertainties associated with litigation and the development of Voluntary Agreements that, if successful, would provide an alternative to the 40% unimpaired flow requirement that is required by the Bay-Delta Plan, BAWSCA redoubled its efforts to ensure that the SFPUC took necessary action to develop alternative water supplies such that they would be in place to fill any potential gap in supply by implementation of the Bay-Delta Plan and that the SFPUC would be able to meet its legal and contractual obligations to its Wholesale Customers.

In 2019, BAWSCA held numerous meetings with the SFPUC encouraging them to develop a division within their organization whose chief mission was to spearhead alternative water supply development. On June 25, 2019, BAWSCA provided a written and oral statement to the Commissioners urging the SFPUC to focus on developing new sources of supply in a manner similar to how it addressed the implementation of the Water System Improvement Program (WSIP). BAWSCA urged that a new water supply program was called for, with clear objectives, persistent focus, a dedicated team, adequate funding, and a plan for successful execution. The SFPUC Commission supported BAWSCA's recommendation and directed staff to undertake such an approach.

In early 2020, the SFPUC began implementation of the Alternative Water Supply Planning Program (AWSP), a program designed to investigate and plan for new water supplies to address future long-term water supply reliability challenges and vulnerabilities on the RWS.

Included in the AWSP is a suite of diverse, non-traditional supply projects that, to a great degree, leverage regional partnerships and are designed to meet the water supply needs of the SFPUC Retail and Wholesale Customers through 2045. As of the most recent Alternative Water Supply Planning Quarterly Update, SFPUC has budgeted $264 million over the next ten years to fund water supply projects. BAWSCA is heavily engaged with the SFPUC on its AWSP efforts.

SFPUC's AWSP is described in more detail below:

The SFPUC is increasing and accelerating its efforts to acquire additional water supplies and explore other projects that would increase overall water supply resilience through the AWSP. The drivers for the program include: (1) the adoption of the Bay-Delta Plan Amendment and the resulting potential limitations to RWS supply during dry years,

(2) the net supply shortfall following the implementation of WSIP, (3) San Francisco's perpetual obligation to supply 184 MGD to the Wholesale Customers, (4) adopted LOS Goals to limit rationing to no more than 20 percent system-wide during droughts, and (5) the potential need to identify water supplies that would be required to offer permanent status to interruptible customers. Developing additional supplies through this program would reduce water supply shortfalls and reduce rationing associated with such shortfalls. The planning priorities guiding the framework of the AWSP are as follows:

1. Offset instream flow needs and meet regulatory requirements
2. Meet existing obligations to existing permanent customers
3. Make interruptible customers permanent
4. Meet increased demands of existing and interruptible customers

In conjunction with these planning priorities, the SFPUC considers how the program fits within the LOS Goals and Objectives related to water supply and sustainability when considering new water supply opportunities. The key LOS Goals and Objectives relevant to this effort can be summarized as:

- Meet dry-year delivery needs while limiting rationing to a maximum of 20 percent system-wide reduction in water service during extended droughts;
- Diversify water supply options during non-drought and drought periods;
- Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers;
- Meet, at a minimum, all current and anticipated legal requirements for protection of fish and wildlife habitat;
- Maintain operational flexibility (although this LOS Goal was not intended explicitly for the addition of new supplies, it is applicate here).

Together, the planning priorities and LOS Goals and Objectives provide a lens through which the SFPUC considers water supply options and opportunities to meet all foreseeable water supply needs.

In addition to the Daly City Recycled Water Expansion project[20], which was a potential project identified in the SFPUC's 2015 UWMP and had committed funding at that time, the SFPUC has taken action to fund the study of potential additional water supply projects. Capital projects under consideration to develop additional water supplies include surface water storage expansion, recycled water expansion, water transfers, desalination, and potable reuse. A more detailed list and descriptions of these efforts are provided below.

The capital projects that are under consideration would be costly and are still in the early feasibility or conceptual planning stages. Because these water supply projects

[20] While this potential project was identified in the 2015 UWMP, it has since been approved by Daly City following environmental review and has a higher likelihood of being implemented.

would take 10 to 30 years to implement, and because required environmental permitting negotiations may reduce the amount of water that can be developed, the yield from these projects are not currently incorporated into SFPUC's supply projections. State and federal grants and other financing opportunities would be pursued for eligible projects, to the extent feasible, to offset costs borne by ratepayers.

- *Daly City Recycled Water Expansion (Regional, Normal- and Dry-Year Supply)*. This project can produce up to 3 MGD of tertiary recycled water during the irrigation season (~7 months). On an average annual basis, this is equivalent to 1.25 MGD or 1,400 AFY. The project is envisioned to provide recycled water to 13 cemeteries and other smaller irrigation customers, offsetting existing groundwater pumping from the South Westside Groundwater Basin; this will free up groundwater, enhancing the reliability of the Basin. The project is a regional partnership between the SFPUC and Daly City. The irrigation customers are located largely within California Water Service's (Cal Water's) service area. RWS customers will benefit from the increased reliability of the South Westside Basin for additional drinking water supply during droughts. In this way, this project supports the GSR Project, which is under construction.
- *ACWD-USD Purified Water Partnership (Regional, Normal- and Dry-Year Supply)*. This project could provide a new purified water supply utilizing Union Sanitary District's (USD) treated wastewater. Purified water produced by advanced water treatment at USD could be transmitted to the Quarry Lakes Groundwater Recharge Area to supplement recharge into the Niles Cone Groundwater Basin or put to other uses in Alameda County Water District's (ACWD) service area. With the additional water supply to ACWD, an in-lieu exchange with the SFPUC would result in more water left in the RWS. Additional water supply could also be directly transmitted to the SFPUC through a new intertie between ACWD and the SFPUC.
- *Crystal Springs Purified Water (Regional, Normal- and Dry-Year Supply)*. The Crystal Springs Purified Water (PREP) Project is a purified water project that could provide 6-12 MGD of water supply through reservoir water augmentation at Crystal Springs Reservoir, which is a facility of the RWS. Treated wastewater from Silicon Valley Clean Water (SVCW) and/or the City of San Mateo would go through an advanced water treatment plant to produce purified water that meets state and federal drinking water quality standards. The purified water would then be transmitted 10 to 20 miles (depending on the alignment) to Crystal Springs Reservoir, blended with regional surface water supplies and treated again at Harry Tracy Water Treatment Plant. Project partners include the SFPUC, Bay Area Water Supply and Conservation Agency (BAWSCA), SVCW, CalWater, Redwood City, Foster City, and the City of San Mateo. Partner agencies are contributing financial and staff resources towards the work effort.
- *Los Vaqueros Reservoir Expansion (Regional, Dry Year Supply)*. The Los Vaqueros Reservoir Expansion (LVE) Project is a storage project that will enlarge the existing reservoir located in northeastern Contra Costa County from 160,000 acre-feet to 275,000 acre-feet. While the existing reservoir is owned and operated by the Contra Costa Water District (CCWD), the expansion will have regional benefits and will be managed by a Joint Powers Authority (JPA) that will be set up prior to construction. Meanwhile, CCWD is leading the planning, design and environmental review efforts. CCWD's Board certified the

EIS/EIR and approved the LVE Project on May 13, 2020. The additional storage capacity from the LVE Project would provide a dry year water supply benefit to the SFPUC. BAWSCA is working in concert with the SFPUC to support their work effort on the LVE project.

  - Conveyance Alternatives: The SFPUC is considering two main pathways to move water from storage in a prospective LVE Project to the SFPUC's service area, either directly to RWS facilities or indirectly via an exchange with partner agencies. The SFPUC is evaluating potential alignments for conveyance.
  - Bay Area Regional Reliability Shared Water Access Program (BARR SWAP): As part of the BARR Partnership, a consortium of 8 Bay Area water utilities (including ACWD, BAWSCA, CCWD, EBMUD, Marin Municipal Water District (MMWD), SFPUC, Valley Water, and Zone 7 Water Agency) are exploring opportunities to move water across the region as efficiently as possible, particularly during times of drought and emergencies. The BARR agencies are proposing two separate pilot projects in 2020-2021 through the Shared Water Access Program (SWAP) to test conveyance pathways and identify potential hurdles to better prepare for sharing water during a future drought or emergency. A strategy report identifying opportunities and considerations will accompany these pilot transfers and will be completed in 2021.

- *Bay Area Brackish Water Desalination (Regional, Normal- and Dry-Year Supply)*. The Bay Area Brackish Water Desalination (Regional Desalination) Project is a partnership between CCWD, the SFPUC, Valley Water, and Zone 7 Water Agency. The East Bay Municipal Utilities District (EBMUD) and ACWD may also participate in the project. The project could provide a new drinking water supply to the region by treating brackish water from CCWD's existing Mallard Slough intake in Contra Costa County. While this project has independent utility as a water supply project, for the current planning effort the SFPUC is considering it as a source of supply for storage in LVE. While the allocations remain to be determined among partners, the SFPUC is considering a water supply benefit of between 5 and 15 MGD during drought conditions when combined with storage at LVE.
- *Calaveras Reservoir Expansion (Regional, Dry Year Supply)*. Calaveras Reservoir would be expanded to create 289,000 acre-feet (AF) additional capacity to store excess Regional Water System supplies or other source water in wet and normal years. In addition to reservoir enlargement, the project would involve infrastructure to pump water to the reservoir, such as pump stations and transmission facilities.
- *Groundwater Banking*. Groundwater banking in the Modesto Irrigation District (MID) and Turlock Irrigation District (TID) service areas could be used to provide some additional water supply to meet instream releases in dry years reducing water supply impacts to the SFPUC service area. For example, additional surface water could be provided to irrigators in wet years, which would offset the use of groundwater, thereby allowing the groundwater to remain in the basin rather than be consumptively used. The groundwater that remains in the basin can then be used in a subsequent dry year for irrigation,

freeing up surface water that would have otherwise been delivered to irrigators to meet instream flow requirements.

A feasibility study of this option is included in the proposed Tuolumne River Voluntary Agreement. Progress on this potential water supply option will depend on the negotiations of the Voluntary Agreement.

- *Inter-Basin Collaborations*. Inter-Basin Collaborations could provide net water supply benefits in dry years by sharing responsibility for in-stream flows in the San Joaquin River and Delta more broadly among several tributary reservoir systems. One mechanism by which this could be accomplished would be to establish a partnership between interests on the Tuolumne River and those on the Stanislaus River, which would allow responsibility for streamflow to be assigned variably based on the annual hydrology.

  As is the case with Groundwater Banking, feasibility of this option is included in the proposed Tuolumne River Voluntary Agreement.

If all the projects identified through the current planning process can be implemented, there would still be a supply shortfall to meet projected needs. Furthermore, each of the supply options being considered has its own inherent challenges and uncertainties that may affect the SFPUC's ability to implement it.

Given the limited availability of water supply alternatives - unless the supply risks are significantly reduced or our needs change significantly - the SFPUC will continue to plan, develop and implement all project opportunities that can help bridge the anticipated water supply gaps during droughts. In 2019, the SFPUC completed a survey among water and wastewater agencies within the service area to identify additional opportunities for purified water. Such opportunities remain limited, but the SFPUC continues to pursue all possibilities.

BAWSCA's Long Term Reliability Water Supply Strategy

BAWSCA's Long-Term Reliable Water Supply Strategy (Strategy), completed in February 2015, quantified the water supply reliability needs of the BAWSCA member agencies through 2040, identified the water supply management projects and/or programs (projects) that could be developed to meet those needs, and prepared an implementation plan for the Strategy's recommendations.

When the 2015 Demand Study concluded it was determined that while there is no longer a regional normal year supply shortfall, there was a regional drought year supply shortfall of up to 43 MGD. In addition, key findings from the Strategy's project evaluation analysis included:

- Water transfers represent a high priority element of the Strategy.
- Desalination potentially provides substantial yield, but its high effective costs and intensive permitting requirements make it a less attractive drought year supply alternative.
- Other potential regional projects provide tangible, though limited, benefit in reducing dry-year shortfalls given the small average yields in drought years.

Since 2015, BAWSCA has completed a comprehensive update of demand projections and engaged in significant efforts to improve regional reliability and reduce the dry-year water supply shortfall.

- *Water Transfers*. BAWSCA successfully facilitated two transfers of portions of Individual Supply Guarantee (ISG) between BAWSCA agencies in 2017 and 2018. Such transfers benefit all BAWSCA agencies by maximizing use of existing supplies. BAWSCA is currently working on an amendment to the Water Supply Agreement between the SFPUC and BAWSCA agencies to establish a mechanism by which member agencies that have an ISG may participate in expedited transfers of a portion of ISG and a portion of a Minimum Annual Purchase Requirement. In 2019, BAWSCA participated in a pilot water transfer that, while ultimately unsuccessful, surfaced important lessons learned and produced interagency agreements that will serve as a foundation for future transfers. BAWSCA is currently engaged in the Bay Area Regional Reliability Partnership (BARR)[21], a partnership among eight Bay Area water utilities (including the SFPUC, Alameda County Water District, BAWSCA, Contra Costa Water District, Santa Clara Valley Water District) to identify opportunities to move water across the region as efficiently as possible, particularly during times of drought and emergencies.
- *Regional Projects*. Since 2015, BAWSCA has coordinated with local and State agencies on regional projects with potential dry-year water supply benefits for BAWSCA's agencies. These efforts include storage projects, indirect/direct water reuse projects, and studies to evaluate the capacity and potential for various conveyance systems to bring new supplies to the region.

BAWSCA continues to implement the Strategy recommendations in coordination with BAWSCA member agencies. Strategy implementation will be adaptively managed to account for changing conditions and to ensure that the goals of the Strategy are met in an efficient and cost-effective manner. On an annual basis, BAWSCA will reevaluate Strategy recommendations and results in conjunction with development of the BAWSCA's FY 2021-22 Work Plan. In this way, actions can be modified to accommodate changing conditions and new developments.

MPMW Strategies and Actions

In addition to the management tools and options discussed below, MPMW has been involved directly and through BAWSCA to advocate for an alternative to the Bay-Delta Plan Amendment, including submitting letters and testimony (see Appendix H) that identify, among other things, the significant impact to local water supply reliability.

Further, as part of this UWMP process, MPMW submitted letters to both BAWSCA and SFPUC (see Appendix H) enumerating concerns regarding the fact that the SFPUC RWS supply allocations do not meet the Level of Service Goals included in the WSA (see Section 7.1.1.1) and, therefore, SFPUC is not meeting its contractual obligations to the Wholesale Customers.

MPMW's letter to BAWSCA further states that while it is applying BAWSCA's revised Tier Two allocation methodology for RWS shortages greater than 20% for preliminary planning purposes, MPMW is not

[21] https://www.bayareareliability.com/

agreeing to, or adopting, the revised Tier Two methodology. Among other issues, MPMW notes that the revised Tier Two methodology does not take minimum health and safety standards into account.

As described in Sections 6 and 9, MPMW is committed to improving its supply reliability, including development of recycled water and groundwater supply sources and continued commitment to its water conservation program.

7.2 Drought Risk Assessment

☑ ***CWC § 10635(b)***

Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following:

(1) A description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted.

(2) A determination of the reliability of each source of supply under a variety of water shortage conditions. This may include a determination that a particular source of water supply is fully reliable under most, if not all, conditions.

(3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.

(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.

In addition to the long-term water service reliability assessment presented above, the DRA evaluates MPMW's supply risks under a severe drought period lasting for the next five consecutive years after the assessment is completed, i.e., from 2021 through 2025. The DRA is intended to inform the demand management measures and water supply projects and programs to be included in the UWMP (see Chapters 8 and 9). Suppliers may conduct an interim update or updates to this DRA within the five-year cycle of its UWMP update, i.e., before the 2025 UWMP.

7.2.1 Data, Methods, and Basis for Water Shortage Condition

As a first step to the DRA, MPMW has estimated unconstrained water demand for the next five years (2021-2025). Unconstrained water demand is the expected water use in the absence of drought water use restrictions. The characteristic five-year water demand is described in Section 4.2.6 and is from the Decision Support System (DSS) Water Demand and Conservation Model.

The available potable water supplies assumed in the DRA are based upon the same methodology and assumptions used for the long-term water service reliability assessment (Section 7.1) and relies on information provided by SFPUC and BAWSCA (Appendix G and Appendix I). The available RWS water supplies are estimated based on the following assumptions: (1) The RWS demands are held constant at

132.1 MGD (i.e., 2020 demand levels), (2) implementation of the Bay-Delta Plan Amendment occurs in 2023, and (3) the 2020 infrastructure conditions are maintained (see Table 1 of the January 22, 2021 SFPUC letter in Appendix I). Details of how MPMW's available supplies are then estimated as part of the DRA are provided below.

7.2.2 DRA Individual Water Source Reliability

As described in Chapter 6, MPMW relies on imported surface water supply purchased from the SFPUC RWS for potable uses and utilizes recycled water for non-potable uses.

MPMW's available potable water supplies during the five-consecutive-year drought are based upon information provided by SFPUC and BAWSCA included in Appendix I, as indicated in Section 7.2.1. Specifically, based on the modeling results presented in the 30 March 2021 SFPUC letter, BAWSCA provided percent reductions in RWS supply for 2021 to 2025 in Table E of the 1 April 2021 BAWSCA updated drought allocation memorandum, which are reproduced for MPMW in Table 7-7 below.

Prior to the assumed implementation of the Bay-Delta Plan Amendment in 2023, sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests during the first two consecutive dry years (i.e., 2021 and 2022). Shortages are projected to begin in 2023 with the implementation of the Bay-Delta Plan Amendment. In the event of a shortage, the current Tier 2 Drought Allocation Plan (Section 7.1.1.1) specifies that each agencies' Allocation Factor would be calculated once at the onset of a shortage based on the previous year's use and remain the same until the shortage condition is over. Therefore, for the purpose of drought allocations for the DRA, the available RWS supply is assumed to remain static in 2023-2025 and is calculated based on MPMW's projected potable demands in 2022 and the percent reductions provided by BAWSCA, as shown in Table 7-7.[22]

[22] BAWSCA also provided drought allocation volumes for each agency, as mentioned in Section 7.1.2. However, MPMW's 2021-2025 demands that were used for the calculations were outdated. Therefore, the DRA performed here used percent cutbacks provided by BAWSCA and re-calculated the supply volumes based on corrected 2021-2025 demands.

Table 7-7 MPMW Supply Availability During Multiple Dry Years for Base Year 2020

Year	2021	2022	2023	2024	2025
Potable Supply (c)					
Allocation Basis (d)	*1,047*	*1,095*	*1,095*	*1,095*	*1,095*
Percent Cutback (e)	*0%*	*0%*	*47%*	*47%*	*47%*
Total Potable Supply	1,047	1,095	580	580	580
Recycled Water Supply	48	48	48	48	48
Total Supplies	**1,095**	**1,143**	**628**	**628**	**628**

NOTES:
(a) Volumes are in units of MG.
(b) Five consecutive year drought assumed to start in 2021.
(c) Scenario reflects implementation of the Bay-Delta Plan Amendment in 2023. Sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests during the first two consecutive dry years, prior to implementation of the Bay-Delta Plan Amendment. System-wide shortages are projected to start in 2023. Wholesale RWS demand is assumed to be static for the remainder of the drought sequence per the Water Supply Agreement. As such, the percent cutbacks in 2023 to 2025 are applied to 2022 demand to calculate each year's projected supply.
(d) MPMW's potable water demand projected for years 2021 and 2022.
(e) Source: Table E from the BAWSCA drought allocation tables dated April 1, 2021.

MPMW considers recycled water to be a reliable and stable water supply source and its recycled water supply is estimated to be available during all hydrologic years at a volume that meets its projected recycled water demands (see Chapters 4 and 6).

As shown in Table 7-7, prior to the assumed implementation of the Bay-Delta Plan Amendment in 2023, sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests during the first two consecutive years (i.e., 2021 and 2022).

Shortages are projected to begin in 2023 with the implementation of the Bay-Delta Plan Amendment. In the event of a shortage, the current Tier 2 Drought Allocation Plan (Section 7.1.1.1) specifies that each agencies' Allocation Factor would be calculated once at the onset of a shortage based on the previous year's use and remain the same until the shortage condition is over. Therefore, for the purpose of drought allocations for the DRA, the available RWS supply is assumed to remain static in 2023-2025 as shown in Table 7-7.

7.2.3 Management Tools and Options

☑ ***CWC § 10620 (f)***

An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

At a regional level, MPMW maintains active involvement in the work that SFPUC and BAWSCA are doing with respect to optimizing the use of regional water supplies and pursuing additional supplies. These efforts are detailed above in Section 7.1.3.5.

In addition to supporting SFPUC and BAWSCA, MPMW has been working with West Bay Sanitary District (WBSD) to develop recycled water supplies. If additional recycled water is made available, the potable water demands will be less than the current projections and therefore the resultant supply shortage will likely to be smaller.

MPMW has also been implementing, and plans to continue to implement, the demand management measures described in Section 9. Further, in response to the anticipated future dry-year shortfalls, MPMW has developed a robust WSCP that systematically identifies ways in which MPMW can reduce water demands. The WSCP is included in Appendix K.

MPMW has also been exploring groundwater resources as a supplemental supply. As part of the WSCP, MPMW plans to operate its emergency groundwater well as a supplemental supply during significant water shortages during a water supply emergency or drought conditions. An additional one or two emergency wells are being considered as part of the Emergency Water Storage/Supply Project.

7.2.4 Drought Risk Assessment Total Water Supply and Use Comparison

Table 7-8 provides a comparison of the water supply sources available to MPMW with the total projected water use for an assumed drought period from 2021 through 2025. MPMW is expected to experience significant shortfalls in years 2023-2025 of the DRA with unconstrained demands because of the assumed implementation of the Bay-Delta Plan Amendment in 2023.

MPMW has developed a WSCP (Appendix K) to address water shortage conditions resulting from any cause (e.g., droughts, impacted distribution system infrastructure, regulatory-imposed shortage restrictions, etc.). The WSCP identifies a variety of actions that MPMW will implement to reduce demands and further ensure supply reliability at various levels of water shortage. MPMW intends to implement its WSCP to reduce water use and address the projected supply shortfalls.

Given the current uncertainty discussed in Section 7.1.3.4, MPMW could update its DRA prior to the 2025 UWMP update if significant new information becomes available. CWC §10635(b) permits urban water suppliers to conduct an interim update or updates to their DRA within the five-year cycle of its UWMP update. MPMW anticipates that by the 2025 UWMP update, SFPUC will provide more specific information about the AWSP, with estimated water supply contributions from such projects. Additionally, MPMW expects that SFPUC will provide more specific information and a refined estimate of the Bay-Delta Plan Amendment impacts to the SFPUC supply. MPMW will also have more information regarding the available uses of recycled water by the 2025 UWMP update. Further, it is anticipated that the Wholesale Customers will negotiate a revised Tier 2 allocation formula that could affect each agency's share of available supplies in drought years relative to what has been presented herein.

MPMW recommends that users of its 2020 UWMP contact MPMW staff for potential updates to the DRA presented in the 2020 UWMP for their planning projects.

Table 7-8 Five-Year Drought Risk Assessment Tables to Address Water Code 10635(b) (DWR Table 7-5)

2021	Total
Total Water Use	1,095
Total Supplies	1,095
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	--
WSCP - use reduction savings benefit	--
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%

2022	Total
Total Water Use	1,143
Total Supplies	1,143
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	--
WSCP - use reduction savings benefit	--
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%

2023	Total
Total Water Use	1,192
Total Supplies	628
Surplus/Shortfall w/o WSCP Action	(564)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	564
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	47%

Table 7-8 Five-Year Drought Risk Assessment Tables to Address Water Code 10635(b) (DWR Table 7-5)

2024	Total
Total Water Use	1,243
Total Supplies	628
Surplus/Shortfall w/o WSCP Action	(615)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	615
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	49%

2025	Total
Total Water Use	1,296
Total Supplies	628
Surplus/Shortfall w/o WSCP Action	(668)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	668
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	52%
NOTES: (a) Volumes are in units of MG. (b) Supply and demand include both potable water and recycled water.	

8 WATER SHORTAGE CONTINGENCY PLAN

Menlo Park Municipal Water's (MPMW's) Water Shortage Contingency Plan (WSCP) is included as Appendix K. The WSCP serves as a standalone document to be engaged in the case of a water shortage event, such as a drought or supply interruption, and defines specific policies and actions that will be implemented at various shortage level scenarios. The primary objective of the WSCP is to ensure that MPMW has in place the necessary resources and management responses needed to protect health and human safety, minimize economic disruption, and preserve environmental and community assets during water supply shortages and interruptions. Consistent with California Water Code (CWC) §10632, the WSCP includes six levels to address shortage conditions ranging from up to 10% to greater than 50% shortage, identifies a suite of demand mitigation measures for MPMW to implement at each level, and identifies procedures for MPMW to annually assess whether or not a water shortage is likely to occur in the coming year, among other things.

A summary of the key elements of the WSCP including water shortage levels and demand-reduction actions is shown in Table 8-1, Table 8-2, and Table 8-3. Additional details are provided in Appendix K.

Table 8-1 Water Shortage Contingency Plan Levels (DWR Table 8-1)

Shortage Level	Percent Shortage Range	Shortage Response Actions
No-Drought	N/A	• Includes water waste prohibitions effective at all times.
1	Up to 10%	• Declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use of up to 10% due to water supply shortages or an emergency. • Includes implementation of mandatory restrictions on end uses (see Table 8-2) as well as agency actions (see Table 8-3).
2	Up to 20%	• Declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use from 10% to 20% due to water supply shortages or emergency. • Includes implementation of mandatory restrictions on end uses (see Table 8-2) as well as agency actions (see Table 8-3).
3	Up to 30%	• Declaration by the City Council upon the determination that the SFPUC or another governing

Shortage Level	Percent Shortage Range	Shortage Response Actions
		authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use from 20% to 30% due to water supply shortages or emergency. • Includes implementation of mandatory restrictions on end uses (see Table 8-2) as well as agency actions (see Table 8-3).
4	Up to 40%	• Declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use from 30% to 40% due to water supply shortages or emergency. • Includes implementation of mandatory restrictions on end uses (see Table 8-2) as well as agency actions (see Table 8-3).
5	Up to 50%	• Declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use from 40% to 50% due to water supply shortages or emergency. • Includes implementation of mandatory restrictions on end uses and water use budgets for customers (see Table 8-2), as well as agency actions and groundwater supply augmentation (see Table 8-3).
6	>50%	• Declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use greater than 50% due to water supply shortages or emergency. • Includes implementation of mandatory restrictions on end uses and water use budgets for customers (see Table 8-2), as well as agency actions and groundwater supply augmentation (see Table 8-3).

Table 8-2 Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
No Drought	Other	--	1. Hoses must be equipped with a shut-off valve for washing vehicles, sidewalks, walkways, or buildings. 2. Ornamental fountains shall use only re-circulated or recycled water. 3. Potable water shall not be applied in any manner to any driveway, sidewalk, or other hard surface except when necessary to address immediate health or safety concerns. 4. Potable water shall not be used to water outdoor landscapes in a manner that causes more than incidental runoff onto non-irrigated areas, walkways, roadways, parking lots, or other hard surfaces. 5. Potable water cannot be applied to outdoor landscapes during and up to 48 hours after measurable rainfall. 6. Potable water shall not be used to irrigate ornamental turf on public street medians. 7. Hotels and motels shall provide guests an option whether to launder towels and linens daily. Hotels and motels shall prominently display notice of this option in each bathroom using clear and easily understood language. 8. Restaurants and other food service operations shall serve water to customers only upon request during a period for which the Governor has issued a proclamation of a state of emergency. 9. Broken or defective plumbing and irrigation systems must be repaired or replaced within a reasonable period. 10. Recreational water features shall be covered when not in use. 11. Single-pass cooling systems on new construction shall not be allowed. 12. Other measures as may be approved by the State Water Resources Control Board or City Council Resolution.	Yes

Table 8-2 Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
1	Other	5%	1. Continue with "no drought" restrictions and prohibitions except where superseded by more stringent requirements. 2. Newly constructed homes and buildings must irrigate with drip or microspray only. 3. Other measures as may be approved by City Council Resolution.	Yes
2	Other	15%	1. Continue with Stage 1 restrictions and prohibitions except where superseded by more stringent requirements. 2. Irrigating outdoor ornamental landscapes or turf with potable water is limited to no more than two (2) days per week on a schedule established by the Director and posted on the City's website, except for hand watering. Water customers may be granted an exception upon review and approval of a Drought Response Plan by the Public Works Director pursuant to such policies and procedures as may be established by the Public Works Director provided that such plan results in an equivalent or greater reduction in water use. 3. Hand watering must be with a continuously monitored hose fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored. 4. Other measures as may be approved by City Council Resolution.	Yes
3	Other	25%	1. Continue with Stage 2 restrictions and prohibitions except where superseded by more stringent requirements. 2. Permits for construction of new pools shall include a requirement that MPMW water shall not be used to fill new pools. 3. Vehicles may only be washed at vehicle washing facilities using recycled or recirculating water. 4. Other measures as may be approved by City Council Resolution.	Yes

Table 8-2 Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
4	Other	35%	1. Continue with Stage 3 restrictions and prohibitions except where superseded by more stringent requirements. 2. Irrigating outdoor ornamental landscapes or turf with potable water is limited to no more than one (1) day per week on a schedule established by the Director and posted on the City's website, except for hand watering. Water customers may be granted an exception upon review and approval of a Drought Response Plan by the Public Works Director pursuant to such policies and procedures as may be established by the Public Works Director provided that such plan results in an equivalent or greater reduction in water use. 3. Potable water shall not be used for construction or dust control. 4. Potable water shall not be used for commercial vehicles that provide street washing, sweeping, or cleaning. 5. Other measures as may be approved by City Council Resolution.	Yes
5	Other	45%	1. Continue with Stage 4 restrictions and prohibitions except where superseded by more stringent requirements. 2. Water use shall not exceed water budgets established for each customer. 3. Hand watering outdoor ornamental landscapes is only allowed between designated hours, as determined by the Public Works Director. 4. Turf irrigation is prohibited at all times, including artificial turf. 5. Existing irrigation systems shall not be expanded. 6. Other measures as may be approved by City Council Resolution.	Yes
6	Other	55%	1. Continue with Stage 5 restrictions and prohibitions except where superseded by more stringent requirements. 2. Hand watering outdoor ornamental landscapes is prohibited at all times. 3. Other measures as may be approved by City Council Resolution.	Yes

Table 8-2 Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
NOTES: (a) The percentages listed in this table are the cumulative savings for each shortage level with implementation of corresponding supply augmentation and other agency actions in Table 8-3. Detailed saving estimates based on end use, response action, and implementation rates can be found in Appendix K.				

Table 8-3 Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference
1	Other	5%	1. Initiate public outreach to inform customers that there is a water shortage emergency. 2. Implement Stage 1 drought surcharge.
2	Other	15%	1. Continue with actions and measures from Stage 1. 2. Increase public outreach for added restrictions and prohibitions, and to provide information regarding fines or penalties for non-compliance. 3. Coordinate with BAWSCA, SFPUC, and other Menlo Park water agencies (California Water Service, O'Connor Cooperative Water Tract, East Palo Alto, Palo Alto Park Mutual Water Company). 4. Evaluate if participation in BAWSCA's subscription water conservation programs can be increased. 5. Train City staff and billing contractor customer service representatives how to respond to customer calls, reports and complaints. 6. Evaluate options to capture water during routine flushing of water mains. 7. Implement Stage 2 drought surcharge.
3	Other	25%	1. Continue with actions and measures from Stage 2. 2. Increase public outreach for added restrictions and prohibitions, and to provide information how to report water waste to the City. 3. Increase public outreach to the top 10% water users in each customer category. 4. Coordinate with Police code enforcement to investigate water waste reports. 5. Request cooperation from Menlo Park Fire District to reduce fire training water use. 6. Implement Stage 3 drought surcharge.

Table 8-3 Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference
4	Other	35%	1. Continue with actions and measures from Stage 3. 2. Increase public outreach for added restrictions and prohibitions. 3. Increase public outreach to the top 20% water users in each customer category. 4. Evaluate staff resources. May include hiring temporary staff or training additional City staff to assist with customer service and enforcement. 5. Reevaluate routine flushing of water mains except when necessary to address immediate health or safety concerns. 6. Consider increasing fines for multiple violations. 7. Implement Stage 4 drought surcharge.
5	Other	45%	1. Continue with actions and measures from Stage 4. 2. Increase public outreach for added restrictions and prohibitions. 3. Increase public outreach to the top 30% water users in each customer category. 4. Implement water waste patrols and increase enforcement. 5. Halt installations of new potable water meters (temporary or permanent) or meter upgrades except if a valid, unexpired building permit has been issued for the project; or the project is necessary to protect the public's health, safety, and welfare. 6. Halt issuing statements of immediate ability to serve or provide potable water service. 7. Consider increasing fines for multiple violations. 8. Develop water budgets for all accounts. 9. Use emergency groundwater well(s). 10. Implement Stage 5 drought surcharge.

Table 8-3 Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference
6	Other	55%	1. Continue with actions and measures from Stage 5. 2. Increase public outreach for added restrictions and prohibitions. 3. Increase public outreach to the top 40% water users in each customer category. 4. Halt installations of new potable water meters (temporary or permanent) even if a valid, unexpired building permit has been issued for the project. 5. Consider increasing fines for multiple violations. 6. Increase water budget reduction requirements. 7. Implement other short-term emergency actions from the Emergency Response Plan. 8. Implement Stage 6 drought surcharge.
NOTES: (a) The percentages listed in this table are the cumulative savings for each shortage level with implementation of corresponding demand reduction actions in Table 8-2. Detailed saving estimates based on end use, response action, and implementation rates can be found in Appendix K.			

9 DEMAND MANAGEMENT MEASURES

☑ ***CWC § 10631 (e)***

Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:

(i) Water waste prevention ordinances.

(ii) Metering.

(iii) Conservation pricing.

(iv) Public education and outreach.

(v) Programs to assess and manage distribution system real loss.

(vi) Water conservation program coordination and staffing support.

(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.

This section provides an overview of Menlo Park Municipal Water's (MPMW's) current and planned demand management measures (DMMs), which include specific types and groupings of water conservation measures typically implemented by water suppliers; the DMMs are closely aligned with the California Urban Water Conservation Council (CUWCC) Best Management Practices. MPMW administers several of its DMMs through participation in Bay Area Water Supply and Conservation Agency's (BAWSCA's) Regional Water Conservation Program. The following sections describe BAWSCA's Regional Water Conservation Program and the nature and extent of the specific DMMs implemented by MPMW.

9.1 Regional Water Conservation

MPMW participates in BAWSCA's Regional Water Conservation Program, as a part of its overall water conservation program.

> BAWSCA manages a Regional Water Conservation Program comprised of several programs and initiatives that support and augment member agencies' and customers' efforts to use water more efficiently. These efforts extend limited water supplies that are available to meet both current and future water needs; increase drought reliability of the existing water system; and save money for both the member agencies and their customers.

> The implementation of the Regional Water Conservation Program builds upon both the Water Conservation Implementation Plan (WCIP, completed in September 2009) and the Regional Demand and Conservation Projections Project (Demand Study, completed in June of 2020). These efforts include both Core Programs (implemented regionally throughout the BAWSCA service area) and Subscription Programs (funded by individual member agencies that elect to participate and implement them within their respective service areas).
>
> BAWSCA's Core Conservation Programs include organizing classes open to the public on topics such as water efficient landscape education and water-wise gardening, assistance related to automated metering infrastructure, and other associated programs that work to promote smart water use and practices. BAWSCA's Subscription Programs include numerous rebate programs, educational programs that can be offered to area schools, technical assistance to member agencies in evaluating water loss, and programs to train and certify contractors employed to install water efficient landscape. In total, BAWSCA offers 22 programs to its member agencies and that number continues to grow over time.
>
> Each fiscal year, BAWSCA prepares an Annual Water Conservation Report that documents how all of BAWSCA's 26 member agencies have benefitted from the Core Conservation Programs. Additionally, the report highlights how all 26 member agencies participate in one or more of the Subscription Programs offered by BAWSCA, such as rebates, water loss management and large landscape audits. The Demand Study indicates that through a combination of active and passive conservation, 37.3 MGD will be conserved by BAWSCA's member agencies by 2045.
>
> Following the 2014-2016 drought, the State of California (State) developed the "Making Water Conservation a California Way of Life" framework to address the long-term water use efficiency requirements called for in executive orders issued by Governor Brown. In May of 2018, AB 1668 and SB 606 (collectively referred to as the efficiency legislation) went into effect, which built upon the executive orders implementing new urban water use objectives for urban retail water suppliers.

Although the BAWSCA Regional Water Conservation Program was designed and available at a regional level, most of the implementation of the individual programs within the MPMW service area is done by MPMW staff.

The Core Programs provided as a part of the Regional Water Conservation Program include conservation measures that benefit from regional implementation and provide overall regional benefit, and are funded through the annual BAWSCA budget. The Subscription Programs are conservation measures that individual agencies must elect to participate in, and whose benefits are primarily realized within individual water agency service areas. As such, the Subscription Programs are funded by individual member agencies, based on their participation level. MPMW is actively participating in the following Subscription Programs.

- Water Conservation School Education Program
- EarthCapades School Assembly Program
- Large Landscape Program
- Lawn Be Gone! Rebate Program

- Lawn Be Gone! Inspection Services Program
- Rain Barrel Program
- Smart Irrigation Controller Program
- Water Loss Management Program
- Decision Support System (DSS) Model Technical Support

MPMW's implementation, and participation in, the Core and Subscription Programs are described in detail below, as they relate to MPMW's implementation of the DMMs.

9.2 Agency Water Conservation

☑ ***CWC § 10631 (e)***

Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years.

MPMW implements all of the DMMs, as described below.

9.2.1 DMM 1 – Water Waste Prevention Ordinances

As discussed in the Water Shortage Contingency Plan (WSCP; Appendix K), MPMW has the authority within Section 7.35 of the City's Municipal Code to require water rationing and conservation and to enforce penalties. The City's current WSCP stage and water waste prohibitions in effect were adopted in 2017 in Resolution 6383. An adopted water shortage contingency resolution corresponding to this 2020 WSCP update is included in Appendix K.

Prohibitions to prevent water waste are included as the Non-Drought Stage of MPMW's 2020 WSCP, and remain in place at all times, irrespective of water supply conditions. The Non-Drought Stage includes the following water waste prohibitions:

- Hoses must be equipped with a shut-off valve for washing vehicles, sidewalks, walkways, or buildings.
- Ornamental fountains shall use only re-circulated or recycled water.
- Potable water shall not be applied in any manner to any driveway, sidewalk, or other hard surface except when necessary to address immediate health or safety concerns.
- Potable water shall not be used to water outdoor landscapes in a manner that causes more than incidental runoff onto non-irrigated areas, walkways, roadways, parking lots, or other hard surfaces.
- Potable water cannot be applied to outdoor landscapes during and up to 48 hours after measurable rainfall.
- Potable water shall not be used to irrigate ornamental turf on public street medians.

- Hotels and motels shall provide guests an option whether to launder towels and linens daily. Hotels and motels shall prominently display notice of this option in each bathroom using clear and easily understood language.
- Restaurants and other food service operations shall serve water to customers only upon request during a period for which the Governor has issued a proclamation of a state of emergency.
- Broken or defective plumbing and irrigation systems must be repaired or replaced within a reasonable period.
- Recreational water features shall be covered when not in use.
- Single-pass cooling systems on new construction shall not be allowed.

In subsequent stages of the WSCP, the water waste prohibitions become increasingly restrictive to respond to water shortages.

9.2.2 DMM 2 – Metering

☑ ***CWC § 526 (a)***

Notwithstanding any other provision of law, an urban water supplier that, on or after January 1, 2004, receives water from the federal Central Valley Project under a water service contract or subcontract … shall do both of the following:

(1) On or before January 1, 2013, install water meters on all service connections to residential and nonagricultural commercial buildings constructed prior to January 1, 1992, located within its service area.

(2) On and after March 1, 2013, or according to the terms of the Central Valley Project water contract in operation, charge customers for water based on the actual volume of deliveries, as measured by a water meter.

☑ ***CWC § 527 (a)***

(a) An urban water supplier that is not subject to Section 526 shall do both of the following:

(1) Install water meters on all municipal and industrial service connections located within its service area on or before January 1, 2025.

MPMW has water meters on each water service connection, with the exception of fire services. All of the meters within the MPMW service area are read on a monthly basis. Some non-residential and multi-family customers also have separate irrigation meters to monitor water use for landscape irrigation separately from indoor uses. The City's updated Water Efficient Landscaping Ordinance (effective February 2016) requires non-residential projects to install a separate irrigation meter if landscaped areas meet specific size thresholds, as discussed in Section 4.

The 2018 Water System Master Plan included a meter replacement/enhancement program as a high priority. In addition, per the City's 2020-2025 five-year Capital Improvement Plan, MPMW plans to install Advanced Metering Infrastructure (AMI) within the next three years (i.e., by Fiscal Year [FY] 2022-23). Implementation of AMI will allow MPMW to automate meter reading and provide real-time water use data to MPMW staff and customers that can be used to aggressively target leaks and atypically high water

use during normal years and periods of water shortage. MPMW may also consider a customer portal for accounts with AMI meters. The system can better identify water theft and improve customer service.

9.2.3 DMM 3 – Conservation Pricing

MPMW's current water rate structure for all customers includes a monthly fixed meter charge based on meter size, plus a capital surcharge and a tiered water consumption charge based on water usage.[23] The water consumption charge is tiered such that customers are billed at a lower rate for efficient water use and a higher rate for high water use. The current rate structure for the water consumption charge includes two tiers of monthly water use: (1) 0 to 6 hundred cubic feet (ccf), and (2) greater than 6 ccf. MPMW recently completed a water rate study and is proposing new rates for the next five years. The proposed rate structure for the water consumption charge includes three tiers of monthly water use: (1) 0 to 6 ccf, (2) 7 to 12 ccf, and (3) greater than 12 ccf. MPMW has scheduled a water rate public hearing for 11 May 2021. If the proposed rates are adopted, they will go into effect on 1 July 2021.

In addition, as discussed in Section 8, MPMW's water rate structure also includes drought surcharge rates, which are applied temporarily upon implementation of the WSCP and are designed to recover drought-related expenditures and lost revenue. The drought surcharge rates increase according to each stage of the WSCP as declared by the City Council.

9.2.4 DMM 4 – Public Education and Outreach

MPMW implements a number of public education and outreach initiatives with support from the BAWSCA Regional Water Conservation Program. Specific initiatives include:

- EarthCapades School Assembly Program: MPMW facilitates the school assemblies performed by EarthCapades at schools within its service area. The EarthCapades' performances combine age-appropriate state science standards with circus skills, juggling, music, storytelling, comedy, and audience participation to teach environmental awareness, water science, and conservation. EarthCapades' assemblies are designed to include local water source and watershed education and specific information pertaining to the MPMW service area. MPMW and BAWSCA provide specific information to EarthCapades regarding the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS) and other topics (e.g., recycled water). EarthCapades integrates this information into the specific scripts used for assemblies conducted within the MPMW service area.
- Water Conservation School Education Program: The water conservation school education program, formerly known as the Water-Wise school education program, is provided by Resource Action Programs (a contractor to BAWSCA) to 5th grade students within the MPMW service area. Resource Action Programs works directly with teachers and schools to provide them with turn-key, in-classroom water conservation curriculum and indoor and outdoor water conservation kits

[23] Current City of Menlo Park five-year water rate structure including drought surcharge rates are located online at http://www.menlopark.org/135/Water-rates..

(i.e., the Water-Wise Kits). The Water-Wise curriculum has been designed to be easily implemented by teachers, and easily understood and taken back into the home by the students. The Water-Wise Kits include water saving devices that can be installed at the student's homes (e.g., low-flow showerheads and faucet aerators) and a water audit that the students can perform with their parents.

The students are provided with the motivation, information, and tools they need to perform an in-home water audit. The information and material provided to the teachers and students also includes methods that can be used to quantify the water savings as a result of installing the equipment contained in the kit and performing the recommended, water-conserving actions. After the student performs the audit and installs the water and energy saving devices, affidavits signed by the parents are returned to the school, collected by the teacher, and forwarded to Resource Action Programs for documentation of measure implementation and the estimated water savings. Resource Action Programs then prepares a final report for distribution to MPMW.

- Water efficient landscape education classes: MPMW hosts a series of Water-Efficient Landscape Education Classes developed by BAWSCA that are free to the public and are designed to introduce homeowners and landscape professionals to the concepts of sustainable landscape design. The classes focus on creating beautiful, water-efficient gardens as an alternative to lawns. Examples of specific class topics include "Lawn Replacement 101", "Drought Tolerant Plants", and "From Graywater to Green Garden", among others. This program was implemented through 2018.
- Hosting information booths at fairs and public events: The City sets up information booths at large City public events to distribute information regarding MPMW's water conservation programs including rebate programs, landscape analysis programs, and fixture give-aways.
- Informative website, online tools, or social media: The City maintains pages on its website (www.menlopark.org) that are dedicated to its water conservation program. The website provides information regarding its rebate programs, water-saving fixture give-aways, water regulations, and conservation tips and links to interactive tools such as *Water-Wise Gardening in the Bay Area* and a consumption calculator. MPMW also posts outreach materials on its Twitter, Instagram and Facebook accounts.
- Media campaigns and other outreach: MPMW encourages water conservation and markets its rebate programs and water-saving fixture give-aways through direct mail, newsletters, local newspapers, and water billing inserts.

The full extent of public outreach that MPMW has conducted between 2015 and 2020 is discussed in Section 9.3.

9.2.5 DMM 5 – Programs to Assess and Manage Distribution System Real Loss

As discussed in Section 4.1.3, distribution system water loss was estimated to be approximately 3% of total water demand between 2015 and 2020. MPMW does not currently implement a program to assess and manage distribution system losses, however, the 2018 Water System Master Plan (City of Menlo Park, 2018) included a meter replacement/enhancement program as a high priority. In addition, per the City's 2020-2025 five-year Capital Improvement Plan, MPMW plans to install Advanced Metering Infrastructure

(AMI) by FY 2022-23. The future AMI system will help evaluate water use and be instrumental in detecting leaks to prevent distribution system losses.

9.2.6 DMM 6 – Water Conservation Program Coordination and Staffing Support

For FY 2015-16 through FY 2018-19, Sustainability Division staff, equating to one full-time equivalent (FTE), administered MPMW water conservation programs. In FY 2019-20, managing water conservation transitioned to Engineering staff with reduced staff resources equating to 0.08 FTE. Contact information for water conservation staff is listed below:

Phone: 650-330-6750

Email: water@menlopark.org

MPMW's water conservation program is funded through its water fund. The total water conservation program budget for FY 2020-21 is $120,000, including the cost for participation in the Subscription Programs through BAWSCA's Regional Water Conservation Program.

9.2.7 DMM 7 – Other DMMs

Other DMMs provided by MPMW, in addition to those discussed above, include the following:

- Water-Saving Fixtures Give-away: MPMW offers its residential customers free water-saving fixtures. MPMW encourages its customers to pick up and install the following free water saving fixtures from City Hall:
    - Bathroom aerator - uses 1 gallons per minute (gpm)
    - Kitchen aerator - uses 1.5 gpm
    - Low-flow shower head - uses 1.5 gpm
    - Toilet leak detection tablets (2 tablets per packet)
    - Water conserving hose nozzles (with shut-off valve)
- HET Rebates: MPMW administered a High Efficiency Toilet (HET) Rebate Program for its residential and commercial customers from 2008 through 2018. The HET program was one of the Subscription Programs available to BAWSCA member agencies. MPMW offered customers the following rebates for customers replacing a high-volume toilet (i.e., 3.5 gallons per flush, gpf, or more):
    - Up to a $125 Rebate for replacing an existing toilet with a qualifying MaP® Premium model toilet (1.06 gallons or less per flush); or
    - Up to a $75 Rebate per standard HET (i.e., between 1.06 gallons and 1.28 gallons per flush).

  Up to three rebates were allowed per residential account and up to ten rebates were allowed per commercial customer account.

- Large Landscape Audits: MPMW administers the BAWSCA Large Landscape Audits program to commercial and multi-family residential accounts, as described below. Waterfluence, BAWSCA's contractor, implements the program:
    - Landscape Analysis Program: MPMW currently offers a Large Landscape Analysis (a $1,400 value) for free to multi-family and commercial accounts. An irrigation expert evaluates landscapes and provides customers with a personalized report on how they can improve water efficiency and save on water costs.
    - Large Landscape Water Budgets: MPMW distributes water budgets to select accounts and has recently targeted irrigation accounts, which include a mix of churches, parks, schools, home owner associations, and office complexes. However, the program can be applied to any account MPMW chooses. Currently, MPMW provides and tracks water budgets for approximately the top 100 irrigation accounts.
- Lawn Be Gone! Turf Replacement Rebates and Lawn Be Gone! Inspection Services Program: MPMW administers the BAWSCA Lawn Be Gone! turf replacement rebate program for its residential and commercial customers. MPMW offers its customers $2 per square foot of turf removed. MPMW previously capped the rebate at $1,400 per account, but the cap was removed in June 2014. In order to qualify for participation in the Lawn Be Gone! Program, the new landscape must include at least 80% live plant coverage, with the difference completed in permeable hardscape, and all plants must be low water use plants from the BAWSCA-approved plant list. Global Sun Landscape, BAWSCA's contractor, performs the inspection services for this program. A pre and post inspection is required. This program offers MPMW's customers a financial incentive to reduce their outdoor water use and create permanent and lasting water savings. Also, because eligible landscapes must include front yards and areas visible to the public, this program has an educational and public-outreach element (i.e., demonstrating to the wider public that low water use landscaping can be an attractive alternative to lawns and encouraging conversations about responsible water use among neighbors).
- Rain Barrel Program: MPMW administers the BAWSCA Rain Barrel program in partnership with the San Mateo Countywide Water Pollution Prevention Program (a program of the City/County Association of Governments of San Mateo County). MPMW offers rebates of up to $200 per barrel for the purchase and installation of qualifying rain barrels and cisterns. This program is only offered to residential customers. BAWSCA and MPMW review installation images and approve applications. Rain barrels are a low-cost system that allow residents to supplement their water supply with a sustainable source and help preserve local watersheds by detaining rainfall.
- Smart Irrigation Controller Program: This program works with Rachio, BAWSCA's contractor, to offer residential customers a Rachio 3 Smart Sprinkler Controller at a discounted price. The Rachio 3 Smart Sprinkler Controller allows users to save up to 20% or more on their outdoor water use. The controller allows residents to check and manage watering from anywhere with their smartphone by creating tailored schedules and make automatic weather adjustments.

The full extent of the DMMs that MPMW has implemented between 2015 and 2020 is discussed in Section 9.3.

9.3 Implementation over the Past Five Years

Table 9-1 and the associated chart summarizes the DMMs implemented by MPMW and the extent of implementation (e.g., number of kits, number of rebates) for each of the programs each year between 2015 and 2020.

Water savings from the HET rebates and the Lawn Be Gone! Turf Replacement Program are conservatively estimated to be over 6 million gallons (MG) over the past five years.[24] Through implementation of the DMMs, MPMW has been able to significantly reduce water demands in its service area and help its customers to achieve water and cost savings.

9.4 Planned Implementation to Achieve Water Use Targets

☑ ***CWC § 10631 (e)***

Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) (A) … The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

MPMW implemented all of the DMMs described in Section 9.2 to achieve its Senate Bill (SB) X7-7 water use targets. As shown in Chapter 5, MPMW's water use in 2020 was 160 gallons per capital per day (GPCD), which is substantially lower than its SB X7-7 water use target of 204 GPCD.

9.5 Urban Water Use Objectives (Future Requirement)

CWC §10609 requires that urban retail water suppliers develop new water use objectives that are based on specific standards for certain water use sectors. These water use objectives will not be developed until 2023. Suppliers are encouraged in this UWMP cycle to consider how they will align their conservation management actions in order to meet these future obligations.

MPMW intends to continue and expand implementation of the DMMs discussed above and will continue to participate in BAWSCA's Regional Water Conservation Program.

[24] Expected annual water savings per each HET change out would be approximately 4,862 gallons per year, using the following calculation (BAWSCA, n.d.): (3.5 gpf - 1.28 gpf) x 5 flushes/day/person x 2.64 persons/house / 2.2 toilets/house x 365 days = 4,862 gal. This calculation assumes that a toilet rated at 3.5 gpf actually operates at 3.5 gpf.

Expected annual water savings per lawn replacement, assuming average area converted per rebate between FY 2015-2017, would be approximately 19,730 gallons per year, using the following calculation (BAWSCA, n.d.): (3.5 acre-feet/acre - 1.0 acre-feet/acre) /43,560 square feet/acre x 1,055 square feet x 325,851 gallons/acre-foot = 19,730 gallons.

BAWSCA led its member agencies in a multi-year effort to develop and implement a strategy to meet these new legislative requirements. BAWSCA's Making Conservation a Way of Life Strategic Plan (Strategic Plan) provided a detailed roadmap for member agencies to improve water efficiency. BAWSCA implementing the following elements of the Strategic Plan:

- Conducted an assessment of the agencies' current practices and water industry best practices for three components of the efficiency legislation that, based on a preliminary review, present the greatest level of uncertainty and potential risk to the BAWSCA agencies. The three components were:
    1. Development of outdoor water use budgets in a manner that incorporates landscape area, local climate, and new satellite imagery data.
    2. Commercial, Industrial, and Institutional water use performance measures.
    3. Water loss requirements.
- Organized an Advanced Metering Infrastructure symposium to enable information exchange, including case studies, implementation strategies, and data analysis techniques.
- Initiated a regional CII audit pilot program, which BAWSCA aims to complete in 2021.[25]
- Implemented a regional program for water loss control to help BAWSCA agencies comply with regulatory requirements and implement cost-effective water loss interventions.
- Engaged with the SFPUC to audit meter testing and calibration practices for SFPUC's meters at BAWSCA agency turnouts.

Finally, BAWSCA's Demand Study developed water demand and conservation projections through 2045 for each BAWSCA agency. These projects are designed to provide valuable insights on long-term water demand patterns and conservation savings potential to support regional efforts, such as implementation of BAWSCA's Long-Term Reliable Water Supply Strategy.

As described in Section 4.2, MPMW's 2021 Demand Management Decision Support System Model (DSS Model) estimates projected water demands and quantifies passive and active conservation water savings potential. As discussed in Section 4.6, the DSS Model projections demonstrate that per capita indoor residential potable water use within MPMW is expected to be below the indoor use standards presented in the legislation.

[25] Efforts on the CII audit pilot program stalled in March 2020 due to the COVID 19 pandemic and related shelter-in-place orders.

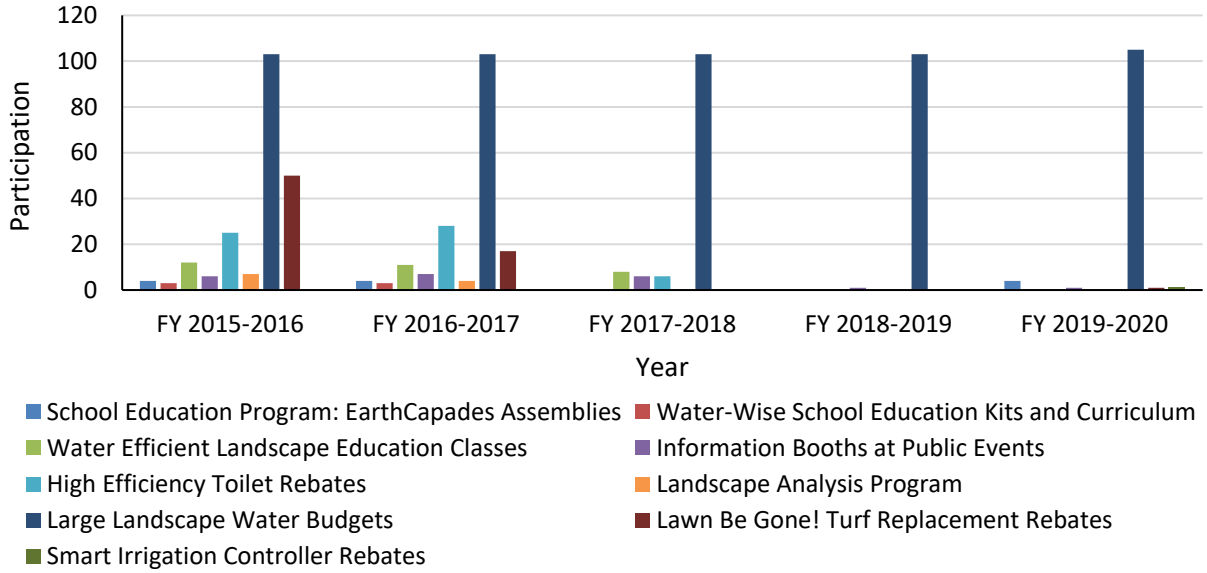
Table 9-1 Summary of DMMs and Implementation over the Past Five Years (2015-2020)

DMM Category	Program or Activity	Target Sector	Nature of Implementation	Extent of Implementation
1	Water Waste Prevention Ordinances	SF, MF, CII And IRR	Prohibition of water uses to prevent water waste included under Stage 1 of the WSCP are in place at all times, irrespective of water supply condition.	Stage 1 water waste prohibitions have been in place since adoption of the 2014 WSCP. The 2016 WSCP adds additional prohibitions.
2	Metering	SF, MF, CII And IRR	All water service connections are metered, with the exception of fire services. Per the City's 2020-2025 five-year CIP, MPMW plans to install AMI within the next three years.	All accounts are metered and read on a monthly basis.
3	Conservation Pricing	SF, MF, CII And IRR	The current water rate structure includes a tiered water consumption charge based on water usage and additional drought surcharge rates: http://www.menlopark.org/waterrates	Tiered rate structure in place during 2015-2020. Drought surcharge rates were established in 2015.
4	School Education Program: EarthCapades Assemblies	SF, MF	School assemblies that teach water science and conservation to students, including local water source and watershed education and specific information pertaining to the MPMW service area. MPMW participates through the BAWSCA Regional Water Conservation Program.	FY 2015-16: 4 assemblies FY 2016-17: 4 assemblies FY 2017-18: Not implemented FY 2018-19: Not implemented FY 2019-20: 4 assemblies
4	Water-Wise School Education Kits and Curriculum	SF, MF	Fifth grade teachers are provided with a water conservation curriculum. Kits are distributed to 5th grade students that enable them to install water saving devices and perform a water audit in their home. MPMW participates through the BAWSCA Regional Water Conservation Program.	FY 2015-16: 3 events FY 2016-17: 3 events FY 2017-18: Not implemented FY 2018-19: Not implemented FY 2019-20: Not implemented
4	Water Efficient Landscape Education Classes	SF, MF	Free classes developed by BAWSCA and hosted by MPMW provide information regarding water efficient landscaping and MPMW's water conservation programs. The classes focus on creating beautiful, water-efficient gardens as an alternative to lawns, and include "Lawn Replacement 101," "Drought Tolerant Plants," and "From Graywater to Green Garden," among others. MPMW participates through the BAWSCA Regional Water Conservation Program.	FY 2015-16: 12 classes FY 2016-17: 11 classes FY 2017-18: 8 classes FY 2018-19: Not implemented FY 2019-20: Not implemented

DMM Category	Program or Activity	Target Sector	Nature of Implementation	Extent of Implementation
4	Information Booths at Public Events	SF, MF, CII And IRR	At public events, MPMW distributes information and materials to participants regarding its water conservation programs.	FY 2015-16: 6 event FY 2016-17: 7 events FY 2017-18: 6 events FY 2018-19: 1 event FY 2019-20: 1 event
4	Other Public Outreach	SF, MF, CII And IRR	MPMW encourages water conservation and markets its rebate programs and water-saving fixture give-aways through newsletters, local newspapers, and water bill inserts. MPMW also maintains water conservation program pages on its website and posts outreach materials on its social media accounts: .http://www.menlopark.org/waterconservation.	FY 2015-16: Not tracked FY 2016-17: Not tracked FY 2017-18: Not tracked FY 2018-19: Not implemented FY 2019-20: Not implemented
5	Programs to Assess and Manage Distribution System Real Loss	Non-revenue	The 2018 Water System Master Plan includes a meter replacement/enhancement program as a high priority. In addition, per the City's 2020-2025 five-year Capital Improvement Plan, MPMW plans to install AMI within the next three years. The future AMI system will help evaluate water use and be instrumental in detecting leaks to prevent distribution system losses.	
6	Conservation Program Coordination and Staff	SF, MF, CII And IRR	City employs coordination staff and funds the water conservation program.	For FY 2015-16 through FY 2018-19, Environmental Services staff, equating to one FTE, administered MPMW water conservation programs. In FY 2019-20, managing water conservation transitioned to Engineering staff with reduced staff resources equating to 0.08 FTE.
7	Free Water-Saving Fixtures	SF, MF	Water-saving fixture kits are available to residential customers at City Hall, and include a bathroom aerator, a kitchen aerator, a low-flow shower head, two (2) toilet leak detection tablets, and water conserving hose nozzles (with shut-off valve).	FY 2015-26: Not tracked FY 2016-17: Not tracked FY 2017-18: Not tracked FY 2018-19: Not tracked FY 2019-20: Not tracked
7	High Efficiency Toilet Rebate	SF, MF, CII	Up to $125 rebate for qualifying toilets less than 1.06 gpf; up to $75 rebate per HET (between 1.06 and 1.28 gpf). Up to three rebates are allowed per residential units and up to ten rebates are allowed per commercial customer account. MPMW participated through the BAWSCA Regional Water Conservation Program.	FY 2015-16: 25 rebates FY 2016-17: 28 rebates FY 2017-18: 6 rebates FY 2018-19: Not implemented FY 2019-20: Not implemented

DMM Category	Program or Activity	Target Sector	Nature of Implementation	Extent of Implementation
7	Landscape Analysis Program	MF, CII	Free landscape analyses (value of $1,400) are offered to commercial and multi-family residential accounts, and provide customers with reports on how to improve landscape water efficiency. MPMW participates through the BAWSCA Regional Water Conservation Program.	FY 2015-16: 7 participants FY 2016-17: 4 participants FY 2017-18: Not implemented FY 2018-19: Not implemented FY 2019-20: Not implemented
7	Large Landscape Water Budgets	IRR, SF	MPMW provides and track water budgets for approximately the top 100 irrigation accounts, including churches, parks, schools, HOA's and office complexes.	FY 2015-16: 103 participants FY 2016-17: 103 participants FY 2017-18: 103 participants FY 2018-19: 103 participants FY 2019-20: 105 participants
7	Lawn Be Gone! Turf Replacement Rebates	SF, MF, CII	Customers are offered $2 per square foot of turf removed and replaced with water-efficient landscaping. The new landscape must include at least 80% live plant coverage, permeable hardscape, and all plants must be low water use plants from the BAWSCA-approved plant list. The rebate was previously capped at $1,400, but as of 17 June 2014, the rebate cap was removed. MPMW participates through the BAWSCA Regional Water Conservation Program.	FY 2015-16: 50 accounts FY 2016-17: 17 accounts FY 2017-18: Not implemented FY 2018-19: Not implemented FY 2019-20: 1 account
7	Rain Barrel Program	SF, MF	MPMW administers this program in partnership with the San Mateo Countywide Water Pollution Prevention Program (a program of the City/County Association of Governments of San Mateo County). MPMW offers rebates of up to $200 per barrel for the purchase and installation of qualifying rain barrels and cisterns.	As this is a new program, no participation data for previous years.
7	Smart Irrigation Controller Rebates	SF	Customers are offered a Rachio 3 Smart Sprinkler Controller at a discounted price which allows users to save 20% or more on their outdoor water use. The controller allows customers to check and manage watering from anywhere with their smartphone, create tailored schedules, and make automatic weather adjustments.	FY 2015-16: Not implemented FY 2016-17: Not implemented FY 2017-18: Not implemented FY 2018-19: Not implemented FY 2019-20: 1 participant

Chart 9-1 DMM Participation (2015-2020)



10 PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

Preparation of the Urban Water Management Plan (UWMP) and the Water Shortage Contingency Plan (WSCP) began in April 2020 for completion in July 2021, with notifications and interactions between stakeholders as discussed further below.

10.1 Notification of UWMP and WSCP Preparation

☑ ***CWC § 10621 (b)***

Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

On 16 February 2021, Menlo Park Municipal Water (MPMW) sent a letter to 68 recipients from 33 entities, including the San Francisco Public Utilities Commission (SFPUC), Bay Area Water Supply and Conservation Agency (BAWSCA), each BAWSCA member agency, San Mateo County, and other local agencies informing them that MPMW was in the process of updating its UWMP and WSCP and soliciting their input in the update process. A listing of the entities contacted is provided in Table 2-4 and Appendix B. The letter was sent more than 60 days before the public hearing as required by code. A sample outreach letter is included in Appendix B.

10.2 Notification of Public Hearing

☑ ***CWC § 10642***

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

10.2.1 Notice to Cities and Counties

On 6 May 2021, MPMW sent a letter to each of the above-mentioned entities informing them the Public Review Draft 2020 UWMP and the updated WSCP were available for review on the City's website and

welcoming their input and comments on the documents. The letter also informed the agencies that the UWMP and WSCP public hearing would be occurring via teleconference on 25 May 2021. A sample copy of the notification letters is included in Appendix B.

10.2.2 Notice to the Public

MPMW issued public notifications soliciting public input during the preparation of 2020 UWMP and WSCP.

The City Council held a Study Session on 13 April 2021 regarding the 2020 UWMP and WSCP development. The City Council meeting agenda and copy of the Staff Report and accompanying presentation were made available to the public on the City's website. As directed by MPMW staff, comments received from the City Council during the Study Session were incorporated into the UWMP and the WSCP.

On 7 May 2021 and 14 May 2021, MPMW published a notice in the *Redwood City Tribune* informing the public that the 2020 UWMP and WSCP would be available for public review on the City's website, consistent with requirements of California Government Code 6066. The notice also informed the public that the 2020 UWMP and WSCP public hearing would be held via teleconference on 25 May 2021. Copies of the newspaper announcements are included in Appendix C.

10.3 Public Hearing and Adoption

☑ ***CWC § 10608.26***

(a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:

(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.

(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.

(3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.

As described above, MPMW informed the public and the appropriate agencies of (1) its intent to prepare a UWMP and the associated WSCP, (2) where the UWMP and WSCP were available for public review, and (3) when the public hearing regarding the UWMP and WSCP would be held. All notifications were completed in compliance with the stipulations of Section 6066 of the Government Code.

As part of the public hearing, MPMW provided the audience with information on compliance with the Senate Bill (SB) X7-7, including its baseline daily per capita water use, water use targets, implementation plan, and 2020 compliance.

This UWMP was adopted by Resolution No. 6630 by the City Council during its 25 May 2021 City Council meeting. The WSCP included as Appendix K was adopted by Resolution No. 6630 during the same meeting. A copy of the resolutions is included in Appendix L.

10.4 Plan Submittal

☑ ***CWC § 10621***

(f) (1) Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.

☑ ***CWC § 10635 (c)***

The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

☑ ***CWC § 10644***

(a) (1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1) shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

(b) If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its water shortage contingency plan prepared pursuant to subdivision (a) of Section 10632 no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.

A copy of the adopted 2020 UWMP and associated WSCP will be provided to the Department of Water Resources (DWR), the California State Library, San Mateo County, and SFPUC within 30 days of the adoption. An electronic copy of the adopted 2020 UWMP will be submitted to the DWR using the DWR online submittal tool.

10.5 Public Availability

☑ ***CWC § 10645***

(a) Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

(b) Not later than 30 days after filing a copy of its water shortage contingency plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

A copy of the adopted 2020 UWMP and associated WSCP will be available for public review in City Hall during normal business hours and on the City's website within 30 days of filing the plan with DWR.

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APPENDIX A
COMPLETED UWMP CHECKLIST

Completed UWMP Checklist

2020 Urban Water Management Plan

Menlo Park Municipal Water

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and Overview	Section 1 Section 1.6
x	x	Chapter 1	10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a supplier may also choose to include a simple description at the beginning of each chapter.	Summary	Section 1.6
x	x	Section 2.2	10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.1
x	x	Section 2.6	10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.2.3

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 2.6.2	10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	Section 1.3 Section 2.2.4
x		Section 2.6, Section 6.1	10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	Section 2.2.2
	x	Section 2.6	10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	N/A
x	x	Section 3.1	10631(a)	Describe the water supplier service area.	System Description	Section 3
x	x	Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3
x	x	Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Section 3.1.1
x	x	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 3.1.2 Section 3.1.3

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Sections 3.4 and 5.4	10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Section 3.1 Section 5.1
x	x	Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	Section 3.2
x	x	Section 4.2	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4
x	x	Section 4.2.4	10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Section 4.1.3
x	x	Section 4.2.6	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System Water Use	Section 4.2.2
x	x	Section 4.2.6	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System Water Use	Section 4.2.2
x	optional	Section 4.3.2.4	10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	System Water Use	Section 4.1.3
x	optional	Section 4.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.2.5
x	x	Section 4.5	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System Water Use	Section 4.4

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x		Chapter 5	10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Section 5
x		Chapter 5	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 5.4
	x	Section 5.1	10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	N/A
x		Section 5.2	10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Section 5.4
x		Section 5.5	10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5-year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.3

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x		Section 5.5 and Appendix E	10608.4	Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SBX7-7 2020 Compliance Form.	Baselines and Targets	Appendix E
x	x	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	System Supplies	Section 7.1.1 Section 7.1.2
x	x	Sections 6.1	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, *including changes in supply due to climate change.*	System Supplies	Section 6.10.1 Section 7.1.1.4
x	x	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	Section 6
x	x	Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Section 6.8
x	x	Section 6.2.8	10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Section 6.9

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 6.2	10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2
x	x	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.2.2
x	x	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 6.2.1
x	x	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.1
x	x	Section 6.2.2.1	10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	Section 6.2.1

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 6.2.2.4	10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Section 6.2.3
x	x	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Section 6.2.4
x	x	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System Supplies	Section 6.7
x	x	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.5.2
x	x	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.4
x	x	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.5.4

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.5.4
x	x	Section 6.2.5	10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.5.5
x	x	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.5
x	x	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6
x	x	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area with quantified amount of collection and treatment and the disposal methods.	System Supplies (Recycled Water)	Section 6.5.2
x	x	Section 6.2.8, Section 6.3.7	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	Section 6.8

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 6.4 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a supplier can readily obtain.	System Suppliers, Energy Intensity	Section 6.11
x	x	Section 7.2	10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Section 7.1.1.3
x	x	Section 7.2.4	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.1.4
x	x	Section 7.3	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.1.3
x	x	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Section 7.2

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	Section 7.2.1
x	x	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Section 7.2.2
x	x	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Section 7.2.3
x	x	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Section 7.2.1
x	x	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Section 8 Appendix K
x	x	Chapter 8	10632(a)(1)	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP	Water Shortage Contingency Planning	Appendix K Section 2

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	Appendix K Section 12
x	x	Section 8.2	10632(a)(2)(A)	Provide the written decision- making process and other methods that the supplier will use each year to determine its water reliability.	Water Shortage Contingency Planning	Appendix K Section 4
x	x	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water Shortage Contingency Planning	Appendix K Section 4
x	x	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	Appendix K Section 5
x	x	Section 8.3	10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	N/A

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 8.4	10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	Appendix K Section 6.2
x	x	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Appendix K Section 6.1
x	x	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Appendix K Section 6.3
x	x	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions.	Water Shortage Contingency Planning	Appendix K Section 6.4
x	x	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	Appendix K Section 6.6
x	x	Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	Appendix K Section 7
x	x	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	Appendix K Section 8

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 8.5 and 8.6	10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water Shortage Contingency Planning	Appendix K Section 8
x		Section 8.6	10632(a)(6)	Retail supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water Shortage Contingency Planning	Appendix K Section 9
x	x	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	Appendix K Section 10
x	x	Section 8.7	10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	Appendix K Section 10
x	x	Section 8.7	10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water Shortage Contingency Planning	Appendix K Section 10
x	x	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix K Section 11
x	x	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix K Section 11

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x		Section 8.8	10632(a)(8)(C)	Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought	Water Shortage Contingency Planning	Appendix K Section 11
x		Section 8.9	10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	Appendix K Section 12
x		Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water Shortage Contingency Planning	Appendix K Section 6.5
x	x	Sections 8.12 and 10.4	10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Appendix K Section 14
x	x	Section 8.14	10632(c)	Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan.	Water Shortage Contingency Planning	Appendix K Section 14

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
	x	Sections 9.1 and 9.3	10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	N/A
x		Sections 9.2 and 9.3	10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Section 9.1 Section 9.2 Section 9.3
x		Chapter 10	10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan Adoption, Submittal, and Implementation	Section 10.3
x	x	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1.	Plan Adoption, Submittal, and Implementation	Section 10.1
x	x	Section 10.4	10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	Section 10.4

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	Section 10.5
x	x	Section 10.2.2	10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Section 10.2.1
x	x	Section 10.3.2	10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3
x	x	Section 10.4	10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Section 10.4	10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Sections 10.4.1 and 10.4.2	10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Section 10.4

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5
x	x	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5
x	x	Section 10.6	10621(c)	If supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan Adoption, Submittal, and Implementation	N/A
x	x	Section 10.7.2	10644(b)	If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4

APPENDIX B
UWMP AGENCY NOTIFICATION LETTERS

Notification Distribution List

Alameda County Water District

BAWSCA

California Water Service

City of Brisbane

City of Burlingame

City of Daly City

City of Hayward

City of Millbrae

City of Milpitas

City of Mountain View

City of Palo Alto

City of Redwood City

City of San Bruno

City of Santa Clara

City of Sunnyvale

Coastside County Water District

EKI Environment & Water, Inc.

Estero Municipal Improvement District

Menlo Park Chamber of Commerce

Menlo Park Fire District

Mid-Peninsula Water District

North Coast County Water Dist.

O'Connor Tract Co-Operative Water Company

Palo Alto Park Mutual Water Company

Purissima Hills Water District

Ravenswood School District

San Francisco Public Utilities Commission

San Jose Municipal Water System

San Mateo County Environmental Health

Stanford University

Town of Hillsborough

West Bay Sanitary District

Westborough Water District

Jaw, Scott

From: Jaw, Scott
Sent: Tuesday, February 16, 2021 2:01 PM
To: 'Leonard.Ash@acwd.com'; 'kelsi.oshiro@acwd.com'; 'NSandkulla@bawsca.org'; 'dmcpherson@bawsca.org'; 'nashoori@bawsca.org'; 'Acarrasco@calwater.com'; 'dsmithson@calwater.com'; 'mbolzowski@calwater.com'; 'jflanagan@ci.brisbane.ca.us'; 'rbreault@ci.brisbane.ca.us'; 'jlee@burlingame.org'; 'amorimoto@burlingame.org'; 'gkrauss@dalycity.org'; 'wdonnelly@dalycity.org'; 'richard.perez@veolia.com'; 'alex.ameri@hayward-ca.gov'; 'Michelle.Tran@hayward-ca.gov'; 'klim@ci.millbrae.ca.us'; 'Bgiang@ci.millbrae.ca.us'; 'tndah@ci.milpitas.ca.gov'; 'hsiddiqui@ci.milpitas.ca.gov'; 'lisa.au@mountainview.gov'; 'Elizabeth.Flegel@mountainview.gov'; 'karla.dailey@cityofpaloalto.org'; 'Lisa.Bilir@CityofPaloAlto.org'; 'tkyaw@redwoodcity.org'; 'jchapel@redwoodcity.org'; 'jtan@sanbruno.ca.gov'; 'MReinhardt@sanbruno.ca.gov'; 'gwelling@santaclaraca.gov'; 'DAsuncion@SantaClaraCA.gov'; 'mnasser@ci.sunnyvale.ca.us'; 'RChinnakotla@sunnyvale.ca.gov'; 'mrogren@coastsidewater.org'; 'cbrennan@coastsidewater.org'; 'twang@ekiconsult.com'; 'ndorais@fostercity.org'; 'asmith@fostercity.org'; 'harolds@menlofire.org'; 'tammyr@midpeninsulawater.org'; 'jeanettek@midpeninsulawater.org'; 'acarr@nccwd.com'; 'stephaniedalton@nccwd.com'; 'philw@purissimawater.org'; 'samv@purissimawater.org'; 'aakastama@sfwater.org'; 'sritchie@sfwater.org'; 'henry.louie@sanjoseca.gov'; 'nicole.harvie@sanjoseca.gov'; 'hforshey@smcgov.org'; 'ekudyba@stanford.edu'; 'juliann@stanford.edu'; 'ecooney@hillsborough.net'; 'pwillis@hillsborough.net'; 'SRamirez@westbaysanitary.org'; 'dbarrow@westboroughwater.com'; 'pmairena@westboroughwater.com'; 'davidlawjones@gmail.com'; 'oconnorwater@gmail.com'; 'papmwc@yahoo.com'; 'info@papmwc.org'; 'gsudaria@ravenswoodschools.org'; 'weger@ravenswoodschools.org'; 'mpfd@menlofire.org'; 'info@westbaysanitary.org'; 'info@menloparkchamber.com'; Dehn Fran
Cc: Lowe, Pam H; Lamm, Christopher T
Subject: City of Menlo Park - Notice of Preparation of the 2020 Urban Water Management Plan

Re: Notice of Preparation of the City of Menlo Park's 2020 Urban Water Management Plan and Water Shortage Contingency Plan

The Urban Water Management Planning Act (California Water Code §10608–10656) requires the City's Menlo Park Municipal Water to update its Urban Water Management Plan (UWMP) and associated Water Shortage Contingency Plan (WSCP) every 5 years. The City is currently reviewing its existing UWMP and WSCP, which were updated in 2016, and considering revisions to the documents. The UWMP integrates land use, water needs and supply, and demand management measures to document the City's ability to provide a reliable supply of water to its customers. The associated WSCP considers dry-year water supply planning, including strategies to address six levels of water supply shortage conditions, and a drought risk assessment.

The City coordinates with its wholesale water supplier, nearby water agencies, relevant public entities, and other interested parties in preparing the UWMP and WSCP. A draft of the 2020 UWMP and WSCP will be made available for public review, and a public hearing is tentatively scheduled for late-spring. If you would like

more information regarding the 2020 UWMP and WSCP, and the schedule for updating these documents, please visit menlopark.org/urbanwatermanagementplan or contact us at:

City of Menlo Park, Menlo Park Municipal Water
701 Laurel Street,
Menlo Park, CA 94025
Phone: (650) 330-6694
Email: scjaw@menlopark.org

Sincerely,
Scott

Jaw, Scott

From: Jaw, Scott
Sent: Thursday, May 6, 2021 12:16 PM
To: 'Leonard.Ash@acwd.com'; 'kelsi.oshiro@acwd.com'; 'NSandkulla@bawsca.org'; 'dmcpherson@bawsca.org'; 'nashoori@bawsca.org'; 'Acarrasco@calwater.com'; 'dsmithson@calwater.com'; 'mbolzowski@calwater.com'; 'jflanagan@ci.brisbane.ca.us'; 'rbreault@ci.brisbane.ca.us'; 'jlee@burlingame.org'; 'amorimoto@burlingame.org'; 'gkrauss@dalycity.org'; 'wdonnelly@dalycity.org'; 'richard.perez@veolia.com'; 'alex.ameri@hayward-ca.gov'; 'Michelle.Tran@hayward-ca.gov'; 'klim@ci.millbrae.ca.us'; 'Bgiang@ci.millbrae.ca.us'; 'tndah@ci.milpitas.ca.gov'; 'hsiddiqui@ci.milpitas.ca.gov'; 'lisa.au@mountainview.gov'; 'Elizabeth.Flegel@mountainview.gov'; 'karla.dailey@cityofpaloalto.org'; 'Lisa.Bilir@CityofPaloAlto.org'; 'tkyaw@redwoodcity.org'; 'jchapel@redwoodcity.org'; 'jtan@sanbruno.ca.gov'; 'MReinhardt@sanbruno.ca.gov'; 'gwelling@santaclaraca.gov'; 'DAsuncion@SantaClaraCA.gov'; 'mnasser@ci.sunnyvale.ca.us'; 'RChinnakotla@sunnyvale.ca.gov'; 'mrogren@coastsidewater.org'; 'cbrennan@coastsidewater.org'; 'twang@ekiconsult.com'; 'ndorais@fostercity.org'; 'asmith@fostercity.org'; 'harolds@menlofire.org'; 'tammyr@midpeninsulawater.org'; 'jeanettek@midpeninsulawater.org'; 'acarr@nccwd.com'; 'stephaniedalton@nccwd.com'; 'philw@purissimawater.org'; 'samv@purissimawater.org'; 'aakastama@sfwater.org'; 'sritchie@sfwater.org'; 'henry.louie@sanjoseca.gov'; 'nicole.harvie@sanjoseca.gov'; 'hforshey@smcgov.org'; 'ekudyba@stanford.edu'; 'juliann@stanford.edu'; 'ecooney@hillsborough.net'; 'pwillis@hillsborough.net'; 'SRamirez@westbaysanitary.org'; 'dbarrow@westboroughwater.com'; 'pmairena@westboroughwater.com'; 'davidlawjones@gmail.com'; 'oconnorwater@gmail.com'; 'papmwc@yahoo.com'; 'info@papmwc.org'; 'gsudaria@ravenswoodschools.org'; 'weger@ravenswoodschools.org'; 'mpfd@menlofire.org'; 'info@westbaysanitary.org'; 'info@menloparkchamber.com'; Dehn Fran
Cc: Lowe, Pam H; Lamm, Christopher T
Subject: City of Menlo Park - Draft 2020 Urban Water Management Plan Available for Public Review

Re: City of Menlo Park's Draft 2020 Urban Water Management Plan and Water Shortage Contingency Plan available for public review

The Urban Water Management Planning Act (California Water Code §10608–10656) requires the City's Menlo Park Municipal Water to update its Urban Water Management Plan (UWMP) and associated Water Shortage Contingency Plan (WSCP) every 5 years. The City is currently reviewing its existing UWMP and WSCP, which were updated in 2016, and considering revisions to the documents. The UWMP integrates land use, water needs and supply, and demand management measures to document the City's ability to provide a reliable supply of water to its customers. The associated WSCP considers dry-year water supply planning, including strategies to address six levels of water supply shortage conditions, and a drought risk assessment.

The City coordinates with its wholesale water supplier, nearby water agencies, relevant public entities, and other interested parties in preparing the UWMP and WSCP. A draft of the 2020 Urban Water Management Plan and Water Shortage Contingency Plan is now available for public review. A public hearing to adopt the

UWMP and WSCP is scheduled for May 25, 2021. If you would like more information, please visit menlopark.org/watermanagementplan or contact us at:

City of Menlo Park, Menlo Park Municipal Water
701 Laurel Street,
Menlo Park, CA 94025
Phone: (650) 330-6694
Email: scjaw@menlopark.org

Sincerely,
Scott

APPENDIX C
UWMP PUBLIC NOTIFICATION

From: City of Menlo Park <water@menlopark.org>
Sent: Wednesday, February 24, 2021 8:59 AM
To: Lowe, Pam H
Subject: Draft 2020 Urban Water Management Plan coming soon for public review

---

Draft 2020 Urban Water Management Plan coming soon for public review

Menlo Park Municipal Water customers:

The Urban Water Management Plan, and associated Water Shortage Contingency Plan, are a critical part of meeting the long-range water supply needs of Menlo Park Municipal Water customers for both normal and dry year weather conditions. As we face increasingly unpredictable climate patterns, the new state planning requirements ensure we will be prepared for various scenarios and continue to be a reliable and dependable water supplier.

An update to the plan for meeting its long-term water needs is under development. Once completed, the 2020 Urban Water Management Plan will serve as the long-term guide to ensure a reliable water supply for the next 20 years.

- Read the previous update, the 2015 Urban Water Management Plan

- Read the latest staff report on the progress of the 2020 planning process

The City Council approved an agreement with EKI Environment & Water, Inc. to develop the 2020 Urban Water Management Plan. A draft of the 2020 Urban Water Management Plan and Water Shortage Contingency Plan is expected to be released for public review in March or April 2021 for a 60-day public comment period. The City Council is then expected to consider adoption of the final plan in May or June 2021. The adopted plans must be submitted to the state by July 1, 2021.

For additional information, please visit the Urban Water Management Plan webpage or contact Senior Civil Engineer Pam Lowe.

Sent by the City of Menlo Park
701 Laurel St., Menlo Park, CA 94025
650-330-6600 phone | 650-679-7022 text
Unsubscribe | My Subscriptions | Support

View this email in a browser

Email SUBSCRIBE

Menlo Park Municipal Water customers,

The Urban Water Management Plan and Water Shortage Contingency Plan are a critical part of meeting the long-range water supply needs of Menlo Park Municipal Water customers for both normal and dry year weather conditions.

The Urban Water Management Plan serves as the long-term guide to ensure a reliable water supply for the next 20 years, and the Water Shortage Contingency Plan outlines the actions and demand management measures that may be implemented based on various future drought conditions.

The City contracted with EKI Environment & Water, Inc. to develop both plans, and presented a study session at the April 13, 2021, City Council meeting.

A draft of the 2020 Urban Water Management Plan and Water Shortage Contingency Plan is available for public review. The City Council is scheduled to hold a public hearing to adopt both plans May 25, 2021.

- Draft 2020 Urban Water Management Plan and Water Shortage Contingency Plan and Appendices
- April 13 City Council study session – Staff Report

The City must submit the plans to the California Department of Water Resources by June 30.

For additional information, please visit the Urban Water Management Plan webpage or contact Senior Civil Engineer Pam Lowe.

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May (May 10) 10

Draft urban water management and water shortage contingency plan available for review

Posted on May 10, 2021 at 6:18 pm by Clay Curtin

The Urban Water Management Plan and Water Shortage Contingency Plan are a critical part of meeting the long-range water supply needs of Menlo Park Municipal Water customers for both normal and dry year weather conditions.

The Urban Water Management Plan serves as the long-term guide to ensure a reliable water supply for the next 20 years, and the Water Shortage Contingency Plan outlines the actions and demand management measures that may be implemented based on various future drought conditions.

The City contracted with EKI Environment & Water, Inc. to develop both plans, and presented a study session at the April 13, 2021, City Council meeting.

The Draft 2020 Urban Water Management Plan and Water Shortage Contingency Plan is available for public review. The City Council is scheduled to hold a public hearing to adopt both plans May 25, 2021. The City must submit the plans to the California Department of Water Resources by June 30.

For additional information, please visit the Urban Water Management Plan webpage or contact Senior Civil Engineer Pam Lowe.

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JUDI HERREN
MENLO PARK/CITY MANAGER, CITY CLERK'S OFFICE
701 LAUREL ST/ CITY HALL 2ND FL.
MENLO PARK, CA 94025

SPEN# 3466088

COPY OF NOTICE

Notice Type: HRG NOTICE OF HEARING

Ad Description

Public hearing on the 2020 urban water management plan and the water shortage contingency plan

To the right is a copy of the notice you sent to us for publication in the REDWOOD CITY TRIBUNE. Please read this notice carefully and call us with any corrections. The Proof of Publication will be filed with the County Clerk, if required, and mailed to you after the last date below. Publication date(s) for this notice is (are):

05/07/2021 , 05/14/2021

The charge(s) for this order is as follows. An invoice will be sent after the last date of publication. If you prepaid this order in full, you will not receive an invoice.

Publication	$127.60
Total	$127.60

Public hearing on the 2020 urban water management plan and the water shortage contingency plan

NOTICE IS HEREBY GIVEN that the City Council of the City of Menlo Park will hold a public hearing to consider proposed revisions and updates to the 2020 urban water management plan (UWMP) and the water shortage contingency plan (WSCP). In conjunction with the update to the UWMP and WSCP, the community must be given an opportunity to give input on the City's urban water use target in the UWMP, any impacts to the local economy, and the City's method of determining its urban water use target. A draft of the 2020 UWMP and WSCP is available for public review on the City's webpage at menlo-park.org/watermanagementplan.

NOTICE IS HEREBY FURTHER GIVEN that the City Council of the City of Menlo Park will hold this public hearing on Tuesday, May 25, 2021 at 5 p.m. or as near as possible thereafter, by virtual meeting, at which time and place interested persons may participate and be heard on the matter. If you challenge this item in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice, or in written correspondence delivered to the City of Menlo Park at, or prior to, the public hearing.
Please call Menlo Park Municipal Water, at 650-330-6750 or email water@menlopark.org if you have any questions or comments.
Visit the City's website at menlopark.org/agenda for the City Council meeting agenda and for links to the public hearing staff report which will be available one week before the public hearing.
DATED: May 3, 2021
BY: Judi A. Herren, City Clerk
5/7, 5/14/21
SPEN-3466088#
EXAMINER - REDWOOD CITY TRIBUNE

A0000005705541

APPENDIX D
POPULATION AND EMPLOYMENT PROJECTIONS

Choose your department

CITY OF MENLO PARK

MEMORANDUM

Date: 10/5/2020
To: Menlo Park Water Department
From: Kyle Perata, Principal Planner
Re: ConnectMenlo Population and Employment Projections for 2020 Urban Water Management Plan

The City of Menlo Park Water Department (Water Department) asked the Planning Division to review the 2015 Urban Water Management Plan (2015 UWMP) projections for employment and population within the Water Department's service area and update the projections for population and employment growth from the City's 2016 General Plan Update (ConnectMenlo) for the period from 2020 through 2045. The General Plan sets the framework for development, with growth focused on the Bayfront Area of the Water Department's service area, through 2040, so the Planning Division has updated residential and employment projections from ConnectMenlo through 2040, not 2045. Projections beyond 2040 would be speculative.

This memo outlines the Planning Division's approach to the updated residential population and commercial employment projections. Outside of ConnectMenlo and the Facebook Campus Expansion Project, Planning Division staff did not adjust the population and employment growth in the remainder of the Water Department's service area.

Residential population within service area

Table 2-1 of the 2015 UWMP identifies the population growth expected through 2040 from the previous general plan and the population expected through 2040 with full buildout of the additional housing units created through ConnectMenlo. ConnectMenlo created the potential for up to 4,500 new housing units and a population of 11,570 new residents[1]. All of these new housing units would be located within the Water Department's service area. Planning Division staff did not modify the total residential population in the projections as the number of housing units is capped in ConnectMenlo; however, Planning Staff reviewed the City's approved and pending projects under ConnectMenlo to reallocate residential population increases within the five year planning increments based on when the currently proposed projects would likely be completed and occupied. The Planning Division is currently reviewing projects for a total of 3,049 housing units and all except Willow Village are anticipated to be complete and occupied by 2025. This shifts much of the residential population growth to 2025, including approximately half of the total proposed housing units in the Willow Village project. For 2030, the second half of the Willow Village project would be expected to be completed. No projects currently on file would be anticipated to be completed after 2030; for those years Planning staff split the additional expected population growth equally between 2035 and 2040. As stated previously, no population growth from ConnectMenlo is projected beyond 2040.

[1] The residential population projection is based on an average household size of 2.57 persons multiplied by the total (4,500) housing units available under ConnectMenlo.

Housing element

The Planning Division will be embarking on the next Housing Element update in 2021, which will require that the City plan for additional housing units. The Regional Housing Needs Assessment (RHNA) allocation from Association of Bay Area Governments (ABAG) has not occurred yet. However, the Planning Division anticipates that the City will be required to plan for approximately 3,000 housing units to accommodate population growth in the City, approximately half of which could be located in the Menlo Park Water Department service area. Since approximately slightly fewer than 1,500 housing units are still available under ConnectMenlo, those units would be able to be applied toward the RHNA allocation. The remaining anticipated approximately 1,500 housing units would likely be planned for outside of the Water Department's service area. Planning staff believe that the Housing Element update can be accommodated in the 2020 UWMP based on the available units under ConnectMenlo.

Employment projections within service area

Commercial square footage within the office, life sciences, and commercial (non-office retail/services) are capped but employees were not limited. Further, hotel rooms are capped at 400 rooms, also without an employment cap. While housing units are capped by ConnectMenlo, employment was not capped and the projections provided in the 2015 UWMP were based on the Planning Division's estimates at the time.

Table 2-2 of the 2015 UWMP identified an increase in approximately 5,500 employees within the Water Department's service area through ConnectMenlo. In addition to the 5,500 employees anticipated by ConnectMenlo, buildout of the previous general plan could accommodate approximately 3,400 employees within the Bayfront Area[2]. The total projected employment by 2040 in the Bayfront Area would be 8,900 employees (ConnectMenlo plus growth available under previous general plan). These are two distinct calculations; however, with 5,500 employees directly related to the net increase in growth under ConnectMenlo and 3,400 employees under the previous general plan and identified in general plan build out within the Water Department's service area. The total estimated employment based on the additional development potential (office, life sciences, commercial-retail, and hotels) created by ConnectMenlo, and accounting for the growth under the existing general plan, would be up to approximately 10,218 employees. This total employment could occur if ConnectMenlo was completely built out. The ConnectMenlo employment projection in Table 3-2 of the Draft EIR did not account for the Facebook office density at the Commonwealth Corporate Center Building 3 project proposal, nor did it accommodate the proposed Willow Village master plan project.

The majority of the proposed projects with commercial components require environmental review under the California Environmental Quality Act (CEQA) to determine if the proposed projects would result in impacts not identified through the ConnectMenlo certified EIR. Therefore, population increases above the estimated projections would be reviewed for potential environmental impacts through the CEQA

[2] Employment projection of previous general plan in Bayfront Area identified in Table 3-2 of the ConnectMenlo Draft Environmental Impact Report.

environmental analysis process for individual projects.

Planning Staff updated the ConnectMenlo employment projections based on approved and built projects, pending projects, and the net available development potential after accounting for all approved/built and pending projects. Reviewing these projects results in some employment growth by 2020 and moves all pending projects, with the exception of Willow Village into 2025. As with the residential population half of Willow Village is assumed to be constructed by 2025 with the second half built out by 2030. For the remaining development potential within ConnectMenlo, Planning staff allocated the employee growth, based on square footage, equally between 2035 and 2040. These projections account for the total available square footage in the Bayfront Area. The growth associated with the previous general plan would be accounted for in the Projected GP Build Out column. To ensure that the employment associated with the previous general plan was not double counted, Planning staff removed the 3,400 employees from the ConnectMenlo column after accounting for full build out since those employees would already have been accounted for in the general plan buildout without ConnectMenlo.

Conclusions and updated projections

The total residential population is static and the Planning Division limited modifications to the allocation of growth over the time period from 2020 to 2040 and did not modify the total expected population. Planning staff believe that ConnectMenlo can accommodate the forthcoming RHNA numbers for housing units that would need to be served by the Menlo Park Water Department. The remaining units would likely be located within the Cal Water service area.

With regard to employment growth, the estimate in ConnectMenlo was lower than the employment that could be accommodated within the square footage within the development cap because it did not account for the proposed Willow Village project or the employment density at the Commonwealth Building 3 project. Those projects are being reviewed through the CEQA process to determine if the proposed projects would result in any environmental effects.

The attached updated projections identify the ConnectMenlo growth in population and employment in five year increments. While the tables in the UWMP showed population and employment cumulatively, the Planning Division has shown the projections by year to help show the actual numbers per planning year for discussion purposes. The Water Department may wish to convert to a cumulative/running total for the projections to be consistent with the 2015 UWMP tables after reviewing the Planning Division’s updates.

	Population						Jobs					
Date	2015 UWMP	Actual (CM)	HE	Projected (CM) - net new	Projected (GP Buildout - net new + growth) (former UWMP #)	Total Projected (GP buildout + CM)	2015 UWMP	Actual (CM)	Projected (CM)	Other (FB West Campus)	Projected (GP Buildout) (numbers from UWMP #)	Total Projected (GP buildout + CM + FB)
2010	14,749						11,637					
2011	14,829						11,798					
2012	14,973						11,959					
2013	15,129						12,121					
2014	15,157						12,282					
2015	15,342						12,443					
2016	15,918						14,693					
2017	16,495						16,943					
2018	17,071						19,193					
2019	17,648											
2020	18,224	0		0	18,224	18,224	23,693	31	0	6,400	17,143	23,574
2025	21,214	5,062		2,893	18,321	23,383	25,918	4,937	1,375	150	17,993	29,511
2030	24,204	1,685		5,785	18,419	25,166	28,143	1,995	2,750	0	18,843	32,356
2035	27,194	2,412		8,678	18,516	27,675	30,368	1,628	4,125	0	19,693	34,834
2040	30,184	2,411		11,570	18,614	30,184	32,593	1,628	5,500	0	20,543	37,311
2045												

APPENDIX E
SBX7-7 COMPLIANCE TABLES

SB X7-7 Table 0: Units of Measure Used in 2020 UWMP* *(select one from the drop down list)*
Million Gallons
**The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.*
NOTES:

SB X7-7 Table 2: Method for 2020 Population Estimate	
Method Used to Determine 2020 Population (may check more than one)	
☐	**1. Department of Finance** (DOF) or **American Community Survey** (ACS)
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☑	**4. Other** DWR recommends pre-review
NOTES: (a) The 2020 population was estimated by the City using the GIS-based method recommended by DWR and is described in Section 5.1.	

SB X7-7 Table 3: 2020 Service Area Population	
2020 Compliance Year Population	
2020	18,276
NOTES:	

SB X7-7 Table 4: 2020 Gross Water Use

Compliance Year 2020	2020 Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.*	2020 Deductions					2020 Gross Water Use
		Exported Water *	Change in Dist. System Storage* (+/-)	Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.*	Water Delivered for Agricultural Use*	Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.*	
	1,069	-	-	-	-	-	**1,069**

*** Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.

NOTES:

SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD)		
2020 Gross Water *Fm SB X7-7 Table 4*	**2020 Population** *Fm SB X7-7 Table 3*	**2020 GPCD**
1,069	18,276	**160**
NOTES:		

SB X7-7 Table 9: 2020 Compliance

Actual 2020 GPCD[1]	Optional Adjustments to 2020 GPCD (Enter "0" if Adjustment Not Used)			TOTAL Adjustments[1]	Adjusted 2020 GPCD [1] *(Adjusted if applicable)*	2020 Confirmed Target GPCD [1, 2]	**Did Supplier Achieve Targeted Reduction for 2020?**
	Extraordinary Events[1]	Weather Normalization[1]	Economic Adjustment[1]				
160	-	-	-	-	160	204	**YES**

[1] *All values are reported in GPCD*

[2] ***2020 Confirmed Target GPCD*** *is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.*

NOTES:

SB X7-7 Table 7: 2020 Target Method *Select Only One*		
Target Method		Supporting Documentation
☑	Method 1	SB X7-7 Table 7A
☐	Method 2	SB X7-7 Tables 7B, 7C, and 7D *Contact DWR for these tables*
☐	Method 3	SB X7-7 Table 7-E
☐	Method 4	Method 4 Calculator
NOTES:		

SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	**2020 Target GPCD**
255	**204**
NOTES:	

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target			
5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target[1]	Calculated 2020 Target[2]	**Confirmed 2020 Target**
236	224	204	**204**

[1] Maximum 2020 Target is 95% of the 5 Year Baseline GPCD *[2] 2020 Target is calculated based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target.*

NOTES:

APPENDIX F
2020 CURRENT POPULATION ESTIMATE

MP Water Demographic and Income Profile

Burgess SRI Census Blocks-Combined
Area: 0.02 square miles

Prepared by Menlo Park GIS

Summary	Census 2010	2020	2025
Population	90	94	94
Households	31	31	31
Families	17	17	17
Average Household Size	2.90	3.03	3.03
Owner Occupied Housing Units	14	15	15
Renter Occupied Housing Units	17	16	16
Median Age	37.8	37.8	38.0

Trends: 2020-2025 Annual Rate	Area	State	National
Population	0.00%	0.55%	0.72%
Households	0.00%	0.50%	0.72%
Families	0.00%	0.50%	0.64%
Owner HHs	0.00%	0.65%	0.72%
Median Household Income	0.00%	1.81%	1.60%

	2020		2025	
Households by Income	Number	Percent	Number	Percent
<$15,000	0	0.0%	0	0.0%
$15,000 - $24,999	1	3.2%	0	0.0%
$25,000 - $34,999	0	0.0%	0	0.0%
$35,000 - $49,999	0	0.0%	0	0.0%
$50,000 - $74,999	2	6.5%	1	3.2%
$75,000 - $99,999	2	6.5%	2	6.5%
$100,000 - $149,999	4	12.9%	4	12.9%
$150,000 - $199,999	5	16.1%	5	16.1%
$200,000+	16	51.6%	17	54.8%

Median Household Income	$200,001	$200,001
Average Household Income	$269,643	$291,603
Per Capita Income	$118,544	$128,199

Source: Esri, U.S. Census

February 04, 2021

...o. 6783
...1419

MP Water Demographic and Income Profile

Burgess SRI Census Blocks-Combined
Area: 0.02 square miles

Prepared by Menlo Park GIS

Population by Age	Census 2010 Number	Census 2010 Percent	2020 Number	2020 Percent	2025 Number	2025 Percent
0 - 4	7	7.7%	7	7.5%	7	7.4%
5 - 9	6	6.6%	6	6.5%	6	6.4%
10 - 14	5	5.5%	5	5.4%	5	5.3%
15 - 19	2	2.2%	2	2.2%	2	2.1%
20 - 24	3	3.3%	3	3.2%	3	3.2%
25 - 34	17	18.7%	18	19.4%	18	19.1%
35 - 44	18	19.8%	18	19.4%	18	19.1%
45 - 54	13	14.3%	12	12.9%	11	11.7%
55 - 64	9	9.9%	9	9.7%	9	9.6%
65 - 74	6	6.6%	8	8.6%	8	8.5%
75 - 84	3	3.3%	3	3.2%	5	5.3%
85+	2	2.2%	2	2.2%	2	2.1%

Race and Ethnicity	Census 2010 Number	Census 2010 Percent	2020 Number	2020 Percent	2025 Number	2025 Percent
White Alone	72	80.0%	69	74.2%	67	70.5%
Black Alone	1	1.1%	1	1.1%	1	1.1%
American Indian Alone	0	0.0%	0	0.0%	0	0.0%
Asian Alone	10	11.1%	15	16.1%	18	18.9%
Pacific Islander Alone	0	0.0%	0	0.0%	0	0.0%
Some Other Race Alone	1	1.1%	1	1.1%	1	1.1%
Two or More Races	6	6.7%	7	7.5%	8	8.4%
Hispanic Origin (Any Race)	5	5.6%	5	5.3%	5	5.3%

Data Note: Income is expressed in current dollars.

Source: Esri, U.S. Census

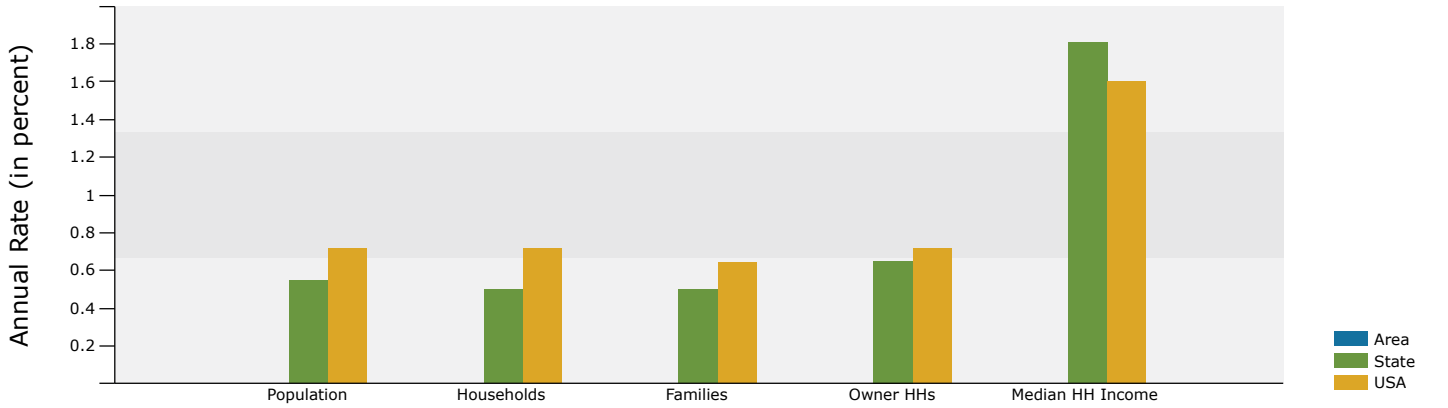
February 04, 2021

MP Water Demographic and Income Profile

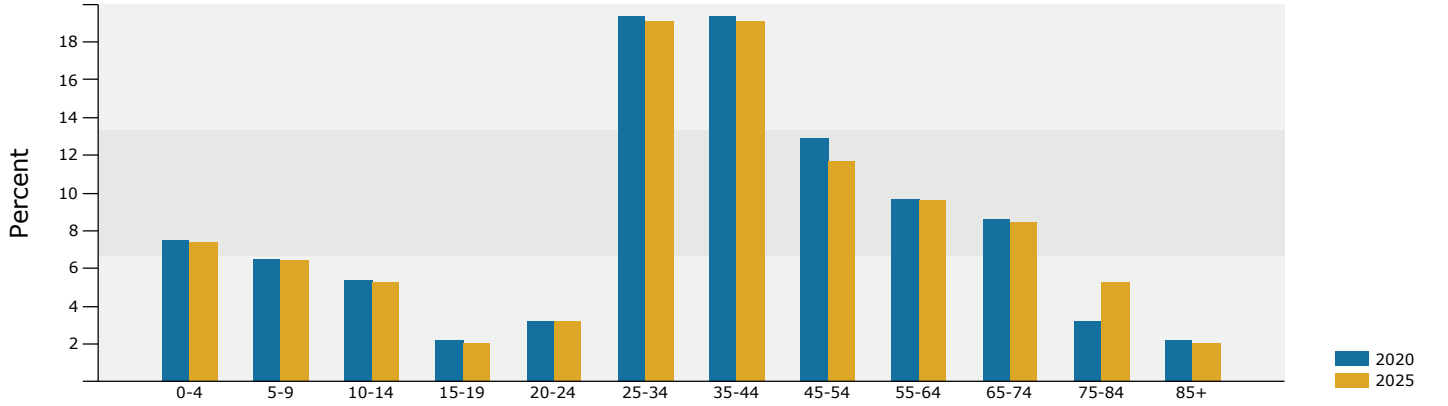
Burgess SRI Census Blocks-Combined
Area: 0.02 square miles

Prepared by Menlo Park GIS

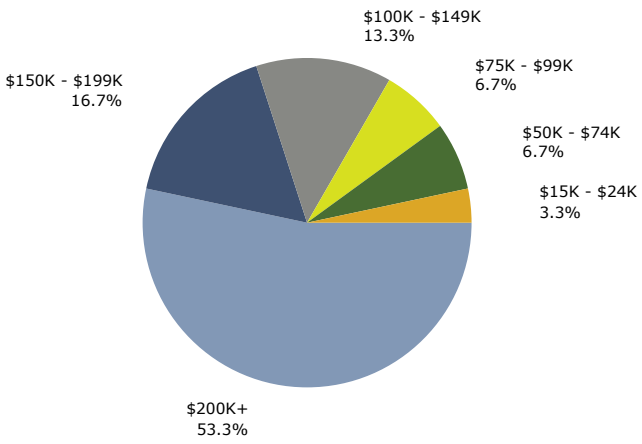
Trends 2020-2025



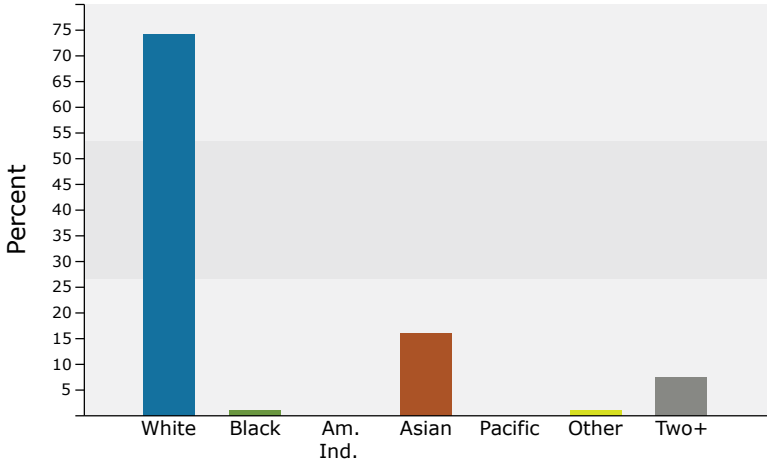
Population by Age



2020 Household Income



2020 Population by Race



2020 Percent Hispanic Origin:5.3%

Source: Esri, U.S. Census

February 04, 2021

CITY OF MENLO PARK

MP Water Demographic and Income Profile

Block 1005

Prepared by Menlo Park GIS

Summary	Census 2010	2020	2025
Population	113	114	114
Households	52	52	52
Families	30	30	30
Average Household Size	2.13	2.15	2.15
Owner Occupied Housing Units	33	34	35
Renter Occupied Housing Units	19	18	18
Median Age	38.4	40.9	41.4

Trends: 2020-2025 Annual Rate	Area	State	National
Population	0.00%	0.55%	0.72%
Households	0.00%	0.50%	0.72%
Families	0.00%	0.50%	0.64%
Owner HHs	0.58%	0.65%	0.72%
Median Household Income	0.00%	1.81%	1.60%

	2020		2025	
Households by Income	Number	Percent	Number	Percent
<$15,000	2	3.8%	2	3.8%
$15,000 - $24,999	1	1.9%	1	1.9%
$25,000 - $34,999	1	1.9%	1	1.9%
$35,000 - $49,999	0	0.0%	0	0.0%
$50,000 - $74,999	3	5.8%	3	5.8%
$75,000 - $99,999	3	5.8%	3	5.8%
$100,000 - $149,999	5	9.6%	5	9.6%
$150,000 - $199,999	7	13.5%	7	13.5%
$200,000+	29	55.8%	32	61.5%
Median Household Income	$200,001		$200,001	
Average Household Income	$259,604		$283,748	
Per Capita Income	$105,255		$115,041	

Source: Esri, U.S. Census

February 04, 2021

701 Laurel St. 6783
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MP Water Demographic and Income Profile

Block 1005

Prepared by Menlo Park GIS

	Census 2010		2020		2025	
Population by Age	Number	Percent	Number	Percent	Number	Percent
0 - 4	10	8.8%	7	6.2%	7	6.1%
5 - 9	10	8.8%	8	7.1%	8	7.0%
10 - 14	5	4.4%	9	8.0%	8	7.0%
15 - 19	3	2.7%	9	8.0%	8	7.0%
20 - 24	5	4.4%	4	3.5%	7	6.1%
25 - 34	16	14.2%	11	9.7%	10	8.8%
35 - 44	22	19.5%	15	13.3%	14	12.3%
45 - 54	16	14.2%	20	17.7%	18	15.8%
55 - 64	16	14.2%	14	12.4%	16	14.0%
65 - 74	6	5.3%	11	9.7%	11	9.6%
75 - 84	3	2.7%	4	3.5%	6	5.3%
85+	1	0.9%	1	0.9%	1	0.9%
	Census 2010		**2020**		**2025**	
Race and Ethnicity	Number	Percent	Number	Percent	Number	Percent
White Alone	88	77.9%	83	72.8%	79	69.3%
Black Alone	3	2.7%	2	1.8%	2	1.8%
American Indian Alone	0	0.0%	0	0.0%	0	0.0%
Asian Alone	11	9.7%	16	14.0%	19	16.7%
Pacific Islander Alone	0	0.0%	0	0.0%	0	0.0%
Some Other Race Alone	4	3.5%	4	3.5%	4	3.5%
Two or More Races	7	6.2%	9	7.9%	10	8.8%
Hispanic Origin (Any Race)	11	9.7%	10	8.8%	10	8.8%

Data Note: Income is expressed in current dollars.

Source: Esri, U.S. Census

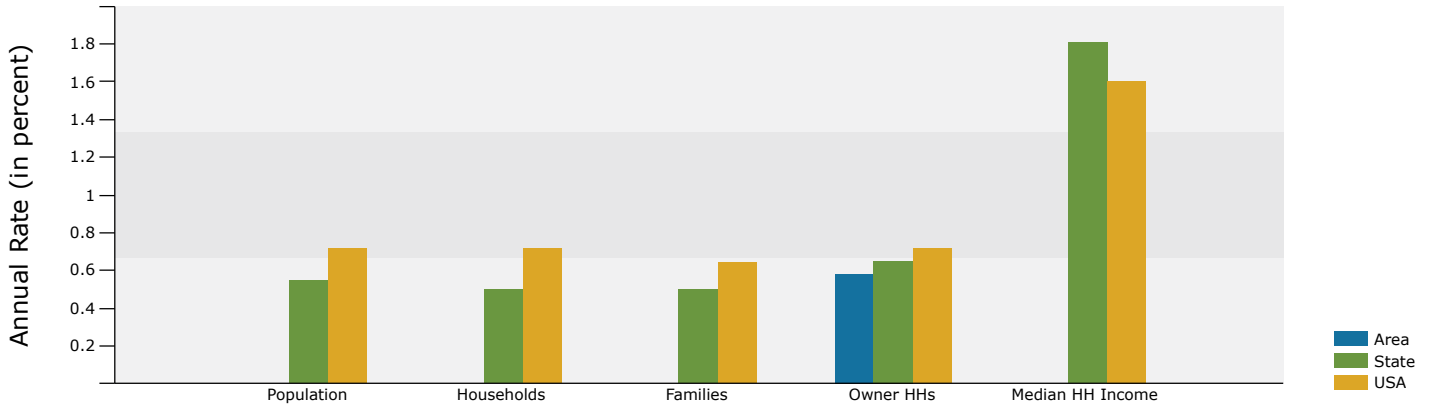
February 04, 2021

MP Water Demographic and Income Profile

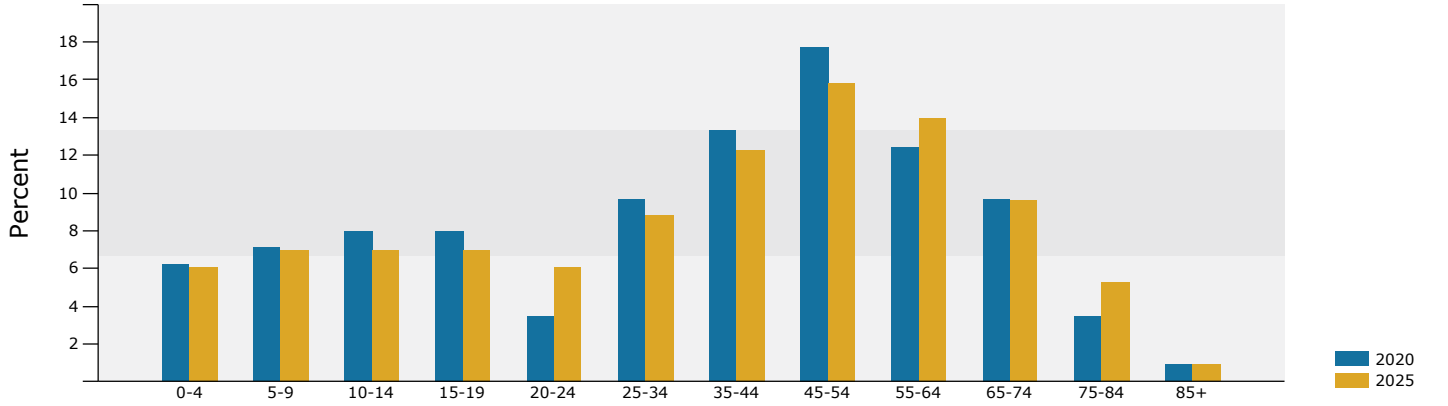
Block 1005

Prepared by Menlo Park GIS

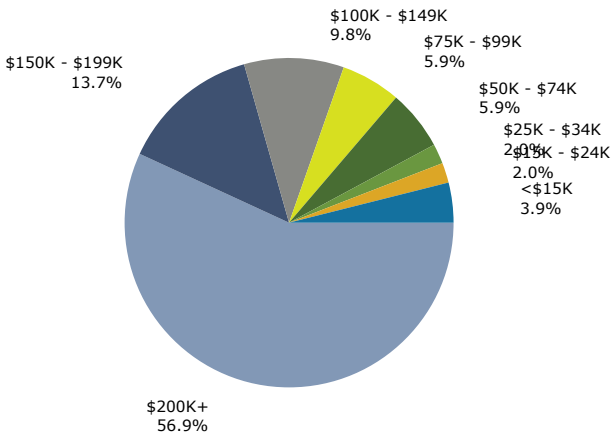
Trends 2020-2025



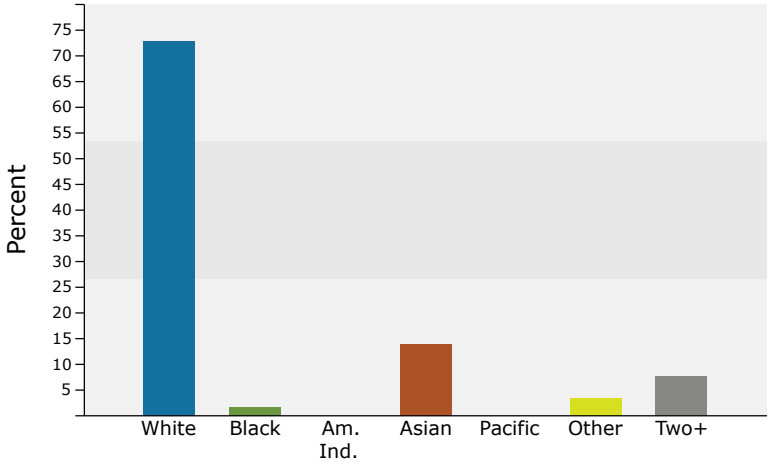
Population by Age



2020 Household Income



2020 Population by Race



2020 Percent Hispanic Origin:8.8%

Source: Esri, U.S. Census

February 04, 2021

MP Water Demographic and Income Profile

Menlo Park Municipal Water-Lower Zone
Area: 5.78 square miles

Prepared by Menlo Park GIS

Summary	Census 2010	2020	2025
Population	11,931	14,235	14,748
Households	3,556	4,335	4,451
Families	2,536	3,167	3,262
Average Household Size	3.27	3.22	3.25
Owner Occupied Housing Units	2,173	2,281	2,368
Renter Occupied Housing Units	1,383	2,054	2,083
Median Age	34.5	34.6	35.3

Trends: 2020-2025 Annual Rate	Area	State	National
Population	0.71%	0.55%	0.72%
Households	0.53%	0.50%	0.72%
Families	0.59%	0.50%	0.64%
Owner HHs	0.75%	0.65%	0.72%
Median Household Income	1.88%	1.81%	1.60%

	2020		2025	
Households by Income	Number	Percent	Number	Percent
<$15,000	356	8.2%	302	6.8%
$15,000 - $24,999	134	3.1%	117	2.6%
$25,000 - $34,999	147	3.4%	125	2.8%
$35,000 - $49,999	257	5.9%	247	5.5%
$50,000 - $74,999	504	11.6%	481	10.8%
$75,000 - $99,999	382	8.8%	399	9.0%
$100,000 - $149,999	659	15.2%	688	15.5%
$150,000 - $199,999	450	10.4%	490	11.0%
$200,000+	1,448	33.4%	1,603	36.0%
Median Household Income	$125,133		$137,379	
Average Household Income	$185,593		$203,256	
Per Capita Income	$58,093		$62,929	

Source: Esri, U.S. Census

February 04, 2021

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MP Water Demographic and Income Profile

Menlo Park Municipal Water-Lower Zone
Area: 5.78 square miles

Prepared by Menlo Park GIS

	Census 2010		2020		2025	
Population by Age	Number	Percent	Number	Percent	Number	Percent
0 - 4	1,072	9.0%	1,120	7.9%	1,168	7.9%
5 - 9	981	8.2%	1,112	7.8%	1,109	7.5%
10 - 14	843	7.1%	1,111	7.8%	1,066	7.2%
15 - 19	757	6.3%	912	6.4%	932	6.3%
20 - 24	699	5.9%	848	6.0%	856	5.8%
25 - 34	1,695	14.2%	2,096	14.7%	2,183	14.8%
35 - 44	1,919	16.1%	2,008	14.1%	2,131	14.5%
45 - 54	1,724	14.4%	1,868	13.1%	1,818	12.3%
55 - 64	1,143	9.6%	1,583	11.1%	1,652	11.2%
65 - 74	573	4.8%	947	6.7%	1,056	7.2%
75 - 84	357	3.0%	424	3.0%	560	3.8%
85+	168	1.4%	204	1.4%	215	1.5%
	Census 2010		**2020**		**2025**	
Race and Ethnicity	Number	Percent	Number	Percent	Number	Percent
White Alone	6,335	53.1%	6,919	48.6%	6,850	46.4%
Black Alone	1,288	10.8%	1,355	9.5%	1,343	9.1%
American Indian Alone	111	0.9%	127	0.9%	134	0.9%
Asian Alone	792	6.6%	1,515	10.6%	1,781	12.1%
Pacific Islander Alone	376	3.2%	442	3.1%	461	3.1%
Some Other Race Alone	2,466	20.7%	3,078	21.6%	3,291	22.3%
Two or More Races	563	4.7%	799	5.6%	888	6.0%
Hispanic Origin (Any Race)	4,689	39.3%	5,784	40.6%	6,116	41.5%

Data Note: Income is expressed in current dollars.

Source: Esri, U.S. Census

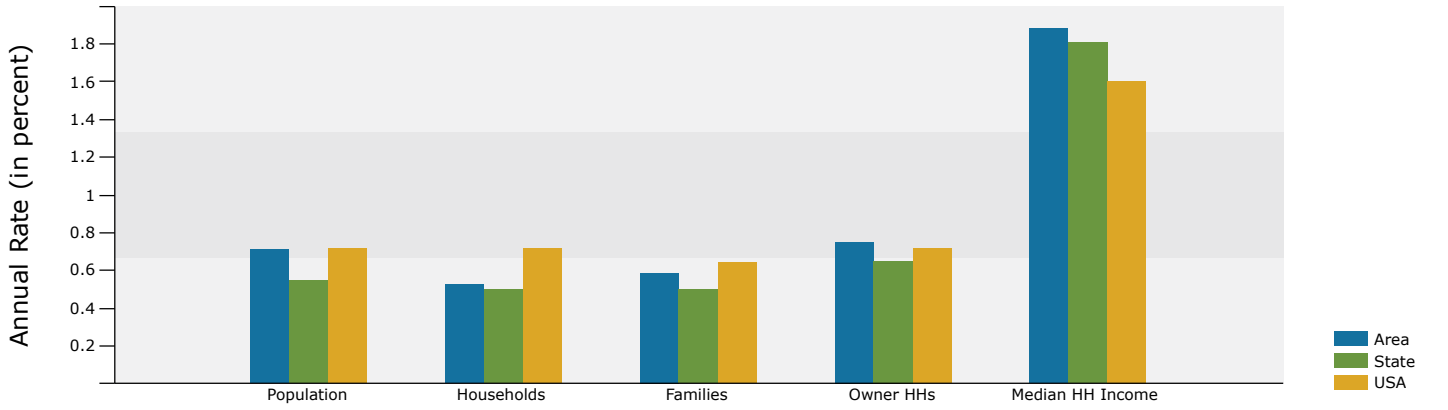
February 04, 2021

MP Water Demographic and Income Profile

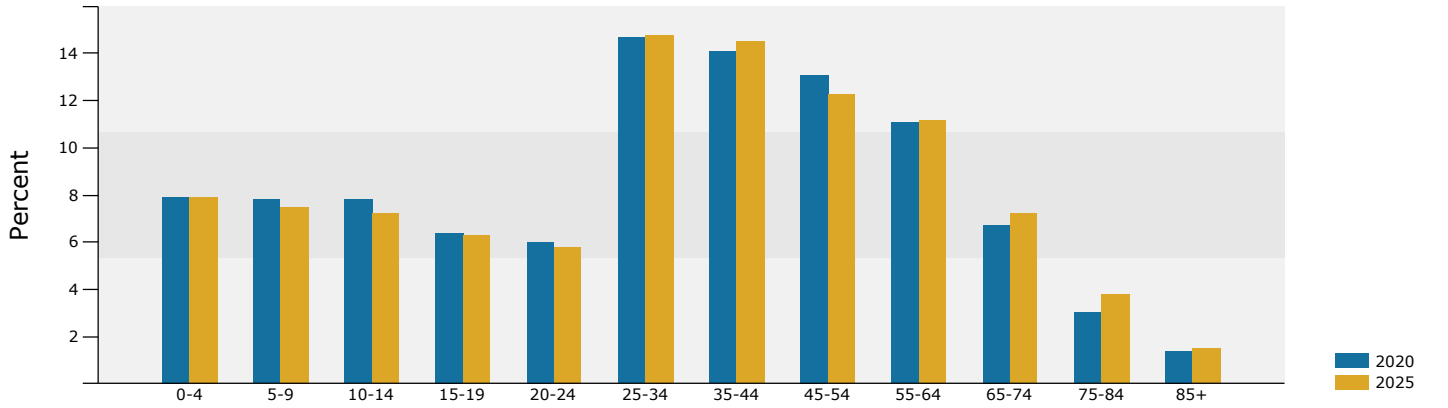
Menlo Park Municipal Water-Lower Zone
Area: 5.78 square miles

Prepared by Menlo Park GIS

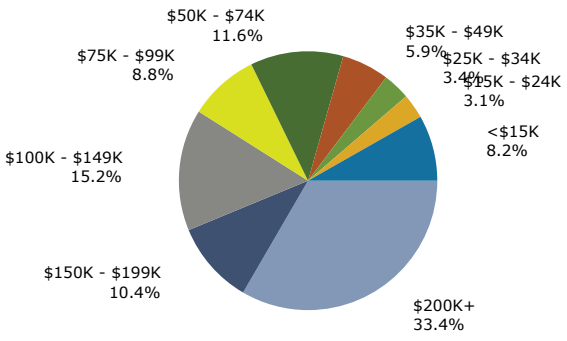
Trends 2020-2025



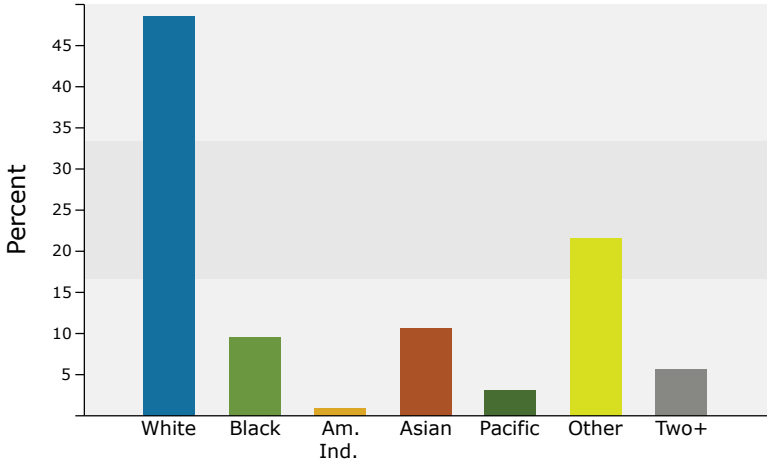
Population by Age



2020 Household Income



2020 Population by Race



2020 Percent Hispanic Origin:40.6%

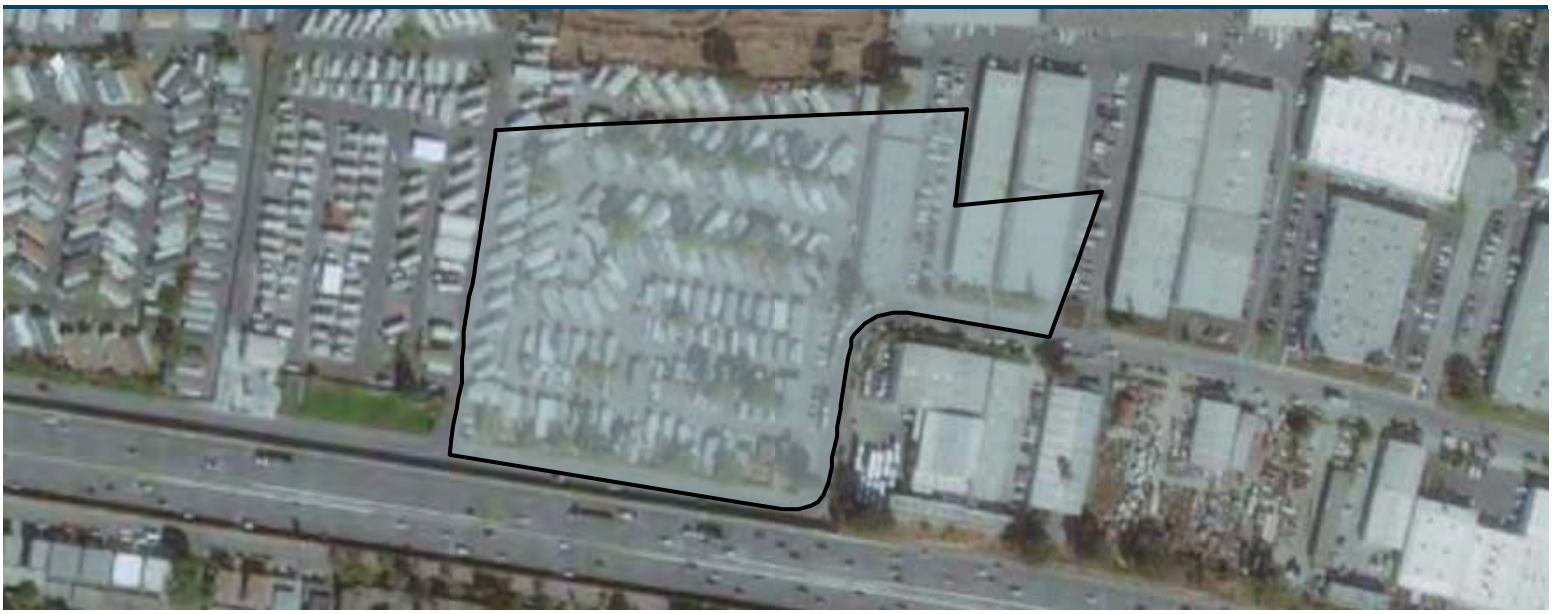
Source: Esri, U.S. Census

February 04, 2021

MP Water Demographic and Income Profile

Uninc Area
Area: 0.02 square miles

Prepared by Menlo Park GIS



Summary	Census 2010	2020	2025
Population	305	609	706
Households	111	184	214
Families	59	99	115
Average Household Size	2.48	3.12	3.14
Owner Occupied Housing Units	67	97	115
Renter Occupied Housing Units	44	87	99
Median Age	40.3	40.1	40.6

Trends: 2020-2025 Annual Rate	Area	State	National
Population	3.00%	0.55%	0.72%
Households	3.07%	0.50%	0.72%
Families	3.04%	0.50%	0.64%
Owner HHs	3.46%	0.65%	0.72%
Median Household Income	0.71%	1.81%	1.60%

	2020		2025	
Households by Income	Number	Percent	Number	Percent
<$15,000	13	7.1%	14	6.5%
$15,000 - $24,999	13	7.1%	14	6.5%
$25,000 - $34,999	13	7.1%	14	6.5%
$35,000 - $49,999	19	10.3%	21	9.8%
$50,000 - $74,999	31	16.8%	38	17.8%
$75,000 - $99,999	8	4.3%	10	4.7%
$100,000 - $149,999	18	9.8%	27	12.6%
$150,000 - $199,999	24	13.0%	30	14.0%
$200,000+	45	24.5%	44	20.6%

Median Household Income	$83,298	$86,309
Average Household Income	$132,620	$132,127
Per Capita Income	$53,121	$53,085

Source: Esri, U.S. Census

February 04, 2021

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MP Water Demographic and Income Profile

Uninc Area
Area: 0.02 square miles

Prepared by Menlo Park GIS

Population by Age	Census 2010 Number	Census 2010 Percent	2020 Number	2020 Percent	2025 Number	2025 Percent
0 - 4	19	6.2%	35	5.7%	41	5.8%
5 - 9	12	3.9%	36	5.9%	42	5.9%
10 - 14	14	4.6%	36	5.9%	43	6.1%
15 - 19	17	5.6%	29	4.8%	42	5.9%
20 - 24	21	6.9%	36	5.9%	37	5.2%
25 - 34	45	14.8%	89	14.6%	91	12.9%
35 - 44	47	15.4%	84	13.8%	98	13.9%
45 - 54	55	18.0%	85	13.9%	94	13.3%
55 - 64	44	14.4%	88	14.4%	97	13.7%
65 - 74	19	6.2%	61	10.0%	76	10.8%
75 - 84	10	3.3%	23	3.8%	36	5.1%
85+	2	0.7%	8	1.3%	9	1.3%

Race and Ethnicity	Census 2010 Number	Census 2010 Percent	2020 Number	2020 Percent	2025 Number	2025 Percent
White Alone	176	57.7%	330	54.2%	366	51.8%
Black Alone	9	3.0%	16	2.6%	17	2.4%
American Indian Alone	5	1.6%	9	1.5%	11	1.6%
Asian Alone	26	8.5%	73	12.0%	99	14.0%
Pacific Islander Alone	4	1.3%	8	1.3%	9	1.3%
Some Other Race Alone	64	21.0%	127	20.9%	148	21.0%
Two or More Races	21	6.9%	46	7.6%	56	7.9%
Hispanic Origin (Any Race)	123	40.3%	242	39.7%	279	39.5%

Data Note: Income is expressed in current dollars.

Source: Esri, U.S. Census

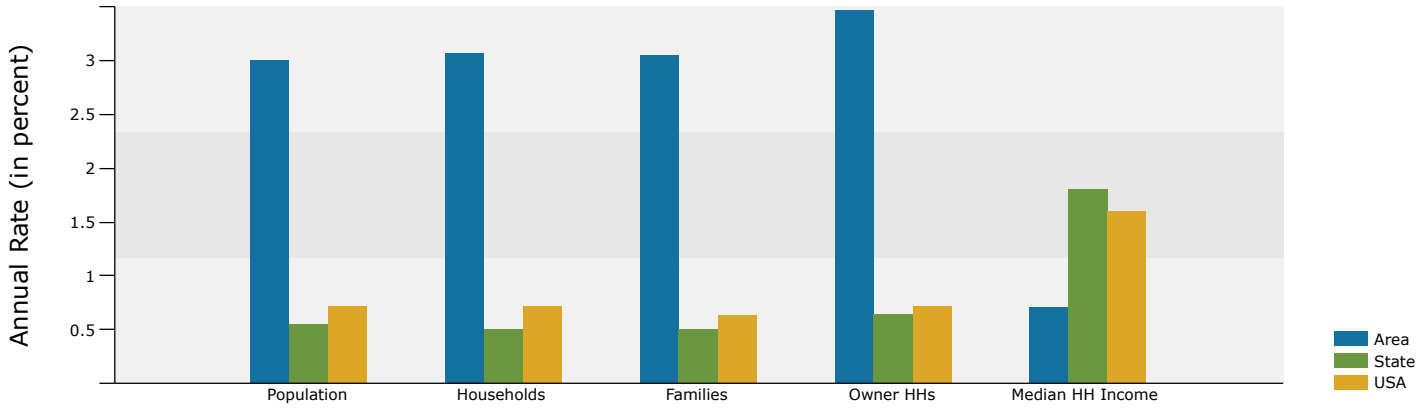
February 04, 2021

MP Water Demographic and Income Profile

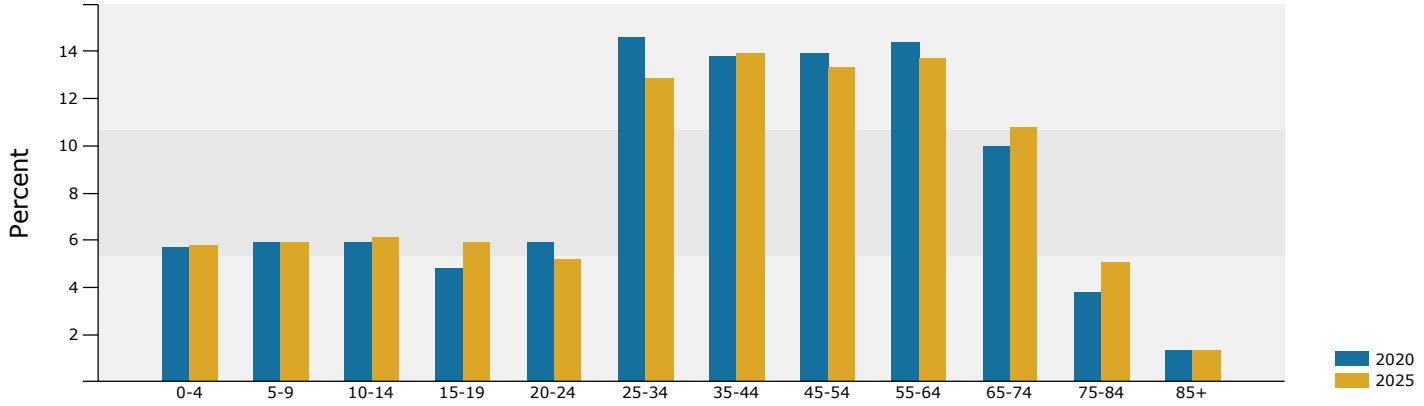
Uninc Area
Area: 0.02 square miles

Prepared by Menlo Park GIS

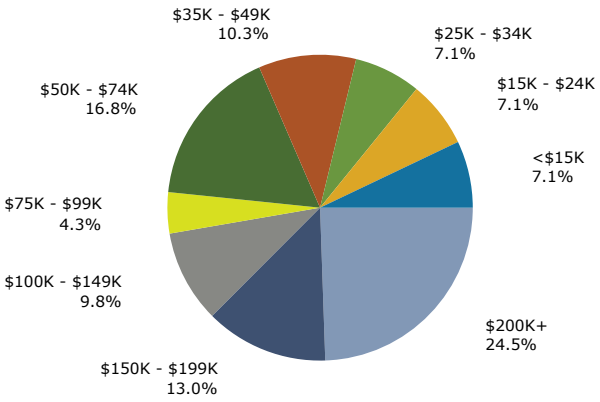
Trends 2020-2025



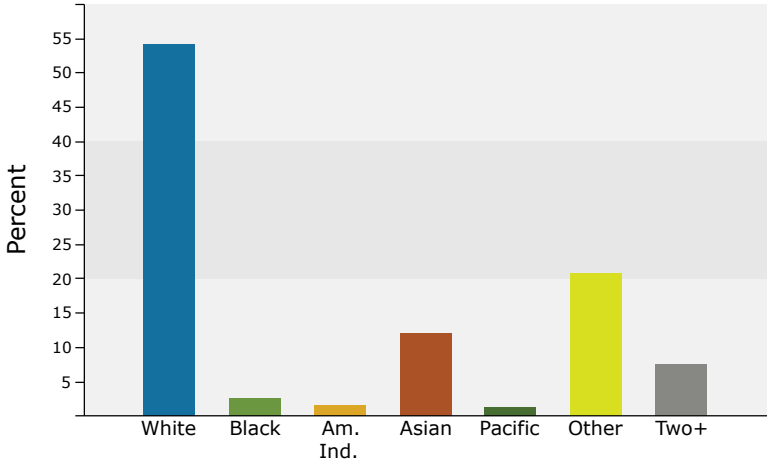
Population by Age



2020 Household Income



2020 Population by Race



2020 Percent Hispanic Origin:39.7%

Source: Esri, U.S. Census

February 04, 2021

APPENDIX G
SFPUC AND BAWSCA COMMON LANGUAGE FOR 2020 UWMPS

February 3, 2021

Draft Common Language for BAWSCA Member Agencies' 2020 UWMPs

Tier One Drought Allocations

In July 2009, San Francisco and its Wholesale Customers in Alameda County, Santa Clara County, and San Mateo County (Wholesale Customers) adopted the Water Supply Agreement (WSA), which includes a Water Shortage Allocation Plan (WSAP) that describes the method for allocating water from the Regional Water System (RWS) between Retail and Wholesale Customers during system-wide shortages of 20 percent or less. The WSAP, also known as the Tier One Plan, was amended in the 2018 Amended and Restated WSA.

The SFPUC allocates water under the Tier One Plan when it determines that the projected available water supply is up to 20 percent less than projected system-wide water purchases. The following table shows the SFPUC (i.e, Retail Customers) share and the Wholesale Customers' share of the annual water supply available during shortages depending on the level of system-wide reduction in water use that is required. The Wholesale Customers' share will be apportioned among the individual Wholesale Customers based on a separate methodology adopted by the Wholesale Customers, known as the Tier Two Plan, discussed further below.

Level of System-Wide Reduction in Water Use Required	Share of Available Water	
	SFPUC Share	Wholesale Customers Share
5% or less	35.5%	64.5%
6% through 10%	36.0%	64.0%
11% through 15%	37.0%	63.0%
16% through 20%	37.5%	62.5%

The Tier One Plan allows for voluntary transfers of shortage allocations between the SFPUC and any Wholesale Customer as well as between Wholesale Customers themselves. In addition, water "banked" by a Wholesale Customer, through reductions in usage greater than required, may also be transferred.

As amended in 2018, the Tier One Plan requires Retail Customers to conserve a minimum of 5% during droughts. If Retail Customer demands are lower than the Retail Customer allocation (resulting in a "positive allocation" to Retail[1]) then the excess percentage would be re-allocated to the Wholesale Customers' share. The additional water conserved by Retail Customers up to the minimum 5% level is deemed to remain in storage for allocation in future successive dry years.

The Tier One Plan will expire at the end of the term of the WSA in 2034, unless mutually extended by San Francisco and the Wholesale Customers.

The Tier One Plan applies only when the SFPUC determines that a system-wide water shortage exists and issues a declaration of a water shortage emergency under California Water Code

[1] See Water Supply Agreement, Water Shortage Allocation Plan (Attachment H), Section 2.1.

Section 350. Separate from a declaration of a water shortage emergency, the SFPUC may opt to request voluntary cutbacks from its Retail and Wholesale Customers to achieve necessary water use reductions during drought periods.

Tier Two Drought Allocations

The Wholesale Customers have negotiated and adopted the Tier Two Plan, referenced above, which allocates the collective Wholesale Customer share from the Tier One Plan among each of the 26 Wholesale Customers. These Tier Two allocations are based on a formula that takes into account multiple factors for each Wholesale Customer including:

- Individual Supply Guarantee;
- Seasonal use of all available water supplies; and
- Residential per capita use.

The water made available to the Wholesale Customers collectively will be allocated among them in proportion to each Wholesale Customer's Allocation Basis, expressed in millions of gallons per day (mgd), which in turn is the weighted average of two components. The first component is the Wholesale Customer's Individual Supply Guarantee, as stated in the WSA, and is fixed. The second component, the Base/Seasonal Component, is variable and is calculated using the monthly water use for three consecutive years prior to the onset of the drought for each of the Wholesale Customers for all available water supplies. The second component is accorded twice the weight of the first, fixed component in calculating the Allocation Basis. Minor adjustments to the Allocation Basis are then made to ensure a minimum cutback level, a maximum cutback level, and a sufficient supply for certain Wholesale Customers.

The Allocation Basis is used in a fraction, as numerator, over the sum of all Wholesale Customers' Allocation Bases to determine each wholesale customer's Allocation Factor. The final shortage allocation for each Wholesale Customer is determined by multiplying the amount of water available to the Wholesale Customers' collectively under the Tier One Plan, by the Wholesale Customer's Allocation Factor.

The Tier Two Plan requires that the Allocation Factors be calculated by BAWSCA each year in preparation for a potential water shortage emergency. As the Wholesale Customers change their water use characteristics (e.g., increases or decreases in SFPUC purchases and use of other water sources, changes in monthly water use patterns, or changes in residential per capita water use), the Allocation Factor for each Wholesale Customer will also change. However, for long-term planning purposes, each Wholesale Customer shall use as its Allocation Factor, the value identified in the Tier Two Plan when adopted.

The Tier Two Plan, which initially expired in 2018, has been extended by the BAWSCA Board of Directors every year since for one additional calendar year. In November 2020, the BAWSCA Board voted to extend the Tier Two Plan through the end of 2021.

Individual Supply Guarantee

San Francisco has a perpetual commitment (Supply Assurance) to deliver 184 mgd to the 24 permanent Wholesale Customers collectively. San Jose and Santa Clara are not included in the Supply Assurance commitment and each has temporary and interruptible water supply

contracts with San Francisco. The Supply Assurance is allocated among the 24 permanent Wholesale Customers through Individual Supply Guarantees (ISG), which represent each Wholesale Customer's allocation of the 184 mgd Supply Assurance.

[Name of Agency's] ISG is _____ mgd.

2028 SFPUC Decisions (formerly 2018 SFPUC Decisions)
[Note: This section is intended to be optional language that individual BAWSCA member agencies may use.]

In the 2009 WSA, the SFPUC committed to make three decisions before 2018 that affect water supply development:

- Whether or not to make the cities of San Jose and Santa Clara permanent customers,
- Whether or not to supply the additional unmet supply needs of the Wholesale Customers beyond 2018, and
- Whether or not to increase the wholesale customer Supply Assurance above 184 mgd.

Events since 2009 made it difficult for the SFPUC to conduct the necessary water supply planning and CEQA analysis required to make these three decisions before 2018. Therefore, in the 2018 Amended and Restated WSA, the decisions were deferred for 10 years to 2028.

Additionally, there have been recent changes to instream flow requirements and customer demand projections that have affected water supply planning beyond 2018. As a result, the SFPUC has established an Alternative Water Supply Planning program to evaluate several regional and local water supply options. Through this program, the SFPUC will conduct feasibility studies and develop an Alternative Water Supply Plan by July 2023 to support the continued development of water supplies to meet future needs.

Reliability of the Regional Water System

In 2008, the SFPUC adopted Level of Service (LOS) Goals and Objectives in conjunction with the adoption of WSIP. The SFPUC updated the LOS Goals and Objectives in February 2020.

The SFPUC's LOS Goals and Objectives related to water supply are:

Program Goal	System Performance Objective
Water Supply – *meet customer water needs in non-drought and drought periods*	• Meet all state and federal regulations to support the proper operation of the water system and related power facilities. • Meet average annual water demand of 265 mgd from the SFPUC watersheds for retail and Wholesale Customers during non–drought years for system demands consistent with the 2009 Water Supply Agreement. • Meet dry-year delivery needs while limiting rationing to a maximum 20 percent system-wide reduction in water service during extended droughts. • Diversify water supply options during non-drought and drought periods. • Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers.

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Factors Impacting Supply Reliability

Adoption of the 2018 Bay-Delta Plan Amendment

In December 2018, the State Water Resources Control Board (SWRCB) adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) to establish water quality objectives to maintain the health of the Bay-Delta ecosystem. The SWRCB is required by law to regularly review this plan. The adopted Bay-Delta Plan Amendment was developed with the stated goal of increasing salmonid populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay-Delta. The Bay-Delta Plan Amendment requires the release of 30-50% of the "unimpaired flow"[2] on the three tributaries from February through June in every year type. In SFPUC modeling of the new flow standard, it is assumed that the required release is 40% of unimpaired flow.

If the Bay-Delta Plan Amendment is implemented, the SFPUC will be able to meet the projected water demands presented in this UWMP in normal years but would experience supply shortages in single dry years or multiple dry years. Implementation of the Bay-Delta Plan Amendment will require rationing in all single dry years and multiple dry years. The SFPUC has initiated an Alternative Water Supply Planning Program to ensure that San Francisco can meet its Retail and Wholesale Customer water needs, address projected dry years shortages, and limit rationing to a maximum 20 percent system-wide in accordance with adopted SFPUC policies. This program is in early planning stages and is intended to meet future water supply challenges and vulnerabilities such as environmental flow needs and other regulatory changes; earthquakes, disasters, and emergencies; increases in population and employment; and climate

[2] "Unimpaired flow represents the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds." (Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Dec. 12, 2018) p.17, fn. 14, available at https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf.)

change. As the region faces future challenges – both known and unknown – the SFPUC is considering this suite of diverse non-traditional supplies and leveraging regional partnerships to meet Retail and Wholesale Customer needs through 2045.

The SWRCB has stated that it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, assuming all required approvals are obtained by that time. But implementation of the Plan Amendment is uncertain for multiple reasons.

First, since adoption of the Bay-Delta Plan Amendment, over a dozen lawsuits have been filed in both state and federal courts, challenging the SWRCB's adoption of the Bay-Delta Plan Amendment, including a legal challenge filed by the federal government, at the request of the U.S. Department of Interior, Bureau of Reclamation. This litigation is in the early stages and there have been no dispositive court rulings as of this date.

Second, the Bay-Delta Plan Amendment is not self-implementing and does not automatically allocate responsibility for meeting its new flow requirements to the SFPUC or any other water rights holders. Rather, the Bay-Delta Plan Amendment merely provides a regulatory framework for flow allocation, which must be accomplished by other regulatory and/or adjudicatory proceedings, such as a comprehensive water rights adjudication or, in the case of the Tuolumne River, may be implemented through the water quality certification process set forth in section 401 of the Clean Water Act as part of the Federal Energy Regulatory Commission's licensing proceedings for the Don Pedro and La Grange hydroelectric projects. It is currently unclear when the license amendment process is expected to be completed. This process and the other regulatory and/or adjudicatory proceedings would likely face legal challenges and have lengthy timelines, and quite possibly could result in a different assignment of flow responsibility (and therefore a different water supply impact on the SFPUC).

Third, in recognition of the obstacles to implementation of the Bay-Delta Plan Amendment, the SWRCB Resolution No. 2018-0059 adopting the Bay-Delta Plan Amendment directed staff to help complete a "Delta watershed-wide agreement, including potential flow measures for the Tuolumne River" by March 1, 2019, and to incorporate such agreements as an "alternative" for a future amendment to the Bay-Delta Plan to be presented to the SWRCB "as early as possible after December 1, 2019." In accordance with the SWRCB's instruction, on March 1, 2019, SFPUC, in partnership with other key stakeholders, submitted a proposed project description for the Tuolumne River that could be the basis for a voluntary substitute agreement with the SWRCB ("March 1st Proposed Voluntary Agreement"). On March 26, 2019, the Commission adopted Resolution No. 19-0057 to support the SFPUC's participation in the Voluntary Agreement negotiation process. To date, those negotiations are ongoing under the California Natural Resources Agency and the leadership of the Newsom administration.[3]

Water Supply – All Year Types

The SFPUC historically has met demand in its service area in all year types from its watersheds, which consist of:

- Tuolumne River watershed
- Alameda Creek watershed

[3] California Natural Resources Agency, "Voluntary Agreements to Improve Habitat and Flow in the Delta and its Watersheds," available at https://files.resources.ca.gov/voluntary-agreements/.

- San Mateo County watersheds

In general, 85 percent of the supply comes from the Tuolumne River through Hetch Hetchy Reservoir and the remaining 15 percent comes from the local watersheds through the San Antonio, Calaveras, Crystal Springs, Pilarcitos and San Andreas Reservoirs. The adopted WSIP retains this mix of water supply for all year types.

WSIP Dry Year Water Supply Projects

The WSIP authorized the SFPUC to undertake a number of water supply projects to meet dry-year demands with no greater than 20 percent system-wide rationing in any one year. Those projects include the following:

- **Calaveras Dam Replacement Project**

  Calaveras Dam is located near a seismically active fault zone and was determined to be seismically vulnerable. To address this vulnerability, the SFPUC constructed a new dam of equal height downstream of the existing dam. Construction on the project occurred between 2011 and July 2019. The SFPUC began impounding water behind the new dam in accordance with California Division of Safety of Dams (DSOD) guidance in the winter of 2018/2019.

- **Alameda Creek Recapture Project**

  As a part of the regulatory requirements for future operations of Calaveras Reservoir, the SFPUC must implement bypass and instream flow schedules for Alameda Creek. The Alameda Creek Recapture Project will recapture a portion of the water system yield lost due to the instream flow releases at Calaveras Reservoir or bypassed around the Alameda Creek Diversion Dam and return this yield to the RWS through facilities in the Sunol Valley. Water that naturally infiltrates from Alameda Creek will be recaptured into an existing quarry pond known as SMP (Surface Mining Permit)-24 Pond F2. The project will be designed to allow the recaptured water to be pumped to the Sunol Valley Water Treatment Plant or to San Antonio Reservoir. Construction of this project will occur from spring 2021 to fall 2022.

- **Lower Crystal Springs Dam Improvements**

  The Lower Crystal Springs Dam (LCSD) Improvements were substantially completed in November 2011. The joint San Mateo County/SFPUC Bridge Replacement Project to replace the bridge across the dam was completed in January 2019. A WSIP follow up project to modify the LCSD Stilling Basin for fish habitat and upgrade the fish water release and other valves started in April 2019. While the main improvements to the dam have been completed, environmental permitting issues for reservoir operation remain significant. While the reservoir elevation was lowered due to DSOD restrictions, the habitat for the Fountain Thistle, an endangered plant, followed the lowered reservoir elevation. Raising the reservoir elevation now requires that new plant populations be restored incrementally before the reservoir elevation is raised. The result is that it may be several years before pre-project water storage volumes can be restored.

- **Regional Groundwater Storage and Recovery Project**

  The Groundwater Storage and Recovery (GSR) Project is a strategic partnership between SFPUC and three San Mateo County agencies – the California Water Service Company (serving South San Francisco and Colma), the City of Daly City, and the City

of San Bruno – to conjunctively operate the south Westside Groundwater Basin. The project sustainably manages groundwater and surface water resources in a way that provides supplies during times of drought. During years of normal or heavy rainfall, the project would provide additional surface water to the partner agencies in San Mateo County in lieu of groundwater pumping. Over time, reduced pumping creates water storage through natural recharge of up to 20 billion gallons of new water supply available during dry years.

The project's Final Environmental Impact Report was certified in August 2014, and the project also received Commission approval that month. Phase 1 of this project consists of construction of thirteen well sites and is over 99 percent complete. Phase 2 of this project consists of completing construction of the well station at the South San Francisco Main site and some carryover work that has not been completed from Phase 1. Phase 2 design work began in December 2019.

- **2 mgd Dry-year Water Transfer**

  In 2012, the dry-year transfer was proposed between the Modesto Irrigation District and the SFPUC. Negotiations were terminated because an agreement could not be reached. Subsequently, the SFPUC had discussions with the Oakdale Irrigation District for a one-year transfer agreement with the SFPUC for 2 mgd (2,240 acre-feet). No progress towards agreement on a transfer was made in 2019, but the irrigation districts recognize SFPUC's continued interest and SFPUC will continue to pursue transfers.

In order to achieve its target of meeting at least 80 percent of its customer demand during droughts with a system demand of 265 mgd, the SFPUC must successfully implement the dry-year water supply projects included in the WSIP.

Furthermore, the permitting obligations for the Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements include a combined commitment of 12.8 mgd for instream flows on average. When this is reduced for an assumed Alameda Creek Recapture Project recovery of 9.3 mgd, the net loss of water supply is 3.5 mgd.

Alternative Water Supply Planning Program

The SFPUC is increasing and accelerating its efforts to acquire additional water supplies and explore other projects that would increase overall water supply resilience through the Alternative Water Supply Planning Program. The drivers for the program include: (1) the adoption of the Bay-Delta Plan Amendment and the resulting potential limitations to RWS supply during dry years, (2) the net supply shortfall following the implementation of WSIP, (3) San Francisco's perpetual obligation to supply 184 MGD to the Wholesale Customers, (4) adopted Level of Service Goals to limit rationing to no more than 20 percent system-wide during droughts, and (5) the potential need to identify water supplies that would be required to offer permanent status to interruptible customers. Developing additional supplies through this program would reduce water supply shortfalls and reduce rationing associated with such shortfalls. The planning priorities guiding the framework of the Alternative Water Supply Planning Program are as follows:

1. Offset instream flow needs and meet regulatory requirements
2. Meet existing obligations to existing permanent customers
3. Make interruptible customers permanent
4. Meet increased demands of existing and interruptible customers

In conjunction with these planning priorities, the SFPUC considers how the program fits within the LOS Goals and Objectives related to water supply and sustainability when considering new water supply opportunities. The key LOS Goals and Objectives relevant to this effort can be summarized as:

- Meet dry-year delivery needs while limiting rationing to a maximum of 20 percent system-wide reduction in water service during extended droughts;
- Diversify water supply options during non-drought and drought periods;
- Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers;
- Meet, at a minimum, all current and anticipated legal requirements for protection of fish and wildlife habitat;
- Maintain operational flexibility (although this LOS Goal was not intended explicitly for the addition of new supplies, it is applicate here).

Together, the planning priorities and LOS Goals and Objectives provide a lens through which the SFPUC considers water supply options and opportunities to meet all foreseeable water supply needs.

In addition to the Daly City Recycled Water Expansion project[4], which was a potential project identified in the 2015 UWMP and had committed funding at that time, the SFPUC has taken action to fund the study of potential additional water supply projects. Capital projects under consideration to develop additional water supplies include surface water storage expansion, recycled water expansion, water transfers, desalination, and potable reuse. A more detailed list and descriptions of these efforts are provided below.

The capital projects that are under consideration would be costly and are still in the early feasibility or conceptual planning stages. Because these water supply projects would take 10 to 30 years to implement, and because required environmental permitting negotiations may reduce the amount of water that can be developed, the yield from these projects are not currently incorporated into SFPUC's supply projections. State and federal grants and other financing opportunities would be pursued for eligible projects, to the extent feasible, to offset costs borne by ratepayers.

- **Daly City Recycled Water Expansion** (Regional, Normal- and Dry-Year Supply)

  This project can produce up to 3 mgd of tertiary recycled water during the irrigation season (~7 months). On an average annual basis, this is equivalent to 1.25 mgd or 1,400 acre-feet per year. The project is envisioned to provide recycled water to 13 cemeteries and other smaller irrigation customers, offsetting existing groundwater pumping from the South Westside Groundwater Basin; this will free up groundwater, enhancing the reliability of the Basin. The project is a regional partnership between the SFPUC and Daly City. The irrigation customers are located largely within California Water Service's (Cal Water's) service area. RWS customers will benefit from the increased reliability of the South Westside Basin for additional drinking water supply during droughts. In this way, this project supports the GSR Project, which is under construction.

[4] While this potential project was identified in the 2015 UWMP, it has since been approved by Daly City following environmental review and has a higher likelihood of being implemented.

- **ACWD-USD Purified Water Partnership** (Regional, Normal- and Dry-Year Supply)

  This project could provide a new purified water supply utilizing Union Sanitary District's (USD) treated wastewater. Purified water produced by advanced water treatment at USD could be transmitted to the Quarry Lakes Groundwater Recharge Area to supplement recharge into the Niles Cone Groundwater Basin or put to other uses in Alameda County Water District's (ACWD) service area. With the additional water supply to ACWD, an in-lieu exchange with the SFPUC would result in more water left in the RWS. Additional water supply could also be directly transmitted to the SFPUC through a new intertie between ACWD and the SFPUC.

- **Crystal Springs Purified Water** (Regional, Normal- and Dry-Year Supply)

  The Crystal Springs Purified Water (PREP) Project is a purified water project that could provide 6-12 mgd of water supply through reservoir water augmentation at Crystal Springs Reservoir, which is a facility of the RWS. Treated wastewater from Silicon Valley Clean Water (SVCW) and/or the City of San Mateo would go through an advanced water treatment plant to produce purified water that meets state and federal drinking water quality standards. The purified water would then be transmitted 10-20 miles (depending on the alignment) to Crystal Springs Reservoir, blended with regional surface water supplies and treated again at Harry Tracy Water Treatment Plant. Project partners include the SFPUC, BAWSCA, SVCW, CalWater, Redwood City, Foster City, and the City of San Mateo. Partner agencies are contributing financial and staff resources towards the work effort.

- **Los Vaqueros Reservoir Expansion** (Regional, Dry Year Supply)

  The Los Vaqueros Reservoir Expansion (LVE) Project is a storage project that will enlarge the existing reservoir located in northeastern Contra Costa County from 160,000 acre-feet to 275,000 acre-feet. While the existing reservoir is owned and operated by the Contra Costa Water District (CCWD), the expansion will have regional benefits and will be managed by a Joint Powers Authority (JPA) that will be set up prior to construction. Meanwhile, CCWD is leading the planning, design and environmental review efforts. CCWD's Board certified the EIS/EIR and approved the LVE Project on May 13, 2020. The additional storage capacity from the LVE Project would provide a dry year water supply benefit to the SFPUC. BAWSCA is working in concert with the SFPUC to support their work effort on the LVE project.
    - **Conveyance Alternatives:** The SFPUC is considering two main pathways to move water from storage in a prospective LVE Project to the SFPUC's service area, either directly to RWS facilities or indirectly via an exchange with partner agencies. The SFPUC is evaluating potential alignments for conveyance.
    - **Bay Area Regional Reliability Shared Water Access Program (BARR SWAP):** As part of the BARR Partnership, a consortium of 8 Bay Area water utilities (including ACWD, BAWSCA, CCWD, EBMUD, Marin Municipal Water District (MMWD), SFPUC, Valley Water, and Zone 7 Water Agency) are exploring opportunities to move water across the region as efficiently as possible, particularly during times of drought and emergencies. The BARR agencies are proposing two separate pilot projects in 2020-2021 through the Shared Water Access Program (SWAP) to test conveyance pathways and identify potential hurdles to better prepare for sharing water during a future drought or emergency. A strategy report identifying opportunities and considerations will accompany these pilot transfers and will be completed in 2021.

- **Bay Area Brackish Water Desalination** (Regional, Normal- and Dry-Year Supply)

  The Bay Area Brackish Water Desalination (Regional Desalination) Project is a partnership between CCWD, the SFPUC, Valley Water, and Zone 7 Water Agency. East Bay Municipal Utilities District (EBMUD) and ACWD may also participate in the project. The project could provide a new drinking water supply to the region by treating brackish water from CCWD's existing Mallard Slough intake in Contra Costa County. While this project has independent utility as a water supply project, for the current planning effort the SFPUC is considering it as a source of supply for storage in LVE. While the allocations remain to be determined among partners, the SFPUC is considering a water supply benefit of between 5 and 15 mgd during drought conditions when combined with storage at LVE.

- **Calaveras Reservoir Expansion** (Regional, Dry Year Supply)

  Calaveras Reservoir would be expanded to create 289,000 AF additional capacity to store excess Regional Water System supplies or other source water in wet and normal years. In addition to reservoir enlargement, the project would involve infrastructure to pump water to the reservoir, such as pump stations and transmission facilities.

- **Groundwater Banking**

  Groundwater banking in the Modesto Irrigation District (MID) and Turlock Irrigation District (TID) service areas could be used to provide some additional water supply to meet instream releases in dry years reducing water supply impacts to the SFPUC service area. For example, additional surface water could be provided to irrigators in wet years, which would offset the use of groundwater, thereby allowing the groundwater to remain in the basin rather than be consumptively used. The groundwater that remains in the basin can then be used in a subsequent dry year for irrigation, freeing up surface water that would have otherwise been delivered to irrigators to meet instream flow requirements.

  A feasibility study of this option is included in the proposed Tuolumne River Voluntary Agreement. Progress on this potential water supply option will depend on the negotiations of the Voluntary Agreement.

- **Inter-Basin Collaborations**

  Inter-Basin Collaborations could provide net water supply benefits in dry years by sharing responsibility for in-stream flows in the San Joaquin River and Delta more broadly among several tributary reservoir systems. One mechanism by which this could be accomplished would be to establish a partnership between interests on the Tuolumne River and those on the Stanislaus River, which would allow responsibility for streamflow to be assigned variably based on the annual hydrology.

  As is the case with Groundwater Banking, feasibility of this option is included in the proposed Tuolumne River Voluntary Agreement.

If all the projects identified through the current planning process can be implemented, there would still be a supply shortfall to meet projected needs. Furthermore, each of the supply options being considered has its own inherent challenges and uncertainties that may affect the SFPUC’s ability to implement it.

Given the limited availability of water supply alternatives - unless the supply risks are significantly reduced or our needs change significantly - the SFPUC will continue to plan,

develop and implement all project opportunities that can help bridge the anticipated water supply gaps during droughts. In 2019, the SFPUC completed a survey among water and wastewater agencies within the service area to identify additional opportunities for purified water. Such opportunities remain limited, but the SFPUC continues to pursue all possibilities.

Projected SFPUC Regional Water System Supply Reliability

The SFPUC will provide tables presenting the projected RWS supply reliability under normal, single dry year, and multiple dry year scenarios.

Climate Change

The issue of climate change has become an important factor in water resources planning in the State, and is frequently considered in urban water management planning processes, though the extent and precise effects of climate change remain uncertain. There is convincing evidence that increasing concentrations of greenhouse gasses have caused and will continue to cause a rise in temperatures around the world, which will result in a wide range of changes in climate patterns. Moreover, observational data show that a warming trend occurred during the latter part of the 20th century and virtually all projections indicate this will continue through the 21st century. These changes will have a direct effect on water resources in California, and numerous studies have been conducted to determine the potential impacts to water resources. Based on these studies, climate change could result in the following types of water resource impacts, including impacts on the watersheds in the Bay Area:

- Reductions in the average annual snowpack due to a rise in the snowline and a shallower snowpack in the low and medium elevation zones, such as in the Tuolumne River basin, and a shift in snowmelt runoff to earlier in the year;
- Changes in the timing, annual average, intensity and variability of precipitation, and an increased amount of precipitation falling as rain rather than snow;
- Long-term changes in watershed vegetation and increased incidence of wildfires that could affect water quality and quantity;
- Sea level rise and an increase in saltwater intrusion;
- Increased water temperatures with accompanying potential adverse effects on some fisheries and water quality;
- Increases in evaporation and concomitant increased irrigation need; and
- Changes in urban and agricultural water demand.

Both the SFPUC and BAWSCA participated in the 2020 update of the Bay Area Integrated Regional Water Management Plan (BAIRWMP), which includes an assessment of the potential climate change vulnerabilities of the region's water resources and identifies climate change adaptation strategies. In addition, the SFPUC continues to study the effect of climate change on the Regional Water System (RWS). These works are summarized below.

Bay Area Integrated Regional Water Management Plan

Climate change adaptation continues to be an overarching theme for the 2019 BAIRWMP update. As stated in the BAIRWMP, identification of watershed characteristics that could

potentially be vulnerable to future climate change is the first step in assessing vulnerabilities of water resources in the Bay Area Region (Region). Vulnerability is defined as the degree to which a system is exposed to, susceptible to, and able to cope with or adjust to, the adverse effects of climate change. A vulnerability assessment was conducted in accordance with the Department of Water Resources' (DWR's) *Climate Change Handbook for Regional Water Planning* and using the most current science available for the Region. The vulnerability assessment, summarized in the table below, provides the main water planning categories applicable to the Region and a general overview of the qualitative assessment of each category with respect to anticipated climate change impacts.

Summary of BAIRWMP Climate Change Vulnerability Assessment

Vulnerability Areas	General Overview of Vulnerabilities
Water Demand	**Urban and Agricultural Water Demand** – Changes to hydrology in the Region as a result of climate change could lead to changes in total water demand and use patterns. Increased irrigation (outdoor landscape or agricultural) is anticipated to occur with temperature rise, increased evaporative losses due to warmer temperature, and a longer growing season. Water treatment and distribution systems are most vulnerable to increases in maximum day demand.
Water Supply	**Imported Water** – Imported water derived from the Sierra Nevada sources and Delta diversions provide 66 percent of the water resources available to the Region. Potential impacts on the availability of these sources resulting from climate change directly affect the amount of imported water supply delivered to the Region. **Regional Surface Water** – Although future projections suggest that small changes in total annual precipitation over the Region will not change much, there may be changes to when precipitation occurs with reductions in the spring and more intense rainfall in the winter. **Regional Groundwater** – Changes in local hydrology could affect natural recharge to the local groundwater aquifers and the quantity of groundwater that could be pumped sustainably over the long-term in some areas. Decreased inflow from more flashy or more intense runoff, increased evaporative losses and warmer and shorter winter seasons can alter natural recharge of groundwater. Salinity intrusion into coastal groundwater aquifers due to sea-level rise could interfere with local groundwater uses. Furthermore, additional reductions in imported water supplies would lead to less imported water available for managed recharge of local groundwater basins and potentially more groundwater pumping in lieu of imported water availability.
Water Quality	**Imported Water** – For sources derived from the Delta, sea-level rise could result in increases in chloride and bromide (a disinfection by-product (DBP) precursor that is also a component of sea water),

Vulnerability Areas	General Overview of Vulnerabilities
	potentially requiring changes in treatment for drinking water. Increased temperature could result in an increase in algal blooms, taste and odor events, and a general increase in DBP formation **Regional Surface Water** – Increased temperature could result in lower dissolved oxygen in streams and prolong thermocline stratification in lakes and reservoirs forming anoxic bottom conditions and algal blooms. Decrease in annual precipitation could result in higher concentrations of contaminants in streams during droughts or in association with flushing rain events. Increased wildfire risk and flashier or more intense storms could increase turbidity loads for water treatment. **Regional Groundwater** – Sea-level rise could result in increases in chlorides and bromide for some coastal groundwater basins in the Region. Water quality changes in imported water used for recharge could also impact groundwater quality.
Sea-Level Rise	Sea-level rise is additive to tidal range, storm surges, stream flows, and wind waves, which together will increase the potential for higher total water levels, overtopping, and erosion. Much of the bay shoreline is comprised of low-lying diked baylands which are already vulnerable to flooding. In addition to rising mean sea level, continued subsidence due to tectonic activity will increase the rate of relative sea-level rise. As sea-level rise increases, both the frequency and consequences of coastal storm events, and the cost of damage to the built and natural environment, will increase. Existing coastal armoring (including levees, breakwaters, and other structures) is likely to be insufficient to protect against projected sea-level rise. Crest elevations of structures will have to be raised or structures relocated to reduce hazards from higher total water levels and larger waves.
Flooding	Climate change projections are not sensitive enough to assess localized flooding, but the general expectation is that more intense storms would occur thereby leading to more frequent, longer and deeper flooding. Changes to precipitation regimes may increase flooding. Elevated Bay elevations due to sea-level rise will increase backwater effects exacerbating the effect of fluvial floods and storm drain backwater flooding.

Vulnerability Areas	General Overview of Vulnerabilities
Ecosystem and Habitat	Changes in the seasonal patterns of temperature, precipitation, and fire due to climate change can dramatically alter ecosystems that provide habitats for California's native species. These impacts can result in species loss, increased invasive species ranges, loss of ecosystem functions, and changes in vegetation growing ranges. Reduced rain and changes in the seasonal distribution of rainfall may alter timing of low flows in streams and rivers, which in turn would have consequences for aquatic ecosystems. Changes in rainfall patterns and air temperature may affect water temperatures, potentially affecting coldwater aquatic species. Bay Area ecosystems and habitat provide important ecosystem services, such as: carbon storage, enhanced water supply and quality, flood protection, food and fiber production. Climate change is expected to substantially change several of these services. The region provides substantial aquatic and habitat-related recreational opportunities, including: fishing, wildlife viewing, and wine industry tourism (a significant asset to the region) that may be at risk due to climate change effects.
Hydropower	Currently, several agencies in the Region produce or rely on hydropower produced outside of the Region for a portion of their power needs. As the hydropower is produced in the Sierra, there may be changes in the future in the timing and amount of energy produced due to changes in the timing and amount of runoff as a result of climate change. Some hydropower is also produced within the region and could also be affected by changes in the timing and amount of runoff.

Source: 2019 Bay Area Integrated Regional Water Management Plan (BAIRWMP), Table 16-3.

SFPUC Climate Change Studies

The SFPUC views assessment of the effects of climate change as an ongoing project requiring regular updating to reflect improvements in climate science, atmospheric/ocean modeling, and human response to the threat of greenhouse gas emissions. Climate change research by the SFPUC began in 2009 and continues to be refined. In its 2012 report "Sensitivity of Upper Tuolumne River Flow to Climate Change Scenarios," the SFPUC assessed the sensitivity of runoff into Hetch Hetchy Reservoir to a range of changes in temperature and precipitation due to climate change. Key conclusions from the report include the following:

- With differing increases in temperature alone, the median annual runoff at Hetch Hetchy would decrease by 0.7-2.1% from present-day conditions by 2040 and by 2.6-10.2% from

present-day by 2100. Adding differing decreases in precipitation on top of temperature increases, the median annual runoff at Hetch Hetchy would decrease by 7.6-8.6% from present-day conditions by 2040 and by 24.7-29.4% from present-day conditions by 2100.

- In critically dry years, these reductions in annual runoff at Hetch Hetchy would be significantly greater, with runoff decreasing up to 46.5% from present day conditions by 2100 utilizing the same climate change scenarios.
- In addition to the total change in runoff, there will be a shift in the annual distribution of runoff. Winter and early spring runoff would increase and late spring and summer runoff would decrease.
- Under all scenarios, snow accumulation would be reduced and snow would melt earlier in the spring, with significant reductions in maximum peak snow water equivalent under most scenarios.

Currently, the SFPUC is conducting a comprehensive assessment of the potential effects of climate change on water supply using a wide range of plausible increases in temperature and changes in precipitation to address the wide uncertainty in climate projections over the planning horizon 2020 to 2070. There are many uncertain factors such as climate change, changing regulations, water quality, growth and economic cycles that may create vulnerabilities for the Regional Water System's ability to meet levels of service. The uncertainties associated with the degree to which these factors will occur and how much risk they present to the water system is difficult to predict, but nonetheless they need to be considered in SFPUC planning. To address this planning challenge, the project uses a vulnerability-based planning approach to explore a range of future conditions to identify vulnerabilities, assess the risks associated with these vulnerabilities that could lead to developing an adaptation plan that is flexible and robust to a wide range of future outcomes.

Common Language for BAWSCA Member Agencies'

2020 UWMP Updates

BAWSCA

Description of BAWSCA

BAWSCA provides regional water reliability planning and conservation programming for the benefit of its 26 member agencies that purchase wholesale water supplies from the San Francisco Public Utilities Commission (SFPUC). Collectively, the BAWSCA member agencies deliver water to over 1.8 million residents and nearly 40,000 commercial, industrial and institutional accounts in Alameda, San Mateo and Santa Clara Counties.

BAWSCA also represents the collective interests of these wholesale water customers on all significant technical, financial, and policy matters related to the operation and improvement of the SFPUC's Regional Water System (RWS).

BAWSCA's role in the development of the 2020 Urban Water Management Plan (UWMP) updates is to work with its member agencies and the SFPUC to seek consistency among UWMP documents.

Regional Water Demand and Conservation Projections

In June 2020, BAWSCA completed the Regional Water Demand and Conservation Projections Report (Demand Study).[1] The goal of the Demand Study was to develop transparent, defensible, and uniform demand and conservation savings projections for each Wholesale Customer using a common methodology to support both regional and individual agency planning efforts and compliance with the new statewide water efficiency targets required by Assembly Bill (AB) 1668 and Senate Bill (SB) 606.

Through the Demand Study process, BAWSCA and the Wholesale Customers (1) quantified the total average-year water demand for each BAWSCA member agency through 2045, (2) quantified passive and active conservation water savings potential for each individual Wholesale Customer through 2045, and (3) identified 24 conservation programs with high water savings potential and/or member agency interest. Implementation of these conservation measures, along with passive conservation, is anticipated to yield an additional 37.3 MGD of water savings by 2045. Based on the revised water demand projections, the identified water conservation savings, increased development and use of other local supplies by the Wholesale Customers, and other actions, the collective purchases of the BAWSCA member agencies from the SFPUC are projected to stay below 184 MGD through 2045.

As part of the Demand Study, each Wholesale Customer was provided with a demand model that can be used to support ongoing demand and conservation planning efforts, including UWMP preparation.

[1] Phase III Final Report: http://bawsca.org/uploads/pdf/BAWSCA_Regional_Water_Demand_and_Conservation%20Projections%20Report_Final.pdf

Long-Term Reliable Water Supply Strategy

BAWSCA's Long-Term Reliable Water Supply Strategy (Strategy), completed in February 2015, quantified the water supply reliability needs of the BAWSCA member agencies through 2040, identified the water supply management projects and/or programs (projects) that could be developed to meet those needs, and prepared an implementation plan for the Strategy's recommendations.

When the 2015 Demand Study concluded it was determined that while there is no longer a regional normal year supply shortfall, there was a regional drought year supply shortfall of up to 43 MGD. In addition, key findings from the Strategy's project evaluation analysis included:

- Water transfers represent a high priority element of the Strategy.
- Desalination potentially provides substantial yield, but its high effective costs and intensive permitting requirements make it a less attractive drought year supply alternative.
- Other potential regional projects provide tangible, though limited, benefit in reducing dry-year shortfalls given the small average yields in drought years.

Since 2015, BAWSCA has completed a comprehensive update of demand projections and engaged in significant efforts to improve regional reliability and reduce the dry-year water supply shortfall.

Water Transfers. BAWSCA successfully facilitated two transfers of portions of Individual Supply Guarantee (ISG) between BAWSCA agencies in 2017 and 2018. Such transfers benefit all BAWSCA agencies by maximizing use of existing supplies. BAWSCA is currently working on an amendment to the Water Supply Agreement between the SFPUC and BAWSCA agencies to establish a mechanism by which member agencies that have an ISG may participate in expedited transfers of a portion of ISG and a portion of a Minimum Annual Purchase Requirement. In 2019, BAWSCA participated in a pilot water transfer that, while ultimately unsuccessful, surfaced important lessons learned and produced interagency agreements that will serve as a foundation for future transfers. BAWSCA is currently engaged in the Bay Area Regional Reliability Partnership[2] (BARR), a partnership among eight Bay Area water utilities (including the SFPUC, Alameda County Water District, BAWSCA, Contra Costa Water District, Santa Clara Valley Water District) to identify opportunities to move water across the region as efficiently as possible, particularly during times of drought and emergencies.

Regional Projects. Since 2015, BAWSCA has coordinated with local and State agencies on regional projects with potential dry-year water supply benefits for BAWSCA's agencies. These efforts include storage projects, indirect/direct water reuse projects, and studies to evaluate the capacity and potential for various conveyance systems to bring new supplies to the region.

BAWSCA continues to implement the Strategy recommendations in coordination with BAWSCA member agencies. Strategy implementation will be adaptively managed to account for changing conditions and to ensure that the goals of the Strategy are met in an efficient and cost-effective manner. On an annual basis, BAWSCA will reevaluate Strategy recommendations and results in conjunction with development of the BAWSCA's FY 2021-22 Work Plan. In this way, actions can be modified to accommodate changing conditions and new developments.

[2] https://www.bayareareliability.com/

Making Conservation a Way of Life Strategic Plan

Following the 2014-2016 drought, the State of California (State) developed the "Making Water Conservation a California Way of Life" framework to address the long-term water use efficiency requirements called for in executive orders issued by Governor Brown. In May of 2018, AB 1668 and SB 606 (collectively referred to as the efficiency legislation) went into effect, which built upon the executive orders implementing new urban water use objectives for urban retail water suppliers.

BAWSCA led its member agencies in a multi-year effort to develop and implement a strategy to meet these new legislative requirements. BAWSCA's Making Conservation a Way of Life Strategic Plan (Strategic Plan) provided a detailed roadmap for member agencies to improve water efficiency. BAWSCA implementing the following elements of the Strategic Plan:

- Conducted an assessment of the agencies' current practices and water industry best practices for three components of the efficiency legislation that, based on a preliminary review, present the greatest level of uncertainty and potential risk to the BAWSCA agencies. The three components were:
    1. Development of outdoor water use budgets in a manner that incorporates landscape area, local climate, and new satellite imagery data.
    2. Commercial, Industrial, and Institutional water use performance measures.
    3. Water loss requirements.
- Organized an Advanced Metering Infrastructure symposium to enable information exchange, including case studies, implementation strategies, and data analysis techniques.
- Initiated a regional CII audit pilot program, which BAWSCA aims to complete in 2021.[3]
- Implemented a regional program for water loss control to help BAWSCA agencies comply with regulatory requirements and implement cost-effective water loss interventions.
- Engaged with the SFPUC to audit meter testing and calibration practices for SFPUC's meters at BAWSCA agency turnouts.

Finally, BAWSCA's Demand Study developed water demand and conservation projections through 2045 for each BAWSCA agency. These projects are designed to provide valuable insights on long-term water demand patterns and conservation savings potential to support regional efforts, such as implementation of BAWSCA's Long-Term Reliable Water Supply Strategy.

[3] Efforts on the CII audit pilot program stalled in March 2020 due to the COVID 19 pandemic and related shelter-in-place orders.

Tier Two Drought Allocations

The Wholesale Customers have negotiated and adopted the Tier Two Plan, referenced above, which allocates the collective Wholesale Customer share from the Tier One Plan among each of the 26 Wholesale Customers. These Tier Two allocations are based on a formula that takes into account multiple factors for each Wholesale Customer including:

- Individual Supply Guarantee;
- Seasonal use of all available water supplies; and
- Residential per capita use.

The water made available to the Wholesale Customers collectively will be allocated among them in proportion to each Wholesale Customer's Allocation Basis, expressed in millions of gallons per day (mgd), which in turn is the weighted average of two components. The first component is the Wholesale Customer's Individual Supply Guarantee, as stated in the WSA, and is fixed. The second component, the Base/Seasonal Component, is variable and is calculated using the monthly water use for three consecutive years prior to the onset of the drought for each of the Wholesale Customers for all available water supplies. The second component is accorded twice the weight of the first, fixed component in calculating the Allocation Basis. Minor adjustments to the Allocation Basis are then made to ensure a minimum cutback level, a maximum cutback level, and a sufficient supply for certain Wholesale Customers.

The Allocation Basis is used in a fraction, as numerator, over the sum of all Wholesale Customers' Allocation Bases to determine each Wholesale Customer's Allocation Factor. The final shortage allocation for each Wholesale Customer is determined by multiplying the amount of water available to the Wholesale Customers' collectively under the Tier One Plan, by the Wholesale Customer's Allocation Factor.

The Tier Two Plan requires that the Allocation Factors be calculated by BAWSCA each year in preparation for a potential water shortage emergency. As the Wholesale Customers change their water use characteristics (e.g., increases or decreases in SFPUC purchases and use of other water sources, changes in monthly water use patterns, or changes in residential per capita water use), the Allocation Factor for each Wholesale Customer will also change. However, for long-term planning purposes, each Wholesale Customer shall use as its Allocation Factor, the value identified in the Tier Two Plan when adopted.

Per WSA Section 3.11, the Tier One and Tier Two Plans will be used to allocate water from the Regional Water System between Retail and Wholesale Customers during system-wide shortages of 20% or less. For Regional Water System shortages in excess of 20%, San Francisco shall (a) follow the Tier 1 Shortage Plan allocations up to the 20% reduction, (b) meet and discuss how to implement incremental reductions above 20% with the Wholesale Customers, and (c) make a final determination of allocations above the 20% reduction. After the SFPUC has made the final allocation decision, the Wholesale Customers shall be free to challenge the allocation on any applicable legal or equitable basis. For purposes of the 2020 UWMPs, for San Francisco Regional Water System (RWS) shortages in excess of 20%, the allocations among the Wholesale Customers is assumed to be equivalent among them and to equal the drought cutback to Wholesale Customer by the SFPUC.

The Tier Two Plan, which initially expired in 2018, has been extended by the BAWSCA Board of Directors every year since for one additional calendar year. In November 2020, the BAWSCA Board voted to extend the Tier Two Plan through the end of 2021.

SFPUC's Efforts to Develop of Alternative Water Supplies

With the adoption of the Bay-Delta Plan Phase 1 (Bay-Delta Plan) by the State Water Resources Control Board in December of 2018, coupled with the uncertainties associated with litigation and the development of Voluntary Agreements that, if successful, would provide an alternative to the 40% unimpaired flow requirement that is required by the Bay-Delta Plan, BAWSCA redoubled its efforts to ensure that the SFPUC took necessary action to develop alternative water supplies such that they would be in place to fill any potential gap in supply by implementation of the Bay-Delta Plan and that the SFPUC would be able to meet its legal and contractual obligations to its Wholesale Customers.

In 2019, BAWSCA held numerous meetings with the SFPUC encouraging them to develop a division within their organization whose chief mission was to spearhead alternative water supply development. On June 25, 2019, BAWSCA provided a written and oral statement to the Commissioners urging the SFPUC to focus on developing new sources of supply in a manner similar to how it addressed the implementation of the Water System Improvement Program (WSIP). BAWSCA urged that a new water supply program was called for, with clear objectives, persistent focus, a dedicated team, adequate funding, and a plan for successful execution. The SFPUC Commission supported BAWSCA's recommendation and directed staff to undertake such an approach.

In early 2020, the SFPUC began implementation of the Alternative Water Supply Planning Program (AWSP), a program designed to investigate and plan for new water supplies to address future long-term water supply reliability challenges and vulnerabilities on the RWS.

Included in the AWSP is a suite of diverse, non-traditional supply projects that, to a great degree, leverage regional partnerships and are designed to meet the water supply needs of the SFPUC Retail and Wholesale Customers through 2045. As of the most recent Alternative Water Supply Planning Quarterly Update, SFPUC has budgeted $264 million over the next ten years to fund water supply projects. BAWSCA is heavily engaged with the SFPUC on its AWSS efforts.

BAWSCA Conservation Programs

BAWSCA manages a Regional Water Conservation Program comprised of several programs and initiatives that support and augment member agencies' and customers' efforts to use water more efficiently. These efforts extend limited water supplies that are available to meet both current and future water needs; increase drought reliability of the existing water system; and save money for both the member agencies and their customers.

The implementation of the Regional Water Conservation Program builds upon both the Water Conservation Implementation Plan (WCIP, completed in September 2009) and the Regional Demand and Conservation Projections Project (Demand Study, completed in June of 2020). These efforts include both Core Programs (implemented regionally throughout the BAWSCA service area) and Subscription Programs (funded by individual member agencies that elect to participate and implement them within their respective service areas).

BAWSCA's Core Conservation Programs include organizing classes open to the public on topics such as water efficient landscape education and water-wise gardening, assistance related to automated metering infrastructure, and other associated programs that work to promote smart water use and practices. BAWSCA's Subscription Programs include numerous rebate programs, educational programs that can be offered to area schools, technical assistance to member agencies in evaluating water loss, and programs to train and certify contractors employed to install water efficient landscape. In total, BAWSCA offers 22 programs to its member agencies and that number continues to grow over time.

Each fiscal year, BAWSCA prepares an Annual Water Conservation Report that documents how all of BAWSCA's 26 member agencies have benefitted from the Core Conservation Programs. Additionally, the report highlights how all 26 member agencies participate in one or more of the Subscription Programs offered by BAWSCA, such as rebates, water loss management and large landscape audits. The Demand Study indicates that through a combination of active and passive conservation, 37.3 MGD will be conserved by BAWSCA's member agencies by 2045.
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7. Additional language requested by the Member Agencies

SFPUC's Decision to use With Bay-Delta Plan Scenario in UWMP Submittal Tables

The adoption of the Bay-Delta Plan Amendment may significantly impact the supply available from the RWS. SFPUC recognizes that the Bay-Delta Plan Amendment has been adopted and that, given that it is now state law, we must plan for a future in which it is fully implemented. SFPUC also acknowledges that the plan is not self-implementing and therefore does not automatically go into effect. SFPUC is currently pursuing a voluntary agreement as well as a lawsuit which would limit implementation of the Plan. With both of these processes occurring on an unknown timeline, SFPUC does not know at this time when the Bay-Delta Plan Amendment is likely to go into effect. As a result, it makes sense to conduct future supply modeling for a scenario that doesn't include implementation of the Bay-Delta Plan Amendment, as that represents a potential supply reliability scenario.

Because of the uncertainty surrounding implementation of the Bay-Delta Plan Amendment, the SFPUC conducted water service reliability assessment that includes: (1) a scenario in which the Bay-Delta Plan Amendment is fully implemented in 2023, and (2) a scenario that considers the SFPUC system's current situation without the Bay-Delta Plan Amendment. The two scenarios provide a bookend for the possible future scenarios regarding RWS supplies. The standardized tables associated with the SFPUC's UWMP contain the future scenario that assumes implementation of the Bay-Delta Plan Amendment starting in 2023.

Bay-Delta Plan Implementation Starting Year

Because of the uncertainty surrounding implementation of the Bay-Delta Plan Amendment, the water service reliability assessment presented in the SFPUC's draft UWMP looks at two future supply scenarios, both with and without implementation of the Bay-Delta Plan Amendment. Although the SWRCB has stated it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, given the current level of uncertainty, it is assumed for the purposes of the SFPUC's draft UWMP that the Bay-Delta Plan Amendment will be fully implemented starting in 2023.

SFPUC's Decision to Present Both Modeling Results in its UWMP

A key input for the HHLSM model is the anticipated level of demand on the RWS. Supply modeling results presented in the text of the SFPUC's UWMP reflect an input of projected demands on the RWS consisting of (1) projected retail demands on the RWS (total retail demands minus local groundwater and recycled water supplies), and (2) projected Wholesale Customer purchases. The SFPUC has a Level of Service objective of meeting average annual water demand of 265 mgd from the SFPUC watersheds for retail and Wholesale Customers during non-drought years, as well as a contractual obligation to supply 184 mgd to the Wholesale Customers. Therefore, the SFPUC has also conducted modeling based on a demand of 265 mgd in order to facilitate planning that supports meeting this Level of Service goal and their contractual obligations.

APPENDIX H
LETTERS FROM MPWD TO BAWSCA AND SFPUC

Public Works

CITY OF MENLO PARK

March 3, 2017

Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
Cal/EPA Headquarters
1001 "I" Street, 24th Floor
Sacramento, CA 95814-0100
commentletters@waterboards.ca.gov

Re: Comment Letter – 2016 Bay-Delta Plan Amendment & SED

Dear Ms. Townsend:

We are submitting the following comments regarding the *Recirculated Draft Substitute Environmental Document in Support of Potential Changes to the Water Quality Control Plan for the San Francisco Bay-Sacramento/San Joaquin Delta Estuary: San Joaquin River Flows and Southern Delta Water Quality* (SED). In addition, we would like to incorporate by reference separate comments submitted by the Bay Area Water Supply and Conservation Agency (BAWSCA) and the San Francisco Public Utilities Commission (SFPUC) that provide more detail of the SED proposal's impact on our Menlo Park Municipal Water District (MPMWD) service area and the region.

Under the SED, the State Water Resources Control Board (SWRCB) proposes substantial changes to flow objectives for the Tuolumne River. These changes are anticipated to result in significantly reduced surface water available for diversions, thereby causing significant, potentially unavoidable impacts to water supply and the environment. Below we provide relevant information that the SWRCB must consider in conducting its analysis of the SED's impacts:

- As a wholesale customer of SFPUC that purchases 100% of its potable water supply from the San Francisco Regional Water System, water supply available to the MPMWD under the SED proposal could be reduced more than 50% under drought conditions for multiple consecutive years.

- MPMWD has made significant strides in water conservation in the past 10 years. Total water use decreased 31.5% from 3.25 million gallons per day (MGD) to 2.23 MGD.

- Based on our 2015 Urban Water Management Plan, a 50% cut to water supply would force MPMWD to take a number of significant actions including developing water budgets for all water accounts and notifying account holders, and not approving new potable water connections, new temporary meters or permanent meters, except under special circumstances.

- MPMWD serves water to 3,600 residential customers and over 250 businesses and other non-residential customers. Potential consequences of the SED proposal include health and safety concerns due to lack of potable supplies, major job losses, slower economic growth and delayed community development in our service area.

- Since outdoor use represents a relatively small proportion of our commercial, industrial, and institutional account water demand, commercial, industrial, and institutional customers generally have fewer opportunities to reduce water use without changing their operations or incurring significant economic impacts.

- MPMWD relies 100% on SFPUC water. MPMWD's only other emergency supply is via interconnections with adjacent water agencies. However, these adjacent water agencies also rely primarily on SFPUC water, so a 50% cut to SFPUC water would be detrimental to our system's ability to provide water to our customers.

In the light of these aforementioned impacts as well as those articulated in the BAWSCA and SFPUC comment letters incorporated here by reference, the MPMWD requests that environmental and economic impacts of any shortage on the San Francisco Regional Water System, and the associated lost jobs and delayed development, be fully and adequately analyzed as part of the SWRCB's proposed flow alternatives. Such full and adequate analysis should be given at least equal weight with all other elements of the SWRCB's subsequent deliberations and decision making.

Last, the Governor has indicated his strong support for negotiated voluntary agreements to resolve these issues. We request that the SWRCB provide adequate time for voluntary agreements to be reached amongst the stakeholders prior to any action on the SED. Please give this settlement process a chance for success instead of expediting implementation of the current proposal. We share BAWSCA's commitment to continue working closely with the diverse interests and stakeholders to develop that shared solution.

If you have any questions about this letter, please do not hesitate to contact me by phone at (650) 330-6725 or by email at jicmurphy@menlopark.org.

Sincerely,

Justin Murphy
Public Works Director

CITY OF MENLO PARK

May 27, 2021

Bay Area Water Supply and Conservation Agency (BAWSCA)
Nicole Sandkulla, CEO / General Manager
155 Bovet Rd, Suite 650
San Mateo, CA 94402

Subject: BAWSCA Methodology for Cutbacks Greater than 20 Percent for the 2020 Urban Water Management Plan

Dear Ms. Sandkulla,

As we prepare our Urban Water Management Plan, we appreciate BAWSCA's support and assistance in clarifying the San Francisco Public Utility Commission's (SFPUC) Regional Water System (RWS) supply reliability data, obtaining and creating Urban Water Management Plans (UWMP) common language, and developing a methodology that the BAWSCA agencies can use for cutbacks greater than 20 percent.

As stated in your February 18, 2021 memorandum, because there is no method for allocating supplies for cutbacks greater than 20 percent, BAWSCA recommended "*when the average Wholesale Customers' RWS shortages are greater than 20 percent, an equal percent reduction will be applied across all agencies.*" With the close deadline for agencies to adopt and submit their UWMPs to the Department of Water Resources by July 1, we appreciate that BAWSCA could quickly develop a methodology that the Wholesale Customers could use in their respective UWMPs.

We have included BAWSCA's equal percent reductions for cutbacks greater than 20 percent in our 2020 UWMP for planning purposes, however, we must go on record that we are not in agreement with this methodology. We understand that the Wholesale Customers will begin discussing and negotiating new Tier 2 calculations later this year, a process that could take upwards of 18 months, and we look forward to be part of that process.

As you are aware, SFPUC's supply reliability data does not meet their contractual obligation (also known as level of service goals) to supply Wholesale Customers with not more than a 20 percent cutback (WSA Section 3.11C4). We know that BAWSCA, in its role of administering the contract on behalf of the Wholesale Customers, will continue to prioritize SFPUC's need to meet its contractual obligations and urge them to expedite water supply projects in order to meet the total 184 million gallons per day (MGD) supply guarantee to all of the Wholesale customers, including MPMW's individual supply guarantee of 4.456 MGD.

We appreciate BAWSCA's diligence and perseverance in administering the contract on behalf of the Wholesale Customers and ensuring that SFPUC meets its contractual obligations, specifically their level of service goals.

Sincerely,

Nicole Nagaya

Nicole Nagaya
Public Works Director

cc: Nira Doherty, City Attorney
Christopher Lamm, Assistant Public Works Director
Pam Lowe, Senior Civil Engineer

CITY OF MENLO PARK

May 27, 2021

San Francisco Public Utilities Commission
Paula Kehoe, Director of Water Resources
525 Golden Gate Avenue, 13th Floor
San Francisco, CA 94102

RE: SFPUC Supply Reliability for the 2020 Urban Water Management Plan

Dear Ms. Kehoe,

As we prepare our Urban Water Management Plan, we appreciate the water supply reliability data and common language provided by the San Francisco Public Utilities Commission (SFPUC) to the Bay Area Water Supply and Conservation Agency (BAWSCA) for the Wholesale Customers on memorandums dated January 22, 2021, March 19, 2021, and March 30, 2021.

The supply reliability data with the Bay-Delta Plan does not meet SFPUC's contractual obligation (also known as level of service goals) to supply Wholesale Customers with not more than a 20 percent cutback. Section 3.11C4 of the 2019 Water Supply Agreement states that "*San Francisco will use its best efforts to identify potential sources of dry year water supplies and establish the contractual and other means to access and deliver those supplies in sufficient quantity to meet a goal of not more than 20 percent system-wide shortage in any year of the design drought.*"

SFPUC needs to meet its contractual obligations and we urge you to expedite the Alternative Water Supply Project in order to meet the total 184 million gallons per day (MGD) supply guarantee to all of the Wholesale customers, including MPMW's individual supply guarantee of 4.456 MGD.

Sincerely,

Nicole Nagaya

Nicole Nagaya
Public Works Director

cc: Nira Doherty, City Attorney
Christopher Lamm, Assistant Public Works Director
Pam Lowe, Senior Civil Engineer

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CITY OF MENLO PARK

June 7, 2021

San Francisco Public Utilities Commission
Paula Kehoe, Director of Water Resources
525 Golden Gate Avenue, 13th Floor
San Francisco, CA 94102

RE: Request to Rerun Water Supply Reliability Model

Dear Ms. Kehoe,

We understand that SFPUC's climate change study, the *Long Term Vulnerability Assessment and Adaptation Plan for the SFPUC Water Enterprise* completed in partnership with the Water Research Foundation, will be released in the summer of 2021 and can be used to help frame the issue of climate change impacts on the water supplies delivered via the San Francisco Regional Water System, including but not limited to the Tuolumne River.

On May 25, our City Council adopted a resolution adopting our 2020 Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan. If the climate change study provides merit to study a shorter Drought Period, we request that SFPUC prepare an appendix with updated supply reliability that we can consider including in our UWMP.

Thank you for considering this request.

Sincerely,

DocuSigned by:
Drew Combs
52C1D491348F4A3...

Drew Combs
Mayor

cc: Vice Mayor Betsy Nash
City Councilmember Jen Wolosin
City Councilmember Ray Mueller
City Councilmember Cecilia Taylor
Starla Jerome-Robinson, City Manager
Nira Doherty, City Attorney

APPENDIX I
SFPUC REGIONAL WATER SYSTEM SUPPLY RELIABILITY AND BAWSCA TIER 2 DROUGHT IMPLEMENTATION SCENARIOS

BAWSCA
Bay Area Water Supply & Conservation Agency

February 18, 2021

TO: BAWSCA Member Agencies

FROM: Danielle McPherson, Senior Water Resources Specialist
Tom Francis, Water Resources Manager

SUBJECT: San Francisco Regional Water System Supply Reliability for 2020 Urban Water Management Plans

The purpose of this memorandum is to provide updated drought allocations among the Member Agencies under the various scenarios provided in the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS) Supply Reliability Letter dated January 22, 2021 and transmitted to the Member Agencies via email on January 25th ("Supply Reliability Letter", Attachment A). As presented and discussed at the February 12th BAWSCA Urban Water Management Plan (UWMP) Workshop, the Tier 2 Drought Allocation Plan was not designed for RWS shortages greater than 20 percent. As a result, the Tier 2 allocation tables shared with the Supply Reliability Letter showed unexpected and wide-ranging results between Member Agencies that should not be used for UWMP purposes.

As provided for in the 2018 Amended and Restated Water Supply Agreement (WSA), the SFPUC will honor new Tier 2 allocations agreed upon by all Member Agencies if an RWS shortage greater than 20 percent is declared. However, at this time, there is no method for allocating supplies under such significant cutbacks. Additionally, the time it would take to negotiate a modified Tier 2 plan to address those significant cutbacks would be extensive and greater than the timeline required for BAWSCA to provide your agency with numbers for input into your 2020 UWMP submittals.

For these reasons, BAWSCA is recommending that for the purpose of the 2020 UWMP updates, allocation of wholesale RWS supplies should be as follows:

1. When the average Wholesale Customers' RWS shortages are 10 percent or less, an equal percent reduction will be applied across all agencies. This is consistent with the existing Tier 2 requirement of a minimum 10 percent cutback in any Tier 2 application scenario.
2. When average Wholesale Customers' shortages are between 10 and 20 percent, the Tier 2 Drought Allocation Plan will be applied.
3. When the average Wholesale Customers' RWS shortages are greater than 20 percent, an equal percent reduction will be applied across all agencies.

Attachment B "Updated 2020 UWMP Drought Cutbacks" provides further detail, including recommended wholesale RWS allocation tables, for use in your agency's 2020 UWMP.

BAWSCA recognizes that this is not an ideal situation or method for allocation of available drought supplies. In the event of actual RWS shortages greater than 20 percent, the Member Agencies would have the opportunity to negotiate and agree upon a more nuanced and equitable approach. Such an approach would likely consider basic health and safety needs, the

water needs to support critical institutions such as hospitals, and minimizing economic impacts on individual communities and the region.

Enclosed: Attachment A: Supply Reliability Letter
Attachment B: Updated 2020 UWMP Drought Cutbacks

cc: Nicole Sandkulla
Allison Schutte

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

525 Golden Gate Avenue, 13th Floor
San Francisco, CA 94102
T 415.554.3155
F 415.554.3161
TTY 415.554.3488

January 22, 2021

Danielle McPherson
Senior Water Resources Specialist
Bay Area Water Supply and Conservation Agency
155 Bovet Road, Suite 650
San Mateo, CA 94402

Dear Ms. McPherson,

Attached please find the information you requested on the Regional Water System's supply reliability for use in the Wholesale Customer's 2020 Urban Water Management Plan (UWMP) updates. The SFPUC has assessed the water supply reliability under the following planning scenarios:

- Projected supply reliability for year 2020 through 2045
- Projected single dry year and multiple dry year reliability for base year 2020, both with and without implementation of the Bay-Delta Plan Amendment
- Projected single dry year and multiple dry year reliability for base year 2025, both with and without implementation of the Bay-Delta Plan Amendment

The tables presented below assume full implementation of the Bay-Delta Plan Amendment will begin in 2023. All tables assume that the wholesale customers will purchase 184 mgd from the RWS through 2045. Assumptions about the status of the dry-year water supply projects included in the Water Supply Improvement Program (WSIP) are provided below in the table 'WSIP Project Assumptions'. The tables reflect instream flow requirements at San Mateo and Alameda Creeks, as described in the common language provided to BAWSCA separately.

Concerning allocation of supply during dry years, the Water Shortage Allocation Plan (WSAP) was utilized to allocate shortages between the SFPUC and the Wholesale Customers collectively. The WSAP implements a method for allocating water between the SFPUC retail customers and wholesale customers collectively which has been adopted by the Wholesale Customers per the July 2009 Water Supply Agreement between the City and County of

London N. Breed
Mayor

Sophie Maxwell
President

Anson Moran
Vice President

Tim Paulson
Commissioner

Ed Harrington
Commissioner

Michael Carlin
Acting
General Manager

San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County. The WSAP, also known as the Tier One Plan, was amended in the 2018 Amended and Restated Water Supply Agreement. The wholesale customers have adopted the Tier Two Plan, the second component of the WSAP, which allocates the collective wholesale customer share among each of the 26 wholesale customers.

Compared to the reliability projections that were provided previously for the 2015 UWMP update, the biggest difference in projected future deliveries is caused by the implementation of the Bay-Delta Plan Amendment. Given the uncertainty about the implementation of the Amendment (described further in the common language provided to BAWSCA), tables are included to show future projected supplies both with and without the Bay-Delta Plan Amendment.

It is our understanding that you will pass this information on to the Wholesale Customers. If you have any questions or need additional information, please do not hesitate to contact Sarah Triolo, at striolo@sfwater.org or (628) 230 0802.

Sincerely,

Paula Kehoe
Director of Water Resources

Table 1: WSIP Project Assumptions

	2020	2025 and Beyond
Calaveras Dam Replacement Project	Calaveras Reservoir partially refilled at spring 2020 level of 63,900 AF	Calaveras Reservoir fully refilled
Lower Crystal Springs Dam Improvements	Crystal Springs storage not restored	
Regional Groundwater Storage and Recovery (GSR) Project	GSR account partially filled at spring 2020 level of 23,500 AF; GSR recovery rate of 6.2 mgd	GSR account fully filled; GSR recovery rate of 6.2 mgd
Alameda Creek Recapture Project	Project not built	Project built
Dry-year Transfers	Not in effect	

Table 2: Projected Wholesale Supply from Regional Water System [For Table 6-9]:

Year	2020	2025	2030	2035	2040	2045
RWS Supply (mgd)	265	265	265	265	265	265
Wholesale Supply (mgd)	184	184	184	184	184	184

Table 3: Basis of Water Supply Data [For Table 7-1], 2020 Infrastructure Conditions With Bay Delta Plan

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2020	265	100%	184	
Single dry year		238.5	90%	157.5	• At 10% shortage, wholesale allocation is 64%, or 152.6 mgd • Retail allocation is 36%, or 85.9 mgd • Retail allocations above 81 mgd are re-allocated to Wholesale Customers, per the 2018 WSA • 4.9 mgd added to wholesale allocation, bringing it to 157.5 mgd
Consecutive 1st Dry year		238.5	90%	157.5	• Same as above
Consecutive 2nd Dry year		212	80%	132.5	• At a 20% shortage, wholesale allocation is 62.5%, or 132.5 mgd • Retail allocation is 37.5%, or 79.5 mgd
Consecutive 3rd Dry year[1]		119.25	45%	74.5	• WSA does not define percentage split above a 20% shortage level • Assume same split as for a 20% shortage level, i.e. Wholesale Customers receive 62.5%
Consecutive 4th Dry year		119.25	45%	74.5	• Same as above
Consecutive 5th Dry year		119.25	45%	74.5	• Same as above

[1] Assuming this year represents 2023, when Bay Delta Plan Amendment would come into effect.

Table 4: Basis of Water Supply Data [For Table 7-1], 2020 Infrastructure Conditions Without Bay Delta Plan

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2020	265	100%	184	
Single dry year		238.5	90%	157.5	• At 10% shortage, wholesale allocation is 64%, or 152.6 mgd • Retail allocation is 36%, or 85.9 mgd • Retail allocations above 81 mgd are re-allocated to Wholesale Customers, per the 2018 WSA • 4.9 mgd added to wholesale allocation, bringing it to 157.5 mgd
Consecutive 1st Dry year		238.5	90%	157.5	• Same as above
Consecutive 2nd Dry year		212	80%	132.5	• At a 20% shortage, wholesale allocation is 62.5%, or 132.5 mgd • Retail allocation is 37.5%, or 79.5 mgd
Consecutive 3rd Dry year		212	80%	132.5	• Same as above
Consecutive 4th Dry year		212	80%	132.5	• Same as above
Consecutive 5th Dry year		212	80%	132.5	• Same as above

Table 5: Basis of Water Supply Data [For Table 7-1], 2025 Infrastructure With Bay Delta Plan

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2025	265	100%	184	
Single dry year		132.5	50%	82.8	• WSA does not define percentage split above a 20% shortage level • Assume same split as for a 20% shortage level, i.e. Wholesale Customers receive 62.5%
Consecutive 1st Dry year		132.5	50%	82.8	• Same as above
Consecutive 2nd Dry year		119.25	45%	74.5	• Same as above
Consecutive 3rd Dry year		119.25	45%	74.5	• Same as above
Consecutive 4th Dry year		119.25	45%	74.5	• Same as above
Consecutive 5th Dry year		119.25	45%	74.5	• Same as above

Table 6: Basis of Water Supply Data [For Table 7-1], 2025 Infrastructure Without Bay Delta Plan

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2025	265	100%	184	
Single dry year		238.5	90%	157.5	• At 10% shortage, wholesale allocation is 64% • Retail allocation is 36%, or 85.9 mgd; retail allocations above 81 mgd are re-allocated to Wholesaler Customers, per the 2018 WSA • 4.9 mgd added to wholesale allocation, bringing it to 157.5 mgd
Consecutive 1st Dry year		238.5	90%	157.5	• Same as above
Consecutive 2nd Dry year		238.5	90%	157.5	• Same as above
Consecutive 3rd Dry year		238.5	90%	157.5	• Same as above
Consecutive 4th Dry year		212	80%	132.5	• At a 20% shortage, wholesale allocation is 62.5%, or 132.5 mgd • Retail allocation is 37.5%, or 79.5 mgd
Consecutive 5th Dry year		212	80%	132.5	• Same as above

Table 7: Projected Multiple Dry Years Wholesale Supply from RWS [For Table 7-4], With Bay Delta Plan

	2025	2030	2035	2040	2045
First year	82.8	82.8	82.8	82.8	82.8
Second year	74.5	74.5	74.5	74.5	74.5
Third year	74.5	74.5	74.5	74.5	74.5
Fourth year	74.5	74.5	74.5	74.5	74.5
Fifth year	74.5	74.5	74.5	74.5	74.5

Table 8: Projected Multiple Dry Years Wholesale Supply from RWS [For Table 7-4], Without Bay Delta Plan

	2025	2030	2035	2040	2045
First year	157.5	157.5	157.5	157.5	157.5
Second year	157.5	157.5	157.5	157.5	157.5
Third year	157.5	157.5	157.5	157.5	157.5
Fourth year	132.5	132.5	132.5	132.5	132.5
Fifth year	132.5	132.5	132.5	132.5	132.5

Table 9: Projected Regional Water System Supply for 5-Year Drought Risk Assessment [For Table 7-5], With Bay Delta Plan. This table assumes Bay Delta Plan comes into effect in 2023.

Year	2021	2022	2023	2024	2025
RWS Supply (mgd)	238.5	212	119.25	119.25	119.25
Wholesale Supply (mgd)	157.5	132.5	74.5	74.5	74.5

Table 10: Projected Regional Water System Supply for 5-Year Drought Risk Assessment [For Table 7-5], Without Bay Delta Plan

Year	2021	2022	2023	2024	2025
RWS Supply (mgd)	238.5	212	212	212	212
Wholesale Supply (mgd)	157.5	132.5	132.5	132.5	132.5

Attachment B: Updated 2020 UWMP Drought Cutbacks

The January 22, 2021, SFPUC Regional Water System (RWS) Supply Reliability Letter (Supply Reliability Letter) provides RWS supplies available to the Wholesale Customers under two scenarios: (1) With Bay-Delta Plan, and (2) Without Bay-Delta Plan. Your agency must choose which scenario to use for your agency's 2020 UWMP submittal tables. However, you may discuss both scenarios in the body of your agency's UWMP. The purpose of this attachment is to provide further detail about your agency's allocation of total RWS supplies available to the Wholesale Customers under both scenarios.

Data Sources for Projected RWS Purchases

Supply allocations are based on projected RWS purchases provided to BAWSCA by the Member Agencies. Following the completion of the Demand Study in June 2020, BAWSCA used the results to develop a table for each Member Agency listing possible supplies and total demand for 2025, 2030, 2035, 2040, and 2045. BAWSCA populated the tables with total demand after passive conservation and entered active conservation, as calculated in the agencies' DSS Model, as a source of supply. Multi-source agencies were asked to complete the table with supply projections, including from the RWS, to meet total demand. Single-source agencies were offered the opportunity to review the tables upon request. Because active conservation was treated as a source of supply, projected RWS purchases are after passive and active conservation.[1]

Water Management Representatives (WMRs) received a draft copy of all projected wholesale RWS purchase requests as part of the January 7, 2021 WMR meeting agenda packet and meeting slides. Agencies were asked to notify BAWSCA if changes were necessary regarding their purchase requests prior to BAWSCA sending those purchase requests to the SFPUC. Purchase requests were transmitted to the SFPUC via a letter dated January 15, 2021 for use in their 2020 UWMP efforts.

Note that the projected RWS purchases used by BAWSCA for fiscal years 2020-21 and for 2021-22 were provided to Christina Tang, BAWSCA's Finance Manager, by each Member Agency in January 2021. This annual reporting is part of the SFPUC's wholesale rate setting process. Member Agencies have provided BAWSCA with these projected purchases annually for the past 10 years.

UWMP Tables 7-1 and 7-5

UWMP Table 7-1 requests supply reliability for a normal year, a single dry year, and multiple (five) dry years. Tables 3, 4, 5, and 6 provided in the Supply Reliability Letter will help your agency complete UWMP Table 7-1. The Drought Risk Assessment (DRA) in UWMP Table 7-5 also requests a five-year drought sequence but specifies years 2021 through 2025. Supply Reliability Letter Tables 9 and 10 will help your agency complete UWMP Table 7-5.

The Supply Reliability Letter provides four scenarios to select from for completing UWMP Table 7-1. The Supply Reliability Letter Tables 3 (with Bay-Delta Plan) and 4 (without Bay-Delta Plan) use 2020 as the base year. Depending on which scenario you choose, these will be the basis for your agency's five-year DRA (UWMP Table 7-5). The Supply Reliability Letter Tables 5 (with Bay-Delta Plan) and 6 (without Bay-Delta Plan) use 2025 as the base year. Depending on which scenario you choose, these will be the basis for UWMP Tables 7-2 through 7-4.

[1] Projected RWS purchases are after conservation, except for Mountain View.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Total RWS supplies available to the Wholesale Customers in the first through fifth consecutive dry years in Supply Reliability Letter Table 3 align with those in Table 9 of the same letter. Similarly, Supply Reliability Letter Table 4 aligns with Table 10 of the same letter.

Table A below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Tables 7-1and 7-5.

Table A: Wholesale Customer Drought Cutbacks Based on a Single Dry Year and Multiple Dry Years (Base Year 2020)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
(1)	Projected SF RWS Wholesale Purchases	132.2 MGD	138.6 MGD	140.8 MGD	142.5 MGD	144.3 MGD	146.0 MGD
(2)	Supply Available to the Wholesale Customers	Percent Cutback on Wholesale RWS Purchases					
		2020	**2021**	**2022**	**2023**	**2024**	**2025**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
(4)	132.5 MGD	0.0%	-4.4%	-5.9%	-7.0%	-8.2%	-9.3%
(5)	82.8 MGD	-37.4%	-40.3%	-41.2%	-41.9%	-42.6%	-43.3%
(6)	74.5 MGD	-43.7%	-46.3%	-47.1%	-47.7%	-48.4%	-49.0%

Table A, column (a), rows 3 through 6 lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative actual wholesale RWS purchases for 2020 and projected purchases for 2021 through 2025. Projected RWS purchases for years 2021 and 2022 were provided to Christina Tang, BAWSCA's Finance Manager, by the Member Agencies in January. Projected RWS purchases for 2025 were provided to BAWSCA by the Member Agencies as described previously in this memo. Projected wholesale RWS purchases for 2023 and 2024 were derived assuming a linear change between 2022 and 2025.

Table B below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Table 7-1.

Table B: Wholesale Customer Drought Cutbacks Based on a Single Dry Year and Multiple Dry Years (Base Year 2025)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
(1)	Projected SF RWS Wholesale Purchases	146.0 MGD	146.4 MGD	146.8 MGD	147.1 MGD	147.5 MGD	147.9 MGD
(2)	Supply Available to the Wholesale Customers	Percent Cutback on Wholesale RWS Purchases					
		2025	**2026**	**2027**	**2028**	**2029**	**2030**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
(4)	132.5 MGD	-9.2%	-9.5%	-9.7%	-9.9%	-10.2%	-10.4%
(5)	82.8 MGD	-43.3%	-43.4%	-43.6%	-43.7%	-43.9%	-44.0%
(6)	74.5 MGD	-49.0%	-49.1%	-49.3%	-49.4%	-49.5%	-49.6%

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table B, column (a), rows 3 through 6 lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative projected wholesale RWS purchases for 2025 through 2030. Projected wholesale RWS purchases for years 2025 and 2030 were provided to BAWSCA by the Member Agencies as described previously in this memo. Projected wholesale RWS purchases for 2026 through 2029 were derived assuming a linear change between 2025 and 2030.

To complete UWMP Tables 7-1 and 7-5, reference tables in the Supply Reliability Letter to identify total RWS supplies available to the Wholesale Customers and apply the percent cutback in the corresponding year of the drought sequence using Tables A and B. For example, in Supply Reliability Letter Table 3, in the 5th consecutive year of a drought, the volume available to the Wholesale Customers is 74.5 MGD. To calculate RWS supplies available to your agency in 2025 using table A, locate the row with 74.5 MGD on the table – row 6 – and the column for 2025 – column (g). Then apply the percent cutback to your agency's RWS demand in 2025.

A list of purchase projections by agency are provided in Tables C, D, E, and F. The table also indicates the percent cutback that should be applied based on total RWS supplies available to the Wholesale Customers. Tables C and E use Scenario 1: With Bay-Delta Plan. Tables D and F use Scenario 2: Without Bay-Delta Plan. Tables C and D use 2020 as the base year and Tables E and F use 2025 as the base year.

BAWSCA understands that agencies are updating projected demands for their 2020 UWMPs and that projected RWS purchases may change from what was previously provided. Additionally, BAWSCA recognizes that not all Member Agencies will choose the same scenario for their UWMP supply reliability tables. For both reasons, projected RWS purchases in each Member Agency's 2020 UWMP may not add up to total Wholesale demands in the SFPUC's 2020 UWMP. This is consistent with direction given by the Department of Water Resources, which encourages suppliers use the UWMP tables to represent what they believe to be the most likely supply reliability scenario and to characterize the five-consecutive year drought in a manner that is best suited for understanding and managing their water service reliability and individual agency level of risk tolerance.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table C: Scenario 1: With Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2020)

	2020 (184 MGD)		**2021** (157.5 MGD)		**2022** (132.5 MGD)		**2023** (74.5 MGD)		**2024** (74.5 MGD)		**2025** (74.5 MGD)	
Agency	Actual Purchases	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.87	0.0%	9.44	0.0%	9.46	-5.9%	8.87	-47.7%	8.27	-48.4%	7.68	-49.0%
Brisbane/GVMID	0.64	0.0%	0.62	0.0%	0.65	-5.9%	0.73	-47.7%	0.81	-48.4%	0.89	-49.0%
Burlingame	3.48	0.0%	3.34	0.0%	3.35	-5.9%	3.67	-47.7%	4.00	-48.4%	4.33	-49.0%
Coastside	1.02	0.0%	1.54	0.0%	1.23	-5.9%	1.29	-47.7%	1.34	-48.4%	1.40	-49.0%
CalWater Total	29.00	0.0%	29.66	0.0%	29.81	-5.9%	29.87	-47.7%	29.93	-48.4%	29.99	-49.0%
Daly City	3.97	0.0%	4.00	0.0%	4.01	-5.9%	3.86	-47.7%	3.72	-48.4%	3.57	-49.0%
East Palo Alto	1.57	0.0%	1.63	0.0%	1.69	-5.9%	1.75	-47.7%	1.81	-48.4%	1.88	-49.0%
Estero	4.34	0.0%	4.48	0.0%	4.51	-5.9%	4.36	-47.7%	4.22	-48.4%	4.07	-49.0%
Hayward	13.92	0.0%	14.47	0.0%	15.12	-5.9%	16.03	-47.7%	16.94	-48.4%	17.86	-49.0%
Hillsborough	2.62	0.0%	2.95	0.0%	3.05	-5.9%	3.12	-47.7%	3.19	-48.4%	3.26	-49.0%
Menlo Park	2.96	0.0%	2.92	0.0%	2.93	-5.9%	3.14	-47.7%	3.35	-48.4%	3.55	-49.0%
Mid-Peninsula	2.66	0.0%	2.65	0.0%	2.80	-5.9%	2.82	-47.7%	2.84	-48.4%	2.86	-49.0%
Millbrae	1.90	0.0%	1.95	0.0%	2.15	-5.9%	2.19	-47.7%	2.24	-48.4%	2.29	-49.0%
Milpitas	5.92	0.0%	5.88	0.0%	5.34	-5.9%	5.76	-47.7%	6.17	-48.4%	6.59	-49.0%
Mountain View	7.67	0.0%	7.80	0.0%	8.05	-5.9%	8.23	-47.7%	8.42	-48.4%	8.60	-49.0%
North Coast	2.37	0.0%	2.58	0.0%	2.66	-5.9%	2.56	-47.7%	2.45	-48.4%	2.34	-49.0%
Palo Alto	9.75	0.0%	9.44	0.0%	9.66	-5.9%	9.79	-47.7%	9.93	-48.4%	10.06	-49.0%
Purissima Hills	1.75	0.0%	1.97	0.0%	2.02	-5.9%	2.04	-47.7%	2.06	-48.4%	2.09	-49.0%
Redwood City	8.76	0.0%	8.72	0.0%	9.07	-5.9%	8.86	-47.7%	8.66	-48.4%	8.46	-49.0%
San Bruno	0.95	0.0%	3.39	0.0%	3.40	-5.9%	3.35	-47.7%	3.29	-48.4%	3.24	-49.0%
San José	4.26	0.0%	4.31	0.0%	4.51	-5.9%	4.51	-47.7%	4.50	-48.4%	4.50	-49.0%
Santa Clara	3.27	0.0%	3.29	0.0%	3.50	-5.9%	3.83	-47.7%	4.17	-48.4%	4.50	-49.0%
Stanford	1.43	0.0%	1.40	0.0%	1.54	-5.9%	1.70	-47.7%	1.85	-48.4%	2.01	-49.0%
Sunnyvale	9.33	0.0%	9.35	0.0%	9.45	-5.9%	9.35	-47.7%	9.26	-48.4%	9.16	-49.0%
Westborough	0.82	0.0%	0.84	0.0%	0.81	-5.9%	0.83	-47.7%	0.84	-48.4%	0.86	-49.0%
Wholesale Total	**132.2**	**132.2†**	**138.6**	**138.6†**	**140.8**	**132.5†**	**142.5**	**74.5†**	**144.3**	**74.5†**	**146.0**	**74.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table D: Scenario 2: Without Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2020)

	2020 (184 MGD)		**2021** (157.5 MGD)		**2022** (132.5 MGD)		**2023** (132.5 MGD)		**2024** (132.5 MGD)		**2025** (132.5 MGD)	
Agency	Actual Purchases	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.87	0.0%	9.44	0.0%	9.46	-5.9%	8.87	-7.0%	8.27	-8.2%	7.68	-9.2%
Brisbane/GVMID	0.64	0.0%	0.62	0.0%	0.65	-5.9%	0.73	-7.0%	0.81	-8.2%	0.89	-9.2%
Burlingame	3.48	0.0%	3.34	0.0%	3.35	-5.9%	3.67	-7.0%	4.00	-8.2%	4.33	-9.2%
Coastside	1.02	0.0%	1.54	0.0%	1.23	-5.9%	1.29	-7.0%	1.34	-8.2%	1.40	-9.2%
CalWater Total	29.00	0.0%	29.66	0.0%	29.81	-5.9%	29.87	-7.0%	29.93	-8.2%	29.99	-9.2%
Daly City	3.97	0.0%	4.00	0.0%	4.01	-5.9%	3.86	-7.0%	3.72	-8.2%	3.57	-9.2%
East Palo Alto	1.57	0.0%	1.63	0.0%	1.69	-5.9%	1.75	-7.0%	1.81	-8.2%	1.88	-9.2%
Estero	4.34	0.0%	4.48	0.0%	4.51	-5.9%	4.36	-7.0%	4.22	-8.2%	4.07	-9.2%
Hayward	13.92	0.0%	14.47	0.0%	15.12	-5.9%	16.03	-7.0%	16.94	-8.2%	17.86	-9.2%
Hillsborough	2.62	0.0%	2.95	0.0%	3.05	-5.9%	3.12	-7.0%	3.19	-8.2%	3.26	-9.2%
Menlo Park	2.96	0.0%	2.92	0.0%	2.93	-5.9%	3.14	-7.0%	3.35	-8.2%	3.55	-9.2%
Mid-Peninsula	2.66	0.0%	2.65	0.0%	2.80	-5.9%	2.82	-7.0%	2.84	-8.2%	2.86	-9.2%
Millbrae	1.90	0.0%	1.95	0.0%	2.15	-5.9%	2.19	-7.0%	2.24	-8.2%	2.29	-9.2%
Milpitas	5.92	0.0%	5.88	0.0%	5.34	-5.9%	5.76	-7.0%	6.17	-8.2%	6.59	-9.2%
Mountain View	7.67	0.0%	7.80	0.0%	8.05	-5.9%	8.23	-7.0%	8.42	-8.2%	8.60	-9.2%
North Coast	2.37	0.0%	2.58	0.0%	2.66	-5.9%	2.56	-7.0%	2.45	-8.2%	2.34	-9.2%
Palo Alto	9.75	0.0%	9.44	0.0%	9.66	-5.9%	9.79	-7.0%	9.93	-8.2%	10.06	-9.2%
Purissima Hills	1.75	0.0%	1.97	0.0%	2.02	-5.9%	2.04	-7.0%	2.06	-8.2%	2.09	-9.2%
Redwood City	8.76	0.0%	8.72	0.0%	9.07	-5.9%	8.86	-7.0%	8.66	-8.2%	8.46	-9.2%
San Bruno	0.95	0.0%	3.39	0.0%	3.40	-5.9%	3.35	-7.0%	3.29	-8.2%	3.24	-9.2%
San José	4.26	0.0%	4.31	0.0%	4.51	-5.9%	4.51	-7.0%	4.50	-8.2%	4.50	-9.2%
Santa Clara	3.27	0.0%	3.29	0.0%	3.50	-5.9%	3.83	-7.0%	4.17	-8.2%	4.50	-9.2%
Stanford	1.43	0.0%	1.40	0.0%	1.54	-5.9%	1.70	-7.0%	1.85	-8.2%	2.01	-9.2%
Sunnyvale	9.33	0.0%	9.35	0.0%	9.45	-5.9%	9.35	-7.0%	9.26	-8.2%	9.16	-9.2%
Westborough	0.82	0.0%	0.84	0.0%	0.81	-5.9%	0.83	-7.0%	0.84	-8.2%	0.86	-9.2%
Wholesale Total	**132.2**	**132.2†**	**138.6**	**138.6†**	**140.8**	**132.5†**	**142.5**	**132.5†**	**144.3**	**132.5†**	**146.0**	**132.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table E: Scenario 1: With Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2025)

	2025 (184 MGD)		**2026** (82.8 MGD)		**2027** (74.5 MGD)		**2028** (74.5 MGD)		**2029** (74.5 MGD)		**2030** (74.5 MGD)	
Agency	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.68	0%	7.68	-43.4%	7.68	-49.3%	7.68	-49.4%	7.68	-49.5%	7.68	-49.6%
Brisbane/GVMID	0.89	0%	0.89	-43.4%	0.89	-49.3%	0.89	-49.4%	0.89	-49.5%	0.89	-49.6%
Burlingame	4.33	0%	4.34	-43.4%	4.35	-49.3%	4.37	-49.4%	4.38	-49.5%	4.40	-49.6%
Coastside	1.40	0%	1.40	-43.4%	1.39	-49.3%	1.39	-49.4%	1.38	-49.5%	1.38	-49.6%
CalWater Total	29.99	0%	29.94	-43.4%	29.89	-49.3%	29.84	-49.4%	29.79	-49.5%	29.74	-49.6%
Daly City	3.57	0%	3.56	-43.4%	3.55	-49.3%	3.54	-49.4%	3.53	-49.5%	3.52	-49.6%
East Palo Alto	1.88	0%	1.89	-43.4%	1.91	-49.3%	1.92	-49.4%	1.93	-49.5%	1.95	-49.6%
Estero	4.07	0%	4.08	-43.4%	4.08	-49.3%	4.09	-49.4%	4.10	-49.5%	4.11	-49.6%
Hayward	17.86	0%	18.02	-43.4%	18.19	-49.3%	18.35	-49.4%	18.52	-49.5%	18.68	-49.6%
Hillsborough	3.26	0%	3.26	-43.4%	3.26	-49.3%	3.26	-49.4%	3.26	-49.5%	3.25	-49.6%
Menlo Park	3.55	0%	3.58	-43.4%	3.60	-49.3%	3.63	-49.4%	3.66	-49.5%	3.68	-49.6%
Mid-Peninsula	2.86	0%	2.85	-43.4%	2.85	-49.3%	2.85	-49.4%	2.84	-49.5%	2.84	-49.6%
Millbrae	2.29	0%	2.33	-43.4%	2.37	-49.3%	2.41	-49.4%	2.46	-49.5%	2.50	-49.6%
Milpitas	6.59	0%	6.62	-43.4%	6.65	-49.3%	6.68	-49.4%	6.72	-49.5%	6.75	-49.6%
Mountain View	8.60	0%	8.66	-43.4%	8.72	-49.3%	8.78	-49.4%	8.84	-49.5%	8.90	-49.6%
North Coast	2.34	0%	2.34	-43.4%	2.33	-49.3%	2.33	-49.4%	2.33	-49.5%	2.33	-49.6%
Palo Alto	10.06	0%	10.08	-43.4%	10.10	-49.3%	10.12	-49.4%	10.13	-49.5%	10.15	-49.6%
Purissima Hills	2.09	0%	2.09	-43.4%	2.09	-49.3%	2.09	-49.4%	2.09	-49.5%	2.09	-49.6%
Redwood City	8.46	0%	8.46	-43.4%	8.47	-49.3%	8.48	-49.4%	8.49	-49.5%	8.49	-49.6%
San Bruno	3.24	0%	3.23	-43.4%	3.23	-49.3%	3.22	-49.4%	3.22	-49.5%	3.22	-49.6%
San José	4.50	0%	4.50	-43.4%	4.50	-49.3%	4.50	-49.4%	4.50	-49.5%	4.50	-49.6%
Santa Clara	4.50	0%	4.50	-43.4%	4.50	-49.3%	4.50	-49.4%	4.50	-49.5%	4.50	-49.6%
Stanford	2.01	0%	2.04	-43.4%	2.08	-49.3%	2.11	-49.4%	2.15	-49.5%	2.18	-49.6%
Sunnyvale	9.16	0%	9.19	-43.4%	9.22	-49.3%	9.24	-49.4%	9.27	-49.5%	9.30	-49.6%
Westborough	0.86	0%	0.86	-43.4%	0.86	-49.3%	0.86	-49.4%	0.85	-49.5%	0.85	-49.6%
Wholesale Total	**146.0**	**146.0†**	**146.4**	**82.8†**	**146.8**	**74.5†**	**147.1**	**74.5†**	**147.5**	**74.5†**	**147.9**	**74.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table F: Scenario 2: Without Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2025)

	2025 (184 MGD)		**2026** (157.5 MGD)		**2027** (157.5 MGD)		**2028** (157.5 MGD)		**2029** (132.5 MGD)		**2030** (132.5 MGD)	
Agency	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.68	0.0%	7.68	0.0%	7.68	0.0%	7.68	0.0%	7.68	-10.2%	7.68	-10.4%
Brisbane/GVMID	0.89	0.0%	0.89	0.0%	0.89	0.0%	0.89	0.0%	0.89	-10.2%	0.89	-10.4%
Burlingame	4.33	0.0%	4.34	0.0%	4.35	0.0%	4.37	0.0%	4.38	-10.2%	4.40	-10.4%
Coastside	1.40	0.0%	1.40	0.0%	1.39	0.0%	1.39	0.0%	1.38	-10.2%	1.38	-10.4%
CalWater Total	29.99	0.0%	29.94	0.0%	29.89	0.0%	29.84	0.0%	29.79	-10.2%	29.74	-10.4%
Daly City	3.57	0.0%	3.56	0.0%	3.55	0.0%	3.54	0.0%	3.53	-10.2%	3.52	-10.4%
East Palo Alto	1.88	0.0%	1.89	0.0%	1.91	0.0%	1.92	0.0%	1.93	-10.2%	1.95	-10.4%
Estero	4.07	0.0%	4.08	0.0%	4.08	0.0%	4.09	0.0%	4.10	-10.2%	4.11	-10.4%
Hayward	17.86	0.0%	18.02	0.0%	18.19	0.0%	18.35	0.0%	18.52	-10.2%	18.68	-10.4%
Hillsborough	3.26	0.0%	3.26	0.0%	3.26	0.0%	3.26	0.0%	3.26	-10.2%	3.25	-10.4%
Menlo Park	3.55	0.0%	3.58	0.0%	3.60	0.0%	3.63	0.0%	3.66	-10.2%	3.68	-10.4%
Mid-Peninsula	2.86	0.0%	2.85	0.0%	2.85	0.0%	2.85	0.0%	2.84	-10.2%	2.84	-10.4%
Millbrae	2.29	0.0%	2.33	0.0%	2.37	0.0%	2.41	0.0%	2.46	-10.2%	2.50	-10.4%
Milpitas	6.59	0.0%	6.62	0.0%	6.65	0.0%	6.68	0.0%	6.72	-10.2%	6.75	-10.4%
Mountain View	8.60	0.0%	8.66	0.0%	8.72	0.0%	8.78	0.0%	8.84	-10.2%	8.90	-10.4%
North Coast	2.34	0.0%	2.34	0.0%	2.33	0.0%	2.33	0.0%	2.33	-10.2%	2.33	-10.4%
Palo Alto	10.06	0.0%	10.08	0.0%	10.10	0.0%	10.12	0.0%	10.13	-10.2%	10.15	-10.4%
Purissima Hills	2.09	0.0%	2.09	0.0%	2.09	0.0%	2.09	0.0%	2.09	-10.2%	2.09	-10.4%
Redwood City	8.46	0.0%	8.46	0.0%	8.47	0.0%	8.48	0.0%	8.49	-10.2%	8.49	-10.4%
San Bruno	3.24	0.0%	3.23	0.0%	3.23	0.0%	3.22	0.0%	3.22	-10.2%	3.22	-10.4%
San José	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	-10.2%	4.50	-10.4%
Santa Clara	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	-10.2%	4.50	-10.4%
Stanford	2.01	0.0%	2.04	0.0%	2.08	0.0%	2.11	0.0%	2.15	-10.2%	2.18	-10.4%
Sunnyvale	9.16	0.0%	9.19	0.0%	9.22	0.0%	9.24	0.0%	9.27	-10.2%	9.30	-10.4%
Westborough	0.86	0.0%	0.86	0.0%	0.86	0.0%	0.86	0.0%	0.85	-10.2%	0.85	-10.4%
Wholesale Total	**146.0**	**146.0†**	**146.4**	**146.4†**	**146.8**	**146.8†**	**147.1**	**147.1†**	**147.5**	**132.5†**	**147.9**	**132.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

UWMP Table 7-4

Supply Reliability Letter Tables 7 and 8 will help your agency complete UWMP Table 7-4. Table G below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Table 7-4. The table assumes (1) the Tier 2 Plan will be used to allocate supplies available to the Wholesale Customers when average Wholesale Customers' RWS shortages are greater than 10 and up to 20 percent, and (2) an equal percent reduction will be shared across all Wholesale Customers when average Wholesale Customers' RWS shortages are 10 percent or less or greater than 20 percent.

Table G: Drought Cutbacks Based on Projected Demands Under All Water Supply Availability Conditions

	(a)	(b)	(c)	(d)	(e)	(f)
(1)	Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
(2)	Supply Available to the Wholesale Customers	% Cutback on Wholesale RWS Purchases				
		2025	**2030**	**2035**	**2040**	**2045**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	-3.2%
(4)	132.5 MGD	-9.3%	-10.4%	Tier 2 Avg. -14%*	Tier 2 Avg. -16%*	Tier 2 Avg. -19%*
(5)	82.8 MGD	-43.3%	-44.0%	-45.5%	-47.0%	-49.1%
(6)	74.5 MGD	-49.0%	-49.6%	-51.0%	-52.3%	-54.2%

* Calculated average. Individual agency cutbacks are calculated in Table H.

Table G, column (a) lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative projected wholesale RWS purchases for 2025, 2030, 2035, 2040, and 2045.

Tables H, I, J and K provide additional detail by agency for each of the four supply availability conditions listed in Table G. To complete UWMP Table 7-4, reference Table 7 or 8 (depending on which Bay-Delta Plan scenario you choose) in the Supply Reliability Letter to identify total RWS supplies available to the Wholesale Customers and apply the percent cutback in the corresponding year using Table G or input the volumetric drought allocation using Tables H, I, J and K below.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table H: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 157.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2030**	**2040**	**2045**
ACWD	7.68	7.68	7.68	7.68	8.82
Burlingame	0.89	0.89	0.88	0.89	0.87
Burlingame	4.33	4.40	4.47	4.58	4.54
Coastside	1.40	1.38	1.36	1.33	1.28
CalWater Total	29.99	29.74	29.81	30.27	29.71
Daly City	3.57	3.52	3.49	3.46	3.32
East Palo Alto	1.88	1.95	2.10	2.49	2.80
Estero	4.07	4.11	4.18	4.23	4.24
Hayward	17.86	18.68	19.75	20.82	21.43
Hillsborough	3.26	3.25	3.26	3.26	3.15
Menlo Park	3.55	3.68	3.87	4.06	4.15
Mid-Peninsula	2.86	2.84	2.88	2.89	2.83
Millbrae	2.29	2.50	2.45	2.82	3.10
Milpitas	6.59	6.75	7.03	7.27	7.29
Mountain View	8.60	8.90	9.20	9.51	9.61
North Coast	2.34	2.33	2.34	2.34	2.27
Palo Alto	10.06	10.15	10.28	10.51	10.44
Purissima Hills	2.09	2.09	2.12	2.13	2.08
Redwood City	8.46	8.49	8.64	8.74	8.62
San Bruno	3.24	3.22	3.20	3.20	3.11
San José	4.50	4.50	4.50	4.50	4.35
Santa Clara	4.50	4.50	4.50	4.50	4.35
Stanford	2.01	2.18	2.35	2.53	2.61
Sunnyvale	9.16	9.30	10.70	11.44	11.71
Westborough	0.86	0.85	0.85	0.84	0.82
Wholesale Total	**146.0**	**147.9**	**151.9**	**156.3**	**157.5**

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table I: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 132.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2030**	**2040**	**2045**
ACWD	6.97	6.88	6.91	6.91	8.20
Burlingame	0.81	0.79	0.73	0.73	0.72
Burlingame	3.93	3.94	3.96	3.89	3.80
Coastside	1.27	1.24	1.22	1.20	1.19
CalWater Total	27.21	26.65	26.46	25.69	24.69
Daly City	3.24	3.15	3.04	3.01	2.98
East Palo Alto	1.70	1.75	1.97	2.30	2.62
Estero	3.69	3.68	3.76	3.87	3.77
Hayward	16.20	16.74	17.32	17.69	18.07
Hillsborough	2.96	2.92	2.90	2.75	2.56
Menlo Park	3.22	3.30	3.37	3.33	3.26
Mid-Peninsula	2.59	2.54	2.59	2.62	2.54
Millbrae	2.07	2.24	2.16	2.32	2.45
Milpitas	5.98	6.05	6.25	6.31	6.35
Mountain View	7.80	7.97	8.28	8.49	8.34
North Coast	2.12	2.09	2.11	2.11	2.11
Palo Alto	9.13	9.09	9.26	9.46	9.71
Purissima Hills	1.89	1.87	1.42	1.38	1.32
Redwood City	7.67	7.61	7.89	7.70	7.49
San Bruno	2.94	2.88	2.56	2.51	2.45
San José	4.08	4.03	3.03	2.91	2.76
Santa Clara	4.08	4.03	3.03	2.91	2.76
Stanford	1.82	1.95	2.06	2.13	2.16
Sunnyvale	8.31	8.33	9.46	9.51	9.43
Westborough	0.78	0.76	0.76	0.76	0.76
Wholesale Total	**132.5**	**132.5**	**132.5**	**132.5**	**132.5**

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table J: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 82.8 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2030**	**2040**	**2045**
ACWD	4.36	4.30	4.19	4.07	4.64
Burlingame	0.51	0.50	0.48	0.47	0.45
Burlingame	2.45	2.46	2.44	2.43	2.39
Coastside	0.79	0.77	0.74	0.71	0.68
CalWater Total	17.00	16.65	16.25	16.03	15.62
Daly City	2.02	1.97	1.90	1.83	1.75
East Palo Alto	1.06	1.09	1.14	1.32	1.47
Estero	2.31	2.30	2.28	2.24	2.23
Hayward	10.13	10.46	10.77	11.03	11.26
Hillsborough	1.85	1.82	1.78	1.73	1.66
Menlo Park	2.01	2.06	2.11	2.15	2.18
Mid-Peninsula	1.62	1.59	1.57	1.53	1.49
Millbrae	1.30	1.40	1.34	1.49	1.63
Milpitas	3.74	3.78	3.83	3.85	3.83
Mountain View	4.88	4.98	5.01	5.04	5.05
North Coast	1.33	1.30	1.28	1.24	1.19
Palo Alto	5.71	5.68	5.61	5.57	5.49
Purissima Hills	1.18	1.17	1.15	1.13	1.10
Redwood City	4.80	4.76	4.71	4.63	4.53
San Bruno	1.83	1.80	1.75	1.70	1.63
San José	2.55	2.52	2.45	2.38	2.29
Santa Clara	2.55	2.52	2.45	2.38	2.29
Stanford	1.14	1.22	1.28	1.34	1.37
Sunnyvale	5.19	5.21	5.83	6.06	6.16
Westborough	0.49	0.48	0.46	0.45	0.43
Wholesale Total	**82.8**	**82.8**	**82.8**	**82.8**	**82.8**

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table K: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 74.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2030**	**2040**	**2045**
ACWD	3.92	3.87	3.77	3.66	4.17
Burlingame	0.46	0.45	0.43	0.42	0.41
Burlingame	2.21	2.21	2.19	2.18	2.15
Coastside	0.71	0.70	0.67	0.64	0.61
CalWater Total	15.30	14.98	14.62	14.43	14.05
Daly City	1.82	1.77	1.71	1.65	1.57
East Palo Alto	0.96	0.98	1.03	1.19	1.32
Estero	2.08	2.07	2.05	2.02	2.00
Hayward	9.11	9.41	9.69	9.92	10.14
Hillsborough	1.66	1.64	1.60	1.55	1.49
Menlo Park	1.81	1.86	1.90	1.94	1.96
Mid-Peninsula	1.46	1.43	1.41	1.38	1.34
Millbrae	1.17	1.26	1.20	1.34	1.47
Milpitas	3.36	3.40	3.45	3.47	3.45
Mountain View	4.39	4.48	4.51	4.53	4.54
North Coast	1.19	1.17	1.15	1.12	1.07
Palo Alto	5.14	5.11	5.04	5.01	4.94
Purissima Hills	1.06	1.05	1.04	1.02	0.99
Redwood City	4.31	4.28	4.24	4.17	4.08
San Bruno	1.65	1.62	1.57	1.53	1.47
San José	2.30	2.27	2.21	2.14	2.06
Santa Clara	2.30	2.27	2.21	2.14	2.06
Stanford	1.03	1.10	1.15	1.21	1.24
Sunnyvale	4.67	4.69	5.25	5.45	5.54
Westborough	0.44	0.43	0.41	0.40	0.39
Wholesale Total	**74.5**	**74.5**	**74.5**	**74.5**	**74.5**

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

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March 30, 2021

Danielle McPherson
Senior Water Resources Specialist
Bay Area Water Supply and Conservation Agency
155 Bovet Road, Suite 650
San Mateo, CA 94402

Dear Ms. McPherson,

Attached please find additional supply reliability modeling results conducted by the SFPUC. The SFPUC has conducted additional supply reliability modeling under the following planning scenarios:

- Projected supply reliability for years 2020 through 2045, assuming that demand is equivalent to the sum of the projected retail demands on the Regional Water System (RWS) and Wholesale Customer purchase request projections provided to SFPUC by BAWSCA on January 21st (see Table 1 below).
- Under the above demand conditions, projected supply reliability for scenarios both with and without implementation of the Bay-Delta Plan Amendment starting in 2023.

The SFPUC will be using this supply modeling in the text of its draft UWMP and moving the original modeling results into an appendix.

Table 1: Retail and Wholesale RWS Demand Assumptions Used for Additional Supply Reliability Modeling (mgd)

	2020	2025	2030	2035	2040	2045
Retail	66.5	67.2	67.5	68.6	70.5	73.7
Wholesale[1, 2]	132.1	146.0	147.9	151.9	156.3	162.8
Total	**198.6**	**213.2**	**215.4**	**220.5**	**226.8**	**236.5**

[1] Wholesale purchase request projections provided to the SFPUC by BAWSCA on January 21st, 2021
[2] Includes demands for Cities of San Jose and Santa Clara

Please note the following about the information presented in the attached tables:

London N. Breed
Mayor
Sophie Maxwell
President
Anson Moran
Vice President
Tim Paulson
Commissioner
Ed Harrington
Commissioner
Michael Carlin
Acting
General Manager

- Assumptions about infrastructure conditions remain the same as what was provided in our January 22nd letter.
- The Tier 1 allocations were applied to the RWS supplies to determine the wholesale supply, as was also described in the January 22nd letter; for any system-wide shortage above 20%, the Tier 1 split for a 20% shortage was applied.
- The SFPUC water supply planning methodology, including simulation of an 8.5-year design drought, is used to develop these estimates of water supply available from the RWS for five dry years. In each demand scenario for 2020 through 2045, the RWS deliveries are estimated using the standard SFPUC procedure, which includes adding increased levels of rationing as needed to balance the demands on the RWS system with available water supply. Some simulations may have increased levels of rationing in the final years of the design drought sequence, which can influence the comparison of results in the first five years of the sequence.
- Tables 7 and 8 in the attached document provide RWS and wholesale supply availability for the five-year drought risk assessment from 2021 to 2025. SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. Therefore, the supply projections for 2021 to 2025 are based on meeting 2020 levels of demand. However, in years when the Bay-Delta Plan Amendment is not in effect, sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests assuming that they are between the 2020 and 2025 projected levels. This is not reflected in Tables 7 and 8 because SFPUC did not want to make assumptions about the growth of purchase requests between 2020 and 2025.

In our draft UWMP, we acknowledge that we have a Level of Service objective of meeting average annual water demand of 265 mgd from the SFPUC watersheds for retail and Wholesale Customers during non-drought years, as well as a contractual obligation to supply 184 mgd to the Wholesale Customers. Therefore, we will still include the results of our modeling based on a demand of 265 mgd in order to facilitate planning that supports meeting this Level of Service objective and our contractual obligations. The results of this modeling will be in an appendix to the draft UWMP. As will be shown in this appendix, in a normal year the SFPUC can provide up to 265 mgd of supply from the RWS. The RWS supply projections shown in the attached tables are more accurately characterized as supplies that will be used to meet projected retail and Wholesale Customer demands.

It is our understanding that you will pass this information on to the Wholesale Customers. If you have any questions or need additional information, please do not hesitate to contact Sarah Triolo, at striolo@sfwater.org or (628) 230 0802.

Sincerely,

Paula Kehoe
Director of Water Resources

Table 2: Projected Total RWS Supply Utilized and Portion of RWS Supply Utilized by Wholesale Customers in Normal Years [For Table 6-9]:

Year	2020	2025	2030	2035	2040	2045
RWS Supply Utilized (mgd)	198.6	213.2	215.4	220.5	226.8	236.5
RWS Supply Utilized by Wholesale Customers[a] (mgd)	132.1	146.0	147.9	151.9	156.3	162.8

[a] RWS supply utilized by Wholesale Customers is equivalent to purchase request projections provided to SFPUC by BAWSCA on January 21, 2021, and includes Cities of San Jose and Santa Clara.

Basis of Water Supply Data: With Bay-Delta Plan Amendment

Table 3a: Basis of Water Supply Data [For Table 7-1], Base Year 2020, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2020	198.6	100%	132.1	
Single dry year		198.6	100%	132.1	
Consecutive 1st Dry year		198.6	100%	132.1	
Consecutive 2nd Dry year		198.6	100%	132.1	
Consecutive 3rd Dry year[1]		119.2	60%	74.5	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 4th Dry year		119.2	60%	74.5	• Same as above
Consecutive 5th Dry year		119.2	60%	74.5	• Same as above

[1] Assuming this year represents 2023, when Bay Delta Plan Amendment would come into effect.

Table 3b: Basis of Water Supply Data [For Table 7-1], Base Year 2025, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2025	213.2	100%	146.0	
Single dry year		149.2	70%	93.3	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		149.2	70%	93.3	• Same as above
Consecutive 2nd Dry year		127.9	60%	80.0	• Same as above
Consecutive 3rd Dry year		127.9	60%	80.0	• Same as above
Consecutive 4th Dry year		127.9	60%	80.0	• Same as above
Consecutive 5th Dry year		127.9	60%	80.0	• Same as above

Table 3c: Basis of Water Supply Data [For Table 7-1], Base Year 2030, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2030	215.4	100%	147.9	
Single dry year		150.8	70%	94.2	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		150.8	70%	94.2	• Same as above
Consecutive 2nd Dry year		129.2	60%	80.8	• Same as above
Consecutive 3rd Dry year		129.2	60%	80.8	• Same as above
Consecutive 4th Dry year		129.2	60%	80.8	• Same as above
Consecutive 5th Dry year		129.2	60%	80.8	• Same as above

Table 3d: Basis of Water Supply Data [For Table 7-1], Base Year 2035, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2035	220.5	100%	151.9	
Single dry year		154.4	70%	96.5	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		154.4	70%	96.5	• Same as above
Consecutive 2nd Dry year		132.3	60%	82.7	• Same as above
Consecutive 3rd Dry year		132.3	60%	82.7	• Same as above
Consecutive 4th Dry year		132.3	60%	82.7	• Same as above
Consecutive 5th Dry year		121.3	55%	75.8	• Same as above

Table 3e: Basis of Water Supply Data [For Table 7-1], Base Year 2040, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2040	226.8	100%	156.3	
Single dry year		158.8	70%	99.2	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		158.8	70%	99.2	• Same as above
Consecutive 2nd Dry year		136.1	60%	85.1	• Same as above
Consecutive 3rd Dry year		136.1	60%	85.1	• Same as above
Consecutive 4th Dry year		120.2	53%	75.1	• Same as above
Consecutive 5th Dry year		120.2	53%	75.1	• Same as above

Table 3f: Basis of Water Supply Data [For Table 7-1], Base Year 2045, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2045	236.5	100%	162.8	
Single dry year		141.9	60%	88.7	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		141.9	60%	88.7	• Same as above
Consecutive 2nd Dry year		141.9	60%	88.7	• Same as above
Consecutive 3rd Dry year		141.9	60%	88.7	• Same as above
Consecutive 4th Dry year		120.6	51%	75.4	• Same as above
Consecutive 5th Dry year		120.6	51%	75.4	• Same as above

Table 3g: Projected RWS Supply Availability [Alternative to Table 7-1], Years 2020-2045, With Bay-Delta Plan Amendment

Year	2020	2025	2030	2035	2040	2045
Average year	100%	100%	100%	100%	100%	100%
Single dry year	100%	70%	70%	70%	70%	60%
Consecutive 1st Dry year	100%	70%	70%	70%	70%	60%
Consecutive 2nd Dry year	100%	60%	60%	60%	60%	60%
Consecutive 3rd Dry year[1]	60%	60%	60%	60%	60%	60%
Consecutive 4th Dry year	60%	60%	60%	60%	53%	51%
Consecutive 5th Dry year	60%	60%	60%	55%	53%	51%

[1] Assuming that at base year 2020, this year represents 2023, when Bay Delta Plan Amendment would come into effect.

Basis of Water Supply Data: Without Bay-Delta Plan Amendment

Table 4a: Basis of Water Supply Data [For Table 7-1], Base Year 2020, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2020	198.6	100%	132.1	
Single dry year		198.6	100%	132.1	
Consecutive 1st Dry year		198.6	100%	132.1	
Consecutive 2nd Dry year		198.6	100%	132.1	
Consecutive 3rd Dry year		198.6	100%	132.1	
Consecutive 4th Dry year		198.6	100%	132.1	
Consecutive 5th Dry year		198.6	100%	132.1	

Table 4b: Basis of Water Supply Data [For Table 7-1], Base Year 2025, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2025	213.2	100%	146.0	
Single dry year		213.2	100%	146.0	
Consecutive 1st Dry year		213.2	100%	146.0	
Consecutive 2nd Dry year		213.2	100%	146.0	
Consecutive 3rd Dry year		213.2	100%	146.0	
Consecutive 4th Dry year		213.2	100%	146.0	
Consecutive 5th Dry year		213.2	100%	146.0	

Table 4c: Basis of Water Supply Data [For Table 7-1], Base Year 2030, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2030	215.4	100%	147.9	
Single dry year		215.4	100%	147.9	
Consecutive 1st Dry year		215.4	100%	147.9	
Consecutive 2nd Dry year		215.4	100%	147.9	
Consecutive 3rd Dry year		215.4	100%	147.9	
Consecutive 4th Dry year		215.4	100%	147.9	
Consecutive 5th Dry year		215.4	100%	147.9	

Table 4d: Basis of Water Supply Data [For Table 7-1], Base Year 2035, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2035	220.5	100%	151.9	
Single dry year		220.5	100%	151.9	
Consecutive 1st Dry year		220.5	100%	151.9	
Consecutive 2nd Dry year		220.5	100%	151.9	
Consecutive 3rd Dry year		220.5	100%	151.9	
Consecutive 4th Dry year		220.5	100%	151.9	
Consecutive 5th Dry year		220.5	100%	151.9	

Table 4e: Basis of Water Supply Data [For Table 7-1], Base Year 2040, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2040	226.8	100%	156.3	
Single dry year		226.8	100%	156.3	
Consecutive 1st Dry year		226.8	100%	156.3	
Consecutive 2nd Dry year		226.8	100%	156.3	
Consecutive 3rd Dry year		226.8	100%	156.3	
Consecutive 4th Dry year		226.8	100%	156.3	
Consecutive 5th Dry year		226.8	100%	156.3	

Table 4f: Basis of Water Supply Data [For Table 7-1], Base Year 2045, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2045	236.5	100%	162.8	
Single dry year		236.5	100%	162.8	
Consecutive 1st Dry year		236.5	100%	162.8	
Consecutive 2nd Dry year		236.5	100%	162.8	
Consecutive 3rd Dry year		236.5	100%	162.8	
Consecutive 4th Dry year		212.8	90%	139.1	• At a 10% shortage level, the wholesale allocation is 64% of available supply • The retail allocation is 36% of supply, which resulted in a positive allocation to retail of 2.9 mgd, which was re-allocated to the Wholesale Customers
Consecutive 5th Dry year		212.8	90%	139.1	• Same as above

Table 4g: Projected RWS Supply [Alternative to Table 7-1], Years 2020-2045, Without Bay-Delta Plan Amendment

Year	2020	2025	2030	2035	2040	2045
Average year	100%	100%	100%	100%	100%	100%
Single dry year	100%	100%	100%	100%	100%	100%
Consecutive 1st Dry year	100%	100%	100%	100%	100%	100%
Consecutive 2nd Dry year	100%	100%	100%	100%	100%	100%
Consecutive 3rd Dry year	100%	100%	100%	100%	100%	100%
Consecutive 4th Dry year	100%	100%	100%	100%	100%	90%
Consecutive 5th Dry year	100%	100%	100%	100%	100%	90%

Supply Projections for Consecutive Five Dry Year Sequences

Table 5: Projected Multiple Dry Years Wholesale Supply from RWS [For Table 7-4], With Bay-Delta Plan Amendment

	2025	2030	2035	2040	2045
First year	93.3	94.2	96.5	99.2	88.7
Second year	80.0	80.8	82.7	85.1	88.7
Third year	80.0	80.8	82.7	85.1	88.7
Fourth year	80.0	80.8	82.7	75.1	75.4
Fifth year	80.0	80.8	75.8	75.1	75.4

Table 6: Projected Multiple Dry Years Wholesale Supply from RWS [For Table 7-4], Without Bay-Delta Plan Amendment

	2025	2030	2035	2040	2045
First year	146.0	147.9	151.9	156.3	162.8
Second year	146.0	147.9	151.9	156.3	162.8
Third year	146.0	147.9	151.9	156.3	162.8
Fourth year	146.0	147.9	151.9	156.3	139.1
Fifth year	146.0	147.9	151.9	156.3	139.1

Table 7: Projected Regional Water System Supply for 5-Year Drought Risk Assessment [For Table 7-5], With Bay-Delta Plan Amendment. This table assumes Bay Delta Plan comes into effect in 2023.

Year	2021	2022	2023	2024	2025
RWS Supply (mgd)	198.6	198.6	119.2	119.2	119.2
Wholesale Supply (mgd)	132.1	132.1	74.5	74.5	74.5

Table 8: Projected Regional Water System Supply for 5-Year Drought Risk Assessment [For Table 7-5], Without Bay Delta Plan

Year	2021	2022	2023	2024	2025
RWS Supply (mgd)	198.6	198.6	198.6	198.6	198.6
Wholesale Supply (mgd)	132.1	132.1	132.1	132.1	132.1

Section 1: Basis for Calculations. Projected Wholesale RWS Purchases Through 2045

Table A: Wholesale RWS Actual Purchases in 2020 and Projected Purchases for 2025, 2030, 2035, 2040, and 2045 (mgd)[a]

Agency	2020 Actual	Projected Wholesale RWS Purchases 2025	2030	2035	2040	2045
ACWD	7.87	7.68	7.68	7.68	7.68	9.11
Brisbane/GVMID	0.64	0.89	0.89	0.88	0.89	0.89
Burlingame	3.48	4.33	4.40	4.47	4.58	4.69
Coastside	1.02	1.40	1.38	1.36	1.33	1.33
CalWater Total	29.00	29.99	29.74	29.81	30.27	30.70
Daly City	3.97	3.57	3.52	3.49	3.46	3.43
East Palo Alto	1.57	1.88	1.95	2.10	2.49	2.89
Estero	4.34	4.07	4.11	4.18	4.23	4.38
Hayward	13.92	17.86	18.68	19.75	20.82	22.14
Hillsborough	2.62	3.26	3.25	3.26	3.26	3.26
Menlo Park	2.96	3.55	3.68	3.87	4.06	4.29
Mid-Peninsula	2.66	2.86	2.84	2.88	2.89	2.93
Millbrae	1.90	2.29	2.50	2.45	2.82	3.20
Milpitas	5.92	6.59	6.75	7.03	7.27	7.53
Mountain View	7.67	8.60	8.90	9.20	9.51	9.93
North Coast	2.37	2.34	2.33	2.34	2.34	2.34
Palo Alto	9.75	10.06	10.15	10.28	10.51	10.79
Purissima Hills	1.75	2.09	2.09	2.12	2.13	2.15
Redwood City	8.76	8.46	8.49	8.64	8.74	8.90
San Bruno	0.95	3.24	3.22	3.20	3.20	3.21
San Jose	4.26	4.50	4.50	4.50	4.50	4.50
Santa Clara	3.27	4.50	4.50	4.50	4.50	4.50
Stanford	1.43	2.01	2.18	2.35	2.53	2.70
Sunnyvale	9.33	9.16	9.30	10.70	11.44	12.10
Westborough	0.82	0.86	0.85	0.85	0.84	0.84
Total	**132.22**	**146.01**	**147.87**	**151.90**	**156.31**	**162.76**

[a] Wholesale RWS purchase projections for 2025, 2030, 2035, 2040, and 2045 were provided to BAWSCA between July 2020 and January 2021 by the Member Agencies following the completion of the June 2020 Demand Study.

Table B: Basis for the 5-Year Drought Risk Assessment Wholesale RWS Actual Purchases in 2020 and 2021-2025 Projected Purchases (mgd)

Agency	2020 Actual	Projected and Estimated Wholesale RWS Purchases 2021[b]	2022[b]	2023[c]	2024[c]	2025[c]
ACWD	7.87	9.44	9.46	9.46	9.46	9.46
Brisbane/GVMID	0.64	0.62	0.65	0.65	0.65	0.65
Burlingame	3.48	3.34	3.35	3.35	3.35	3.35
Coastside	1.02	1.54	1.23	1.23	1.23	1.23
CalWater Total	29.00	29.66	29.81	29.81	29.81	29.81
Daly City	3.97	4.00	4.01	4.01	4.01	4.01
East Palo Alto	1.57	1.63	1.69	1.69	1.69	1.69
Estero	4.34	4.48	4.51	4.51	4.51	4.51
Hayward	13.92	14.47	15.12	15.12	15.12	15.12
Hillsborough	2.62	2.95	3.05	3.05	3.05	3.05
Menlo Park	2.96	2.92	2.93	2.93	2.93	2.93
Mid-Peninsula	2.66	2.65	2.80	2.80	2.80	2.80
Millbrae	1.90	1.95	2.15	2.15	2.15	2.15
Milpitas	5.92	5.88	5.34	5.34	5.34	5.34
Mountain View	7.67	7.80	8.05	8.05	8.05	8.05
North Coast	2.37	2.58	2.66	2.66	2.66	2.66
Palo Alto	9.75	9.44	9.66	9.66	9.66	9.66
Purissima Hills	1.75	1.97	2.02	2.02	2.02	2.02
Redwood City	8.76	8.72	9.07	9.07	9.07	9.07
San Bruno	0.95	3.39	3.40	3.40	3.40	3.40
San Jose	4.26	4.31	4.51	4.51	4.51	4.51
Santa Clara	3.27	3.29	3.50	3.50	3.50	3.50
Stanford	1.43	1.40	1.54	1.54	1.54	1.54
Sunnyvale	9.33	9.35	9.45	9.45	9.45	9.45
Westborough	0.82	0.84	0.81	0.81	0.81	0.81
Total	**132.22**	**138.61**	**140.77**	**140.77**	**140.77**	**140.77**

[b] Wholesale RWS purchase projections for 2021 and 2022 were provided to Christina Tang, BAWSCA's Finance Manager, by the Member Agencies in January 2021.

[c] The SFPUC's supply reliability tables assume the Bay-Delta Plan takes effect in 2023. In the event of a shortage, the Tier 2 Plan specifies that each agencies' Allocation Factor would be calculated once at the onset of a shortage based on the previous year's use and remains the same until the shortage condition is over. Therefore, for the purpose of drought allocations for the 5-year Drought Risk Assessment, wholesale RWS demand is assumed to remain static from 2022 through the drought sequence.

Section 2: Drought Allocations *With* Bay-Delta Plan

Table C: RWS Supply Available to the Wholesale Customers (Combined Tables 3a-3f from the SFPUC's March 30th letter) *With* Bay-Delta Plan (mgd)

	2020[e]	2025	2030	2035	2040	2045
Projected Purchases[d]	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 1st Dry Year	138.6	93.3	94.2	96.5	99.2	88.7
Consecutive 2nd Dry Year	140.8	80.0	80.8	82.7	85.1	88.7
Consecutive 3rd Dry Year	74.5	80.0	80.8	82.7	85.1	88.7
Consecutive 4th Dry Year	74.5	80.0	80.8	82.7	75.1	75.4
Consecutive 5th Dry Year	74.5	80.0	80.8	75.8	75.1	75.4

[d] Values for 2020 are actual purchases. This row aligns with what is labeled as an "Average Year" in Tables 3a-3f in the SFPUC's March 30th letter. However, these values do not represent an average year and instead are actual purchases for 2020 or projected purchases for 2025 through 2045.

[e] In years when the Bay-Delta Plan is not in effect, sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests assuming that they are between the 2020 and 2025 projected levels. As such, RWS supply available to the Wholesale Customers in the 1st and 2nd consecutive dry years under base year 2020 is equal to the cumulative projected wholesale RWS purchases for 2021 and 2022, respectively.

Table D: Wholesale RWS Demand (Combined Totals from Tables A and B) (mgd)[f]

	2020	2025	2030	2035	2040	2045
Projected Purchases[d]	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 1st Dry Year	138.6	146.0	147.9	151.9	156.3	162.8
Consecutive 2nd Dry Year	140.8	146.0	147.9	151.9	156.3	162.8
Consecutive 3rd Dry Year	140.8	146.0	147.9	151.9	156.3	162.8
Consecutive 4th Dry Year	140.8	146.0	147.9	151.9	156.3	162.8
Consecutive 5th Dry Year	140.8	146.0	147.9	151.9	156.3	162.8

[f] The SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. Additionally, the Tier 2 Plan calculates each agencies' Allocation Factor once at the onset of a drought and it remains the same until the shortage condition is over. When system-wide shortages are projected, wholesale RWS demand is assumed to be static for the remainder of the drought sequence.

Table E: Percent Cutback to the Wholesale Customers *With* Bay-Delta Plan[g]

	2020	2025	2030	2035	2040	2045
Projected Purchases[d]	0%	0%	0%	0%	0%	0%
Consecutive 1st Dry Year	0%	36%	36%	36%	37%	46%
Consecutive 2nd Dry Year	0%	45%	45%	46%	46%	46%
Consecutive 3rd Dry Year	47%	45%	45%	46%	46%	46%
Consecutive 4th Dry Year	47%	45%	45%	46%	52%	54%
Consecutive 5th Dry Year	47%	45%	45%	50%	52%	54%

[g] Agencies that wish to use new or different projected RWS purchases may use the percent cutbacks listed in this table to determine their drought allocation.

Table F1: Basis of Water Supply Data [For Tables 7-1 and 7-5], Base Year 2020, *With* Bay-Delta Plan (mgd)

Year Consecutive Dry Year	2020 Actual	2021 1st	2022 2nd	2023 3rd	2024 4th	2025 5th
Wholesale RWS Demand	132.2	138.6	140.8	140.8	140.8	140.8
Wholesale RWS Supply Available	132.2	138.6	140.8	74.5	74.5	74.5
Percent Cutback	0%	0%	0%	47%	47%	47%

Table F2: Individual Agency Drought Allocations [For Tables 7-1 and 7-5], Base Year 2020, *With* Bay-Delta Plan (mgd)

	2020	Wholesale RWS Drought Allocations				
Agency	Actual	2021	2022	2023	2024	2025
ACWD	7.87	9.44	9.46	5.01	5.01	5.01
Brisbane/GVMID	0.64	0.62	0.65	0.34	0.34	0.34
Burlingame	3.48	3.34	3.35	1.77	1.77	1.77
Coastside	1.02	1.54	1.23	0.65	0.65	0.65
CalWater Total	29.00	29.66	29.81	15.78	15.78	15.78
Daly City	3.97	4.00	4.01	2.12	2.12	2.12
East Palo Alto	1.57	1.63	1.69	0.89	0.89	0.89
Estero	4.34	4.48	4.51	2.39	2.39	2.39
Hayward	13.92	14.47	15.12	8.00	8.00	8.00
Hillsborough	2.62	2.95	3.05	1.61	1.61	1.61
Menlo Park	2.96	2.92	2.93	1.55	1.55	1.55
Mid-Peninsula	2.66	2.65	2.80	1.48	1.48	1.48
Millbrae	1.90	1.95	2.15	1.14	1.14	1.14
Milpitas	5.92	5.88	5.34	2.83	2.83	2.83
Mountain View	7.67	7.80	8.05	4.26	4.26	4.26
North Coast	2.37	2.58	2.66	1.41	1.41	1.41
Palo Alto	9.75	9.44	9.66	5.11	5.11	5.11
Purissima Hills	1.75	1.97	2.02	1.07	1.07	1.07
Redwood City	8.76	8.72	9.07	4.80	4.80	4.80
San Bruno	0.95	3.39	3.40	1.80	1.80	1.80
San Jose	4.26	4.31	4.51	2.39	2.39	2.39
Santa Clara	3.27	3.29	3.50	1.85	1.85	1.85
Stanford	1.43	1.40	1.54	0.82	0.82	0.82
Sunnyvale	9.33	9.35	9.45	5.00	5.00	5.00
Westborough	0.82	0.84	0.81	0.43	0.43	0.43
Total	**132.2**	**138.6**	**140.8**	**74.5**	**74.5**	**74.5**

Table G1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2025, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	146.0	146.0	146.0	146.0	146.0
Wholesale RWS Supply Available	93.3	80.0	80.0	80.0	80.0
Percent Cutback	36%	45%	45%	45%	45%

Table G2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2025, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.91	4.21	4.21	4.21	4.21
Brisbane/GVMID	0.57	0.49	0.49	0.49	0.49
Burlingame	2.76	2.37	2.37	2.37	2.37
Coastside	0.89	0.77	0.77	0.77	0.77
CalWater Total	19.16	16.43	16.43	16.43	16.43
Daly City	2.28	1.96	1.96	1.96	1.96
East Palo Alto	1.20	1.03	1.03	1.03	1.03
Estero	2.60	2.23	2.23	2.23	2.23
Hayward	11.41	9.78	9.78	9.78	9.78
Hillsborough	2.08	1.79	1.79	1.79	1.79
Menlo Park	2.27	1.95	1.95	1.95	1.95
Mid-Peninsula	1.83	1.57	1.57	1.57	1.57
Millbrae	1.46	1.25	1.25	1.25	1.25
Milpitas	4.21	3.61	3.61	3.61	3.61
Mountain View	5.49	4.71	4.71	4.71	4.71
North Coast	1.49	1.28	1.28	1.28	1.28
Palo Alto	6.43	5.51	5.51	5.51	5.51
Purissima Hills	1.33	1.14	1.14	1.14	1.14
Redwood City	5.40	4.63	4.63	4.63	4.63
San Bruno	2.07	1.77	1.77	1.77	1.77
San Jose	2.88	2.47	2.47	2.47	2.47
Santa Clara	2.88	2.47	2.47	2.47	2.47
Stanford	1.28	1.10	1.10	1.10	1.10
Sunnyvale	5.85	5.02	5.02	5.02	5.02
Westborough	0.55	0.47	0.47	0.47	0.47
Total	**93.3**	**80.0**	**80.0**	**80.0**	**80.0**

Table H1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2030, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	147.9	147.9	147.9	147.9	147.9
Wholesale RWS Supply Available	94.2	80.8	80.8	80.8	80.8
Percent Cutback	36%	45%	45%	45%	45%

Table H2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2030, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.89	4.20	4.20	4.20	4.20
Brisbane/GVMID	0.56	0.48	0.48	0.48	0.48
Burlingame	2.80	2.40	2.40	2.40	2.40
Coastside	0.88	0.75	0.75	0.75	0.75
CalWater Total	18.94	16.25	16.25	16.25	16.25
Daly City	2.24	1.92	1.92	1.92	1.92
East Palo Alto	1.24	1.07	1.07	1.07	1.07
Estero	2.62	2.24	2.24	2.24	2.24
Hayward	11.90	10.21	10.21	10.21	10.21
Hillsborough	2.07	1.78	1.78	1.78	1.78
Menlo Park	2.35	2.01	2.01	2.01	2.01
Mid-Peninsula	1.81	1.55	1.55	1.55	1.55
Millbrae	1.59	1.37	1.37	1.37	1.37
Milpitas	4.30	3.69	3.69	3.69	3.69
Mountain View	5.67	4.86	4.86	4.86	4.86
North Coast	1.48	1.27	1.27	1.27	1.27
Palo Alto	6.47	5.55	5.55	5.55	5.55
Purissima Hills	1.33	1.14	1.14	1.14	1.14
Redwood City	5.41	4.64	4.64	4.64	4.64
San Bruno	2.05	1.76	1.76	1.76	1.76
San Jose	2.87	2.46	2.46	2.46	2.46
Santa Clara	2.87	2.46	2.46	2.46	2.46
Stanford	1.39	1.19	1.19	1.19	1.19
Sunnyvale	5.92	5.08	5.08	5.08	5.08
Westborough	0.54	0.47	0.47	0.47	0.47
Total	**94.2**	**80.8**	**80.8**	**80.8**	**80.8**

Table I1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2035, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	151.9	151.9	151.9	151.9	151.9
Wholesale RWS Supply Available	96.5	82.7	82.7	82.7	75.8
Percent Cutback	36%	46%	46%	46%	50%

Table I2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2035, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.88	4.18	4.18	4.18	3.83
Brisbane/GVMID	0.56	0.48	0.48	0.48	0.44
Burlingame	2.84	2.44	2.44	2.44	2.23
Coastside	0.86	0.74	0.74	0.74	0.68
CalWater Total	18.94	16.23	16.23	16.23	14.88
Daly City	2.22	1.90	1.90	1.90	1.74
East Palo Alto	1.33	1.14	1.14	1.14	1.05
Estero	2.66	2.28	2.28	2.28	2.09
Hayward	12.55	10.75	10.75	10.75	9.86
Hillsborough	2.07	1.78	1.78	1.78	1.63
Menlo Park	2.46	2.10	2.10	2.10	1.93
Mid-Peninsula	1.83	1.57	1.57	1.57	1.44
Millbrae	1.56	1.34	1.34	1.34	1.22
Milpitas	4.47	3.83	3.83	3.83	3.51
Mountain View	5.84	5.01	5.01	5.01	4.59
North Coast	1.49	1.27	1.27	1.27	1.17
Palo Alto	6.53	5.60	5.60	5.60	5.13
Purissima Hills	1.34	1.15	1.15	1.15	1.06
Redwood City	5.49	4.70	4.70	4.70	4.31
San Bruno	2.03	1.74	1.74	1.74	1.60
San Jose	2.86	2.45	2.45	2.45	2.25
Santa Clara	2.86	2.45	2.45	2.45	2.25
Stanford	1.49	1.28	1.28	1.28	1.17
Sunnyvale	6.80	5.83	5.83	5.83	5.34
Westborough	0.54	0.46	0.46	0.46	0.42
Total	**96.5**	**82.7**	**82.7**	**82.7**	**75.8**

Table J1: Basis of Water Supply Data [For Table 7-1 and 7-4], Base Year 2040, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	156.3	156.3	156.3	156.3	156.3
Wholesale RWS Supply Available	99.2	85.1	85.1	75.1	75.1
Percent Cutback	37%	46%	46%	52%	52%

Table J2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2040, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.87	4.18	4.18	3.69	3.69
Brisbane/GVMID	0.56	0.48	0.48	0.43	0.43
Burlingame	2.91	2.49	2.49	2.20	2.20
Coastside	0.85	0.73	0.73	0.64	0.64
CalWater Total	19.21	16.48	16.48	14.54	14.54
Daly City	2.20	1.88	1.88	1.66	1.66
East Palo Alto	1.58	1.36	1.36	1.20	1.20
Estero	2.69	2.30	2.30	2.03	2.03
Hayward	13.21	11.34	11.34	10.00	10.00
Hillsborough	2.07	1.78	1.78	1.57	1.57
Menlo Park	2.58	2.21	2.21	1.95	1.95
Mid-Peninsula	1.84	1.58	1.58	1.39	1.39
Millbrae	1.79	1.53	1.53	1.35	1.35
Milpitas	4.62	3.96	3.96	3.49	3.49
Mountain View	6.03	5.18	5.18	4.57	4.57
North Coast	1.49	1.27	1.27	1.12	1.12
Palo Alto	6.67	5.72	5.72	5.05	5.05
Purissima Hills	1.35	1.16	1.16	1.03	1.03
Redwood City	5.55	4.76	4.76	4.20	4.20
San Bruno	2.03	1.74	1.74	1.54	1.54
San Jose	2.86	2.45	2.45	2.16	2.16
Santa Clara	2.86	2.45	2.45	2.16	2.16
Stanford	1.61	1.38	1.38	1.22	1.22
Sunnyvale	7.26	6.23	6.23	5.49	5.49
Westborough	0.54	0.46	0.46	0.41	0.41
Total	**99.2**	**85.1**	**85.1**	**75.1**	**75.1**

Table K1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2045, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	162.8	162.8	162.8	162.8	162.8
Wholesale RWS Supply Available	88.7	88.7	88.7	75.4	75.4
Percent Cutback	46%	46%	46%	54%	54%

Table K2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2045, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.97	4.97	4.97	4.22	4.22
Brisbane/GVMID	0.49	0.49	0.49	0.41	0.41
Burlingame	2.56	2.56	2.56	2.17	2.17
Coastside	0.72	0.72	0.72	0.61	0.61
CalWater Total	16.73	16.73	16.73	14.22	14.22
Daly City	1.87	1.87	1.87	1.59	1.59
East Palo Alto	1.58	1.58	1.58	1.34	1.34
Estero	2.39	2.39	2.39	2.03	2.03
Hayward	12.07	12.07	12.07	10.26	10.26
Hillsborough	1.78	1.78	1.78	1.51	1.51
Menlo Park	2.34	2.34	2.34	1.99	1.99
Mid-Peninsula	1.59	1.59	1.59	1.36	1.36
Millbrae	1.74	1.74	1.74	1.48	1.48
Milpitas	4.11	4.11	4.11	3.49	3.49
Mountain View	5.41	5.41	5.41	4.60	4.60
North Coast	1.28	1.28	1.28	1.09	1.09
Palo Alto	5.88	5.88	5.88	5.00	5.00
Purissima Hills	1.17	1.17	1.17	1.00	1.00
Redwood City	4.85	4.85	4.85	4.12	4.12
San Bruno	1.75	1.75	1.75	1.49	1.49
San Jose	2.45	2.45	2.45	2.08	2.08
Santa Clara	2.45	2.45	2.45	2.08	2.08
Stanford	1.47	1.47	1.47	1.25	1.25
Sunnyvale	6.59	6.59	6.59	5.61	5.61
Westborough	0.46	0.46	0.46	0.39	0.39
Total	**88.7**	**88.7**	**88.7**	**75.4**	**75.4**

Section 3: Drought Allocations *Without* Bay-Delta Plan

Table L: RWS Supply Available to the Wholesale Customers (Combined Tables 4a-4f from the SFPUC's March 30th letter) *Without* Bay-Delta Plan (mgd)[h]

	2020	2025	2030	2035	2040	2045
Projected Purchases[i]	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 1st Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 2nd Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 3rd Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 4th Dry Year	132.2	146.0	147.9	151.9	156.3	139.1
Consecutive 5th Dry Year	132.2	146.0	147.9	151.9	156.3	139.1

[h] The SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. However, the SFPUC has indicated that sufficient supplies are available to meet wholesale RWS demand so long as they reasonably stay within 2020 and 2040 levels. The SFPUC's modeling does not indicate cutbacks will be required till the 4th and 5th consecutive dry year at 2045 levels.

[i] Values for 2020 are actual purchases. This row aligns with what is labeled as an "Average Year" in Tables 4a-4f in the SFPUC's March 30th letter. However, these values do not represent an average year and instead are actual purchases for 2020 or projected purchases for 2025 through 2045.

Table M: Wholesale RWS Demand (Combined Totals from Tables A and B) (mgd)

	2020	2025	2030	2035	2040	2045
Projected Purchases[i]	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 1st Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 2nd Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 3rd Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 4th Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 5th Dry Year	132.2	146.0	147.9	151.9	156.3	162.8

Table N: Percent Cutback to the Wholesale Customers *Without* Bay-Delta Plan

	2020	2025	2030	2035	2040	2045
Projected Purchases[i]	0%	0%	0%	0%	0%	0%
Consecutive 1st Dry Year	0%	0%	0%	0%	0%	0%
Consecutive 2nd Dry Year	0%	0%	0%	0%	0%	0%
Consecutive 3rd Dry Year	0%	0%	0%	0%	0%	0%
Consecutive 4th Dry Year	0%	0%	0%	0%	0%	15%
Consecutive 5th Dry Year	0%	0%	0%	0%	0%	15%

Table O1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2045, *Without* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	162.8	162.8	162.8	162.8	162.8
Wholesale RWS Supply Available	162.8	162.8	162.8	139.1	139.1
Percent Cutback	0%	0%	0%	Tier 2 Plan	Tier 2 Plan

Table O2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2045, *Without* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations					Tier 2 Drought Cutback
Consecutive Dry Year	1st	2nd	3rd	4th	5th	
ACWD	9.11	9.11	9.11	8.20	8.20	10.0%
Brisbane/GVMID	0.89	0.89	0.89	0.74	0.74	16.8%
Burlingame	4.69	4.69	4.69	4.02	4.02	14.3%
Coastside	1.33	1.33	1.33	1.19	1.19	10.0%
CalWater Total	30.70	30.70	30.70	26.73	26.73	12.9%
Daly City	3.43	3.43	3.43	3.01	3.01	12.4%
East Palo Alto	2.89	2.89	2.89	2.68	2.68	7.3%
Estero	4.38	4.38	4.38	3.94	3.94	10.0%
Hayward	22.14	22.14	22.14	18.67	18.67	15.7%
Hillsborough	3.26	3.26	3.26	2.93	2.93	10.2%
Menlo Park	4.29	4.29	4.29	3.58	3.58	16.5%
Mid-Peninsula	2.93	2.93	2.93	2.63	2.63	10.0%
Millbrae	3.20	3.20	3.20	2.54	2.54	20.7%
Milpitas	7.53	7.53	7.53	6.55	6.55	13.1%
Mountain View	9.93	9.93	9.93	8.91	8.91	10.3%
North Coast	2.34	2.34	2.34	2.11	2.11	10.0%
Palo Alto	10.79	10.79	10.79	9.71	9.71	10.0%
Purissima Hills	2.15	2.15	2.15	1.41	1.41	34.5%
Redwood City	8.90	8.90	8.90	7.92	7.92	11.1%
San Bruno	3.21	3.21	3.21	2.60	2.60	19.1%
San Jose	4.50	4.50	4.50	2.95	2.95	34.5%
Santa Clara	4.50	4.50	4.50	2.95	2.95	34.5%
Stanford	2.70	2.70	2.70	2.27	2.27	16.0%
Sunnyvale	12.10	12.10	12.10	10.11	10.11	16.5%
Westborough	0.84	0.84	0.84	0.76	0.76	10.0%
Total	**162.8**	**162.8**	**162.8**	**139.1**	**139.1**	

Attachment B: Updated 2020 UWMP Drought Cutbacks

The January 22, 2021, SFPUC Regional Water System (RWS) Supply Reliability Letter (Supply Reliability Letter) provides RWS supplies available to the Wholesale Customers under two scenarios: (1) With Bay-Delta Plan, and (2) Without Bay-Delta Plan. Your agency must choose which scenario to use for your agency's 2020 UWMP submittal tables. However, you may discuss both scenarios in the body of your agency's UWMP. The purpose of this attachment is to provide further detail about your agency's allocation of total RWS supplies available to the Wholesale Customers under both scenarios.

Data Sources for Projected RWS Purchases

Supply allocations are based on projected RWS purchases provided to BAWSCA by the Member Agencies. Following the completion of the Demand Study in June 2020, BAWSCA used the results to develop a table for each Member Agency listing possible supplies and total demand for 2025, 2030, 2035, 2040, and 2045. BAWSCA populated the tables with total demand after passive conservation and entered active conservation, as calculated in the agencies' DSS Model, as a source of supply. Multi-source agencies were asked to complete the table with supply projections, including from the RWS, to meet total demand. Single-source agencies were offered the opportunity to review the tables upon request. Because active conservation was treated as a source of supply, projected RWS purchases are after passive and active conservation.

Water Management Representatives (WMRs) received a draft copy of all projected wholesale RWS purchase requests as part of the January 7, 2021 WMR meeting agenda packet and meeting slides. Agencies were asked to notify BAWSCA if changes were necessary regarding their purchase requests prior to BAWSCA sending those purchase requests to the SFPUC. Purchase requests were transmitted to the SFPUC via a letter dated January 15, 2021 for use in their 2020 UWMP efforts.

Note that the projected RWS purchases used by BAWSCA for fiscal years 2020-21 and for 2021-22 were provided to Christina Tang, BAWSCA's Finance Manager, by each Member Agency in January 2021. This annual reporting is part of the SFPUC's wholesale rate setting process. Member Agencies have provided BAWSCA with these projected purchases annually for the past 10 years.

UWMP Tables 7-1 and 7-5

UWMP Table 7-1 requests supply reliability for a normal year, a single dry year, and multiple (five) dry years. Tables 3, 4, 5, and 6 provided in the Supply Reliability Letter will help your agency complete UWMP Table 7-1. The Drought Risk Assessment (DRA) in UWMP Table 7-5 also requests a five-year drought sequence but specifies years 2021 through 2025. Supply Reliability Letter Tables 9 and 10 will help your agency complete UWMP Table 7-5.

The Supply Reliability Letter provides four tables for completing UWMP Table 7-1. The Supply Reliability Letter Tables 3 (with Bay-Delta Plan) and 4 (without Bay-Delta Plan) use 2020 as the base year. Depending on which scenario you choose, these will be the basis for your agency's five-year DRA (UWMP Table 7-5). The Supply Reliability Letter Tables 5 (with Bay-Delta Plan) and 6 (without Bay-Delta Plan) use 2025 as the base year. Depending on which scenario you choose, these will be the basis for UWMP Tables 7-2 through 7-4. Your agency may submit multiple UWMP Tables 7-1 with different base years (see Figure 1 below).

Attachment B: Updated 2020 UWMP Drought Cutbacks

Figure 1: Footnote from Draft UWMP Table 7-1

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a Supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.

Total RWS supplies available to the Wholesale Customers in the first through fifth consecutive dry years in Supply Reliability Letter Table 3 align with those in Table 9 of the same letter. Similarly, Supply Reliability Letter Table 4 aligns with Table 10 of the same letter.

Table A below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Tables 7-1and 7-5.

Table A: Wholesale Customer Drought Cutbacks Based on a Single Dry Year and Multiple Dry Years (Base Year 2020)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
(1)	Projected SF RWS Wholesale Purchases	132.2 MGD	138.6 MGD	140.8 MGD	140.8 MGD	140.8 MGD	140.8 MGD
(2)	Supply Available to the Wholesale Customers	Percent Cutback on Wholesale RWS Purchases					
		2020	**2021**	**2022**	**2023**	**2024**	**2025**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
(4)	132.5 MGD	0.0%	-4.4%	-5.9%	-5.9%	-5.9%	-5.9%
(5)	82.8 MGD	-37.4%	-40.3%	-41.2%	-41.2%	-41.2%	-41.2%
(6)	74.5 MGD	-43.7%	-46.3%	-47.1%	-47.1%	-47.1%	-47.1%

Table A, column (a), rows 3 through 6 lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative actual wholesale RWS purchases for 2020. In years when the Bay-Delta Plan is not in effect, sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests assuming that they are between the 2020 and 2025 projected levels. As such, RWS supply available to the Wholesale Customers in the 2021 and 2022 is equal to the cumulative projected wholesale RWS.. Projected RWS purchases for years 2021 and 2022 were provided to Christina Tang, BAWSCA's Finance Manager, by the Member Agencies in January 2021. The SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. Additionally, the Tier 2 Plan calculates each agencies' Allocation Factor once at the onset of a drought and it remains the same until the shortage condition is over. Therefore, wholesale RWS demand in 2023 through 2025 is assumed to be static based on the 2022 projected demand.

Table B below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Table 7-1.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table B: Wholesale Customer Drought Cutbacks Based on a Single Dry Year and Multiple Dry Years (Base Year 2025)

	(a)	(b)	(c)	(d)	(e)	(f)
(1)	Projected SF RWS Wholesale Purchases	146.0 MGD	146.0 MGD	146.0 MGD	146.0 MGD	146.0 MGD
(2)	Supply Available to the Wholesale Customers	Percent Cutback on Wholesale RWS Purchases				
		2025	**2026**	**2027**	**2028**	**2029**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	0.0%
(4)	132.5 MGD	-9.2%	-9.2%	-9.2%	-9.2%	-9.2%
(5)	82.8 MGD	-43.3%	-43.3%	-43.3%	-43.3%	-43.3%
(6)	74.5 MGD	-49.0%	-49.0%	-49.0%	-49.0%	-49.0%

Table B, column (a), rows 3 through 6 lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative projected wholesale RWS purchases for 2025 through 2029. The SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. Additionally, the Tier 2 Plan calculates each agencies' Allocation Factor once at the onset of a drought and it remains the same until the shortage condition is over. Therefore, wholesale RWS demand is assumed to be static between 2025 and 2029 based on the 2025 projected demand.

To complete UWMP Tables 7-1 and 7-5, reference tables in the Supply Reliability Letter to identify total RWS supplies available to the Wholesale Customers and apply the percent cutback in the corresponding year of the drought sequence using Tables A and B. For example, in Supply Reliability Letter Table 3, in the 5th consecutive year of a drought, the volume available to the Wholesale Customers is 74.5 MGD. To calculate RWS supplies available to your agency in 2025 using table A, locate the row with 74.5 MGD on the table – row 6 – and the column for 2025 – column (g). Then apply the percent cutback to your agency's RWS demand in 2025.

A list of purchase projections by agency are provided in Tables C, D, E, and F. The table also indicates the percent cutback that should be applied based on total RWS supplies available to the Wholesale Customers. Tables C and E use Scenario 1: With Bay-Delta Plan. Tables D and F use Scenario 2: Without Bay-Delta Plan. Tables C and D use 2020 as the base year and Tables E and F use 2025 as the base year.

BAWSCA understands that agencies are updating projected demands for their 2020 UWMPs and that projected RWS purchases may change from what was previously provided. Additionally, BAWSCA recognizes that not all Member Agencies will choose the same scenario for their UWMP supply reliability tables. For both reasons, projected RWS purchases in each Member Agency's 2020 UWMP may not add up to total Wholesale demands in the SFPUC's 2020 UWMP. This is consistent with direction given by the Department of Water Resources, which encourages suppliers use the UWMP tables to represent what they believe to be the most likely supply reliability scenario and to characterize the five-consecutive year drought in a manner that is best suited for understanding and managing their water service reliability and individual agency level of risk tolerance.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table C: Scenario 1: With Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2020)

	2020 (184 MGD)		**2021** (157.5 MGD)		**2022** (132.5 MGD)		**2023** (74.5 MGD)		**2024** (74.5 MGD)		**2025** (74.5 MGD)	
Agency	Actual Purchases	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.87	0.0%	9.44	0.0%	9.46	-5.9%	9.46	-47%	9.46	-47%	9.46	-47%
Brisbane/GVMID	0.64	0.0%	0.62	0.0%	0.65	-5.9%	0.65	-47%	0.65	-47%	0.65	-47%
Burlingame	3.48	0.0%	3.34	0.0%	3.35	-5.9%	3.35	-47%	3.35	-47%	3.35	-47%
Coastside	1.02	0.0%	1.54	0.0%	1.23	-5.9%	1.23	-47%	1.23	-47%	1.23	-47%
CalWater Total	29.00	0.0%	29.66	0.0%	29.81	-5.9%	29.81	-47%	29.81	-47%	29.81	-47%
Daly City	3.97	0.0%	4.00	0.0%	4.01	-5.9%	4.01	-47%	4.01	-47%	4.01	-47%
East Palo Alto	1.57	0.0%	1.63	0.0%	1.69	-5.9%	1.69	-47%	1.69	-47%	1.69	-47%
Estero	4.34	0.0%	4.48	0.0%	4.51	-5.9%	4.51	-47%	4.51	-47%	4.51	-47%
Hayward	13.92	0.0%	14.47	0.0%	15.12	-5.9%	15.12	-47%	15.12	-47%	15.12	-47%
Hillsborough	2.62	0.0%	2.95	0.0%	3.05	-5.9%	3.05	-47%	3.05	-47%	3.05	-47%
Menlo Park	2.96	0.0%	2.92	0.0%	2.93	-5.9%	2.93	-47%	2.93	-47%	2.93	-47%
Mid-Peninsula	2.66	0.0%	2.65	0.0%	2.80	-5.9%	2.80	-47%	2.80	-47%	2.80	-47%
Millbrae	1.90	0.0%	1.95	0.0%	2.15	-5.9%	2.15	-47%	2.15	-47%	2.15	-47%
Milpitas	5.92	0.0%	5.88	0.0%	5.34	-5.9%	5.34	-47%	5.34	-47%	5.34	-47%
Mountain View	7.67	0.0%	7.80	0.0%	8.05	-5.9%	8.05	-47%	8.05	-47%	8.05	-47%
North Coast	2.37	0.0%	2.58	0.0%	2.66	-5.9%	2.66	-47%	2.66	-47%	2.66	-47%
Palo Alto	9.75	0.0%	9.44	0.0%	9.66	-5.9%	9.66	-47%	9.66	-47%	9.66	-47%
Purissima Hills	1.75	0.0%	1.97	0.0%	2.02	-5.9%	2.02	-47%	2.02	-47%	2.02	-47%
Redwood City	8.76	0.0%	8.72	0.0%	9.07	-5.9%	9.07	-47%	9.07	-47%	9.07	-47%
San Bruno	0.95	0.0%	3.39	0.0%	3.40	-5.9%	3.40	-47%	3.40	-47%	3.40	-47%
San José	4.26	0.0%	4.31	0.0%	4.51	-5.9%	4.51	-47%	4.51	-47%	4.51	-47%
Santa Clara	3.27	0.0%	3.29	0.0%	3.50	-5.9%	3.50	-47%	3.50	-47%	3.50	-47%
Stanford	1.43	0.0%	1.40	0.0%	1.54	-5.9%	1.54	-47%	1.54	-47%	1.54	-47%
Sunnyvale	9.33	0.0%	9.35	0.0%	9.45	-5.9%	9.45	-47%	9.45	-47%	9.45	-47%
Westborough	0.82	0.0%	0.84	0.0%	0.81	-5.9%	0.81	-47%	0.81	-47%	0.81	-47%
Wholesale Total	**132.2**	**132.2†**	**138.6**	**138.6†**	**140.8**	**132.5†**	**140.8**	**74.5†**	**140.8**	**74.5†**	**140.8**	**74.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table D: Scenario 2: Without Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2020)

	2020 (184 MGD)		**2021** (157.5 MGD)		**2022** (132.5 MGD)		**2023** (132.5 MGD)		**2024** (132.5 MGD)		**2025** (132.5 MGD)	
Agency	Actual Purchases	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.87	0.0%	9.44	0.0%	9.46	-5.9%	9.46	-5.9%	9.46	-5.9%	9.46	-5.9%
Brisbane/GVMID	0.64	0.0%	0.62	0.0%	0.65	-5.9%	0.65	-5.9%	0.65	-5.9%	0.65	-5.9%
Burlingame	3.48	0.0%	3.34	0.0%	3.35	-5.9%	3.35	-5.9%	3.35	-5.9%	3.35	-5.9%
Coastside	1.02	0.0%	1.54	0.0%	1.23	-5.9%	1.23	-5.9%	1.23	-5.9%	1.23	-5.9%
CalWater Total	29.00	0.0%	29.66	0.0%	29.81	-5.9%	29.81	-5.9%	29.81	-5.9%	29.81	-5.9%
Daly City	3.97	0.0%	4.00	0.0%	4.01	-5.9%	4.01	-5.9%	4.01	-5.9%	4.01	-5.9%
East Palo Alto	1.57	0.0%	1.63	0.0%	1.69	-5.9%	1.69	-5.9%	1.69	-5.9%	1.69	-5.9%
Estero	4.34	0.0%	4.48	0.0%	4.51	-5.9%	4.51	-5.9%	4.51	-5.9%	4.51	-5.9%
Hayward	13.92	0.0%	14.47	0.0%	15.12	-5.9%	15.12	-5.9%	15.12	-5.9%	15.12	-5.9%
Hillsborough	2.62	0.0%	2.95	0.0%	3.05	-5.9%	3.05	-5.9%	3.05	-5.9%	3.05	-5.9%
Menlo Park	2.96	0.0%	2.92	0.0%	2.93	-5.9%	2.93	-5.9%	2.93	-5.9%	2.93	-5.9%
Mid-Peninsula	2.66	0.0%	2.65	0.0%	2.80	-5.9%	2.80	-5.9%	2.80	-5.9%	2.80	-5.9%
Millbrae	1.90	0.0%	1.95	0.0%	2.15	-5.9%	2.15	-5.9%	2.15	-5.9%	2.15	-5.9%
Milpitas	5.92	0.0%	5.88	0.0%	5.34	-5.9%	5.34	-5.9%	5.34	-5.9%	5.34	-5.9%
Mountain View	7.67	0.0%	7.80	0.0%	8.05	-5.9%	8.05	-5.9%	8.05	-5.9%	8.05	-5.9%
North Coast	2.37	0.0%	2.58	0.0%	2.66	-5.9%	2.66	-5.9%	2.66	-5.9%	2.66	-5.9%
Palo Alto	9.75	0.0%	9.44	0.0%	9.66	-5.9%	9.66	-5.9%	9.66	-5.9%	9.66	-5.9%
Purissima Hills	1.75	0.0%	1.97	0.0%	2.02	-5.9%	2.02	-5.9%	2.02	-5.9%	2.02	-5.9%
Redwood City	8.76	0.0%	8.72	0.0%	9.07	-5.9%	9.07	-5.9%	9.07	-5.9%	9.07	-5.9%
San Bruno	0.95	0.0%	3.39	0.0%	3.40	-5.9%	3.40	-5.9%	3.40	-5.9%	3.40	-5.9%
San José	4.26	0.0%	4.31	0.0%	4.51	-5.9%	4.51	-5.9%	4.51	-5.9%	4.51	-5.9%
Santa Clara	3.27	0.0%	3.29	0.0%	3.50	-5.9%	3.50	-5.9%	3.50	-5.9%	3.50	-5.9%
Stanford	1.43	0.0%	1.40	0.0%	1.54	-5.9%	1.54	-5.9%	1.54	-5.9%	1.54	-5.9%
Sunnyvale	9.33	0.0%	9.35	0.0%	9.45	-5.9%	9.45	-5.9%	9.45	-5.9%	9.45	-5.9%
Westborough	0.82	0.0%	0.84	0.0%	0.81	-5.9%	0.81	-5.9%	0.81	-5.9%	0.81	-5.9%
Wholesale Total	**132.2**	**132.2†**	**138.6**	**138.6†**	**140.8**	**132.5†**	**140.8**	**132.5†**	**140.8**	**132.5†**	**140.8**	**132.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table E: Scenario 1: With Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2025)

	2025 (184 MGD)		**2026** (82.8 MGD)		**2027** (74.5 MGD)		**2028** (74.5 MGD)		**2029** (74.5 MGD)	
Agency	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.68	0%	7.68	-43.3%	7.68	-49%	7.68	-49%	7.68	-49%
Brisbane/GVMID	0.89	0%	0.89	-43.3%	0.89	-49%	0.89	-49%	0.89	-49%
Burlingame	4.33	0%	4.33	-43.3%	4.33	-49%	4.33	-49%	4.33	-49%
Coastside	1.40	0%	1.40	-43.3%	1.40	-49%	1.40	-49%	1.40	-49%
CalWater Total	29.99	0%	29.99	-43.3%	29.99	-49%	29.99	-49%	29.99	-49%
Daly City	3.57	0%	3.57	-43.3%	3.57	-49%	3.57	-49%	3.57	-49%
East Palo Alto	1.88	0%	1.88	-43.3%	1.88	-49%	1.88	-49%	1.88	-49%
Estero	4.07	0%	4.07	-43.3%	4.07	-49%	4.07	-49%	4.07	-49%
Hayward	17.86	0%	17.86	-43.3%	17.86	-49%	17.86	-49%	17.86	-49%
Hillsborough	3.26	0%	3.26	-43.3%	3.26	-49%	3.26	-49%	3.26	-49%
Menlo Park	3.55	0%	3.55	-43.3%	3.55	-49%	3.55	-49%	3.55	-49%
Mid-Peninsula	2.86	0%	2.86	-43.3%	2.86	-49%	2.86	-49%	2.86	-49%
Millbrae	2.29	0%	2.29	-43.3%	2.29	-49%	2.29	-49%	2.29	-49%
Milpitas	6.59	0%	6.59	-43.3%	6.59	-49%	6.59	-49%	6.59	-49%
Mountain View	8.60	0%	8.60	-43.3%	8.60	-49%	8.60	-49%	8.60	-49%
North Coast	2.34	0%	2.34	-43.3%	2.34	-49%	2.34	-49%	2.34	-49%
Palo Alto	10.06	0%	10.06	-43.3%	10.06	-49%	10.06	-49%	10.06	-49%
Purissima Hills	2.09	0%	2.09	-43.3%	2.09	-49%	2.09	-49%	2.09	-49%
Redwood City	8.46	0%	8.46	-43.3%	8.46	-49%	8.46	-49%	8.46	-49%
San Bruno	3.24	0%	3.24	-43.3%	3.24	-49%	3.24	-49%	3.24	-49%
San José	4.50	0%	4.50	-43.3%	4.50	-49%	4.50	-49%	4.50	-49%
Santa Clara	4.50	0%	4.50	-43.3%	4.50	-49%	4.50	-49%	4.50	-49%
Stanford	2.01	0%	2.01	-43.3%	2.01	-49%	2.01	-49%	2.01	-49%
Sunnyvale	9.16	0%	9.16	-43.3%	9.16	-49%	9.16	-49%	9.16	-49%
Westborough	0.86	0%	0.86	-43.3%	0.86	-49%	0.86	-49%	0.86	-49%
Wholesale Total	**146.0**	**146.0†**	**146.0**	**82.8†**	**146.0**	**74.5†**	**146.0**	**74.5†**	**146.0**	**74.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table F: Scenario 2: Without Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2025)

	2025 (184 MGD)		**2026** (157.5 MGD)		**2027** (157.5 MGD)		**2028** (157.5 MGD)		**2029** (132.5 MGD)	
Agency	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.68	0.0%	7.68	0.0%	7.68	0.0%	7.68	0.0%	7.68	-9.2%
Brisbane/GVMID	0.89	0.0%	0.89	0.0%	0.89	0.0%	0.89	0.0%	0.89	-9.2%
Burlingame	4.33	0.0%	4.33	0.0%	4.33	0.0%	4.33	0.0%	4.33	-9.2%
Coastside	1.40	0.0%	1.40	0.0%	1.40	0.0%	1.40	0.0%	1.40	-9.2%
CalWater Total	29.99	0.0%	29.99	0.0%	29.99	0.0%	29.99	0.0%	29.99	-9.2%
Daly City	3.57	0.0%	3.57	0.0%	3.57	0.0%	3.57	0.0%	3.57	-9.2%
East Palo Alto	1.88	0.0%	1.88	0.0%	1.88	0.0%	1.88	0.0%	1.88	-9.2%
Estero	4.07	0.0%	4.07	0.0%	4.07	0.0%	4.07	0.0%	4.07	-9.2%
Hayward	17.86	0.0%	17.86	0.0%	17.86	0.0%	17.86	0.0%	17.86	-9.2%
Hillsborough	3.26	0.0%	3.26	0.0%	3.26	0.0%	3.26	0.0%	3.26	-9.2%
Menlo Park	3.55	0.0%	3.55	0.0%	3.55	0.0%	3.55	0.0%	3.55	-9.2%
Mid-Peninsula	2.86	0.0%	2.86	0.0%	2.86	0.0%	2.86	0.0%	2.86	-9.2%
Millbrae	2.29	0.0%	2.29	0.0%	2.29	0.0%	2.29	0.0%	2.29	-9.2%
Milpitas	6.59	0.0%	6.59	0.0%	6.59	0.0%	6.59	0.0%	6.59	-9.2%
Mountain View	8.60	0.0%	8.60	0.0%	8.60	0.0%	8.60	0.0%	8.60	-9.2%
North Coast	2.34	0.0%	2.34	0.0%	2.34	0.0%	2.34	0.0%	2.34	-9.2%
Palo Alto	10.06	0.0%	10.06	0.0%	10.06	0.0%	10.06	0.0%	10.06	-9.2%
Purissima Hills	2.09	0.0%	2.09	0.0%	2.09	0.0%	2.09	0.0%	2.09	-9.2%
Redwood City	8.46	0.0%	8.46	0.0%	8.46	0.0%	8.46	0.0%	8.46	-9.2%
San Bruno	3.24	0.0%	3.24	0.0%	3.24	0.0%	3.24	0.0%	3.24	-9.2%
San José	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	-9.2%
Santa Clara	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	-9.2%
Stanford	2.01	0.0%	2.01	0.0%	2.01	0.0%	2.01	0.0%	2.01	-9.2%
Sunnyvale	9.16	0.0%	9.16	0.0%	9.16	0.0%	9.16	0.0%	9.16	-9.2%
Westborough	0.86	0.0%	0.86	0.0%	0.86	0.0%	0.86	0.0%	0.86	-9.2%
Wholesale Total	**146.0**	**146.0†**	**146.0**	**146.4†**	**146.0**	**146.8†**	**146.0**	**147.1†**	**146.0**	**132.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

UWMP Table 7-4

Supply Reliability Letter Tables 7 and 8 will help your agency complete UWMP Table 7-4. Table G below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Table 7-4. The table assumes (1) the Tier 2 Plan will be used to allocate supplies available to the Wholesale Customers when average Wholesale Customers' RWS shortages are greater than 10 and up to 20 percent, and (2) an equal percent reduction will be shared across all Wholesale Customers when average Wholesale Customers' RWS shortages are 10 percent or less or greater than 20 percent.

Table G: Drought Cutbacks Based on Projected Demands Under All Water Supply Availability Conditions

	(a)	(b)	(c)	(d)	(e)	(f)
(1)	Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
(2)	Supply Available to the Wholesale Customers	% Cutback on Wholesale RWS Purchases				
		2025	**2030**	**2035**	**2040**	**2045**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	-3.2%
(4)	132.5 MGD	-9.3%	-10.4%	Tier 2 Avg. -14%*	Tier 2 Avg. -16%*	Tier 2 Avg. -19%*
(5)	82.8 MGD	-43.3%	-44.0%	-45.5%	-47.0%	-49.1%
(6)	74.5 MGD	-49.0%	-49.6%	-51.0%	-52.3%	-54.2%

* Calculated average. Individual agency cutbacks are calculated in Table H.

Table G, column (a) lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative projected wholesale RWS purchases for 2025, 2030, 2035, 2040, and 2045.

Tables H, I, J and K provide additional detail by agency for each of the four supply availability conditions listed in Table G. To complete UWMP Table 7-4, reference Table 7 or 8 (depending on which Bay-Delta Plan scenario you choose) in the Supply Reliability Letter to identify total RWS supplies available to the Wholesale Customers and apply the percent cutback in the corresponding year using Table G or input the volumetric drought allocation using Tables H, I, J and K below.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table H: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 157.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2035**	**2040**	**2045**
ACWD	7.68	7.68	7.68	7.68	8.82
Brisbane/GVMID	0.89	0.89	0.88	0.89	0.87
Burlingame	4.33	4.40	4.47	4.58	4.54
Coastside	1.40	1.38	1.36	1.33	1.28
CalWater Total	29.99	29.74	29.81	30.27	29.71
Daly City	3.57	3.52	3.49	3.46	3.32
East Palo Alto	1.88	1.95	2.10	2.49	2.80
Estero	4.07	4.11	4.18	4.23	4.24
Hayward	17.86	18.68	19.75	20.82	21.43
Hillsborough	3.26	3.25	3.26	3.26	3.15
Menlo Park	3.55	3.68	3.87	4.06	4.15
Mid-Peninsula	2.86	2.84	2.88	2.89	2.83
Millbrae	2.29	2.50	2.45	2.82	3.10
Milpitas	6.59	6.75	7.03	7.27	7.29
Mountain View	8.60	8.90	9.20	9.51	9.61
North Coast	2.34	2.33	2.34	2.34	2.27
Palo Alto	10.06	10.15	10.28	10.51	10.44
Purissima Hills	2.09	2.09	2.12	2.13	2.08
Redwood City	8.46	8.49	8.64	8.74	8.62
San Bruno	3.24	3.22	3.20	3.20	3.11
San José	4.50	4.50	4.50	4.50	4.35
Santa Clara	4.50	4.50	4.50	4.50	4.35
Stanford	2.01	2.18	2.35	2.53	2.61
Sunnyvale	9.16	9.30	10.70	11.44	11.71
Westborough	0.86	0.85	0.85	0.84	0.82
Wholesale Total	**146.0**	**147.9**	**151.9**	**156.3**	**157.5**

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table I: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 132.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2035**	**2040**	**2045**
ACWD	6.97	6.88	6.91	6.91	8.20
Brisbane/GVMID	0.81	0.79	0.73	0.73	0.72
Burlingame	3.93	3.94	3.96	3.89	3.80
Coastside	1.27	1.24	1.22	1.20	1.19
CalWater Total	27.21	26.65	26.46	25.69	24.69
Daly City	3.24	3.15	3.04	3.01	2.98
East Palo Alto	1.70	1.75	1.97	2.30	2.62
Estero	3.69	3.68	3.76	3.87	3.77
Hayward	16.20	16.74	17.32	17.69	18.07
Hillsborough	2.96	2.92	2.90	2.75	2.56
Menlo Park	3.22	3.30	3.37	3.33	3.26
Mid-Peninsula	2.59	2.54	2.59	2.62	2.54
Millbrae	2.07	2.24	2.16	2.32	2.45
Milpitas	5.98	6.05	6.25	6.31	6.35
Mountain View	7.80	7.97	8.28	8.49	8.34
North Coast	2.12	2.09	2.11	2.11	2.11
Palo Alto	9.13	9.09	9.26	9.46	9.71
Purissima Hills	1.89	1.87	1.42	1.38	1.32
Redwood City	7.67	7.61	7.89	7.70	7.49
San Bruno	2.94	2.88	2.56	2.51	2.45
San José	4.08	4.03	3.03	2.91	2.76
Santa Clara	4.08	4.03	3.03	2.91	2.76
Stanford	1.82	1.95	2.06	2.13	2.16
Sunnyvale	8.31	8.33	9.46	9.51	9.43
Westborough	0.78	0.76	0.76	0.76	0.76
Wholesale Total	**132.5**	**132.5**	**132.5**	**132.5**	**132.5**

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table J: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 82.8 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2035**	**2040**	**2045**
ACWD	4.36	4.30	4.19	4.07	4.64
Brisbane/GVMID	0.51	0.50	0.48	0.47	0.45
Burlingame	2.45	2.46	2.44	2.43	2.39
Coastside	0.79	0.77	0.74	0.71	0.68
CalWater Total	17.00	16.65	16.25	16.03	15.62
Daly City	2.02	1.97	1.90	1.83	1.75
East Palo Alto	1.06	1.09	1.14	1.32	1.47
Estero	2.31	2.30	2.28	2.24	2.23
Hayward	10.13	10.46	10.77	11.03	11.26
Hillsborough	1.85	1.82	1.78	1.73	1.66
Menlo Park	2.01	2.06	2.11	2.15	2.18
Mid-Peninsula	1.62	1.59	1.57	1.53	1.49
Millbrae	1.30	1.40	1.34	1.49	1.63
Milpitas	3.74	3.78	3.83	3.85	3.83
Mountain View	4.88	4.98	5.01	5.04	5.05
North Coast	1.33	1.30	1.28	1.24	1.19
Palo Alto	5.71	5.68	5.61	5.57	5.49
Purissima Hills	1.18	1.17	1.15	1.13	1.10
Redwood City	4.80	4.76	4.71	4.63	4.53
San Bruno	1.83	1.80	1.75	1.70	1.63
San José	2.55	2.52	2.45	2.38	2.29
Santa Clara	2.55	2.52	2.45	2.38	2.29
Stanford	1.14	1.22	1.28	1.34	1.37
Sunnyvale	5.19	5.21	5.83	6.06	6.16
Westborough	0.49	0.48	0.46	0.45	0.43
Wholesale Total	**82.8**	**82.8**	**82.8**	**82.8**	**82.8**

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table K: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 74.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2035**	**2040**	**2045**
ACWD	3.92	3.87	3.77	3.66	4.17
Brisbane/GVMID	0.46	0.45	0.43	0.42	0.41
Burlingame	2.21	2.21	2.19	2.18	2.15
Coastside	0.71	0.70	0.67	0.64	0.61
CalWater Total	15.30	14.98	14.62	14.43	14.05
Daly City	1.82	1.77	1.71	1.65	1.57
East Palo Alto	0.96	0.98	1.03	1.19	1.32
Estero	2.08	2.07	2.05	2.02	2.00
Hayward	9.11	9.41	9.69	9.92	10.14
Hillsborough	1.66	1.64	1.60	1.55	1.49
Menlo Park	1.81	1.86	1.90	1.94	1.96
Mid-Peninsula	1.46	1.43	1.41	1.38	1.34
Millbrae	1.17	1.26	1.20	1.34	1.47
Milpitas	3.36	3.40	3.45	3.47	3.45
Mountain View	4.39	4.48	4.51	4.53	4.54
North Coast	1.19	1.17	1.15	1.12	1.07
Palo Alto	5.14	5.11	5.04	5.01	4.94
Purissima Hills	1.06	1.05	1.04	1.02	0.99
Redwood City	4.31	4.28	4.24	4.17	4.08
San Bruno	1.65	1.62	1.57	1.53	1.47
San José	2.30	2.27	2.21	2.14	2.06
Santa Clara	2.30	2.27	2.21	2.14	2.06
Stanford	1.03	1.10	1.15	1.21	1.24
Sunnyvale	4.67	4.69	5.25	5.45	5.54
Westborough	0.44	0.43	0.41	0.40	0.39
Wholesale Total	**74.5**	**74.5**	**74.5**	**74.5**	**74.5**

APPENDIX J
26 MARCH 2021 SFPUC COMMISSION SPECIAL MEETING – WATER WORKSHOP NUMBER 3 WATER SUPPLY PLANNING SCENARIOS SFPUC STAFF PRESENTATION MATERIALS

Operated by the San Francisco Public Utilities Commission

Water Workshop Number 3
Water Supply Planning Scenarios

March 26, 2021

Introduction

- Ten water supply planning scenarios were run using our HHLSM system modeling tool and the Regional Water System Supply and Demand Worksheet.
- For each scenario the ultimate result is either a surplus or deficit of supply, and each scenario produces different results, demonstrating the effect of the choices that are made.
- The assumptions and results for each scenario will be displayed in this presentation.
- The presentation concludes with a summary table of the bottom-line results for all the scenarios.

The Ten Scenarios

I. Previous Demand Estimates
II. Current Conditions
III. Tuolumne River Voluntary Agreement
IV. Bay-Delta Plan
V. Bay-Delta Plan with Alternative Water Supply Projects
VI. Bay-Delta Plan with Alternative Water Supply Projects and Modified Rationing Policy
VII. Bay-Delta Plan with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought
VIII. Water Quality Certification (401) with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought
IX. NGO scenario 1: Current system, 198 mgd constant demand, Bay-Delta Plan flows
X. NGO Scenario 2: Current system, 223 mgd constant demand, 7 ½ year design drought, Bay-Delta Plan flows

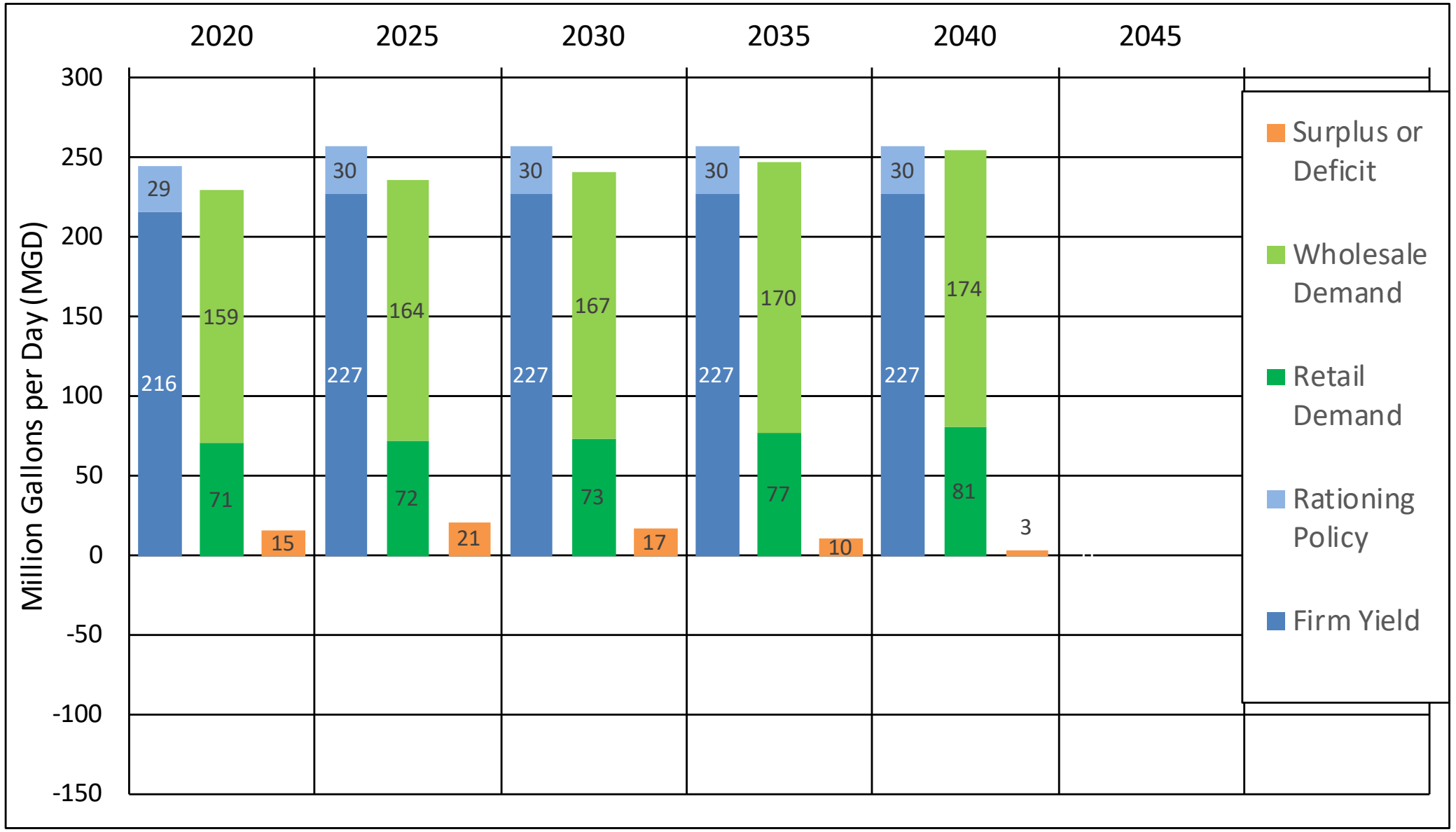
I. Prior Demand Estimates

- Includes retail demand projections from the 2015 Urban Water Management Plan
- Includes 2015 purchase projections from wholesale customers
- Includes current side agreement on flows in the lower Tuolumne River
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	2020	2025	2030	2035	2040	2045
Total Yield:	245	257	257	257	257	NA
RWS Demand:	230	236	241	247	255	NA
Lower Tuolumne Contribution:	NA	NA	NA	NA	NA	NA
Surplus or Deficit:	15	21	17	10	3	NA

I. Prior Demand Estimates



II. Current Conditions

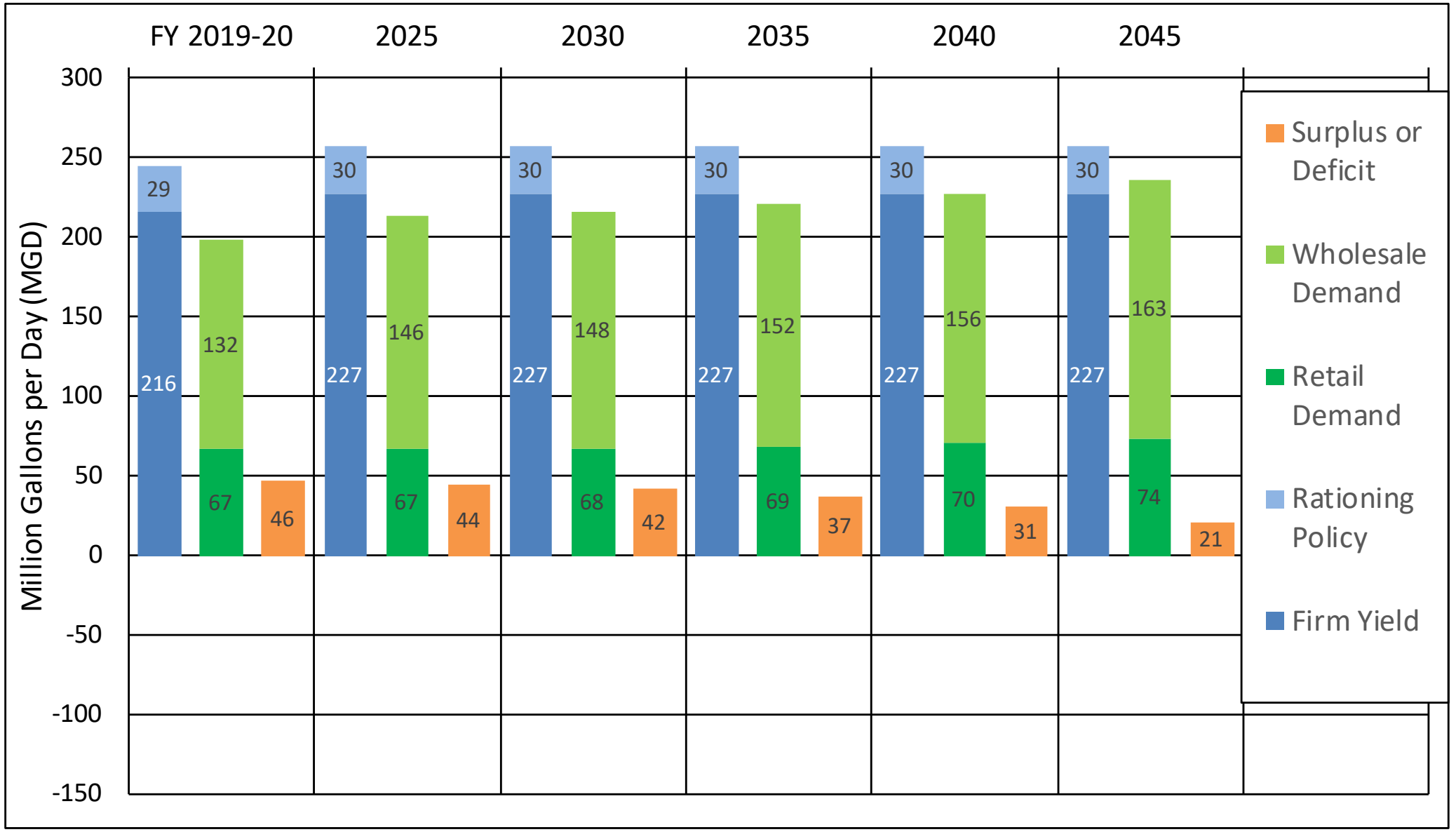
- Includes updated demand projections for anticipated development in retail service area*
- Includes most recent purchase projections from wholesale customers*
- Includes a total of 9 MGD for San Jose and Santa Clara*
- Includes the 1995 side agreement on flows in the lower Tuolumne River
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	245	257	257	257	257	257
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	NA	NA	NA	NA	NA
Surplus or Deficit:	46	44	42	37	31	21

* Base Conditions in later slides

II. Current Conditions



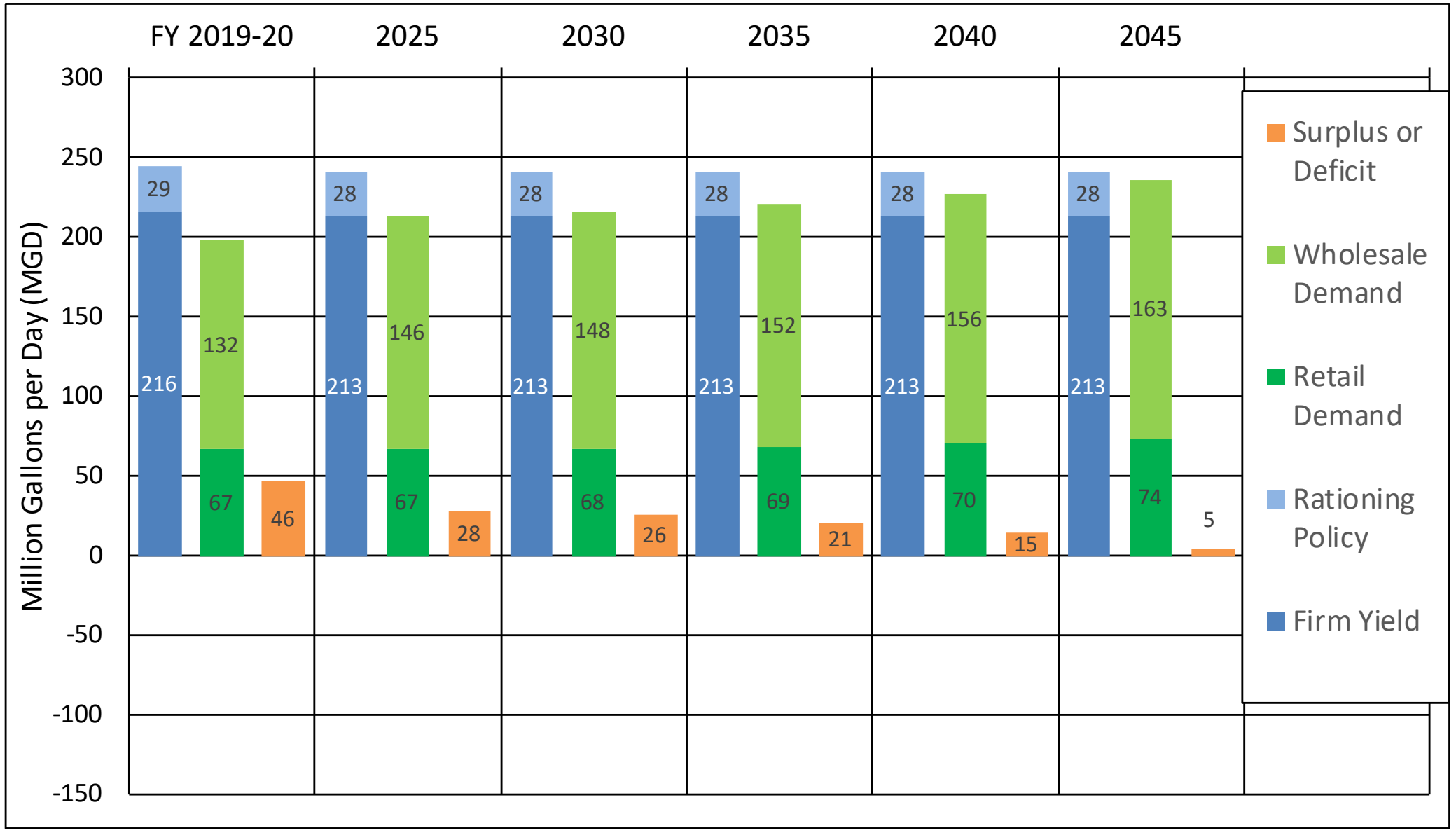
III. Tuolumne River Voluntary Agreement

- Base Conditions
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy
- Includes SFPUC contribution to the TRVA, displayed in the graph as a reduction in Firm Yield
- SFPUC contributions are calculated according to the 4th Agreement and assumes continuation of the 1995 side agreement.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	245	241	241	241	241	241
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	14	14	14	14	14
Surplus or Deficit:	46	28	26	21	15	5

III. Tuolumne River Voluntary Agreement



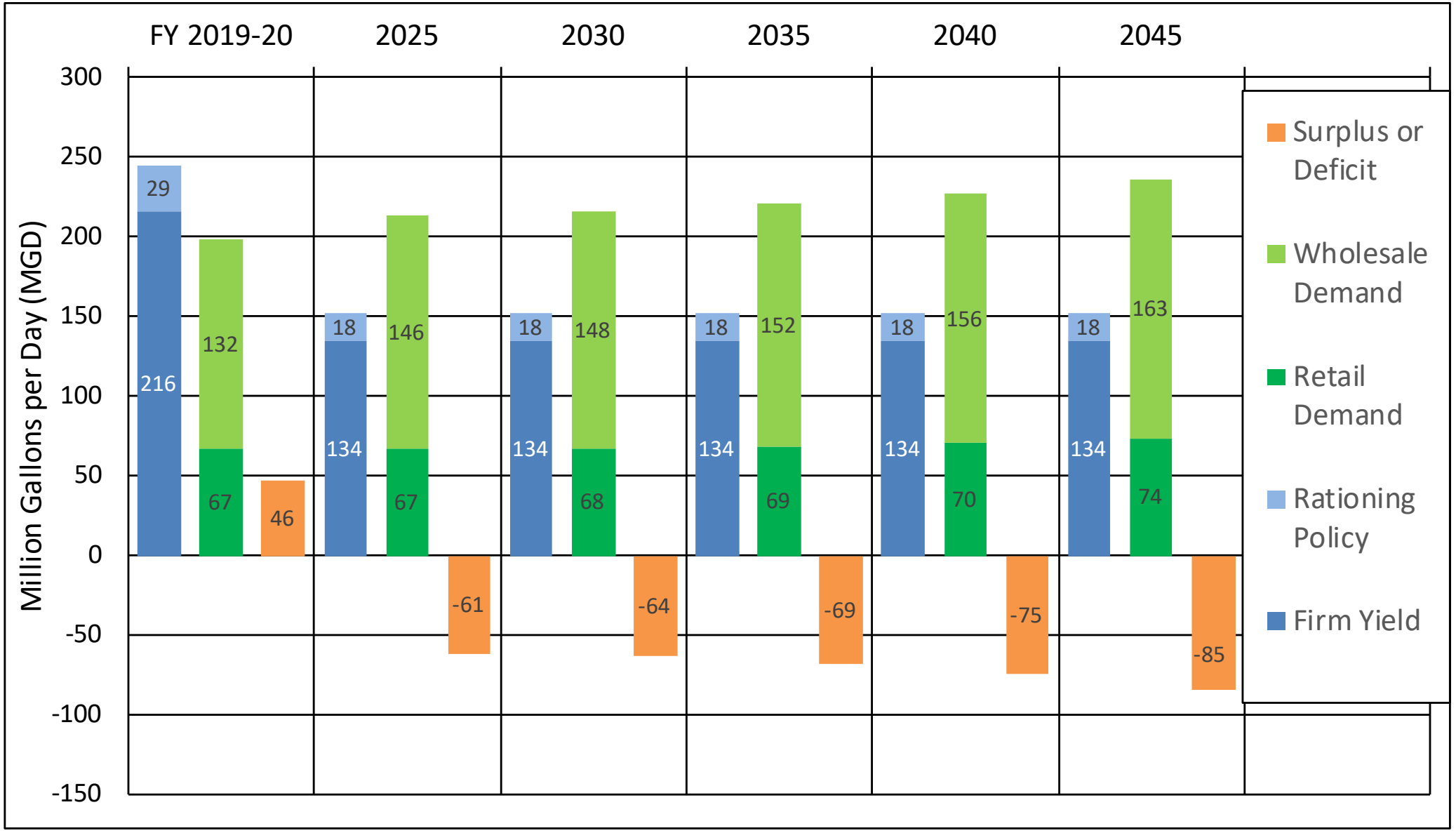
IV. Bay-Delta Plan

- Base Conditions
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy
- Includes SFPUC contribution to the Bay-Delta Plan displayed in the graph as a reduction in Firm Yield, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	245	152	152	152	152	152
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	93	93	93	93	93
Surplus or Deficit:	46	-61	-64	-69	-75	-85

IV. Bay-Delta Plan



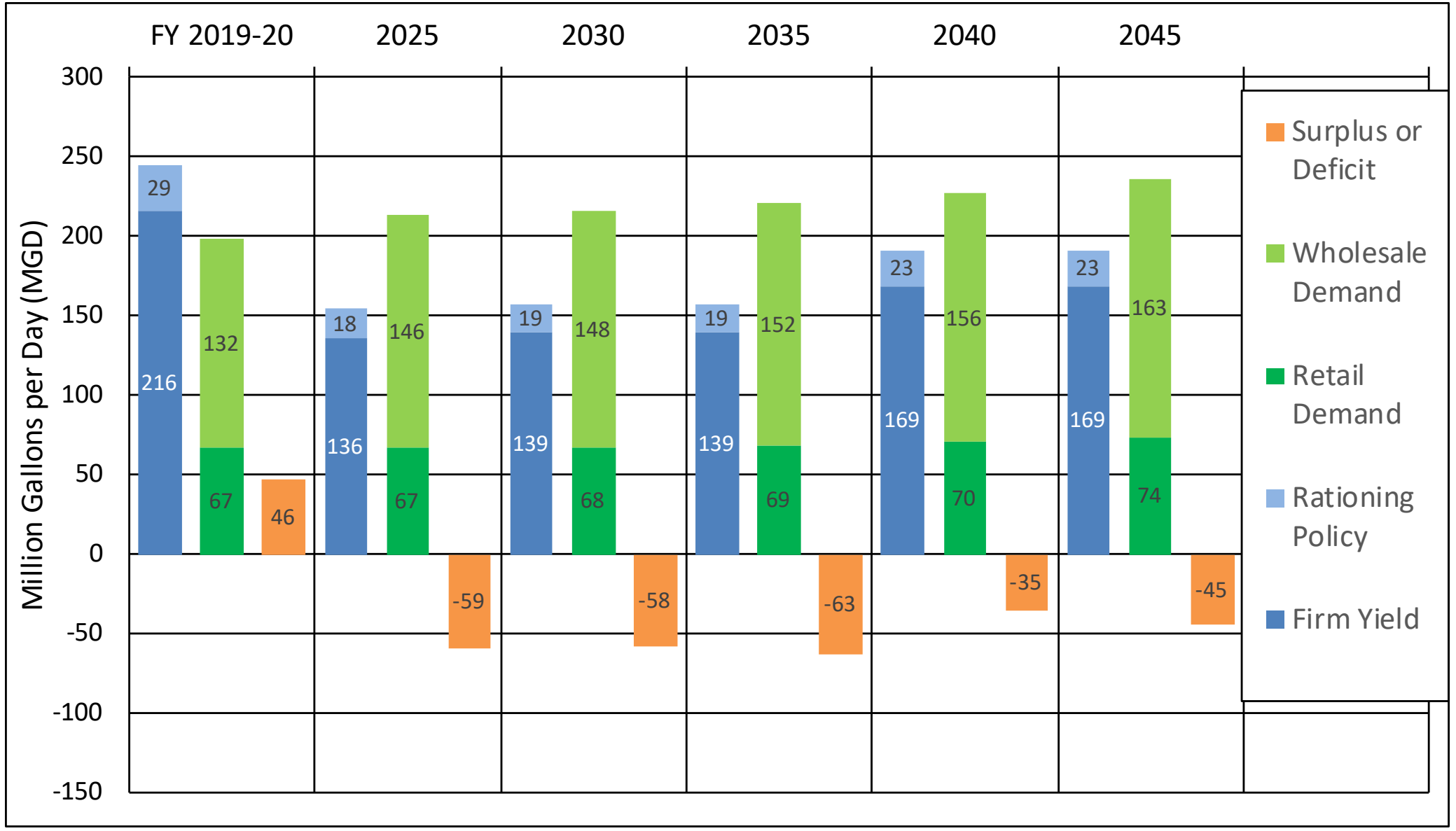
V. Bay-Delta Plan with Alternative Water Supply Projects

- Base Conditions
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy
- Includes SFPUC contribution to the Bay-Delta Plan displayed in the graph as a reduction in Firm Yield, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and continuation of the 1995 side agreement.
- Includes a total of 35 MGD of new water supply projects, which are assumed to be added between 2025 and 2040. The firm yield from the new projects is shown separately in the table to demonstrate the estimated development of the projects over time. The new project yield is also included in the Total Yield shown in the table.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	245	154	158	158	192	192
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	93	93	93	93	93
Alternative Water Supply Projects:	NA	2	5	5	35	35
Surplus or Deficit:	46	-59	-58	-63	-35	-45

V. Bay-Delta Plan with Alternative Water Supply Projects



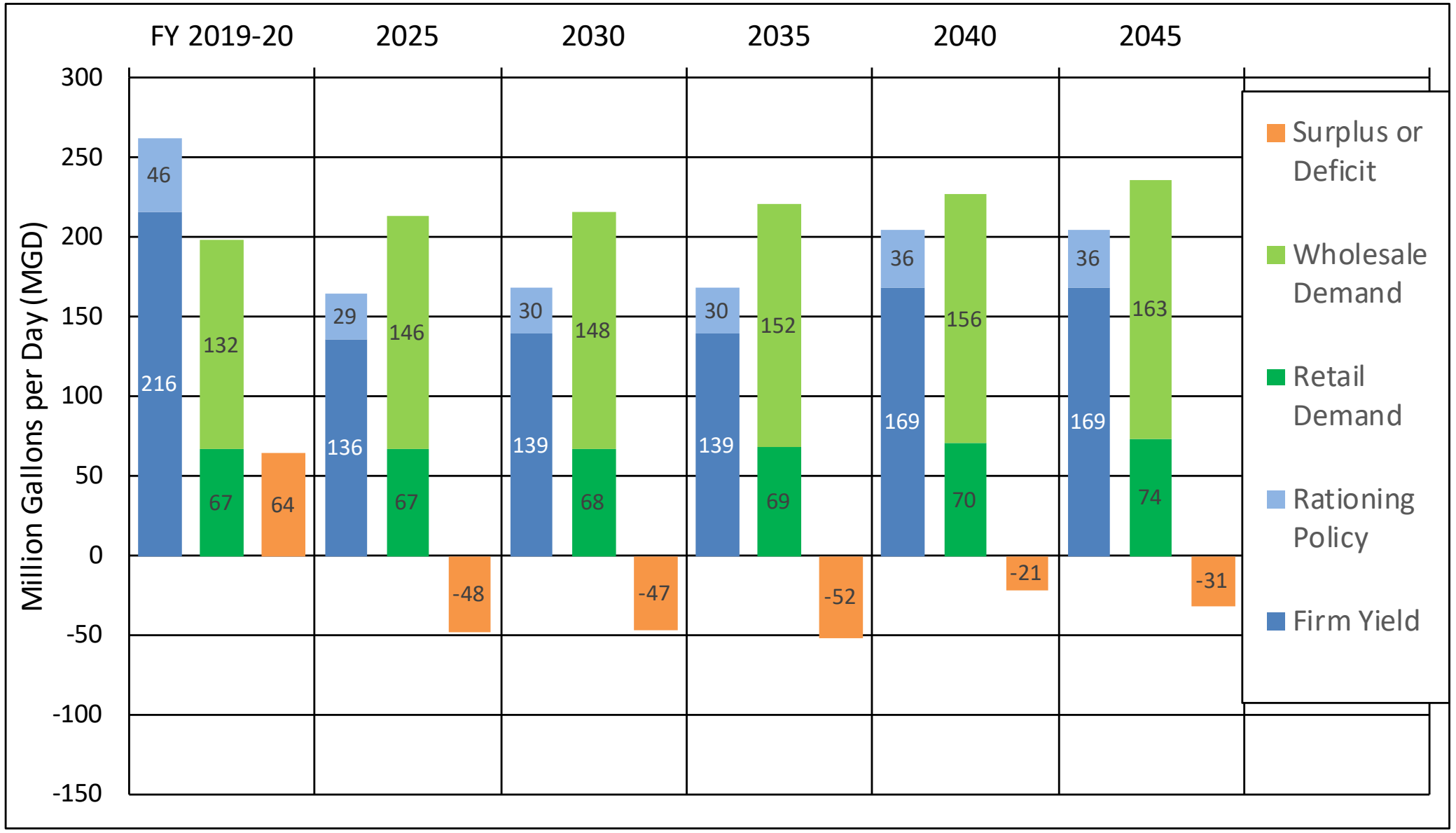
VI. Bay-Delta Plan with Alternative Water Supply Projects and Modified Rationing Policy

- Base Conditions
- Yield values are based on the 8.5-year design drought
- Includes SFPUC contribution to the Bay-Delta Plan displayed in the graph as a reduction in Firm Yield, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.
- Includes a total of 35 MGD of new water supply projects, as described on slide 12 for scenario V
- Includes 7.5 years of rationing at 20% in the 8.5-year design drought sequence

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	262	165	169	169	205	205
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	93	93	93	93	93
Surplus or Deficit:	64	-48	-47	-52	-21	-31

VI. Bay-Delta Plan with Alternative Water Supply Projects and Modified Rationing Policy



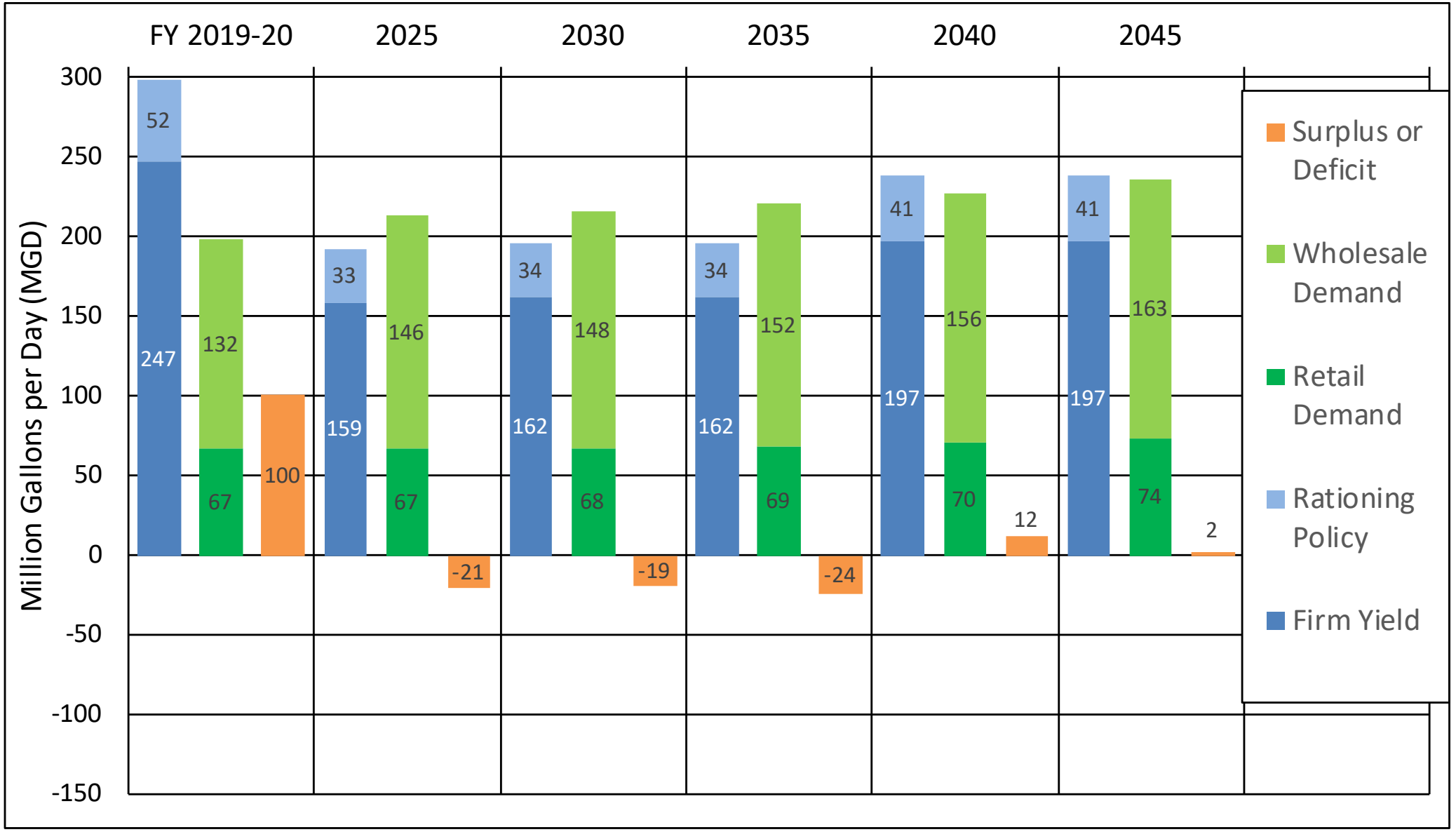
VII. Bay-Delta Plan with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought

- Base Conditions
- Includes SFPUC contribution to the Bay-Delta Plan displayed in the graph as a reduction in Firm Yield, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.
- Includes a total of 35 MGD of new water supply projects, as described on slide 12 for scenario V
- Yield values are estimated using a 7.5-year design drought
- Includes 6.5 years of rationing at 20% in the 7.5-year design drought sequence.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	299	192	196	196	238	238
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	101	101	101	101	101
Surplus or Deficit:	100	-21	-19	-24	12	2

VII. Bay-Delta Plan with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought



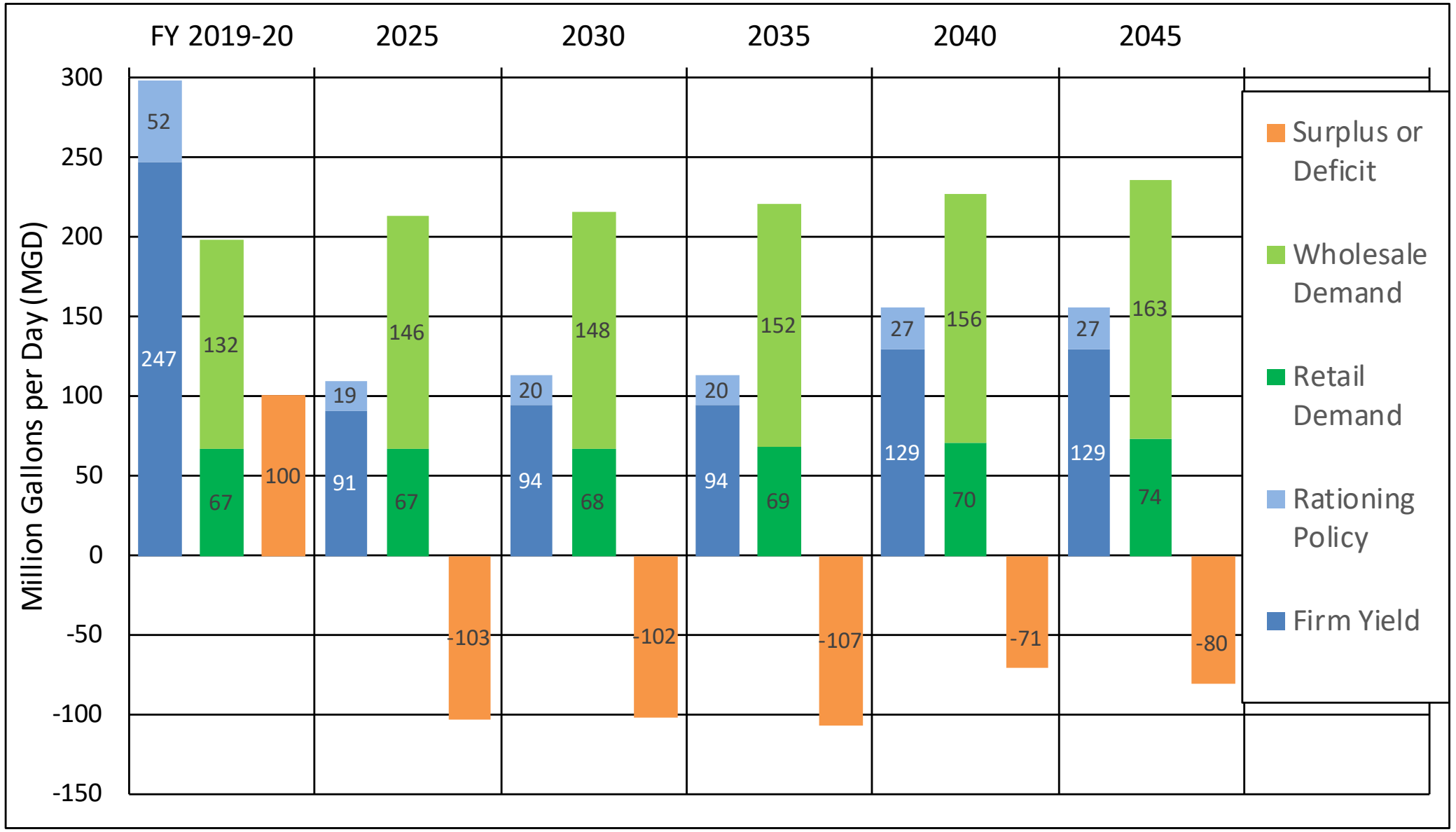
VIII. Water Quality Certification (401) with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought

- Base Conditions
- Includes SFPUC contribution to the Section 401 water quality certification on the FERC license displayed in the graph as a reduction in Firm Yield.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.
- Includes a total of 35 MGD of new water supply projects, as described on slide 12 for scenario V
- Yield values are estimated using a 7.5-year design drought
- Includes 6.5 years of rationing at 20% in the 7.5-year design drought sequence.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	299	110	114	114	156	156
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	169	169	169	169	169
Surplus or Deficit:	100	-103	-102	-107	-71	-80

VIII. Water Quality Certification (401) with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought



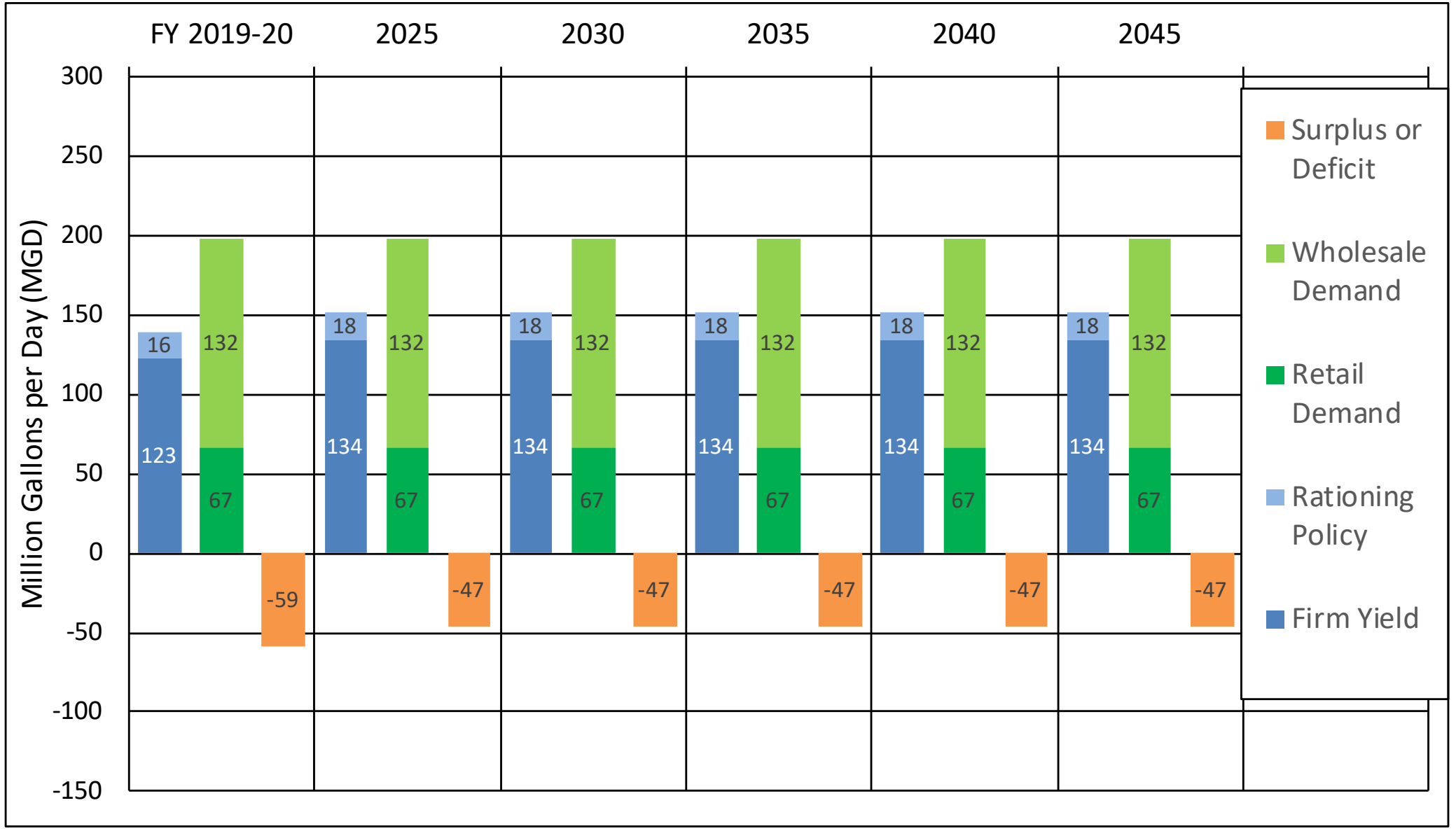
IX. NGO scenario 1: Current system, 198 mgd constant demand, Bay-Delta Plan flows

- Assumes that retail and wholesale demand on the RWS remain at the current level of approximately 198 MGD, and that SFPUC contributions to the Bay-Delta Plan are being made now
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy
- Includes SFPUC contribution to the Bay-Delta Plan, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	139	152	152	152	152	152
RWS Demand:	198	198	198	198	198	198
Lower Tuolumne Contribution:	93	93	93	93	93	93
Surplus or Deficit:	-59	-47	-47	-47	-47	-47

IX. NGO scenario 1: Current system, 198 mgd constant demand, Bay-Delta Plan flows



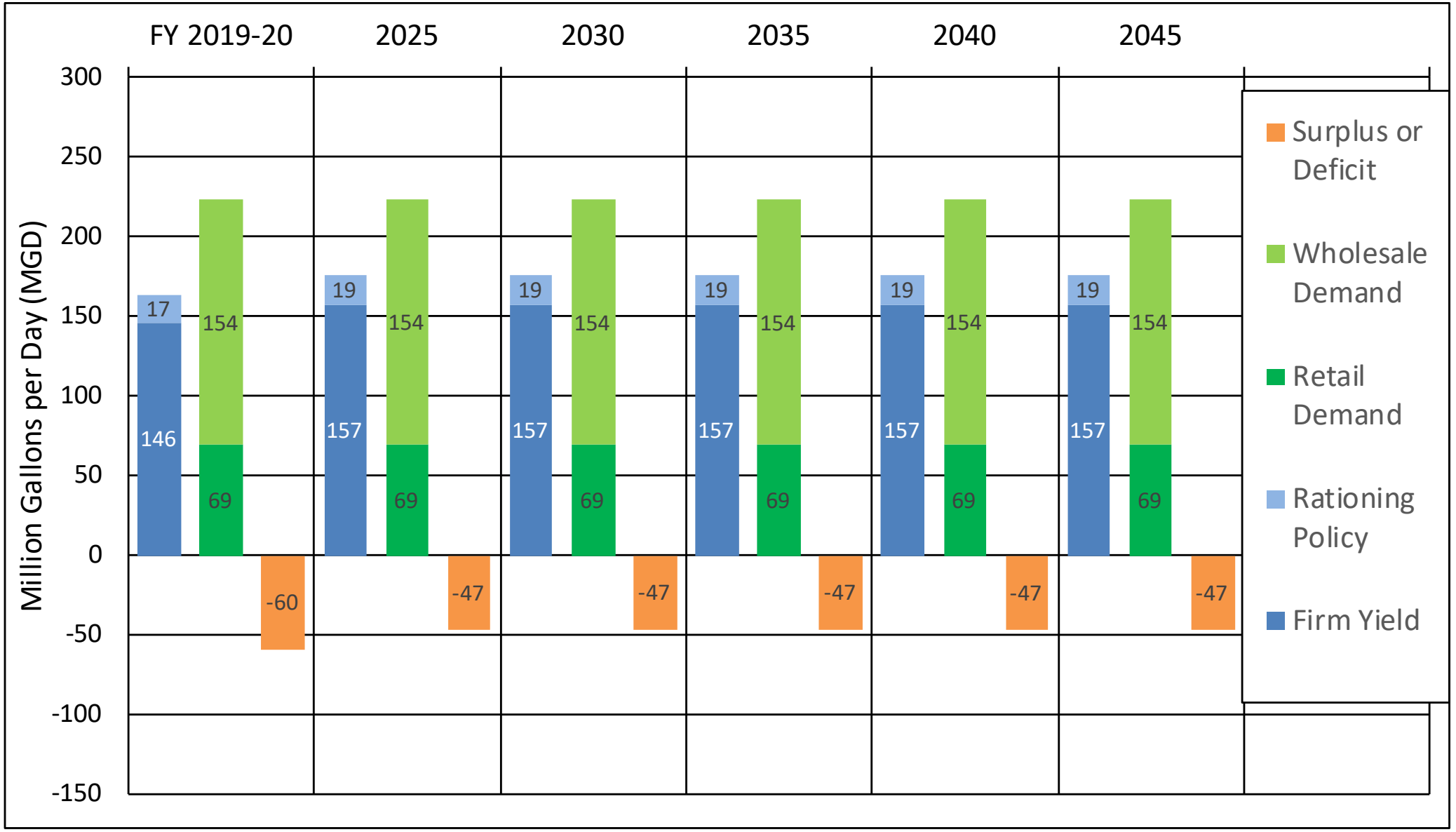
X. NGO scenario 2: Current system, 223 mgd constant demand, 7½ year design drought, Bay-Delta Plan flows

- Includes an assumed demand of 223 MGD for the SFPUC service area in all years
- Includes a total of 9 MGD for San Jose and Santa Clara
- Includes SFPUC contribution to the Bay-Delta Plan, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year. Assumes this contribution begins now.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.
- Yield values are estimated using a 7.5-year design drought and a truncated version of the adopted WSIP rationing policy

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	163	176	176	176	176	176
RWS Demand:	223	223	223	223	223	223
Lower Tuolumne Contribution:	101	101	101	101	101	101
Surplus or Deficit:	-59	-47	-47	-47	-47	-47

X. NGO scenario 2: Current system, 223 mgd constant demand, 7½ year design drought, Bay-Delta Plan flows



SCENARIO SURPLUSES OR DEFICITS

SCENARIOS	FY19-20	2025	2030	2035	2040	2045
I. Previous Demand Estimates	15	21	17	10	3	NA
II. Current Conditions	46	44	42	37	31	21
III. Tuolumne River Voluntary Agreement	46	28	26	21	15	5
IV. Bay-Delta Plan	46	-61	-64	-69	-75	-85
V. Bay-Delta Plan with Alternative Water Supply Projects	46	-59	-58	-63	-35	-45
VI. Bay-Delta Plan with Alternative Water Supply Projects and Modified Rationing Policy	64	-48	-47	-52	-21	-31
VII. Bay-Delta Plan with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design	100	-21	-19	-24	12	2
VIII. Water Quality Certification (401) with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought	100	-103	-102	-107	-71	-80
IX. NGO scenario 1: Current system and 198 mgd constant demand and Bay-Delta Plan flows	-59	-47	-47	-47	-47	-47
X. NGO Scenario 2: Current system, 223 mgd constant demand, 7 ½ year design drought and Bay-Delta Plan	-60	-47	-47	-47	-47	-47

APPENDIX K
WATER SHORTAGE CONTINGENCY PLAN

Water Shortage Contingency Plan
2020 Update

Menlo Park Municipal Water

June 2021

TABLE OF CONTENTS

1. INTRODUCTION 4
2. WATER SUPPLY RELIABILITY ANALYSIS 6
3. PRIOR DROUGHT ACTIONS 8
4. ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES 10
5. WATER SHORTAGE LEVELS 11
6. SHORTAGE RESPONSE ACTIONS 13
6.1 Demand Reduction Methods 13
6.2 Supply Augmentation 13
6.3 Operational Changes 22
6.4 Prohibitions on End Uses 22
6.5 Defining Water Features 22
6.6 Shortage Response Action Effectiveness 22
6.7 Catastrophic Supply Interruption 28
7. SEISMIC RISK ASSESSMENT 32
8. COMMUNICATION PROTOCOLS 33
8.1 Water Shortage Declaration and Termination Procedures 33
9. COMPLIANCE AND ENFORCEMENT 35
10. LEGAL AUTHORITIES 37
11. FINANCIAL CONSEQUENCES OF WSCP 38
12. MONITORING AND REPORTING 39
13. WSCP REFINEMENT PROCEDURES 40
14. PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY 41
REFERENCES 42

TABLES

Table 5-1 Water Shortage Contingency Plan Levels (DWR Table 8-1)
Table 6-1 Demand Reduction Actions (DWR Table 8-2)
Table 6-2 Supply Augmentation and Other Actions (DWR Table 8-3)
Table 6-3 Baseline Residential Per Capita Water Demand
Table 6-4 Baseline Water Use Profile
Table 6-5 Preparation Actions for Catastrophes
Table 6-6 Activation Action in Response to Supply Interruptions
Table 9-1 Enforcement of Water Use Restrictions and Prohibitions
Table 9-2 Charges for Installation or Removal of Flow Restricting Devices

ATTACHMENTS

Attachment 1. Section 7.35 of City of Menlo Park's Municipal Code
Attachment 2. Annual Water Supply and Demand Assessment Procedures
Attachment 3. Drought Response Tool Quantitative Assessment
Attachment 4. SFPUC Emergency Preparedness Procedures
Attachment 5. Water Shortage Contingency Plan Resolutions

1. INTRODUCTION

☑ ***CWC § 10640***

(a) Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

(b) Every urban water supplier required to prepare a water shortage contingency plan shall prepare a water shortage contingency plan pursuant to Section 10632. The supplier shall likewise periodically review the water shortage contingency plan as required by paragraph (10) of subdivision (a) of Section 10632 and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

Menlo Park Municipal Water's (MPMW's) Water Shortage Contingency Plan (WSCP) is developed to serve as a flexible framework of planned response measures to mitigate future water supply shortages. This WSCP builds upon and supersedes the WSCP that was presented in the 2015 Urban Water Management Plan (UWMP).

The WSCP includes the stages of response to a water shortage caused by drought or by supply interruptions caused by infrastructure failure, regulatory mandate, or catastrophic human-caused or natural events. The primary objective of the WSCP is to ensure that MPMW has in place the necessary resources and management responses needed to protect health and human safety, minimize economic disruption, and preserve environmental and community assets during water supply shortages and interruptions. The WSCP also includes procedures to conduct an annual assessment of water supply and demand in order to determine whether water shortage conditions are likely to exist in the forthcoming year, and to proactively begin the process of implementing WSCP stages of action, as appropriate.

This WSCP has been prepared in accordance with California Water Code (CWC) § 10640 and CWC § 10632 of the UWMP Act. Text from the UWMP Act has been included in grey text boxes with italicized font at beginning of relevant sections of this WSCP. The information presented in the respective WSCP sections and the associated text and tables are collectively intended to fulfill the requirements of that sub-section of the UWMP Act.

MPMW has authority within Section 7.35 of City of Menlo Park's (City's) Municipal Code to require water rationing and conservation and to enforce penalties. Municipal Code Section 7.35 is included as Attachment 1 of this WSCP.

MPMW developed this WSCP based on the following guiding principle:

> *Eliminate water waste, prioritize the reduction of non-essential water uses, and preserve water uses that are essential to the health, safety, welfare, and economic vitality of MPMW's customers during periods of water shortage.*

Practically, this principle guides MPMW to ask for a shared contribution from all of its customers towards meeting water reduction goals during periods of water shortage. It further directs MPMW to focus its water conservation efforts on reducing discretionary water uses such as outdoor irrigation, while attempting to minimize economic and other impacts to its residential and commercial customers.

MPMW also adopted a Water Service Priority Policy by Resolution No. 6187, in compliance with requirements of Government Code Section 65589.7. The Water Service Priority Policy prioritizes water service to proposed developments that include units for lower income households.

2. WATER SUPPLY RELIABILITY ANALYSIS

☑ ***CWC § 10632 (a) (1)*** *The analysis of water supply reliability conducted pursuant to Section 10635.*

This section provides a summary of MPMW's water supply reliability analysis in Chapter 7 of MPMW's 2020 UWMP, recognizing that the WSCP is intended to be a standalone document that can be adopted and amended independently.

MPMW relies on the San Francisco Public Utilities Commission Regional Water System (SFPUC RWS) for all of its potable water supply. In accordance with the SFPUC's perpetual obligation to MPMW's Supply Assurance, MPMW has an Individual Supply Guarantee (ISG) of 4.456 million gallons per day (MGD), or 1,630 million gallons (MG) per year. MPMW also uses recycled water for non-potable uses. Recycled water is currently supply 2% of MPMW's total demand and is anticipated to supply 8% of MPMW's total demand by 2040. The recycled water supply is expected to be 100% reliable in all year types.

MPMW's supply reliability relies largely on the reliability of the SFPUC RWS. The SFPUC has committed to, among other things, meeting the retail and wholesale customers' average annual water demand during non–drought years and meeting dry-year delivery needs while limiting rationing to a maximum 20% system-wide reduction in water service during extended droughts. However, several potential constraints have been identified on the future supply availability of the SFPUC RWS. One of the key factors is the adoption of the 2018 Bay-Delta Plan Amendment. If the Bay-Delta Plan Amendment is implemented, the SFPUC is anticipated to have sufficient supplies to meet the projected water demands in normal years but would experience significant supply shortages in single dry years or multiple dry years.

Based on the current allocation methodology[1] and SFPUC dry year cutbacks, MPMW is anticipated to experience up to 422 MG (28%) supply shortfall in single dry years by 2040 and up to 652 MG (44%) supply shortfall in multiple dry years by 2040.

However, numerous uncertainties remain in the implementation of the Bay-Delta Plan Amendment and the allocation of the available supply between the wholesale customers. The resultant actual supply reliability and the frequency of supply shortfalls for MPMW cannot be known currently. MPMW has placed high priority on working with SFPUC and the Bay Area Water Supply and Conservation Agency (BAWSCA) to better refine the estimates of RWS supply reliability and may revise its UWMP accordingly. The SFPUC and BAWSCA have also been taking various actions to improve the reliability of the RWS supply,

[1] The SFPUC and the wholesale customers have negotiated and adopted a plan to allocate the RWS supply during system-wide shortages of 20% or less. To address the instances where the supply shortfalls are projected to be greater than 20%, BAWSCA has developed a revised methodology to allocate the RWS supply. This allocation method is intended to serve as the preliminary basis for the 2020 UWMP supply reliability analysis and does not in any way imply an agreement by BAWSCA member agencies as to the exact allocation methodology. Details on the SFPUC RWS supply reliability are provided by the SFPUC and the BAWSCA and are documented in Sections 7.1 through 7.3 as well as Appendix H of the 2020 UWMP.

including implementing a number of dry year water supply projects, exploring alternative water supplies, and implementing Long-Term Reliable Water Supply Strategy recommendations.

As part of the supply reliability analysis, MPMW has conducted a Drought Risk Assessment (DRA), which evaluates the effects on available water supply sources of an assumed five-year drought commencing the year after the assessment is completed (i.e., from 2021 through 2025). Prior to the assumed implementation of the Bay-Delta Plan Amendment in 2023, MPMW's supply is expected to be sufficient to meet demands during the first two consecutive dry years (i.e., 2021 and 2022). However, based on the current allocation methodology and SFPUC dry year cutbacks, MPMW is expected to experience significant shortfalls in subsequent years of the assumed drought through 2025. The largest shortfall is estimated to be 587 MG in 2025.

MPMW has developed this WSCP to address water shortage conditions resulting from any cause (e.g., droughts, impacted distribution system infrastructure, regulatory-imposed shortage restrictions, etc.). The WSCP identifies a variety of actions that MPMW will implement to reduce demands and further ensure supply reliability at various levels of water shortage.

3. PRIOR DROUGHT ACTIONS

MPMW has historically developed different strategies for reducing water demand during water shortages. MPMW's actions in response to the recent severe drought that occurred in California between 2014 and 2017 are discussed below.

On 1 April 2015, Governor Brown issued the fourth in a series of Executive Orders regarding actions necessary to address California's severe drought conditions. Executive Order B-29-15 directed the State Water Resources Control Board (SWRCB) to impose the first ever mandatory restrictions on urban water suppliers to achieve a statewide 25% reduction in potable urban water usage through February 2016. The Executive Order also requires commercial, industrial, and institutional (CII) users to implement water efficiency measures, prohibits irrigation with potable water of ornamental turf in public street medians, and prohibits irrigation with potable water outside newly constructed homes and buildings that is not delivered by drip or microspray systems, along with numerous other directives.

On 5 May 2015, the SWRCB adopted Resolution 2015-0032 that mandates minimum actions by water suppliers and their customers to conserve water supplies into 2016 and assigns a mandatory water conservation savings goal to each water supplier based on their residential gallons per capita per day (R-GPCD) water use. The Office of Administrative Law approved the regulations and modified the CWC on 18 May 2015. On 2 February 2016, the SWRCB voted to extend the emergency regulations until October 2016 with some modifications. On 9 May 2016, the Governor issued Executive Order B-37-16, which directed the SWRCB to extend the emergency regulations through the end of January 2017 as well as make certain water use restrictions permanent. On 18 May 2016, the SWRCB adopted Resolution 2016-0029 that adjusts the water conservation savings goal and replaces the February 2016 emergency regulation. The SWRCB is expected to take separate action to make some of the requirements of the regulations permanent in response to the Executive Order.

The mandatory conservation standards included in CWC § 865(c) ranged from 8% for suppliers with an R-GPCD below 65 R-GPCD, up to 36% for suppliers with an R GPCD of greater than 215 GPCD. As with previous emergency drought regulations adopted by the SWRCB in 2014, the new water conservation regulation was primarily intended to reduce outdoor urban water use. Based on the SWRCB's Regulatory Framework Tier 4 residential per capita use of 88.6 GPCD , MPMW was required to reduce water use by 16% relative to its 2013 water use.

Prior to the 2015 SWRCB Resolution, the City Council had already declared Stage 2 of the 2014 WSCP to respond to 2014 SWRCB actions. Stage 2 of the 2014 WSCP called for an up to 20% water reduction and included prohibitions that targeted water waste and discretionary outdoor uses. This stage of action remained in place to meet the 2015 SRWCB mandated reduction target.

During the June 2015 through February 2016 compliance period, the City surpassed its water use reduction target of 16% with a cumulative saving of 38% relative to its 2013 use. The reductions were largely due to high savings (up to a 50% reduction in total demand) during the summer and fall months, likely corresponding to large cutbacks in irrigation water use.

The 2014 WSCP was updated as part of the 2015 UWMP. In June 2016, the City adopted its 2015 UWMP and associated WSCP update. In April 2017, the Governor Brown ended the drought State of Emergency. On 2 May 2017, Resolution 6383 revoked the City's drought declaration and enacted Stage 1 of its 2015

WSCP, which is a no-drought stage that maintains prohibitions to prevent water waste per State regulations.

4. ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

☑ ***CWC § 10632 (a) (2)***

The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:

(A) The written decision-making process that an urban water supplier will use each year to determine its water supply reliability.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

(iii) Existing infrastructure capabilities and plausible constraints.

(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of water supply.

☑ ***CWC § 10632.1***

An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.

☑ ***CWC § 10632.2***

An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan, as identified in subdivision (a) of Section 10632, or reasonable alternative actions, provided that descriptions of the alternative actions are submitted with the annual water shortage assessment report pursuant to Section 10632.1. Nothing in this section prohibits an urban water supplier from taking actions not specified in its water shortage contingency plan, if needed, without having to formally amend its urban water management plan or water shortage contingency plan.

On an annual basis, MPMW will conduct an Annual Supply-Demand Assessment (Annual Assessment) to identify whether there is likely to be a water shortage condition in the following year. Because MPMW's sole source of potable water supply is from the SFPUC RWS, the evaluation of MPMW supplies for a particular year will be based on information provided by the SFPUC or BAWSCA. MPMW will conduct the Annual Assessment as part of a coordinated effort lead by BAWSCA. The procedure used by BAWSCA in conducting an Annual Assessment is outlined in Attachment 2 of this WSCP.

5. WATER SHORTAGE LEVELS

☑ ***CWC § 10632 (a) (3)***

(A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.

(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross-reference relating its existing categories to the six standard water shortage levels.

Consistent with the requirements of CWC § 10632(a)(3), this WSCP is based on the six water shortage levels (also referred to as "stages") shown in Table 5-1. These shortage stages are intended to address shortages caused by any condition, including catastrophic interruption of water supplies. Table 5-1 summarizes the water supply reductions and supply conditions associated with each stage of action.

Table 5-1 Water Shortage Contingency Plan Levels (DWR Table 8-1)

Shortage Level	Percent Shortage Range	Shortage Response Actions
No-Drought	N/A	• Includes water waste prohibitions effective at all times.
1	Up to 10%	• Declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use of up to 10% due to water supply shortages or an emergency. • Includes implementation of mandatory restrictions on end uses (see Table 6-1) as well as agency actions (see Table 6-2).
2	Up to 20%	• Declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use from 10% to 20% due to water supply shortages or emergency. • Includes implementation of mandatory restrictions on end uses (see Table 6-1) as well as agency actions (see Table 6-2).

Shortage Level	Percent Shortage Range	Shortage Response Actions
3	Up to 30%	• Declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use from 20% to 30% due to water supply shortages or emergency. • Includes implementation of mandatory restrictions on end uses (see Table 6-1) as well as agency actions (see Table 6-2).
4	Up to 40%	• Declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use from 30% to 40% due to water supply shortages or emergency. • Includes implementation of mandatory restrictions on end uses (see Table 6-1) as well as agency actions (see Table 6-2).
5	Up to 50%	• Declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use from 40% to 50% due to water supply shortages or emergency. • Includes implementation of mandatory restrictions on end uses and water use budgets for customers (see Table 6-1), as well as agency actions and groundwater supply augmentation (see Table 6-2).
6	>50%	• Declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use greater than 50% due to water supply shortages or emergency. • Includes implementation of mandatory restrictions on end uses and water use budgets for customers (see Table 6-1), as well as agency actions and groundwater supply augmentation (see Table 6-2).

6. SHORTAGE RESPONSE ACTIONS

☑ ***CWC § 10632 (a) (4)***

Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

☑ ***CWC § 10632 (b)***

For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

This section describes the response actions MPMW will take to deal with the shortages associated with each of the six stages enumerated in Section 5.

6.1 Demand Reduction Methods

As discussed above and shown in Table 6-1, the WSCP lists the demand reduction methods that MPMW will implement during each stage of action to reduce MPMW's water consumption and encourage reduction in water use by its customers. The monthly and cumulative annual water savings impacts associated with each restriction, prohibition and consumption reduction method were quantitatively estimated using the Drought Response Tool (DRT) for each stage of action, see Attachment 3.

A main focus of MPMW's planned demand reduction measures is to increase public outreach and keep customers informed of the water shortage emergency and actions they can take to reduce consumption. The public outreach efforts that MPMW will implement to respond to a water shortage are described in Section 8.

6.2 Supply Augmentation

As shown in Table 6-2, the City will utilize its emergency supply well(s) as supply augmentation during Stages 5 and 6. MPMW has constructed one emergency groundwater well (the Corporation Yard Well) which can produce up to 1,500 gallons per minute (gpm) of supply to the Lower Zone. An additional one or two emergency wells are being considered to achieve another 1,500 gpm of supply capacity (for a total of 3,000 gpm). Water supply from the emergency supply well(s) is currently not considered in MPMW's

planning for normal or dry year supply. The well(s) will provide augmented supply for MPMW in the event of significant water shortage due to severe drought conditions, an earthquake, or other emergency.

According to the Corporation Yard Well's Initial Study/Mitigation Negative Declaration (IS/MND) document (Infrastructure Engineering Corporation, 2016), operating the well at 900 gpm over a 30-day failure on the SFPUC RWS will supply 119 acre-feet (AF) of water. The IS/NMD has estimated that the well could provide 1,900 AF over the course of a year without a significant impact to the groundwater basin.

Table 6-2 also includes other actions that the City will take, including coordination with other agencies, implementing drought surcharge, increasing water waste patrols, etc.

Table 6-1 Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
No Drought	Other	--	1. Hoses must be equipped with a shut-off valve for washing vehicles, sidewalks, walkways, or buildings. 2. Ornamental fountains shall use only re-circulated or recycled water. 3. Potable water shall not be applied in any manner to any driveway, sidewalk, or other hard surface except when necessary to address immediate health or safety concerns. 4. Potable water shall not be used to water outdoor landscapes in a manner that causes more than incidental runoff onto non-irrigated areas, walkways, roadways, parking lots, or other hard surfaces. 5. Potable water cannot be applied to outdoor landscapes during and up to 48 hours after measurable rainfall. 6. Potable water shall not be used to irrigate ornamental turf on public street medians. 7. Hotels and motels shall provide guests an option whether to launder towels and linens daily. Hotels and motels shall prominently display notice of this option in each bathroom using clear and easily understood language. 8. Restaurants and other food service operations shall serve water to customers only upon request during a period for which the Governor has issued a proclamation of a state of emergency. 9. Broken or defective plumbing and irrigation systems must be repaired or replaced within a reasonable period. 10. Recreational water features shall be covered when not in use. 11. Single-pass cooling systems on new construction shall not be allowed. 12. Other measures as may be approved by the State Water Resources Control Board or City Council Resolution.	Yes

Table 6-1 Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
1	Other	5%	1. Continue with "no drought" restrictions and prohibitions except where superseded by more stringent requirements. 2. Newly constructed homes and buildings must irrigate with drip or microspray only. 3. Other measures as may be approved by City Council Resolution.	Yes
2	Other	15%	1. Continue with Stage 1 restrictions and prohibitions except where superseded by more stringent requirements. 2. Irrigating outdoor ornamental landscapes or turf with potable water is limited to no more than two (2) days per week on a schedule established by the Director and posted on the City's website, except for hand watering. Water customers may be granted an exception upon review and approval of a Drought Response Plan by the Public Works Director pursuant to such policies and procedures as may be established by the Public Works Director provided that such plan results in an equivalent or greater reduction in water use. 3. Hand watering must be with a continuously monitored hose fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored. 4. Other measures as may be approved by City Council Resolution.	Yes
3	Other	25%	1. Continue with Stage 2 restrictions and prohibitions except where superseded by more stringent requirements. 2. Permits for construction of new pools shall include a requirement that MPMW water shall not be used to fill new pools. 3. Vehicles may only be washed at vehicle washing facilities using recycled or recirculating water. 4. Other measures as may be approved by City Council Resolution.	Yes

Table 6-1 Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
4	Other	35%	1. Continue with Stage 3 restrictions and prohibitions except where superseded by more stringent requirements. 2. Irrigating outdoor ornamental landscapes or turf with potable water is limited to no more than one (1) day per week on a schedule established by the Director and posted on the City's website, except for hand watering. Water customers may be granted an exception upon review and approval of a Drought Response Plan by the Public Works Director pursuant to such policies and procedures as may be established by the Public Works Director provided that such plan results in an equivalent or greater reduction in water use. 3. Potable water shall not be used for construction or dust control. 4. Potable water shall not be used for commercial vehicles that provide street washing, sweeping, or cleaning. 5. Other measures as may be approved by City Council Resolution.	Yes
5	Other	45%	1. Continue with Stage 4 restrictions and prohibitions except where superseded by more stringent requirements. 2. Water use shall not exceed water budgets established for each customer. 3. Hand watering outdoor ornamental landscapes is only allowed between designated hours, as determined by the Public Works Director. 4. Turf irrigation is prohibited at all times, including artificial turf. 5. Existing irrigation systems shall not be expanded. 6. Other measures as may be approved by City Council Resolution.	Yes
6	Other	55%	1. Continue with Stage 5 restrictions and prohibitions except where superseded by more stringent requirements. 2. Hand watering outdoor ornamental landscapes is prohibited at all times. 3. Other measures as may be approved by City Council Resolution.	Yes

Table 6-1 Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
NOTES: (a) The percentages listed in this table are the cumulative savings for each shortage level with implementation of corresponding supply augmentation and other agency actions in Table 6-2. Detailed saving estimates based on end use, response action, and implementation rates can be found in Attachment 3.				

Table 6-2 Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference
1	Other	5%	1. Initiate public outreach to inform customers that there is a water shortage emergency. 2. Implement Stage 1 drought surcharge.
2	Other	15%	1. Continue with actions and measures from Stage 1. 2. Increase public outreach for added restrictions and prohibitions, and to provide information regarding fines or penalties for non-compliance. 3. Coordinate with BAWSCA, SFPUC, and other Menlo Park water agencies (California Water Service, O'Connor Cooperative Water Tract, East Palo Alto, Palo Alto Park Mutual Water Company). 4. Evaluate if participation in BAWSCA's subscription water conservation programs can be increased. 5. Train City staff and billing contractor customer service representatives how to respond to customer calls, reports and complaints. 6. Evaluate options to capture water during routine flushing of water mains. 7. Implement Stage 2 drought surcharge.
3	Other	25%	1. Continue with actions and measures from Stage 2. 2. Increase public outreach for added restrictions and prohibitions, and to provide information how to report water waste to the City. 3. Increase public outreach to the top 10% water users in each customer category. 4. Coordinate with Police code enforcement to investigate water waste reports. 5. Request cooperation from Menlo Park Fire District to reduce fire training water use. 6. Implement Stage 3 drought surcharge.

Table 6-2 Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference
4	Other	35%	1. Continue with actions and measures from Stage 3. 2. Increase public outreach for added restrictions and prohibitions. 3. Increase public outreach to the top 20% water users in each customer category. 4. Evaluate staff resources. May include hiring temporary staff or training additional City staff to assist with customer service and enforcement. 5. Reevaluate routine flushing of water mains except when necessary to address immediate health or safety concerns. 6. Consider increasing fines for multiple violations. 7. Implement Stage 4 drought surcharge.
5	Other	45%	1. Continue with actions and measures from Stage 4. 2. Increase public outreach for added restrictions and prohibitions. 3. Increase public outreach to the top 30% water users in each customer category. 4. Implement water waste patrols and increase enforcement. 5. Halt installations of new potable water meters (temporary or permanent) or meter upgrades except if a valid, unexpired building permit has been issued for the project; or the project is necessary to protect the public's health, safety, and welfare. 6. Halt issuing statements of immediate ability to serve or provide potable water service. 7. Consider increasing fines for multiple violations. 8. Develop water budgets for all accounts. 9. Use emergency groundwater well(s). 10. Implement Stage 5 drought surcharge.

Table 6-2 Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference
6	Other	55%	1. Continue with actions and measures from Stage 5. 2. Increase public outreach for added restrictions and prohibitions. 3. Increase public outreach to the top 40% water users in each customer category. 4. Halt installations of new potable water meters (temporary or permanent) even if a valid, unexpired building permit has been issued for the project. 5. Consider increasing fines for multiple violations. 6. Increase water budget reduction requirements. 7. Implement other short-term emergency actions from the Emergency Response Plan. 8. Implement Stage 6 drought surcharge.
NOTES: (a) The percentages listed in this table are the cumulative savings for each shortage level with implementation of corresponding demand reduction actions in Table 6-1. Detailed saving estimates based on end use, response action, and implementation rates can be found in Attachment 3.			

6.3 Operational Changes

The WSCP lists the operational changes that MPMW will implement during each stage of action including measures to: (1) reduce system losses through a reduction in line flushing and fire training exercises, (2) increase enforcement and patrols, (3) develop water budgets, and in certain conditions, (4) implement a moratorium on new services.

6.4 Prohibitions on End Uses

MPMW has the authority to restrict or prohibit specific water use practices during water shortages (Municipal Code Section 7.35). Restrictions and prohibitions associated with each stage of action are presented in Table 6-1. As discussed above, these responses focus on the reduction of non-essential water uses such as ornamental landscape irrigation, and preserve water uses that are essential to the health, safety, welfare, and economic vitality of MPMW's customers.

In addition, several mandatory prohibitions are enforced at all times as part of the Non-Drought Stage to eliminate water waste, which include each of the prohibitions on end uses that are anticipated to be mandated by the SWRCB in response to Executive Order B-37-16. Prohibitions in subsequent stages go beyond the SWRCB requirements and become increasingly restrictive.

6.5 Defining Water Features

☑ ***CWC § 10632 (b)***

For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

As required by CWC § 10632, MPMW distinguishes between "decorative water features" such as ponds, lakes, and fountains that are artificially supplied with water and "recreational water features" such as swimming pools and spas. Prohibitions on water use for decorative water features are listed separately from those for recreational water features (see Table 6-1).

6.6 Shortage Response Action Effectiveness

In order to evaluate and ensure that effective actions will be implemented with the proper level of intensity, MPMW employed the DRT, an Excel spreadsheet model developed by EKI Environment and Water, Inc. The DRT model calculates monthly savings anticipated by implementing each stage of action as detailed below.

6.6.1 Baseline Water Use Profile

Using the DRT, MPMW developed a baseline water use profile that reflected usage patterns within MPMW's service area by major water use sector during 2019 and was used to guide development of the WSCP. Key findings from this analysis are presented below.

Residential Per Capita Demand

As shown in Table 6-3 and associated chart, MPMW's baseline R-GPCD demand in 2019 was approximately 62 R-GPCD. This R-GPCD is close to the BAWSCA-wide average of 61 R-GPCD but is significantly less than the statewide average of 85 R-GPCD.

Estimated Proportion of Outdoor Water Use

As shown in Table 6-4 and the associated charts, outdoor water use, which can generally be considered as a "discretionary water use", was estimated to be approximately 46% of MPMW's total consumption during this baseline time period (2019). Notably, dedicated irrigation meters accounted for approximately 26% of the total estimated irrigation demand, indicating that approximately 74% of outdoor water use is not metered with a separate meter, and is therefore more difficult to track and directly target.

The DRT estimates indoor water use to be equivalent to the lowest monthly water use for each sector, accounting for the number of days in each month. Outdoor water use for each sector was estimated to be the difference between the total water use and the estimated indoor water use. If MPMW customers tend to irrigate more heavily during winter months, an underestimation of the proportion of outdoor water use would occur.

The proportion of outdoor water use within residential and commercial sectors is estimated to be 41%. This indicates that there is the potential to achieve significant water savings across these sectors (e.g., up to WSCP Stage 4), simply by focusing on outdoor uses. If the proportion of outdoor water use is being underestimated by the DRT method, then even more substantial savings may be achieved through targeting outdoor water use. As further shown in Table 6-4 and the associated charts, the seasonal variation in baseline water use reflects increased irrigation demands during the summer and fall months. Therefore, the greatest potential for reductions in non-essential water use is expected during these months.

Table 6-3 Baseline Residential Per Capita Water Demand

	Baseline Residential Per Capita Water Demand (R-GPCD)
MPMW (a)	62
BAWSCA Agencies (b)	61
Statewide Average (c)	85

NOTES:
(a) MPMW R-GPCD calculated using 2019 metering data.
(b) Average BAWSCA R-GPCD calculated from data provided in BAWSCA Annual Survey FY 2018-19 (BAWSCA, 2020).
(c) State-wide R-GPCD for 2019 obtained from data provided at California State Water Resources Control Board Water Conservation Portal - Conservation Reporting, http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/conservation_reporting.shtml, accessed March 2021.

Chart 6-3 Baseline Residential Per Capita Water Demand

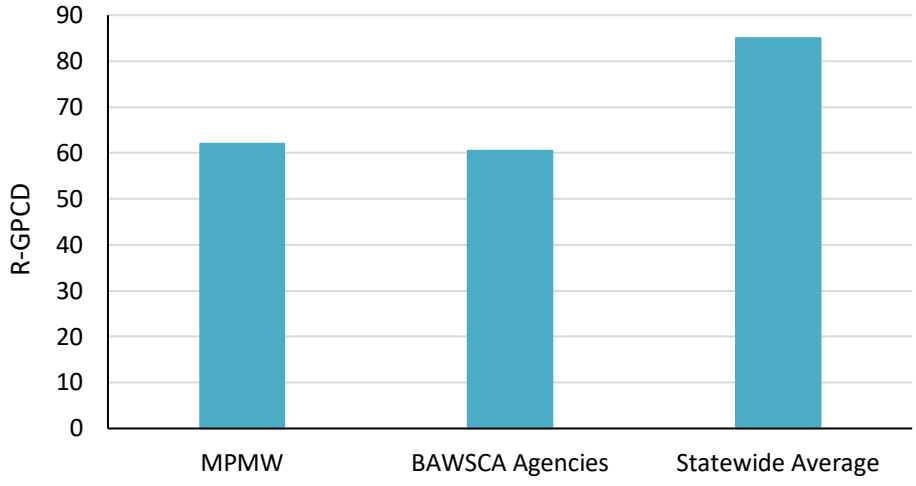


Table 6-4 Baseline Water Use Profile

Sector	End-Use	Baseline (2019) Water Use													Annual % of Total by Sector
		January	February	March	April	May	June	July	August	September	October	November	December	Annual	
Residential	Indoor	21	19	21	20	21	20	21	21	20	21	20	21	242	59%
	Outdoor	1	0	1	9	17	22	26	25	22	25	13	4	165	41%
	Subtotal Residential	*21*	*19*	*22*	*28*	*37*	*42*	*47*	*46*	*42*	*45*	*33*	*25*	*406*	-
CII	Indoor	23	21	23	22	23	22	23	23	22	23	22	23	268	59%
	Outdoor	0	0	5	15	17	22	31	30	26	27	11	2	186	41%
	Subtotal CII	*23*	*21*	*28*	*37*	*40*	*44*	*53*	*52*	*48*	*50*	*33*	*24*	*454*	-
Dedicated Irrigation	Outdoor	2	1	2	8	13	17	20	19	15	13	8	3	122	100%
Non-Revenue	Non-Revenue	6	6	3	-1	4	14	4	6	6	-3	6	0	50	100%
Total	Indoor	43	39	43	42	43	42	43	43	42	43	42	43	510	49%
	Outdoor	3	1	8	31	47	61	77	74	64	65	32	9	473	46%
	Non-Revenue	6	6	3	-1	4	14	4	6	6	-3	6	0	50	4.9%
	Total	**52**	**47**	**55**	**72**	**95**	**117**	**125**	**123**	**111**	**106**	**80**	**52**	**1,033**	-

NOTES:
(a) Volumes are in units of MG.
(b) Baseline water use from MPMW's monthly metering data for each sector.
(c) Indoor water use was estimated to be the lowest monthly water use for each sector, accounting for the number of days in each month. Outdoor water use for each sector was estimated to be the difference between the total water use and the estimated indoor water use.

Chart 6-4A Baseline Year Annual Water Use by Sector and End Use

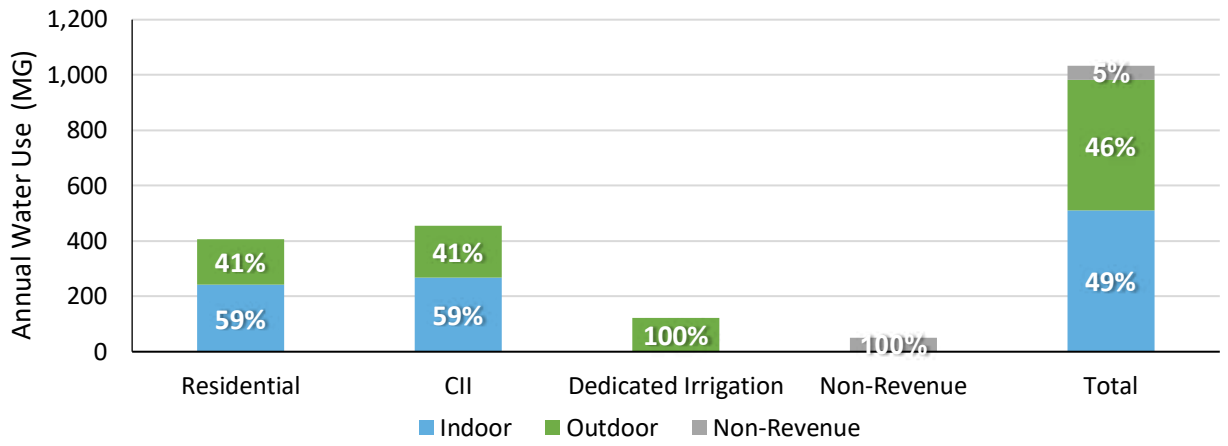
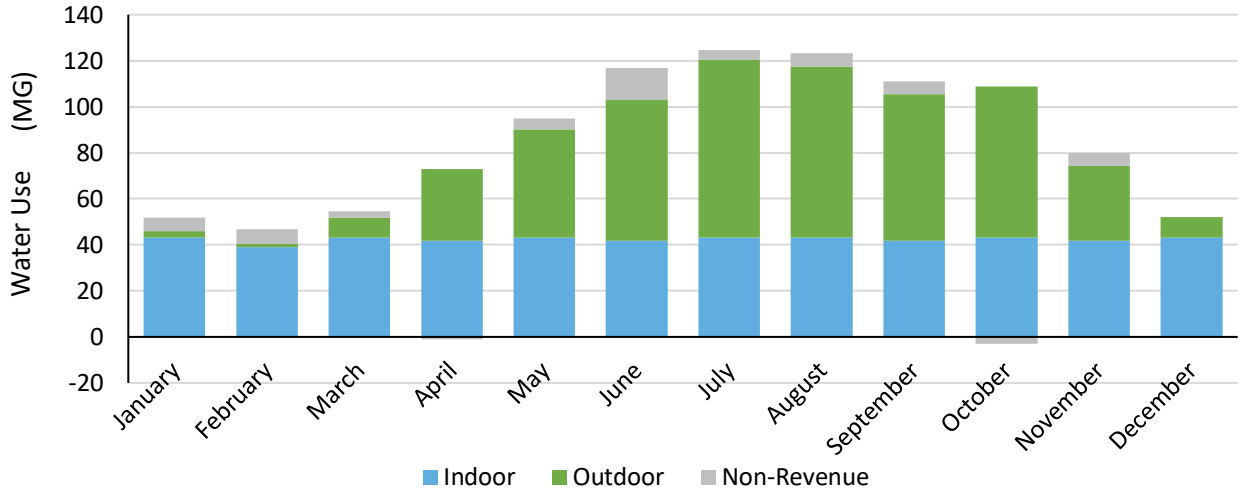


Chart 6-4B Baseline Year Monthly Indoor vs. Outdoor Water Use



6.6.2 Shortage Response Action Effectiveness

The DRT provides a quantitative framework that allows MPMW to systematically estimate the monthly and cumulative annual demand reductions expected to result from particular combinations of drought response actions and associated implementation rates. Data inputs to the DRT include total production, class-specific water use, population, and assumptions regarding the split between indoor and outdoor water use for each customer class.

For each drought response action, the user specifies:

- The customer class(es) and end use(s) that are affected;
- The percent savings for that end use for each account that implements the action. These are based on evaluations reported in the literature, or where such studies are not available, on best estimates based on MPMW's experience; and
- The percentage of accounts assumed to implement the action, which is presumed to be the result of the intensity level of MPMW's program implementation, including but not limited to, marketing and enforcement activities.

An additional critical DRT user input is a set of constraints on demand reductions to ensure that usage levels do not endanger health and safety or result in unacceptable economic impacts. The DRT will not permit estimated usage reductions to violate these constraints, regardless of the demand reduction actions selected. The constraints are:

- A minimum residential indoor per capita daily usage of 25 gallons,
- A maximum residential outdoor usage reduction of 100%,
- A maximum CII indoor usage reduction of 30%, and
- A maximum CII outdoor usage reduction of 100%.

Based on the foregoing data, the DRT model calculates the resulting monthly savings. MPMW adjusted the combination of actions and implementation levels to achieve the targeted savings levels at each of the six stages of action.

For each of the stages of action, the modeling targeted the mid-range of the required demand reduction range, ergo:

- 5% for Stage 1,
- 15% for Stage 2,
- 25% for Stage 3,
- 35% for Stage 4,
- 45% for Stage 5, and
- 55% for Stage 6.

MPMW's shortage response actions are summarized in Table 6-1 and Table 6-2. Key DRT inputs and outputs for each of the stages of action are reproduced in Attachment 3, including the water shortage reduction actions, savings assumptions, and implementation rates that are required for MPMW to achieve the required annual demand reductions for each of the six stages of action. At each stage, there are two types of demand-reduction actions identified:

- Restrictions on customer water usage; and
- Consumption reduction actions by MPMW to encourage decreased water usage.

Many actions are implemented across a number of stages, some at increasing implementation levels. Therefore the actions in Table 6-1 and Table 6-2 are listed as a row under the first stage at which they are implemented. The percentages shown in the tables represent savings of the end uses.

6.7 Catastrophic Supply Interruption

Catastrophic supply interruptions may be caused by a regional power outage, an earthquake, or other disaster. MPMW benefits from two levels of emergency planning: planning by SFPUC and its own emergency planning work. In the event of a catastrophic supply interruption, the response procedures that MPMW would follow are described in:

- SFPUC Emergency Operations Plan (EOP);
- San Mateo County's Operational Area EOP Potable Water Procurement and Distribution Annex;
- City of Menlo Park's EOP; and
- MPMW's Emergency Response Plan (ERP).

Actions described in the SFPUC EOP focus on maintaining flow within, and from, the SFPUC RWS pipelines. SFPUC's emergency preparedness procedures are described in detail in Attachment 4. City of Menlo Park's EOP was written in coordination with the County of San Mateo's Operational Area EOP Potable Water Procurement and Distribution Annex (County of San Mateo, 2004). Together, these EOPs provide the framework for responding to major emergencies or disasters associated with natural disasters, technological incidents, and national security/terrorism emergencies. Sections of these EOPs outline specific strategies to prepare for, mitigate, respond to, and recover from an emergency or disaster that affects the water utilities that serve the population within San Mateo County and the City, in particular.

MPMW's emergency planning efforts particular to its water distribution system are summarized below.

6.7.1 MPMW Emergency Response Plan

In accordance with the Emergency Services Act, MPMW has developed an ERP. This ERP guides response to unpredicted catastrophic events that might impact water delivery including regional power outages, earthquakes or other disasters. The ERP outlines standard operating procedures for all levels of emergency, from minor accidents to major disasters. Table 6-5 summarizes actions included in the ERP for specific catastrophic effects. MPMW's most recent ERP is dated 2016 and is being updated as required per Section 2013 of America's Water Infrastructure Act of 2018.

A water supply interruption may result in a partial or full interruption potable supply for MPMW and adjacent water suppliers. Therefore, the City plans for four levels of action triggers that depends on the severity and duration of a supply interruption. Table 6-6 summarizes MPMW's actions under each water supply action trigger.

In the seismic evaluation for MPMW, there was a recommendation to install saltwater standpipes at regular intervals, along its San Francisco Bay Frontage, to allow for additional firefighting capacity. MPMW

has not pursued the recommendation at this time, because the Menlo Park Fire District has not identified this area as in need of additional fire protection. MPMW will re-evaluate this recommendation if substantial land use changes are proposed for this area.

Additionally, as discussed in Sections 6.2 and 6.7 of the 2020 UWMP, MPMW has constructed one emergency groundwater well (the Corporation Yard Well) which can produce up to 1,500 gpm of emergency/backup supply to the Lower Zone. Reservoir storage and an additional one or two emergency wells are being considered to achieve additional storage and another 1,500 gpm of supply capacity (for a total of 3,000 gpm). As the emergency storage and groundwater well(s) comes on-line, MPMW will add important redundancy and flexibility to its system and will have additional ability to manage catastrophic short-term interruptions in service.

Table 6-5 Preparation Actions for Catastrophes[2]

Possible Catastrophe	Summary of Actions
Earthquake	• Shut-off isolation valves and use of spare piping for ruptured mains • Storage supplies for service interruption • Portable and emergency generators available for facilities • Procedures for assessing water quality, notifying public, and disinfecting system
Flooding	• Portable and emergency generators available for facilities • Storage supplies for service interruption • Procedures for assessing water quality, notifying public, and disinfecting system
Toxic Spills (interrupts Agency Supply)	• Use of local groundwater • Procedures for assessing water quality, notifying public and disinfecting system
Fire	• Storage supplies for fire flows • Mutual aid plans and responders identified • Portable and emergency generators available for facilities
Power outage or grid failure	• Portable and emergency generators available for facilities
Severe Winter Storms	• Portable and emergency generators available for facilities
Hot Weather	• Portable and emergency generators available for facilities

[2] With completion of MPMW's Corporation Yard Well, MPMW may use groundwater supplies from the Corporation Yard Well depending on the impact to water supplies.

Table 6-6 Activation Action in Response to Supply Interruptions

Response Category	Sample Activation Triggers	Potential Activation Actions[⊙]
Level 0	• Changes in SFPUC wholesale water blends due to seasonal changes or plant maintenance • No loss in water supply	• None
Level 1	• Possible partial or full shutdown of SFPUC water supply source • Potential turnout threat	• Fill reservoirs and standby • Activate security monitoring of critical facilities (see ***Appendix 1***) • Mandatory rationing • Contact bottled water companies • Open water distribution points on reservoirs • Request assistance through WARN agreement
Level 2	• Complete loss of SFPUC supply (lasting < 24 hours*)	• Notify customers • Operate reservoirs • Close turnout(s) • Turn on pump stations • Open 4 key isolation valves • Mandatory rationing • Contact bottled water companies • Open water distribution points on reservoirs • Request assistance through WARN agreement
Level 3 (possible EOC activation)	• Complete loss of SFPUC supply (lasting > 24 hours*)	• Notify customers • Turn on wells • Open interties • Open remaining isolation valves • Mandatory rationing • Contact bottled water companies • Open water distribution points on reservoirs • Request assistance through WARN agreement

* The 24-hour period is an estimate only. The actual time period shall be the length of time that the City can supply reservoir water.

7. SEISMIC RISK ASSESSMENT

☑ ***CWC § 10632.5***

(a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

Ballantyne Consulting completed a Seismic Vulnerability Assessment for MPMW's water distribution system in July 2017. The report was incorporated into the MPMW 2018 Water Master Plan.[3]

In addition, as part of MPMW's Sand Hill Reservoir #2 Roof Replacement Project, Beyaz & Patel, Inc. (2019) performed a structural and seismic evaluation of Reservoir #2 and developed structural and seismic design criteria for the project. Construction of the Reservoir #2 Roof Replacement project is anticipated to start in fall 2021 and be completed by fall 2022.

[3] MPMW's 2018 Water Master Plan can be accessed at https://www.menlopark.org/watersystemmasterplan.

8. COMMUNICATION PROTOCOLS

☑ ***CWC § 10632 (a) (5)***

Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications.

Each stage of the WSCP is implemented with a formal declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use due to a water supply shortage or emergency. Procedures for water shortage declaration and termination are detailed below in Section 8.1.

Even before formal declaration of a water shortage, a public information program will be activated to provide customers with as much advance notice as possible. Following declaration of a shortage, MPMW's customers would need to be provided notice of water shortage rules and regulations via a variety of media and communications methods.

Coordination between MPMW and with other public agencies can begin prior to formal declaration of a water shortage and can be accomplished through regular meetings, e-mail group updates, and presentations. In a regional water shortage scenario, MPMW would use the public outreach resources and materials provided by BAWSCA and/or the SFPUC. In addition to these materials, MPMW may develop its own materials to communicate with customers, such as a dedicated customer service hotline, and expand its normal public outreach to support its water conservation efforts (see Chapter 9 of the 2020 UWMP). Communication and public outreach actions to be taken by MPMW under each shortage level are detailed in Table 6-2.

As discussed in Chapter 9 of the 2020 UWMP, the City has several staff members that jointly share the responsibility for water conservation. Staff time dedicated to water conservation and enforcement action will increase with the severity of a supply shortage. Additional duties may be assigned to current employees or hiring of temporary staff may be considered to meet staffing needs during extreme water shortages.

8.1 Water Shortage Declaration and Termination Procedures

The provisions of each water shortage stage of action are triggered upon the City Council's determination that a Governing Authority has required MPMW to achieve a voluntary or mandatory reduction in water use because of water shortage conditions.

The stage of action will become effective after the City Council declares a particular stage of action and MPMW has notified its customers of this determination. Once effective, the provisions of a water shortage stage of action will stay in effect until: (1) the City Council declares a different stage of

action; or (2) the City Council determines that the water shortfall condition no longer exists and MPMW has notified its customers of this determination.

After the termination of the water shortage conditions, MPMW will oversee any remaining termination and WSCP review activities. These activities could include:

- Publicize gratitude for the community's cooperation.
- Restore water utility operations, organization, and services to pre-event levels.
- Document the event and response and compile applicable records for future reference.
- Collect cost accounting information, assess revenue losses and financial impact, and review deferred projects or programs.
- Debrief staff to review effectiveness of actions, to identify the lessons learned, and to enhance response and recovery efforts in the future.
- Update the WSCP, as needed.

9. COMPLIANCE AND ENFORCEMENT

☑ ***CWC § 10632 (a) (6)*** *For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.*

Enforcement of MPMW's water use restrictions and prohibitions focuses on soliciting cooperation from water customers who are unaware of the restrictions or have failed to comply with the provisions of the City's Water Conservation Ordinance (City Municipal Code Title 7, Chapter 7.35) and this WSCP. If discussions with the customer are unsuccessful in obtaining compliance, MPMW is authorized to issue penalties to customers that violate the restrictions and prohibitions. The City's current compliance and enforcement procedures are adopted in City Resolution No. 6383.

Table 9-1 describes the penalties, charges, and other enforcement actions that MPMW is authorized to take after each violation of the WSCP. The City takes progressively increasing actions associated with more egregious levels of violations. Actions range from a warning after the first violation, up to a $500 fine and discontinuance of water service after the sixth violation. As shown in Table 9-2, customers will incur additional charges for installation and removal of flow restricting devices and disconnection and reconnection of service if MPMW deems these actions necessary. Customers may contest a fine by submitting a written appeal to the Public Works Director within thirty (30) days of the fine.

Additionally, as shown in Table 6-2, MPMW will facilitate compliance with the WSCP by employing increasing levels of customer service, public outreach, and water-waste patrols with increasing shortage levels.

The City employees and members of the public may report water waste complaints through the City's website at www.menlopark.org/waterwaste. Staff is available to provide information and respond to complaints. Staff may also seek assistance from other City Departments in responding to complaints and enforcing water use restrictions.

Table 9-1 Enforcement of Water Use Restrictions and Prohibitions

Violation	Enforcement Action or Penalty
1st	Warning Only. Educate customer on proper water conservation practices
2nd	$50 fine
3rd	$100 fine
4th	$200 fine and review by the Public Works Director (or his or her designee) to determine if a flow restricting device should be installed
5th	$500 fine, and review by the Public Works Director (or his or her designee) to determine if water service should be discontinued
6th	$500 fine and water service shall be discontinued

References:

(1) City of Menlo Park, Resolution No. 6383, Resolution of the City Council of the City of Menlo Park Adopting a Water Conservation Plan, 2 May 2017.

Table 9-2 Charges for Installation or Removal of Flow Restricting Devices and Disconnection or Reconnection of Service

Meter Size	Installation Cost	Removal Cost
Charges for Installation or Removal of Flow Restricting Devices		
5/8" to 2"	$155.00	$155.00
3" or larger	Actual Cost	Actual Cost
Charges for Disconnecting and Reconnecting Service		
All sizes	$155.00	$155.00

References:

(1) City of Menlo Park, Resolution No. 6383, Resolution of the City Council of the City of Menlo Park Adopting a Water Conservation Plan, 2 May 2017.

10. LEGAL AUTHORITIES

☑ ***CWC § 10632 (a) (7)***

(A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

☑ ***CWC § 10632.3***

It is the intent of the Legislature that, upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the board defer to implementation of locally adopted water shortage contingency plans to the extent practicable.

As discussed above, MPMW has authority within Section 7.35 of the City's Municipal Code to require water rationing and conservation and to enforce penalties. Municipal Code Section 7.35 is included as Attachment 1 of this WSCP. The City's current WSCP stage and water waste prohibitions in effect were adopted in 2017 in Resolution 6383. An adopted water shortage contingency resolution corresponding to this 2021 WSCP update is included as Attachment 5.

MPMW shall declare a water shortage emergency in accordance with Water Code Chapter 3 (commencing with Section 350) of Division 1. MPMW shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency. A list of contacts for other water suppliers within the City of Menlo Park, and the County of San Mateo is provided below:

California Water Service, Bear Gulch District	(650) 561-9709
O'Connor Tract Co-operative Water	(650) 321-2723
Palo Alto Park Mutual Water Company	(650) 322-6903
San Mateo County Environmental Health	(650) 372-6200

MPMW is a member of BAWSCA and anticipates coordinating with other Member Agencies via BAWSCA during a water shortage or emergency on the SFPUC RWS.

11. FINANCIAL CONSEQUENCES OF WSCP

☑ ***CWC § 10632 (a) (8)***

A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

In the event of a drought, if MPMW anticipates significant loss in revenue due to decreased consumption, MPMW may increase its water rates so that customers are charged for the actual cost of providing water during a shortage. These rates will be specified in MPMW's water rate schedule, as approved by the City Council and in accordance with Proposition 218 requirements.

Black & Veatch Management Consulting prepared a Water Rate Study for MPMW in March 2021 (Black & Veatch Management Consulting, 2021). The study includes an analysis of projected revenue and expenditure impacts resulting from implementation of the 2020 WSCP during periods of water shortage. To promote financial stability during water supply shortages, the 2021 Water Rate Study includes drought surcharge rates designed to compensate for lost revenue due to decreased volumetric water sales and additional expenses related to implementation of the WSCP. The City approved the five-year water rates including the drought surcharge rates on May 11, 2021. The drought surcharge rates are levied on all usage temporarily until MPMW determines that water supply conditions have returned to normal and drought-related expenditures and lost revenue have been recovered[4].

As shown in Table 6-2, the City will enforce a drought surcharge rate in each water shortage level. The City's drought surcharge rate prohibits excessive water use pursuant to CWC §365 et seq. The cost of compliance with CWC §365 et seq. has been considered in the development of the drought rate schedule in the 2021 Water Rate Study.

In addition, MPMW manages an emergency reserve fund to address the potential financial impacts of a severe drought. The City may also defer expense on capital improvement projects during a severe drought.

[4] Current City of Menlo Park five-year water rate structure including drought surcharge rate located online at https://www.menlopark.org/waterrates.

12. MONITORING AND REPORTING

☑ ***CWC § 10632 (a) (9)*** *For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.*

MPMW monitors water use through analysis of wholesale water purchases and customer meter readings. MPMW reads meters installed on each of its supply turnouts to monitor wholesale water purchases, and SFPUC's AMI Eye On Water portal provides real-time turnout meter reads. In addition, each customer account is metered. Some non-residential and multi-family customers also have separate irrigation meters to monitor water use for landscape irrigation separately from indoor uses. The City's Water Efficient Landscaping Ordinance (February 2016) requires non-residential projects to install a separate irrigation meter if landscaped areas meet specific size thresholds.

MPMW contracts to have all meters read on a monthly basis. During a supply shortage, MPMW will continue to monitor water use on this schedule to determine the effectiveness of the customer response to the implementation of this WSCP. Monthly water meter readings also allow MPMW to document atypically high water use and notify individual customers to resolve the cause of the high water use.

In addition, MPMW is planning to install advanced metering infrastructure (AMI) over the next two fiscal years. Implementation of AMI will allow MPMW to automate meter reading and provide real-time water use data to MPMW staff and customers that can be used to aggressively target leaks and atypically high water use during normal years and periods of water shortage.

Pursuant to California Code of Regulations (CCR) Title 23 §991, MPMW reports monthly water use and production to the SWRCB[5]. Effective October 1, 2020, during a governor declared drought emergency or when an urban water supplier invokes a water shortage level to respond to a drought greater than 10%, each supplier is required to submit an expanded report that contains the supplier's actions and statistics in achieving planning reductions.

[5] Water supplier monthly reports can be accessed at https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/conservation_reporting.html

13. WSCP REFINEMENT PROCEDURES

☑ ***CWC § 10632 (a) (10)*** *Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.*

The WSCP is implemented as an adaptive management plan. MPMW will evaluate the need to revise its WSCP every year after performing its Annual Assessment. The evaluation will consider effectiveness of WSCP actions and any anticipated water supply shortages assessed by the Annual Assessment. If the WSCP is revised, the City Council will adopt a new resolution adopting the revised WSCP, and if necessary, declare a water shortage level to implement.

14. PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY

☑ ***CWC § 10632 (c)*** *The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.*

MPMW informed the public and the appropriate agencies of: (1) its intent to prepare a WSCP, (2) where the WSCP was available for public review, and (3) when the public hearing regarding the WSCP would be held. All notifications were completed in compliance with the stipulations of Section 6066 of the Government Code.

A copy of the adopted 2020 WSCP including any amendments will be provided to the Department of Water Resources (DWR), the California State Library, San Mateo County, and SFPUC within 30 days of the adoption. An electronic copy of the adopted 2020 WSCP will be submitted to the DWR using the DWR online submittal tool.

A copy of the adopted 2020 WSCP will be available for public review in the City Hall during normal business hours and on MPMW website within 30 days after filing the plan with DWR.

REFERENCES

BAWSCA, 2020. *Bay Area Water Supply and Conservation Agency Annual Survey FY 2018-19*, March 2020.

Beyaz & Patel, Inc., 2019. *Preliminary Design Report for Sand Hill Reservoir #2 Roof Replacement Project*, April 2019.

Black & Veatch Management Consulting, 2021. *City of Menlo Park Water Rate Study 2021*, March 2021.

County of San Mateo, 2004. *San Mateo County/Operational Area Emergency Operations Plan, Potable Water Procurement and Distribution Annex, 3rd Edition*, July 2004.

Infrastructure Engineering Corporation, 2016. *Corporation Yard Emergency Back-Up Water Supply Well No. 1 Initial Study/Mitigated Negative Declaration*, April 2016.

ATTACHMENT 1
SECTION 7.35 OF CITY OF MENLO PARK'S MUNICIPAL CODE

Chapter 7.35
WATER CONSERVATION

Sections:

7.35.010 Purpose.

7.35.020 Water conservation.

7.35.030 Penalty.

7.35.010 Purpose.

The purpose of this chapter is to promote water conservation and provide the city with the flexibility to respond to a drought emergency whether it be emergency regulations adopted by the State Water Board, or drought-related actions imposed by the San Francisco public utilities commission. (Ord. 1011 § 4 (part), 2014: Ord. 1010 § 4 (part), 2014).

7.35.020 Water conservation.

Upon the adoption of emergency water conservation regulations by the State Water Board and within the timelines prescribed by the State Water Board, or drought-related actions imposed by the San Francisco public utilities commission, the city council of the city of Menlo Park shall adopt by resolution a water conservation plan that mandates those water conservation measures. (Ord. 1011 § 4 (part), 2014: Ord. 1010 § 4 (part), 2014).

7.35.030 Penalty.

Any violations of the water conservation plan shall be an infraction or enforced as provided in the resolution adopted pursuant to Section 7.35.020. (Ord. 1011 § 4 (part), 2014: Ord. 1010 § 4 (part), 2014).

The Menlo Park Municipal Code is current through Ordinance 1074, passed January 12, 2021.

Disclaimer: The city clerk's office has the official version of the Menlo Park Municipal Code. Users should contact the city clerk's office for ordinances passed subsequent to the ordinance cited above.

City Website: https://www.menlopark.org/
City Telephone: (650) 330-6620

Code Publishing Company

ATTACHMENT 2
ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

Each year the SFPUC evaluates the amount of total water storage expected to occur throughout the RWS and compares it to expected demands. This annual Water Supply and Demand Assessment (WSDA) is described in the subsections below, which are organized by the sequential steps the SFPUC takes to conduct the assessment each year and reference the relevant California Water Code requirements for a WSDA.[1]

The SFPUC's annual WSDA is a robust planning system that considers a range of input factors unique to the SFPUC's water supplies and system configuration while also providing the flexibility to consider new factors. Traditional surface water supplies from the SFPUC's up country, East Bay, and Peninsula reservoirs are the backbone of the water supply, but the SFPUC extends and protects those supplies in many additional ways by: (1) partnering with the community to help save water through robust conservation programs; (2) minimizing the need for additional water to serve new developments through an onsite water reuse program; (3) recycling wastewater resources to deliver water for large non-potable uses; (4) utilizing local groundwater supplies to supplement surface water supplies; (5) investigating new, alternative water supply options such as purified water and desalination; and (6) investing in innovations that allow for creative solutions to meet diverse needs. These efforts help the SFPUC conserve water and diversify supplies to reduce likelihood of a water shortage condition.

1.1 DEMAND ASSESSMENT [WATER CODE SECTION 10632(A)(2)(B)(I)]

To calculate unconstrained customer demand for the purpose of an annual WSDA, the SFPUC collects information on both the retail and wholesale system demands. Retail customer demand is estimated based on the best available information to date, and typically includes the previous year's demands as well as consideration of current demand use patterns or other conditions impacting demands, such as weather and growth. Each year, in February, the SFPUC receives from BAWSCA a report of estimated Wholesale Customer demand for the upcoming year. BAWSCA typically estimates unconstrained demands for the Wholesale Customers by using total water purchased by those customers in the prior year along with other relevant information. Relatively small demands from the two additional wholesale customers not part of the WSA are estimated based on the best available information to date, and typically includes the previous year's demands as well as consideration of current demand use patterns or other conditions impacting demands, such as weather and growth.

1.2 SUPPLY ASSESSMENT [WATER CODE SECTIONS 10632(A)(2)(B)(II) AND 10632(A)(2)(B)(V)]

The RWS collects water from the Tuolumne River watershed in the Sierra Nevada and from local reservoirs in the Alameda and Peninsula watersheds. The RWS draws an average of 85 percent of its supply from the Tuolumne River watershed. This water feeds into an aqueduct system delivering water 167 miles by gravity to Bay Area reservoirs and customers. The remaining RWS supply is drawn from local surface waters in the Alameda and Peninsula watersheds. The split between these resources varies from year to year depending on the water year hydrology and operational circumstances.

To project and evaluate water supply conditions, the SFPUC uses measurements of precipitation and snowpack in the watersheds above Hetch Hetchy, Cherry, and Eleanor Reservoirs. Snowpack conditions are evaluated regularly by the Cooperative Snow Survey (conducted by the SFPUC in partnership with state and federal agencies) beginning in late January of each year. The SFPUC also estimates snowpack conditions using information from airborne snow observatory (ASO) and other sources. The SFPUC maintains a hydrologic model

[1] California Water Code section 10632(a)(1) requires "*the analysis of water supply reliability conducted pursuant to Section 10635."* Additional information about the SFPUC's water supply reliability analysis can be found in Chapter 7 of the SFPUC's 2020 UWMP.

of the watersheds that uses this information to project expected runoff for the coming year. This process also includes a statistical analysis of additional expected precipitation. In addition to projected runoff, the determination of projected available water supply also takes into account stored water throughout the RWS, water acquired by the SFPUC from non-SFPUC sources, inactive storage, reservoir losses, and allowances for carryover storage.

Additionally, the SFPUC accounts for groundwater provided by the San Francisco Groundwater Supply Project for the in-City retail system and recycled water provided for irrigation at Harding Park, Fleming and Sharp Park Golf Courses.

The RWS relies on precipitation and snowmelt captured and stored in its reservoirs. During droughts, water supply deliveries can exceed inflows, such that water stored in previous years is relied upon to meet demands. Because of the importance of carry-over storage, the SFPUC constantly monitors and evaluates water supply conditions in the RWS. Look-ahead forecasts are updated as a year's hydrology and operations change. Generally, in early winter of any year, SFPUC staff can begin providing a forecast of water supply conditions for the upcoming year based on known and anticipated winter and spring precipitation and snowpack. The predictive power of this forecast improves greatly through the spring. The annual precipitation, snowmelt, and carry-over storage together constitute the SFPUC's reservoir storage condition. Using data for each of these factors, the SFPUC can determine whether the reservoir system will be capable of serving full deliveries to its customers. Section 1.3 describes the system modeling SFPUC conducts

Table 0-1 shows the availability of RWS supplies for retail customers and Wholesale Customers in normal years. Table 0-2 shows the current and projected RWS supply needs to meet retail and wholesale demands based on information and projections presented in the SFPUC's 2020 UWMP.

The SFPUC sells water to 26 of its 28 wholesale customers under the terms of the 25-year contract known as the Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County (WSA) and associated individual water sales contracts with each Wholesale Customer. The WSA carries forward the SFPUC's "Supply Assurance" of 184 million gallons per day (mgd) to the Wholesale Customers. The SFPUC has agreed to deliver water to the Wholesale Customers up to the amount of the Supply Assurance, and this agreement is perpetual and survives the expiration of the WSA. The Supply Assurance is, however, subject to reduction due to water shortage, drought, scheduled RWS maintenance activities, and emergencies. The WSA also describes the temporary limitation on water sales established by the Phased Water System Improvement Plan (WSIP) in 2008. This "Interim Supply Limitation" (ISL) limits water sales from the RWS to an average annual amount of 265 mgd. The WSA allocations the ISL between the SFPUC's retail customers and Wholesale Customers as follows:

- Wholesale supply allocation: 184 mgd
- Retail supply allocation: 81 mgd[2]

Table 0-1. Regional Water System Supply Availability in Normal Years (mgd)

RWS Supply Allocation	Actual	Projected				
	2020	2025	2030	2035	2040	2045
Retail Customers[a, b]	81	81	81	81	81	81
Wholesale Customers[c, d]	184	184	184	184	184	184

[2] Groveland CSD is considered a retail customer of the SFPUC. Thus, RWS supplies to Groveland CSD are accounted for in the retail supply allocation of 81 mgd.

Total RWS Supplies	265	265	265	265	265	265

a Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if these alternative supplies are not available, up to 81 mgd of RWS supply could be used in normal years.

b Groveland CSD is reported as a wholesale customer for the purposes of this 2020 UWMP, but it is considered a retail customer of the SFPUC solely for purposes of allocating RWS supplies between retail and Wholesale Customers. Its demands would be met by the retail supply allocation of 81 mgd.

c Projected Wholesale Customer deliveries are limited to 184 mgd, including the demands of the Cities of San Jose and Santa Clara, which are supplied on a temporary and interruptible basis, with their total supply not exceeding 9 mgd assuming supply is available (decision to be made by end of 2028).

d Cordilleras MWC is not a party to the WSA, and it is not included in the wholesale supply allocation of 184 mgd. The demands of Cordilleras MWC are minor (projected to be less than 0.01 mgd) and are anticipated to be met with RWS supplies through 2045.

Table 0-2. Regional Water System Supply Utilized in Normal Years (mgd)

RWS Supply Allocation	Actual	Projected				
	2020	2025	2030	2035	2040	2045
Retail Customers[a, b]	66.5	67.2	67.5	68.6	70.5	73.7
Wholesale Customers[c, d]	132.1	146.0	147.9	151.9	156.3	162.8
Total RWS Supplies	198.6	213.2	215.4	220.5	226.8	236.5

a Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if these alternative supplies are not available, up to 81 mgd of RWS supply could be used in normal years.

b Groveland CSD is reported as a wholesale customer for the purposes of this 2020 UWMP, but it is considered a retail customer of the SFPUC solely for purposes of allocating RWS supplies between retail and Wholesale Customers. Its demands would be met by the retail supply allocation of 81 mgd.

c Projected Wholesale Customer deliveries are limited to 184 mgd, including the demands of the Cities of San Jose and Santa Clara, which are supplied on a temporary and interruptible basis, with their total supply not exceeding 9 mgd assuming supply is available (decision to be made by end of 2028).

d Cordilleras MWC is not a party to the WSA, and it is not included in the wholesale supply allocation of 184 mgd. The demands of Cordilleras MWC are minor (projected to be less than 0.01 mgd) and are anticipated to be met with RWS supplies through 2045.

1.3 INFRASTRUCTURE CONSIDERATIONS [WATER CODE SECTION 10632(A)(2)(B)(III)]

On an ongoing basis, the SFPUC's Hetch Hetchy Water and Power, Water Supply and Treatment Division, and Hydrology and Water Systems group conduct analyses of the RWS that incorporate planned facility outages and multiple levels of projected system demands to evaluate and plan for potential water delivery constraints. These groups meet quarterly to share plans and coordinate how facility outages, changes in service area demand, wet or dry weather, and other variables shape the operating plans each year. Facility outages due to maintenance or upgrades are coordinated in an adaptive manner to respond to changes as they occur. For new water supplies or new capital projects related to supply distribution, impacts on the system are evaluated extensively prior to initiation of any changes. Results from these modeling efforts are considered in the annual WSDA.

1.4 SYSTEM MODELING [WATER CODE SECTION 10632(A)(2)(B)(IV)]

To proactively plan for conditions that would result in a shortage of water supplies, the SFPUC models conditions using a hypothetical drought that is more severe than what the RWS has historically experienced. This drought sequence is referred to as the "design drought" and serves as the basis for planning and modeling of future scenarios. The design drought consists of an 8.5-year sequence of dry conditions.

In applying its water supply planning methodology, the SFPUC performs an initial model simulation of the system for the design drought sequence and then reviews the ability of the system to deliver water to the service area through the entire design drought sequence. If the projected water supply runs out before the end of the design drought sequence in the initial model run, system-wide water supply rationing is added and the scenario is re-run. This process continues iteratively until a model simulation of the system is achieved in which the water supply in storage at the end of the design drought sequence is brought to the system "dead pool," where no additional storage is available for delivery (currently simulated as 96,775 acre-feet). Drawing system storage down to the dead pool without going below it indicates that water supply delivery, including the adjusted amount of rationing, is maintained through the design drought sequence.

Estimated rationing levels and corresponding storage threshold values can then be used to simulate the operation of the system through the historical record of hydrology, or to evaluate system water supply conditions during an ongoing drought. While the design drought sequence does not occur in the historical hydrology, the rationing and storage threshold values that are adjusted to allow a system configuration to maintain water delivery through the design drought sequence can be used to evaluate system performance in the historical record, or as a comparison for real-time system conditions. Through use of this planning method, the SFPUC can simulate a response to declining water supply in storage that is appropriate for the system conditions being evaluated.

The SFPUC plans its water deliveries using indicators for water supply rationing that are developed through analysis with the design drought sequence. As a result, the SFPUC system operations are designed to provide sufficient carry-over water in SFPUC reservoirs to continue delivering water, although at reduced levels, during multiple-year droughts.

1.5 DECISION-MAKING PROCESS [WATER CODE SECTION 10632(A)(2)(A)]

Regardless of the expectation of shortage conditions, as part of the normal course of business, the SFPUC provides a water supply condition update to its executive team every two weeks throughout the year. The SFPUC also provides water supply estimates to its Wholesale Customers on a monthly basis beginning February 1. A Wholesale Customer Annual Meeting is held in the last week of February at which the SFPUC makes a presentation on current water supply conditions and forecasts. The last snow survey of the season typically occurs within the first week of April, followed by a runoff forecast to determine total system storage expected as of July 1. By the middle of April, the SFPUC sends a formal letter to the Wholesale Customers summarizing the water supply availability for the coming year.

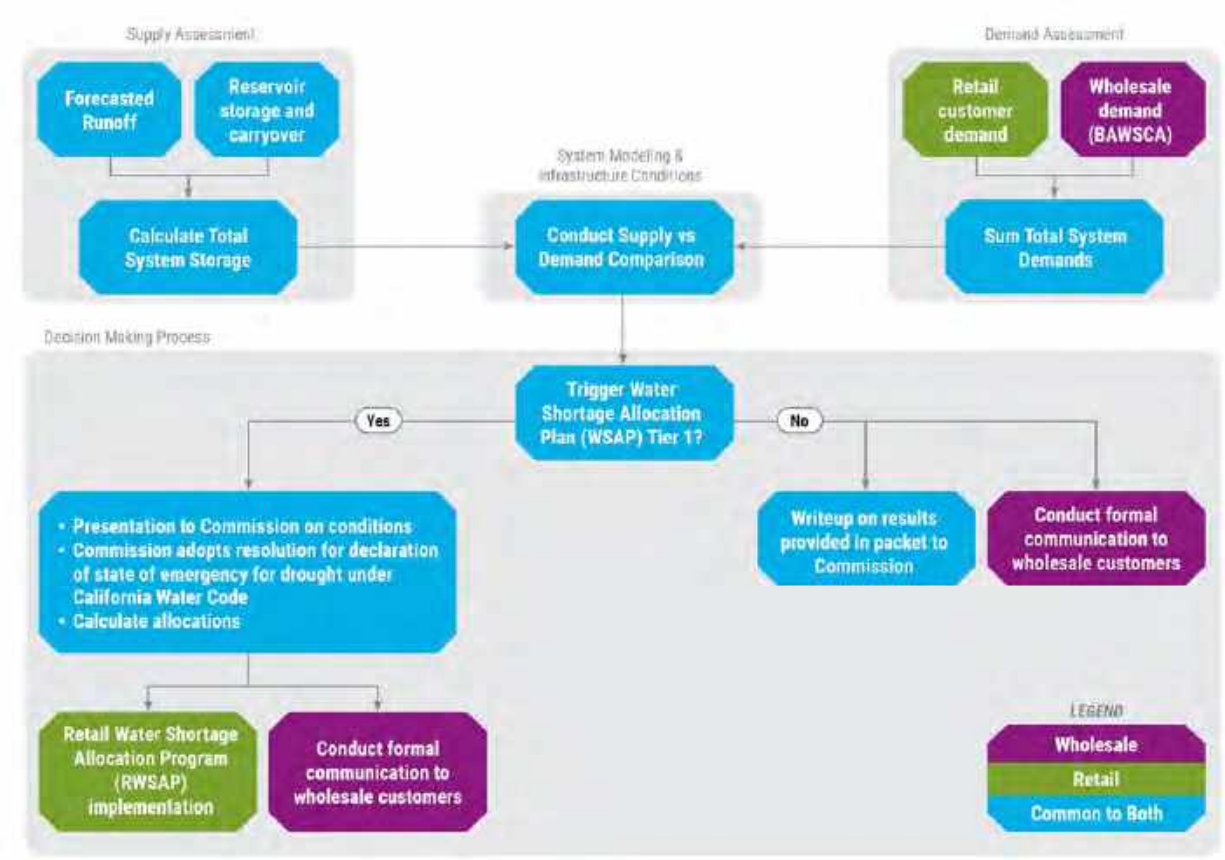
If the RWS appears incapable of meeting system-wide demand due to drought, the SFPUC is expected to declare a water shortage by March 31 of that drought year. The General Manager, or designee, is responsible for declaring such a shortage. A presentation would be made to the Commission as part of the General Manager's report, showing conditions of precipitation to date, snowpack, and storage levels with more information as necessary depending on the particulars of the supply forecast. Depending on the level of shortage, the Commission may adopt a resolution declaring a water shortage emergency under the California Water Code, or lesser actions such as a call for voluntary conservation efforts.

Prior to the initiation of any water delivery reductions to its retail customers, whether it be initial implementation of delivery reductions or implementing a different water shortage level, the SFPUC will outline a drought response plan to address the following: the water supply situation; proposed water use reduction objectives; alternatives to water use reductions; methods to calculate water use allocations and adjustments; compliance methodology and enforcement measures; and budget considerations. Details on the expected allocation program are described further in Section **Error! Reference source not found.**. This drought response plan will be presented

at a regularly scheduled SFPUC Commission meeting and advertised in accordance with the requirements of Section 6066 of the California Government Code.

The overall WSDA process is described visually in the flowchart presented in Figure 0-1.

Figure 0-1: Water Supply and Demand Assessment Process



ATTACHMENT 3
DROUGHT RESPONSE TOOL QUANTITATIVE ASSESSMENT

Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Menlo Park Municipal Water

Enter Agency Information	
Agency Name	Menlo Park Municipal Water
Total Population Served	17,780
Number of Residential Accounts	3,577
Number of Commercial, Industrial, and Institutional (CII) Accounts	462
Number of Dedicated Irrigation Accounts	142
Baseline Year(s)	2019
Percentage of Residential Indoor Use During Minimum Month (%)	100%
Percentage of CII Indoor Use During Minimum Month (%)	100%
Comments	

Navigation	
USER'S GUIDE	Download and read the guide before using this Tool
1 - HOME	Enter agency information
2 - INPUT BASELINE YEAR WATER USE	Enter Baseline Year production and use
3 - BASELINE YEAR WATER USE	Review and confirm entered information
4 - DROUGHT RESPONSE ACTIONS	Select Drought Response Actions and input estimated water savings and implementation rates.
5 - ESTIMATED WATER SAVINGS	Review estimated water production and compare estimated savings to conservation target.
6 - DROUGHT RESPONSE TRACKING	Track production and water savings against the conservation target.

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Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Menlo Park Municipal Water

For questions about this tool or for additional information, contact:

Anona Dutton, P.G., C.Hg.
adutton@ekiconsult.com
(650) 292-9100

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Drought Response Tool

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2 - Input Baseline Year (2019) Water Use

Menlo Park Municipal Water

Input Baseline Year (2019) Production and Water Use

Units: (mg)

Select the units to input monthly production and use data. Enter the total monthly potable water production for the Baseline Year. Next, enter monthly water use data by sector for the Baseline Year. If you bill on a bi-monthly basis, divide your billing data between the months that the billing cycle includes. If your single-family and multi-family accounts are tracked separately, enter the combined water use for both sectors in the Residential Water Use column. If your commercial, industrial, and institutional (CII) accounts are tracked separately, enter the combined water use for each sector in the CII Water Use column. Your non-revenue water use is calculated by subtracting your monthly residential, CII, and dedicated irrigation water uses from your monthly production. Your monthly residential gallons per capita per day (R-GPCD) is calculated by dividing your monthly residential water use by your population entered in Worksheet 1 - Home.

Date	Total Production (mg)	Residential Water Use (mg)	CII Water Use (mg)	Dedicated Irrigation Water Use (mg)	Non-Revenue Water Use (mg)	Total R-GPCD	Comments
January	52	21	23	2	6	39	
February	47	19	21	1	6	37	
March	55	22	28	2	3	39	
April	72	28	37	8	-1	53	
May	95	37	40	13	4	67	
June	117	42	44	17	14	79	
July	125	47	53	20	4	85	
August	123	46	52	19	6	83	
September	111	42	48	15	6	79	
October	106	45	50	13	-3	82	
November	80	33	33	8	6	61	
December	52	25	24	3	0	45	

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Drought Response Tool

3 - Baseline Year (2019) Water Use Profile

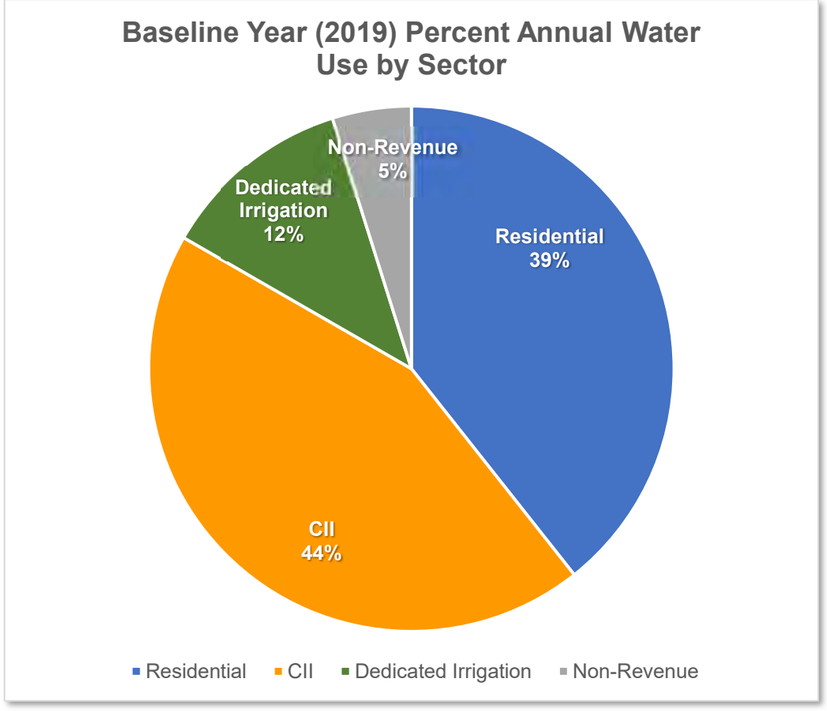
Menlo Park Municipal Water

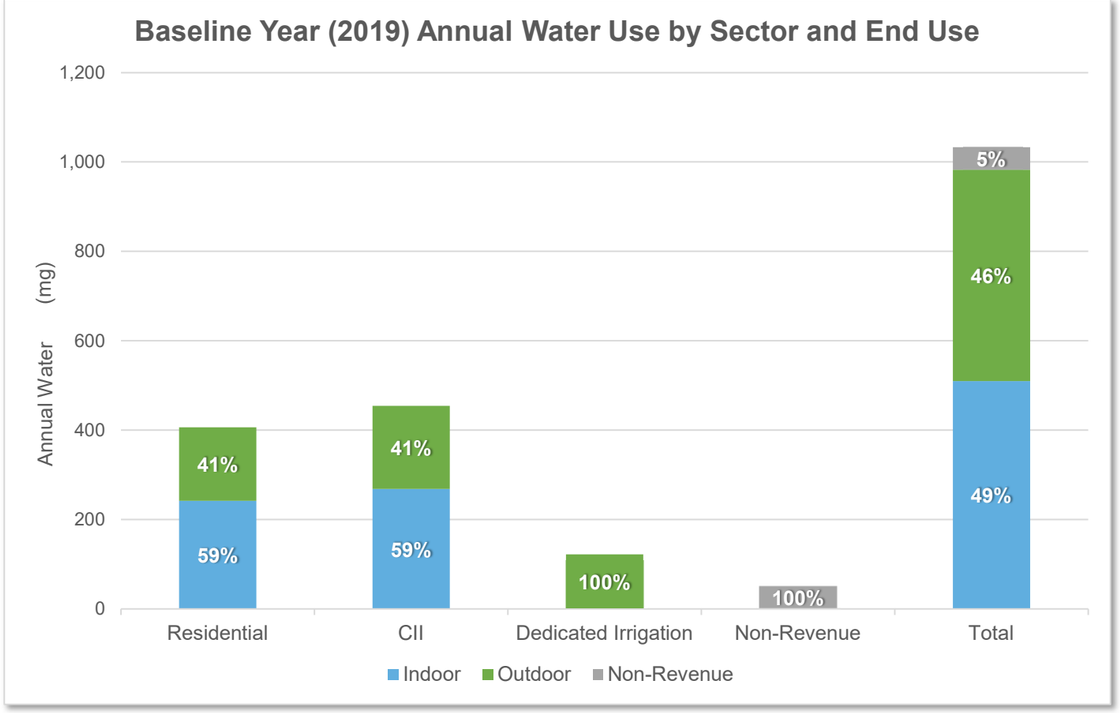
Baseline Year (2019) Annual Water Use Summary

Units: (mg)

A summary of your Baseline Year water use by sector and major end use category is shown below. Select the units in which your production and use data are displayed.

Water Use	Total Production (mg)	Water Use (mg)				Comments
		Residential	CII	Dedicated Irrigation	Non-Revenue	
Total	1,033	406	454	122	50	
Total Indoor	510	242	268	--	--	
Total Outdoor	473	165	186	122	--	
Total Non-Revenue	50	--	--	--	50	
Total Indoor %	49%	59%	59%	0%	--	
Total Outdoor %	46%	41%	41%	100%	--	
Total Non-Revenue %	5%	--	--	--	100%	





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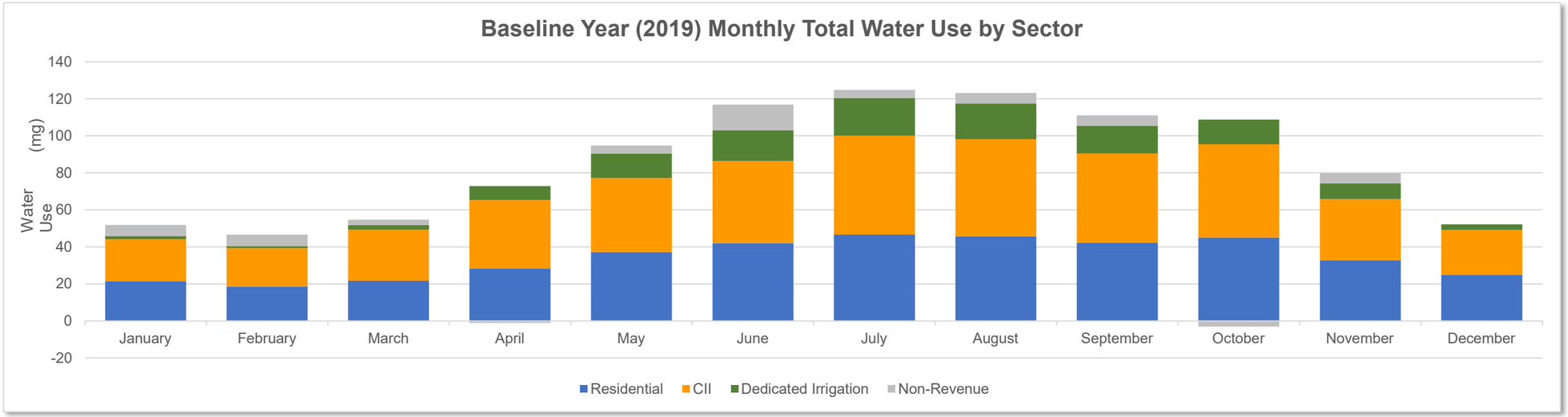
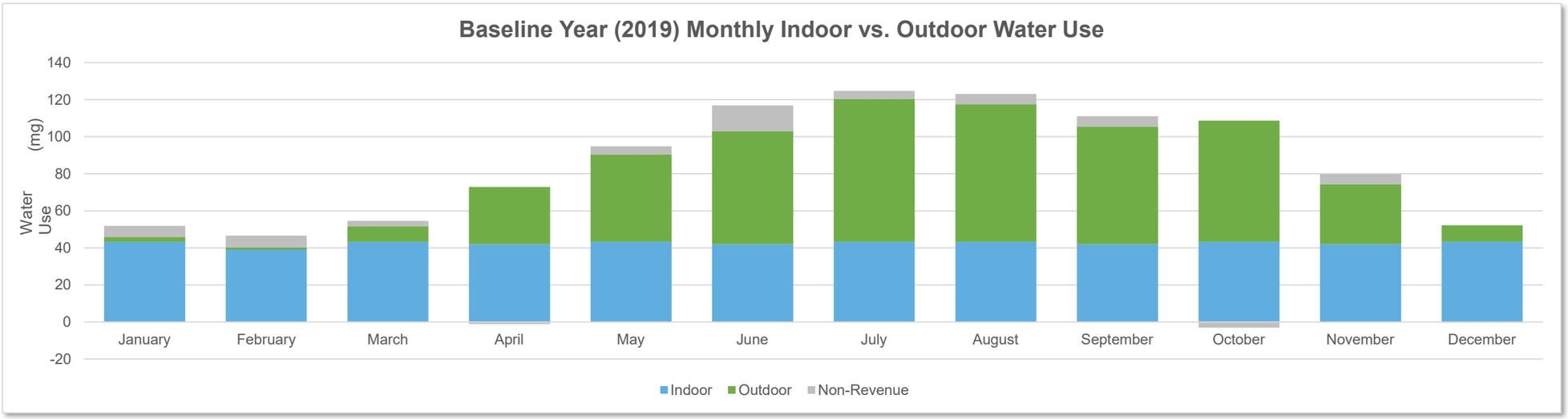
Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

3 - Baseline Year (2019) Water Use Profile

Menlo Park Municipal Water





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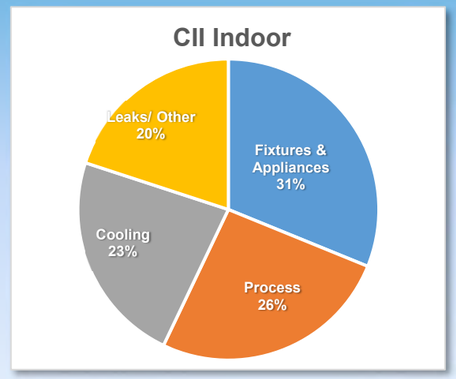
Drought Response Tool

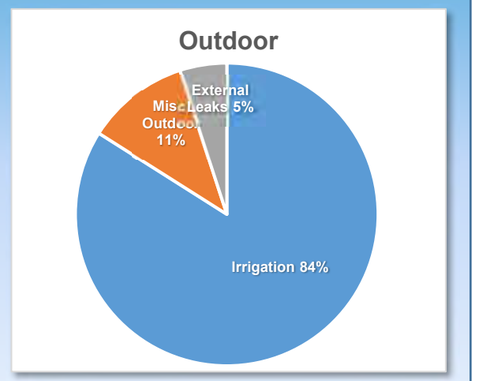
4 - Drought Response Actions - Stage 1

Menlo Park Municipal Water

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	25	R-GPCD
Maximum Residential Outdoor Savings	100%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	30%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	100%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	100%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	**64%**	of Total Baseline Production

Assumed Proportion of Water Use by End Uses and Sector





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Drought Response Tool

4 - Drought Response Actions - Stage 1

Menlo Park Municipal Water

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**35%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☑	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☐	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☐	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☑	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☐			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☐			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--

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4 - Drought Response Actions - Stage 1

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	0.5%	50%	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☐		50%	--	--
Water Efficiency Workshops, Public Events	All	☐	0.5%	25%	EBMUD, 2011	--
Water Bill Inserts	All	☑	0.5%	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☐	100%		--	--
Home or Mobile Water Use Reports	All	☐	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☐	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☐	45%	50%	DWR, 2015	Target 50% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☑	**1%**	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☐			--	--
Move to Monthly Metering / Billing	All	☐	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☐			--	--
Establish Drought Hotline	All	☐			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☐	30%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	50%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Require Repair of all Leaks within 24 hours	External Leaks	☑	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☐	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☐	75%	50%	--	--

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4 - Drought Response Actions - Stage 1

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Residential**						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☐	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	50%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☐	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Require Pool Covers	Misc. Outdoor	☑	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☐	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All Residential Uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All Residential Uses	☐	20%	50%	--	--
► **CII**						
Conduct CII Surveys Targeting High Water Users	All CII uses	☐	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	50%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☐		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☑	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☐	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☐	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All CII uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All CII uses	☐	20%	50%	--	--
Establish Water Budget - 30% Reduction	All CII uses	☐	30%	50%	--	--

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4 - Drought Response Actions - Stage 1

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

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5 - Estimated Water Savings - Stage 1

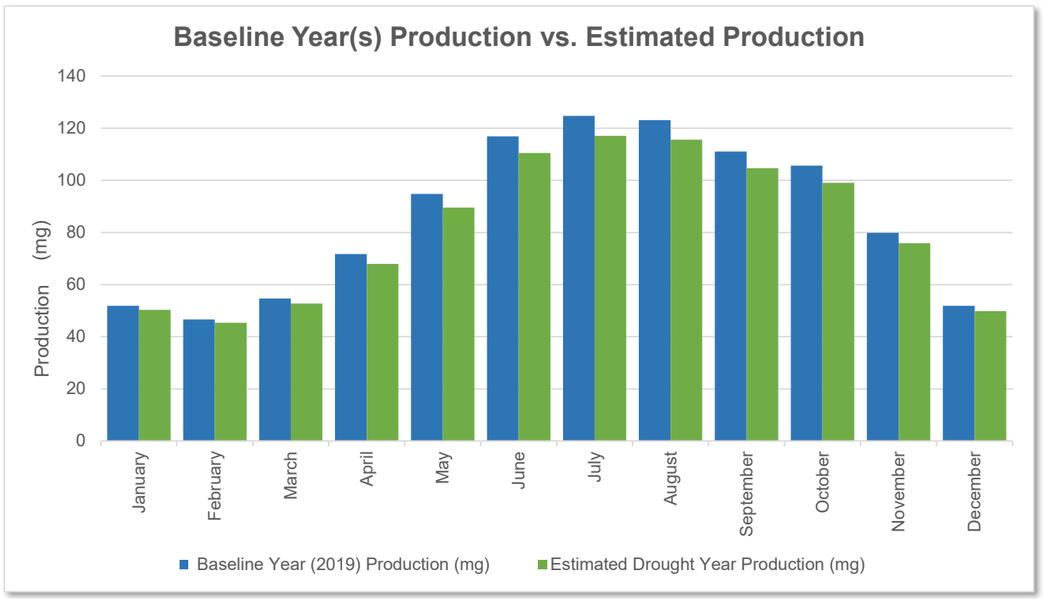
Menlo Park Municipal Water

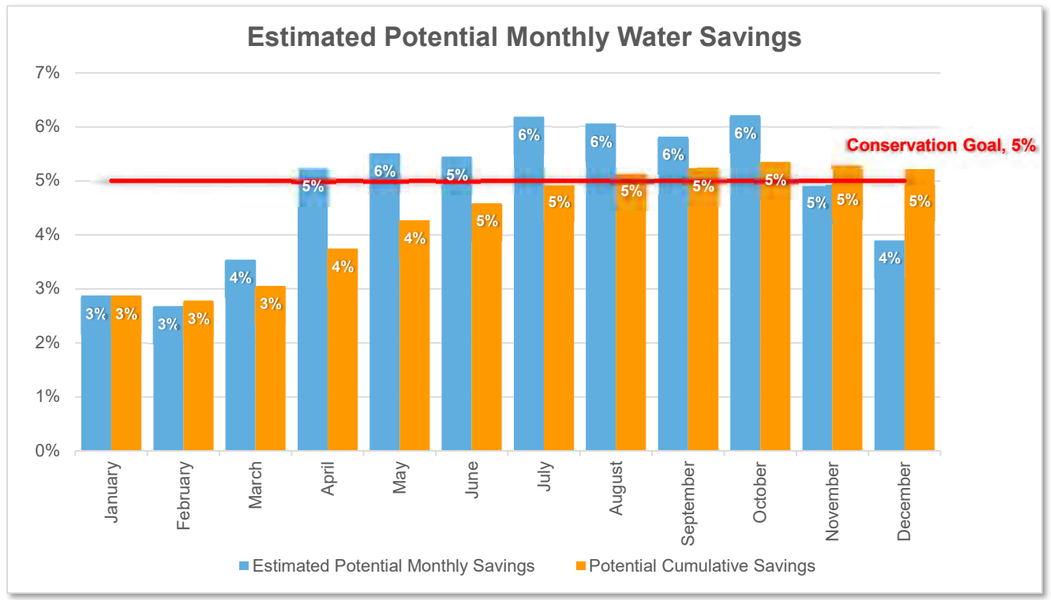
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
January	52	50	3%	3%	5%	
February	47	45	3%	3%	5%	
March	55	53	4%	3%	5%	
April	72	68	5%	4%	5%	
May	95	90	6%	4%	5%	
June	117	111	5%	5%	5%	
July	125	117	6%	5%	5%	
August	123	116	6%	5%	5%	
September	111	105	6%	5%	5%	
October	106	99	6%	5%	5%	
November	80	76	5%	5%	5%	
December	52	50	4%	5%	5%	





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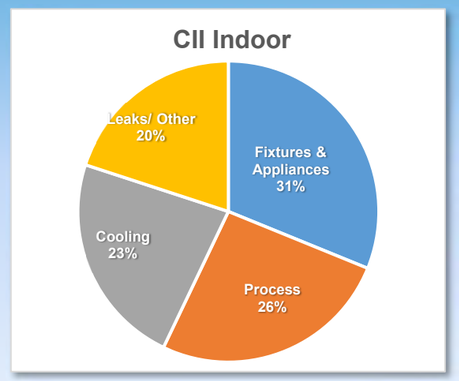
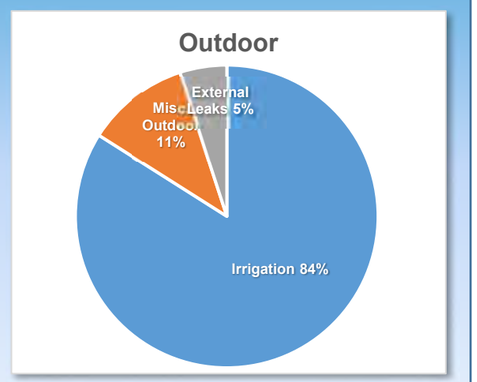
4 - Drought Response Actions - Stage 2

Menlo Park Municipal Water

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	25	R-GPCD
Maximum Residential Outdoor Savings	100%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	30%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	100%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	100%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	**64%**	of Total Baseline Production

Assumed Proportion of Water Use by End Uses and Sector





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4 - Drought Response Actions - Stage 2

Menlo Park Municipal Water

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**55%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☑	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☐	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☐	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☑	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☐			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☐			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--

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4 - Drought Response Actions - Stage 2

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	0.5%	**55%**	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☑		50%	--	--
Water Efficiency Workshops, Public Events	All	☐	0.5%	25%	EBMUD, 2011	--
Water Bill Inserts	All	☑	0.5%	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☐	100%		--	--
Home or Mobile Water Use Reports	All	☑	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☐	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☑	45%	**30%**	DWR, 2015	Target 30% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☑	**2%**	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☐			--	--
Move to Monthly Metering / Billing	All	☐	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☐			--	--
Establish Drought Hotline	All	☑			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☐	30%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	38%	50%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Require Repair of all Leaks within 24 hours	External Leaks	☑	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☐	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☐	75%	50%	--	--

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4 - Drought Response Actions - Stage 2

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► Agency Drought Actions / Restrictions						
► Residential						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☐	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	38%	50%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☐	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Require Pool Covers	Misc. Outdoor	☑	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☐	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All Residential Uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All Residential Uses	☐	20%	50%	--	--
► CII						
Conduct CII Surveys Targeting High Water Users	All CII uses	☐	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	38%	50%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☐		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☑	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☐	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☐	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All CII uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All CII uses	☐	20%	50%	--	--
Establish Water Budget - 30% Reduction	All CII uses	☐	30%	50%	--	--

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4 - Drought Response Actions - Stage 2

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

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5 - Estimated Water Savings - Stage 2

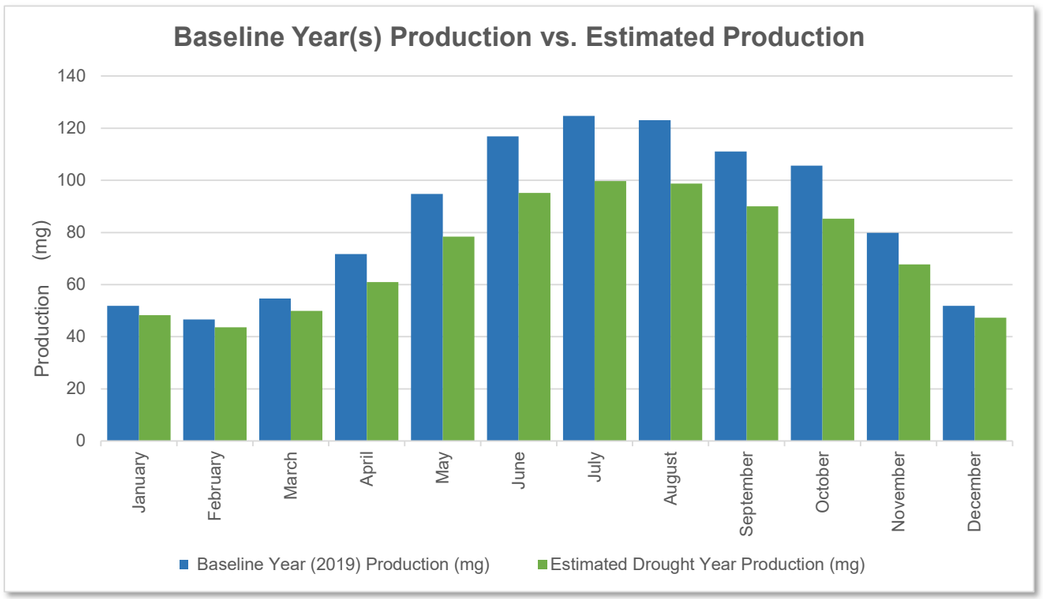
Menlo Park Municipal Water

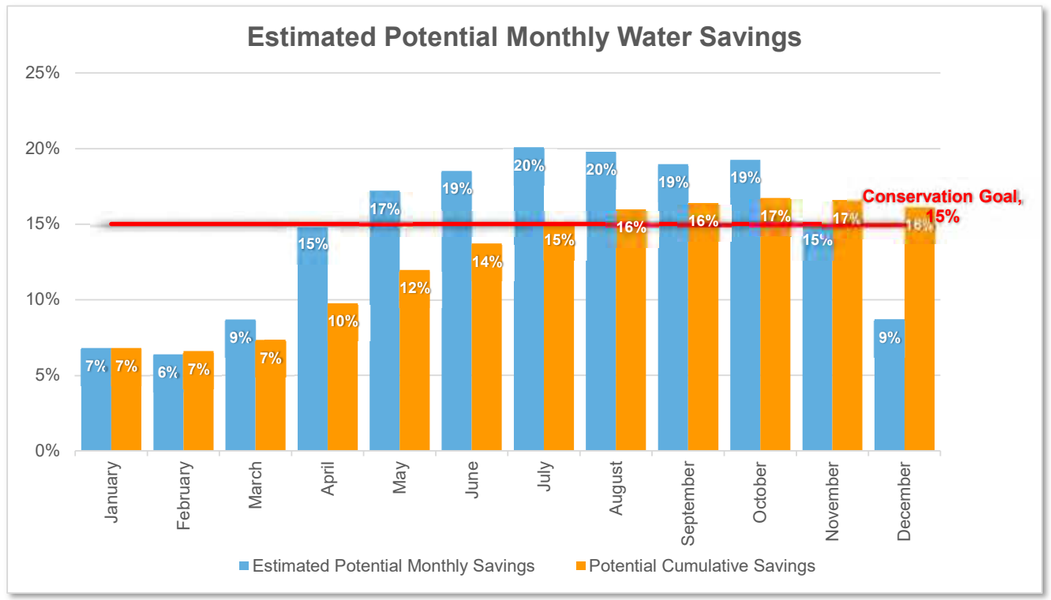
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
January	52	48	7%	7%	15%	
February	47	44	6%	7%	15%	
March	55	50	9%	7%	15%	
April	72	61	15%	10%	15%	
May	95	78	17%	12%	15%	
June	117	95	19%	14%	15%	
July	125	100	20%	15%	15%	
August	123	99	20%	16%	15%	
September	111	90	19%	16%	15%	
October	106	85	19%	17%	15%	
November	80	68	15%	17%	15%	
December	52	47	9%	16%	15%	





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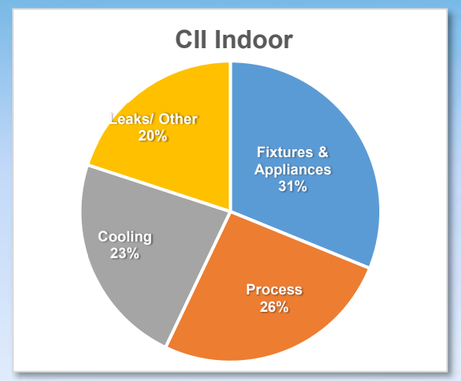
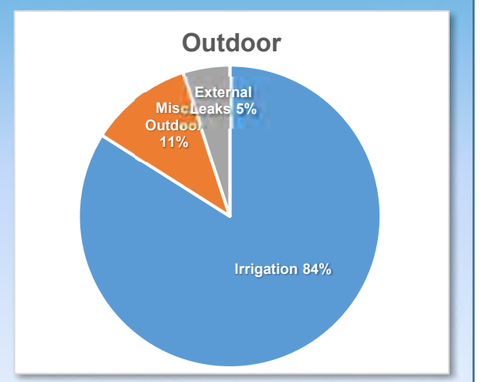
4 - Drought Response Actions - Stage 3

Menlo Park Municipal Water

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	25	R-GPCD
Maximum Residential Outdoor Savings	100%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	30%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	100%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	100%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	**64%**	of Total Baseline Production

Assumed Proportion of Water Use by End Uses and Sector





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4 - Drought Response Actions - Stage 3

Menlo Park Municipal Water

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**70%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☑	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☐	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☐	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☑	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☐			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☐			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--

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4 - Drought Response Actions - Stage 3

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	0.5%	**65%**	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☑		50%	--	--
Water Efficiency Workshops, Public Events	All	☑	0.5%	**30%**	EBMUD, 2011	--
Water Bill Inserts	All	☑	0.5%	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☐	100%		--	--
Home or Mobile Water Use Reports	All	☑	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☐	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☑	45%	**30%**	DWR, 2015	Target 30% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☑	**4%**	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☐			--	--
Move to Monthly Metering / Billing	All	☐	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☑			--	--
Establish Drought Hotline	All	☑			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☑	30%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	38%	**75%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Require Repair of all Leaks within 24 hours	External Leaks	☑	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☐	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☐	75%	50%	--	--

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4 - Drought Response Actions - Stage 3

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► Agency Drought Actions / Restrictions						
► Residential						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☑	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	38%	**75%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Require Pool Covers	Misc. Outdoor	☑	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☑	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All Residential Uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All Residential Uses	☐	20%	50%	--	--
► CII						
Conduct CII Surveys Targeting High Water Users	All CII uses	☑	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	38%	**75%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☐		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☑	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☐	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All CII uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All CII uses	☐	20%	50%	--	--
Establish Water Budget - 30% Reduction	All CII uses	☐	30%	50%	--	--

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4 - Drought Response Actions - Stage 3

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

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5 - Estimated Water Savings - Stage 3

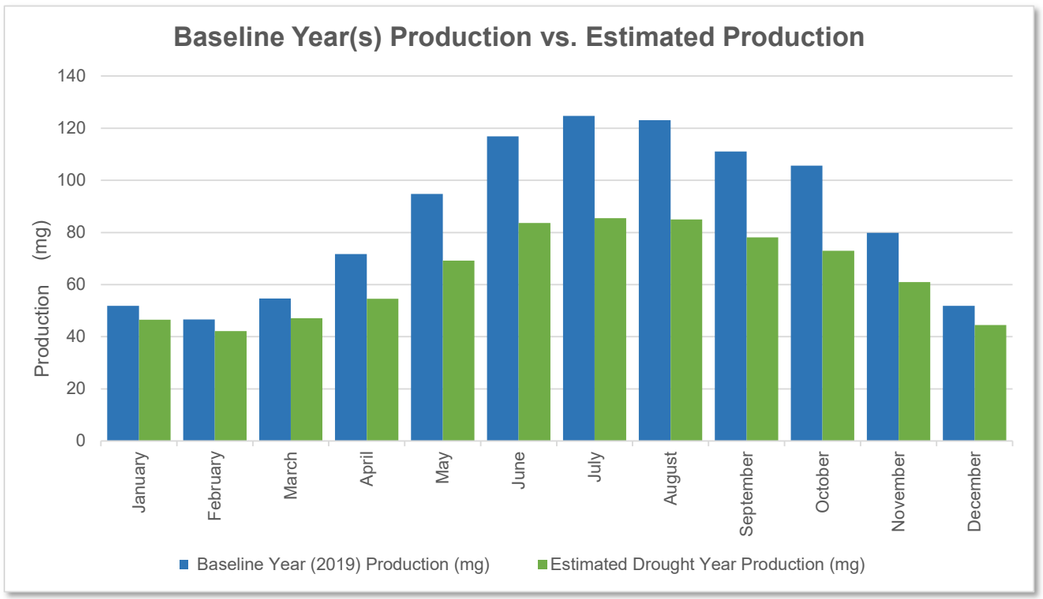
Menlo Park Municipal Water

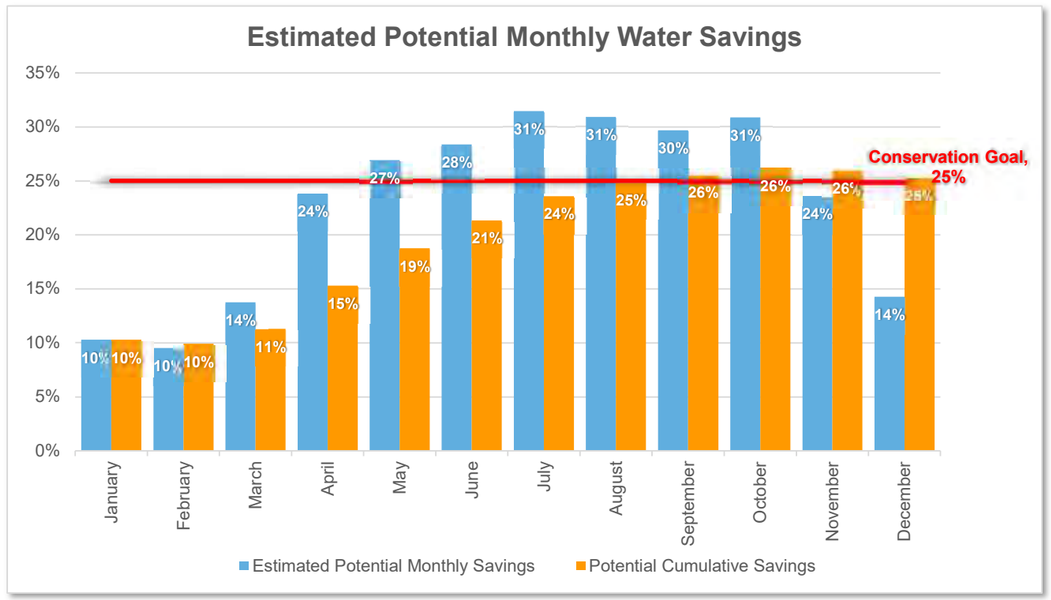
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
January	52	46	10%	10%	25%	
February	47	42	10%	10%	25%	
March	55	47	14%	11%	25%	
April	72	55	24%	15%	25%	
May	95	69	27%	19%	25%	
June	117	84	28%	21%	25%	
July	125	85	31%	24%	25%	
August	123	85	31%	25%	25%	
September	111	78	30%	26%	25%	
October	106	73	31%	26%	25%	
November	80	61	24%	26%	25%	
December	52	44	14%	25%	25%	





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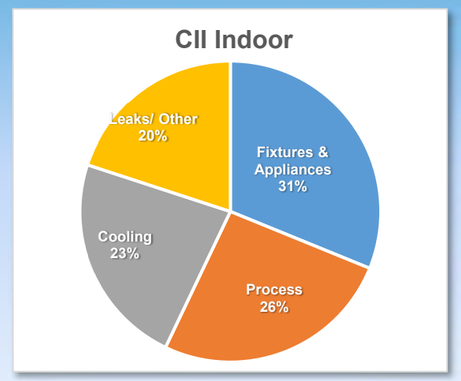
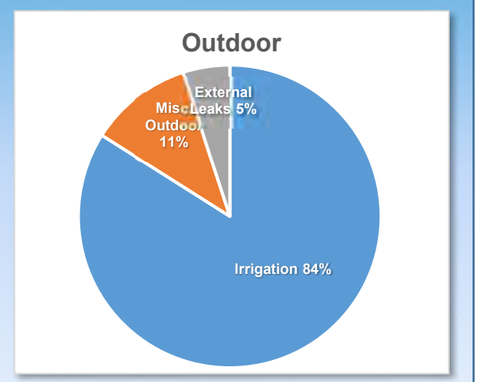
4 - Drought Response Actions - Stage 4

Menlo Park Municipal Water

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	25	R-GPCD
Maximum Residential Outdoor Savings	100%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	30%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	100%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	100%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	**64%**	of Total Baseline Production

Assumed Proportion of Water Use by End Uses and Sector





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4 - Drought Response Actions - Stage 4

Menlo Park Municipal Water

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**70%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☑	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☐	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☐	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☑	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☐			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☐			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--

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4 - Drought Response Actions - Stage 4

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	0.5%	**65%**	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☑		50%	--	--
Water Efficiency Workshops, Public Events	All	☑	0.5%	**30%**	EBMUD, 2011	--
Water Bill Inserts	All	☑	0.5%	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☐	100%		--	--
Home or Mobile Water Use Reports	All	☑	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☑	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☑	45%	**30%**	DWR, 2015	Target 30% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☑	5%	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☐			--	--
Move to Monthly Metering / Billing	All	☐	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☑			--	--
Establish Drought Hotline	All	☑			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☑	30%	**20%**	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	**60%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	**60%**		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Require Repair of all Leaks within 24 hours	External Leaks	☑	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☐	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☐	75%	50%	--	--

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4 - Drought Response Actions - Stage 4

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► Agency Drought Actions / Restrictions						
► Residential						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☑	10%	**20%**	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	**60%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	**60%**		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Require Pool Covers	Misc. Outdoor	☑	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☑	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All Residential Uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All Residential Uses	☐	20%	50%	--	--
► CII						
Conduct CII Surveys Targeting High Water Users	All CII uses	☑	10%	**20%**	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	**60%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	**60%**		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☐		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☑	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☐	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All CII uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All CII uses	☐	20%	50%	--	--
Establish Water Budget - 30% Reduction	All CII uses	☐	30%	50%	--	--

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4 - Drought Response Actions - Stage 4

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

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5 - Estimated Water Savings - Stage 4

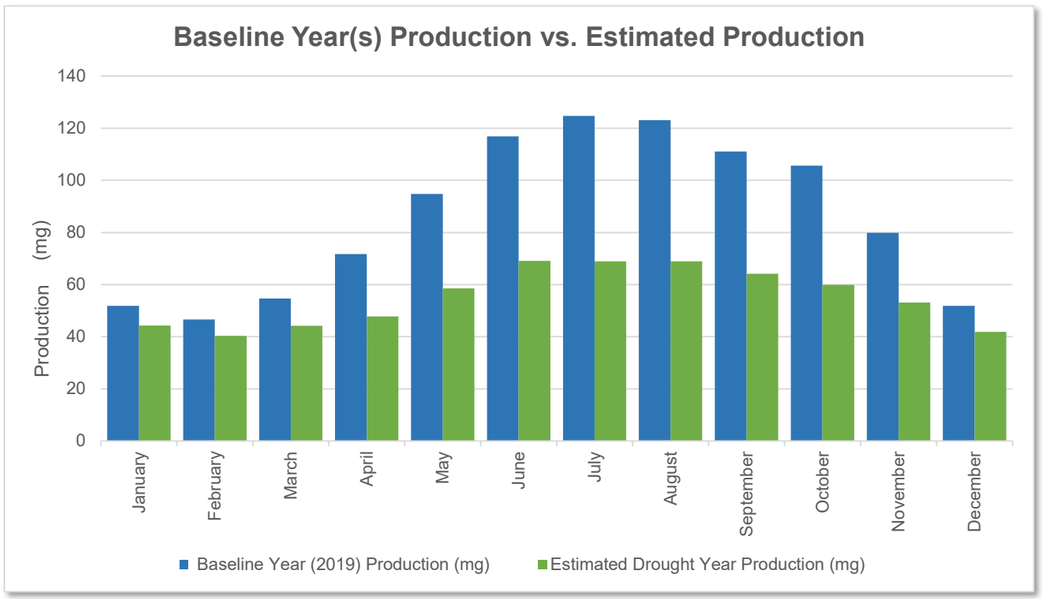
Menlo Park Municipal Water

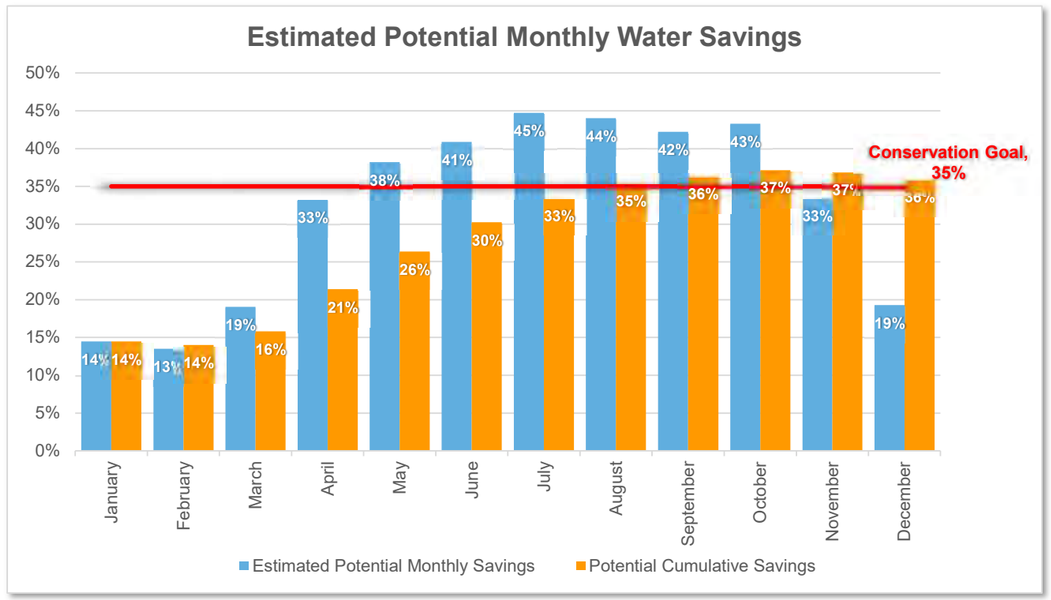
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
January	52	44	14%	14%	35%	
February	47	40	13%	14%	35%	
March	55	44	19%	16%	35%	
April	72	48	33%	21%	35%	
May	95	59	38%	26%	35%	
June	117	69	41%	30%	35%	
July	125	69	45%	33%	35%	
August	123	69	44%	35%	35%	
September	111	64	42%	36%	35%	
October	106	60	43%	37%	35%	
November	80	53	33%	37%	35%	
December	52	42	19%	36%	35%	





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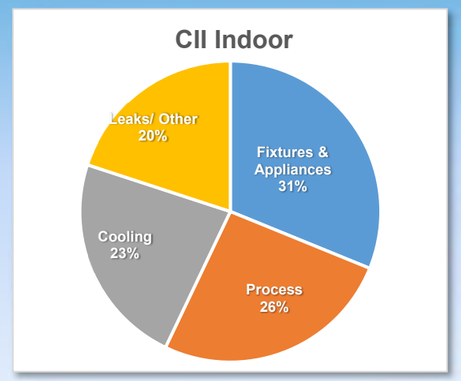
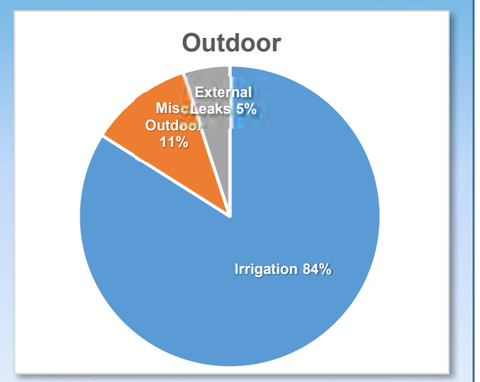
4 - Drought Response Actions - Stage 5

Menlo Park Municipal Water

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	25	R-GPCD
Maximum Residential Outdoor Savings	100%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	30%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	100%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	100%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	**64%**	of Total Baseline Production

Assumed Proportion of Water Use by End Uses and Sector





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4 - Drought Response Actions - Stage 5

Menlo Park Municipal Water

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**70%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☑	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☐	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☐	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☑	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☐			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☐			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--

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4 - Drought Response Actions - Stage 5

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	0.5%	**70%**	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☑		50%	--	--
Water Efficiency Workshops, Public Events	All	☑	0.5%	**30%**	EBMUD, 2011	--
Water Bill Inserts	All	☑	0.5%	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☐	100%		--	--
Home or Mobile Water Use Reports	All	☑	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☑	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☑	45%	**30%**	DWR, 2015	Target 30% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☑	5%	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☑			--	--
Move to Monthly Metering / Billing	All	☐	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☑			--	--
Establish Drought Hotline	All	☑			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☑	30%	**30%**	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	**60%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	**70%**		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Require Repair of all Leaks within 24 hours	External Leaks	☑	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☑	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☐	75%	**55%**	--	--

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4 - Drought Response Actions - Stage 5

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► Agency Drought Actions / Restrictions						
► Residential						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☑	10%	**30%**	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	**60%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	**70%**		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Require Pool Covers	Misc. Outdoor	☑	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☑	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All Residential Uses	☑	10%	50%	--	--
Establish Water Budget - 25% Reduction	All Residential Uses	☐	25%	55%	--	--
► CII						
Conduct CII Surveys Targeting High Water Users	All CII uses	☑	10%	**30%**	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	60%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	**70%**		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☐		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☑	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☐	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All CII uses	☑	10%	50%	--	--
Establish Water Budget - 25% Reduction	All CII uses	☐	25%	60%	--	--
Establish Water Budget - 35% Reduction	All CII uses	☐	35%	55%	--	--

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Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

4 - Drought Response Actions - Stage 5

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

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Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

5 - Estimated Water Savings - Stage 5

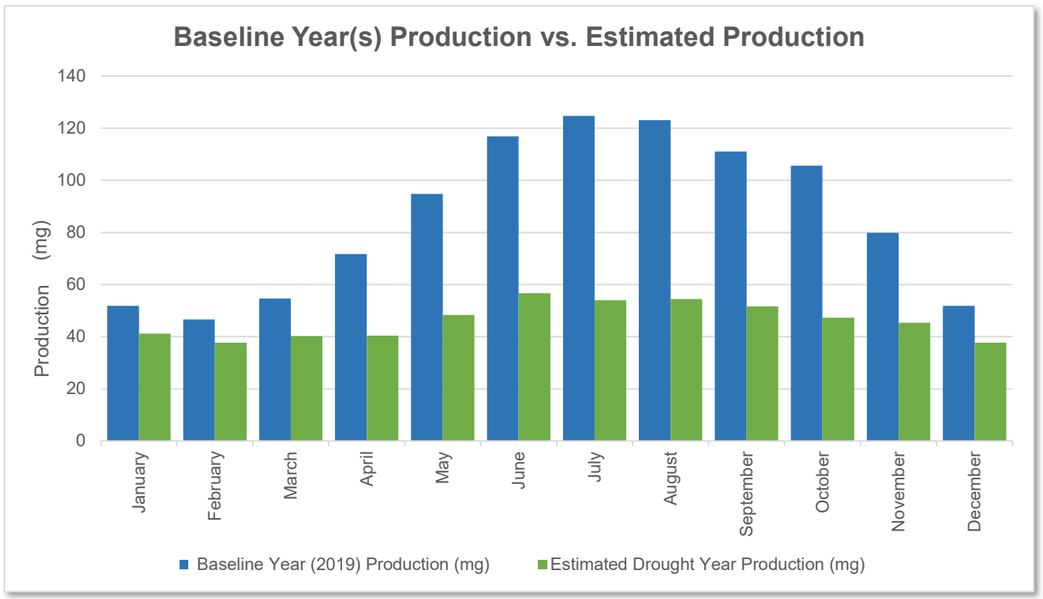
Menlo Park Municipal Water

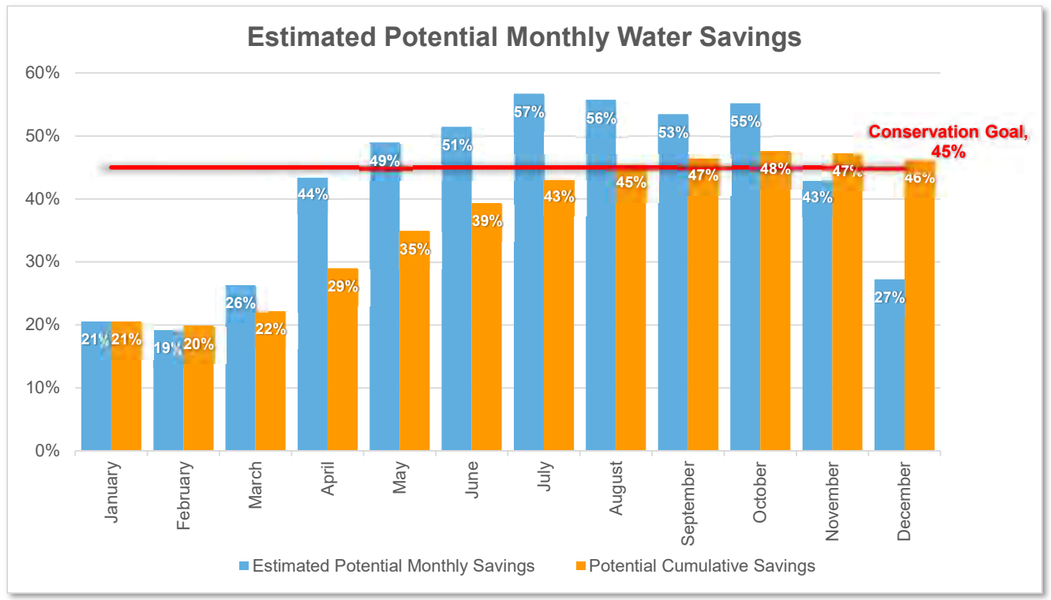
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
January	52	41	21%	21%	45%	
February	47	38	19%	20%	45%	
March	55	40	26%	22%	45%	
April	72	40	44%	29%	45%	
May	95	48	49%	35%	45%	
June	117	57	51%	39%	45%	
July	125	54	57%	43%	45%	
August	123	54	56%	45%	45%	
September	111	52	53%	47%	45%	
October	106	47	55%	48%	45%	
November	80	45	43%	47%	45%	
December	52	38	27%	46%	45%	





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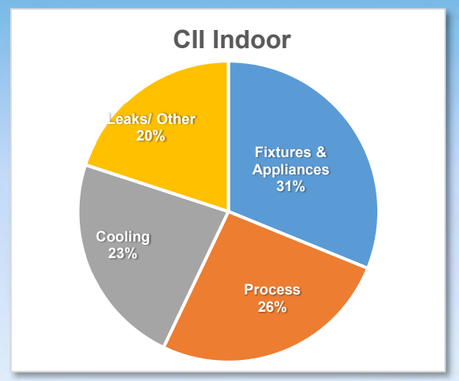
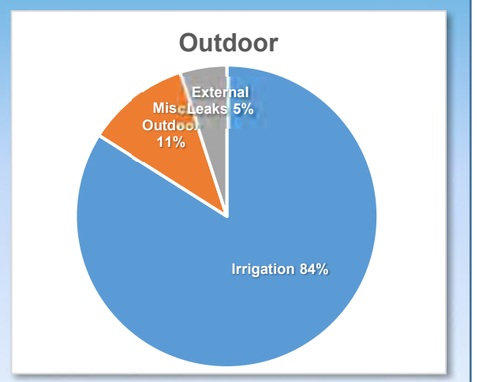
4 - Drought Response Actions - Stage 6

Menlo Park Municipal Water

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	25	R-GPCD
Maximum Residential Outdoor Savings	100%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	30%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	100%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	100%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	**64%**	of Total Baseline Production

Assumed Proportion of Water Use by End Uses and Sector





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4 - Drought Response Actions - Stage 6

Menlo Park Municipal Water

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**70%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☑	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☐	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☐	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☑	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☐			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☐			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--

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4 - Drought Response Actions - Stage 6

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	0.5%	**70%**	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☑		50%	--	--
Water Efficiency Workshops, Public Events	All	☑	0.5%	**30%**	EBMUD, 2011	--
Water Bill Inserts	All	☑	0.5%	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☐	100%		--	--
Home or Mobile Water Use Reports	All	☑	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☑	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☑	45%	**30%**	DWR, 2015	Target 30% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☑	5%	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☑			--	--
Move to Monthly Metering / Billing	All	☐	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☑			--	--
Establish Drought Hotline	All	☑			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☑	30%	**40%**	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	**60%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	**70%**		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Require Repair of all Leaks within 24 hours	External Leaks	☑	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☐	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☑	75%	50%	--	--

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4 - Drought Response Actions - Stage 6

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► Agency Drought Actions / Restrictions						
► Residential						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☑	10%	**40%**	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	**60%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	**70%**		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Require Pool Covers	Misc. Outdoor	☑	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☑	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All Residential Uses	☐	10%	50%	--	--
Establish Water Budget - 25% Reduction	All Residential Uses	☑	**25%**	50%	--	--
► CII						
Conduct CII Surveys Targeting High Water Users	All CII uses	☑	10%	**40%**	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	**60%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	**70%**		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☐		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☑	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☐	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All CII uses	☐	10%	50%	--	--
Establish Water Budget - 25% Reduction	All CII uses	☐	25%	60%	--	--
Establish Water Budget - 35% Reduction	All CII uses	☑	**35%**	50%	--	--

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4 - Drought Response Actions - Stage 6

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

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Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

5 - Estimated Water Savings - Stage 6

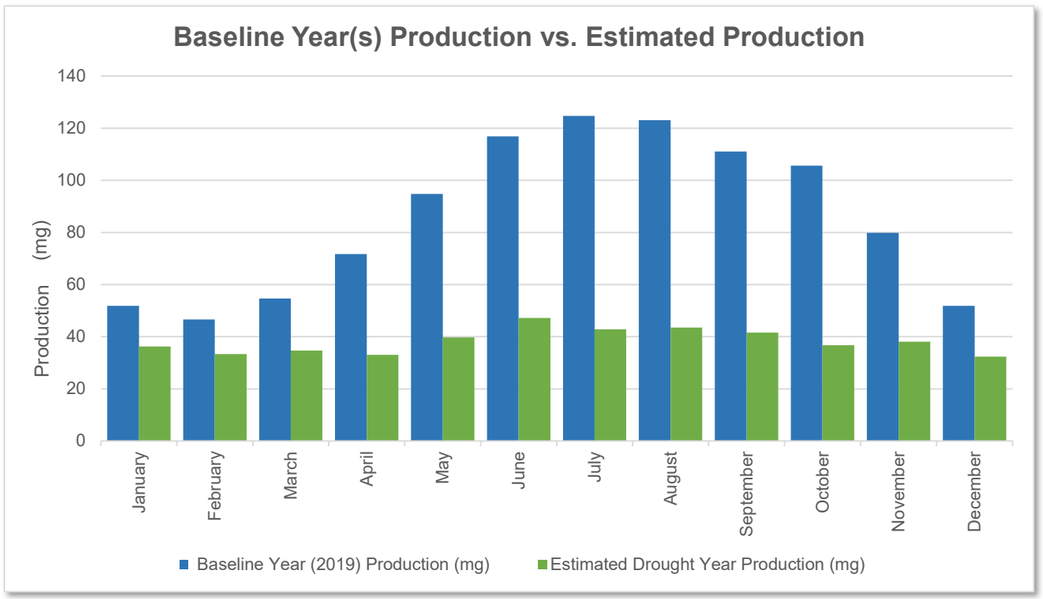
Menlo Park Municipal Water

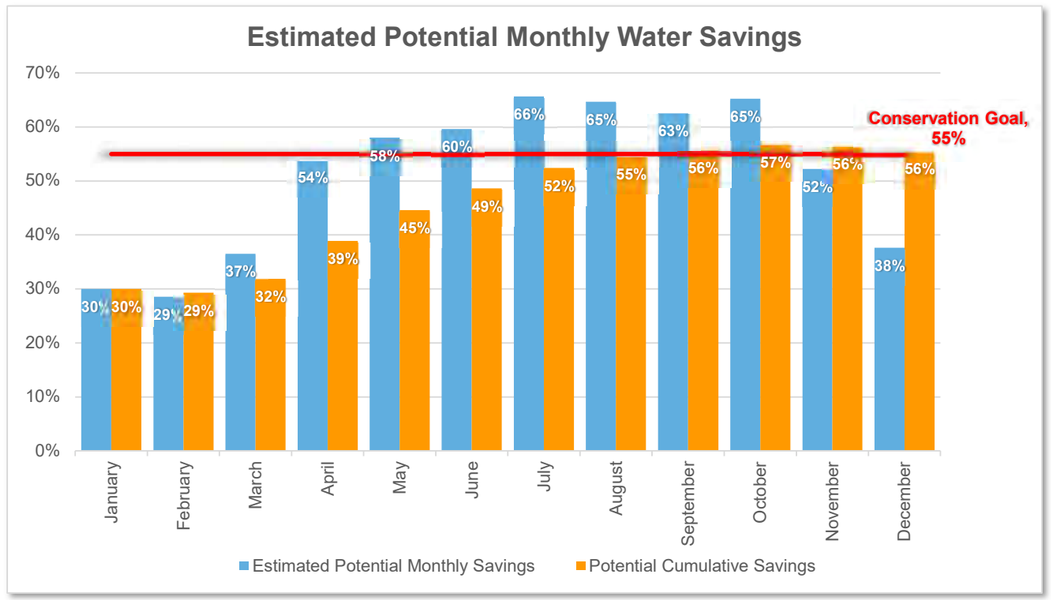
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
January	52	36	30%	30%	55%	
February	47	33	29%	29%	55%	
March	55	35	37%	32%	55%	
April	72	33	54%	39%	55%	
May	95	40	58%	45%	55%	
June	117	47	60%	49%	55%	
July	125	43	66%	52%	55%	
August	123	43	65%	55%	55%	
September	111	42	63%	56%	55%	
October	106	37	65%	57%	55%	
November	80	38	52%	56%	55%	
December	52	32	38%	56%	55%	





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ATTACHMENT 4
SFPUC EMERGENCY PREPAREDNESS PROCEDURES

PREPARATION FOR CATASTROPHIC SUPPLY INTERRUPTION

The SFPUC maintains various planning documents which collectively address its emergency preparedness and planned response in the event of a catastrophic interruption of water supplies due to power outages, earthquakes, or other disasters. These plans are described in sections 1.1 (Emergency Preparedness Plans), 1.2 (Emergency Drinking Water Planning), and 1.3 (Power Outage Preparedness and Response) below. Section 1.4 addresses the seismic risk assessment and mitigation plan required by California Water Code Section 10632.5.(a). Should a catastrophic interruption occur, the SFPUC will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency (California Government Code, California Emergency Services Act Article 2, Section 8558).

1.1 EMERGENCY PREPAREDNESS PLANS

Following the 1989 Loma Prieta Earthquake, the SFPUC created a departmental Emergency Operations Plan (EOP). The SFPUC EOP was originally released in 1992 and has been updated as necessary ever since. Most recently, the SFPUC developed a Water System Emergency Response Plan (Water ERP) to comply with the America's Water Infrastructure Act (AWIA) passed in 2018. The Water ERP acts as a unifying document, integrating and referencing common components of SFPUC plans and programs that have been developed to date. The Water ERP is intended to address water transmission and distribution systems and identify the Enterprises, Divisions, and Bureaus with direct roles and responsibilities. The Water ERP integrates directly into, and functions as an annex to, the SFPUC Emergency Operations Plan (EOP). The SFPUC EOP addresses a broad range of potential emergency situations that may affect the SFPUC and supplements the City's Emergency Response Plan, which was prepared by the Department of Emergency Management and most recently updated in 2017. Specifically, the purpose of the SFPUC EOP is to describe its emergency management organization, roles and responsibilities, and emergency policies and procedures.

In addition, SFPUC divisions and bureaus each have their own Division Emergency Operations Plans (DEOP) (in alignment with the SFPUC EOP), which detail that entity's specific emergency management organization, roles and responsibilities, and emergency policies and procedures. The SFPUC tests its DEOPs on a regular basis by conducting emergency exercises. Through these exercises, the SFPUC learns how well the plans and procedures will or will not work in response to an emergency. DEOP improvements are based on the results of these exercises and real-world event response and evaluation. The SFPUC also has an emergency response training plan that is based on federal, State, and local standards and exercise and incident improvement plans. SFPUC employees have emergency training requirements that are based on their emergency response roles.

The SFPUC EOP functions as a front end for the SFPUC's DEOPs, covering emergency response at the Department level; while each DEOP covers Division-specific information on the Division's emergency organization and response procedures specific to Division responsibilities, assets, technical scope, and operations. The types of events affecting SFPUC that may require emergency plans include but are not limited to:

- Major earthquake
- Loss of power
- Loss of water supply
- Major fire
- Hazardous material release that threatens water supply or environment
- Major pipeline breaks
- Dam break
- Significant outage of SFPUC services
- Man-made or intentional acts of terrorism resulting in damage to the system or interruption in service

In addition to the documents described above, the SFPUC also maintains various plans and procedures that deal with the possibility of alternate supply schemes and options. These include:

- Emergency Disinfection and Recovery Plan (EDRP)
- Emergency Response Action Plan (ERAP)
- Emergency Drinking Water Equipment and Alternatives Report
- Disinfection of SFPUC Water Trailers Procedure
- City Distribution Division Hydrant Manifold Standard Operating Procedure
- Pilot plant trailer (Mobile Pilot Plan O&M Plan)

1.2 EMERGENCY DRINKING WATER PLANNING

In February 2005, the SFPUC published the City Emergency Drinking Water Alternatives report. The purpose of this report was to outline a plan for supplying emergency drinking water in the City after damage and/or contamination of the SFPUC raw and/or treated water systems resulting from a major disaster. Since the publication of this report, the SFPUC has implemented a number of projects to increase its capability to support the provision of emergency drinking water during an emergency. These projects include:

- Completion of many Water System Improvement Program (WSIP) projects and other capital upgrades to improve security, detection, and communication (see Section 1.4);

- Public Information and materials for home and business;

- Construction of a disinfection and fill station at the existing San Francisco Zoo well, and obtaining a permit to utilize this well as a standby emergency drinking water source;

- Constructed six wells as part of the San Francisco Groundwater Supply Project, two of which also serve as emergency drinking water supplies, including a distribution system to fill emergency water tankers;

- Purchase and engineering of emergency-related equipment, including water tanker trucks and water distribution manifolds, to help with distribution post-disaster; and

- Coordination of planning with other City departments, neighboring jurisdictions, and other public and private partners to maximize resources and supplies for emergency response.

The SFPUC has also prepared the RWS Water Quality Notifications and Communications Plan. This plan, which was first prepared in 1996 and was most recently updated in 2017, provides contact information, procedures, and guidelines to be implemented by several SFPUC divisions, wholesale customers, and BAWSCA in the event of water quality impacts. The plan treats water quality issues as potential or actual supply problems, which fall under the emergency response structure of the SFPUC ERP.

1.3 POWER OUTAGE PREPAREDNESS AND RESPONSE

The SFPUC's water transmission system is primarily gravity fed from Hetch Hetchy Reservoir to the City. Within the in-City distribution system, key pump stations have generators on site and all others have connections in place that would allow portable generators to be used.

Although water conveyance throughout the RWS would not be greatly impacted by power outages because it is gravity fed, the SFPUC has prepared for potential regional power outages as follows:

- The Tesla Treatment Facility, the Sunol Valley Water Treatment Plant (SVWTP), and the San Antonio Pump Station have back-up power on site in the form of generators or diesel-powered pumps. Additionally, both the SVWTP and San Antonio Pump Station would not be impacted by a failure of the regional power grid because these facilities are powered by hydropower generated by the Hetch Hetchy Water and Power System.

- Both the Harry Tracy Water Treatment Plant (HTWTP) and the Baden Pump Station (part of the Peninsula System) have back-up generators in place.

- Administrative facilities that will act as emergency operation centers also have back-up power.

- The SFPUC has an emergency water supply connection with the Santa Clara Valley Water District (SCVWD), the SCVWD intertie, which also has back-up generators in place.

- Additionally, as described in the next section, the WSIP includes projects that expand the SFPUC's ability to remain in operation during power outages and other emergency situations.

1.4 SEISMIC RISK ASSESSMENT AND MITIGATION PLAN

As part of the Facilities Reliability Program and the Water System Improvement Program (WSIP), the SFPUC performed an extensive multi-year evaluation of seismic risks to its water system that resulted in major capital improvements to increase seismic reliability. The goals of WSIP include enhancing the ability of the SFPUC water system to meet identified service goals for water quality, seismic reliability, delivery reliability, and water supply. One of the original goals of WSIP was to limit rationing to no more than 20 percent on a system-wide basis; the WSIP was developed to reduce the likelihood of shortages, thereby reducing the likelihood of needing to implement the WSCP.

The WSIP projects include several projects located in San Francisco to improve the seismic reliability of the in-City distribution system, including more wells that can be used as emergency drinking water sources. The WSIP also incorporates many projects related to the RWS to address both seismic reliability and overall system reliability. As of August 2018, the WSIP is over 96 percent complete. Local San Francisco projects are 100 percent complete as of June 2020. The current forecasted date to complete the overall WSIP is December 2021.

WSIP seismic levels of service (LOS) informed development of capital projects and guided program implementation. The LOS established post-earthquake delivery and recovery objectives under the following seismic scenarios:

- Magnitude 7.9 event on the San Andreas fault
- Magnitude 7.3 event on the Hayward fault
- Magnitude 6.9 event on the Calaveras fault

An assessment of seismic risk and resilience is contained in the body of analysis performed to support the WSIP. The risks associated with the seismic scenarios considered are reflected in the delivery objectives established in the LOS, specifically:

- Delivery of winter month demand 24 hours after a major earthquake, and
- Delivery of average day demand 30 days after a major earthquake

In addition to the improvements that have or will come from the WSIP, the City has already constructed system interties for use during catastrophic emergencies, short-term facility maintenance and upgrade activities, and times of water shortages. These are listed below:

- A 35 mgd intertie with the EBMUD allowing EBMUD to serve the City of Hayward's demand and/or supply the SFPUC directly (and vice versa);
-
- A 40-mgd system intertie between the SFPUC and SCVWD; and,
-
- One permanent and one temporary intertie to the South Bay Aqueduct, which would enable the SFPUC to receive State Water Project water.

The WSIP also includes projects related to standby power facilities at various locations. These projects provide for standby electrical power at six critical facilities to keep them in operation during power outages and other emergency situations. Permanent engine generators are located at four locations (San Pedro Valve Lot, Millbrae Facility, Alameda West, and HTWTP), while hookups for portable engine generators are at two locations (San Antonio Reservoir and Calaveras Reservoir).The City of San Francisco also has a Hazard Mitigation Plan which was last updated in June 2014 and includes sections describing earthquakes hazards and mitigation for assets within the City's boundary, including state-regulated reservoirs (Sutro, Sunset North and South, and University Mound North and South).

ATTACHMENT 5
RESOLUTION 6630 WATER SHORTAGE CONTINGENCY PLAN, 2020 UPDATE

RESOLUTION NO. 6630

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MENLO PARK ADOPTING THE 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, the Urban Water Management Planning Act (Water Code Section 10610 – 10656 and 10608) requires every urban water supplier to prepare an Urban Water Management Plan ("UWMP"), the primary function of which is to support the suppliers' long-term resource planning to ensure that adequate water supplies are available to meet existing and future water needs; and

WHEREAS, the City's Menlo Park Municipal Water is an urban water supplier serving approximately 19,000 water customers; and

WHEREAS, the Water Shortage Contingency Plan ("WSCP") is included as a chapter of the UWMP and provides an action plan for a drought or catastrophic water supply; and

WHEREAS, the City's last Urban Water Management Plan was prepared in 2016; and

WHEREAS, the Urban Water Management Planning Act requires periodic review of the UWMP at least once every five years, followed by any amendments or changes to the UWMP that are indicated by that review; and

WHEREAS, an updated Urban Water Management Plan must be adopted by the City Council by July 1, 2021 and filed with the California Department of Water Resources within 30 days of adoption; and

WHEREAS, recent amendments to the Urban Water Management Planning Act require an updated Water Shortage Contingency Plan must be adopted by the City Council by July 1, 2021 and filed with the California Department of Water Resources within 30 days of adoption; and

WHEREAS, the City hired EKI Environmental & Water, Inc. ("EKI") to develop Menlo Park Municipal Water's ("MPMW") 2020 UWMP and WSCP; and

WHEREAS, MPMW receives all of its water from the San Francisco Public Utilities Commission (SFPUC); and

WHEREAS, the SFPUC has provided supply reliability data with the 2018 Bay-Delta Plan Amendment based on projected demands which reduces available supplies by almost 50 percent starting in year 2023 during dry years; and

WHEREAS, the Bay Area Water Supply and Conservation Agency ("BAWSCA") provided a temporary refined methodology that allocates SFPUC supplies as an equal percent reduction applied across all agencies when SFPUC shortages are greater than 20 percent. This allocation method is only temporary as the preliminary basis for the 2020 UWMP supply reliability analysis, and does not in any way imply an agreement by BAWSCA member agencies as to the exact allocation methodology; and

WHEREAS, the City has prepared and circulated a draft Urban Water Management Plan and Water Shortage Contingency Plan for public review, and properly noticed a public hearing

regarding said plan held by the City Council on May 25, 2021; and

WHEREAS, the Menlo Park City Council considered the Urban Water Management Plan and Water Shortage Contingency Plan, staff report, and all public testimony on May 25, 2021;

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF MENLO PARK HEREBY RESOLVES, as follows:

1. The City Council hereby finds that the above recitations are true and correct and, accordingly, are incorporated as a material part of this Resolution.

2. The City Council adopts the 2020 Urban Water Management Plan.

3. The City Council adopts the 2020 Water Shortage Contingency Plan.

4. The City Council finds that adoption of the 2020 Urban Water Management Plan and 2020 Water Shortage Contingency Plan is categorically exempt from the California Environmental Quality Act ("CEQA") under Section 15307 of the CEQA Guidelines (Actions by Regulatory Agencies for Protection of Natural Resources).

I, Judi A. Herren, City Clerk of Menlo Park, do hereby certify that the above and foregoing City Council Resolution was duly and regularly passed and adopted at a meeting by said City Council on twenty-fifth day of May, 2021, by the following votes:

AYES: Combs, Mueller, Nash, Taylor, Wolosin

NOES: None

ABSENT: None

ABSTAIN: None

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the Official Seal of said City on this twenty-fifth day of May, 2021.

DocuSigned by:

39280A20D0BE491...

Judi A. Herren, City Clerk

APPENDIX L
RESOLUTION 6630 URBAN WATER MANAGEMENT PLAN, 2020 UPDATE

RESOLUTION NO. 6630

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AYES: Combs, Mueller, Nash, Taylor, Wolosin

NOES: None

ABSENT: None

ABSTAIN: None

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the Official Seal of said City on this twenty-fifth day of May, 2021.

DocuSigned by:

39280A20D0BE491...

Judi A. Herren, City Clerk

eki environment & water

2001 Junipero Serra Blvd., Suite 300 | Daly City, CA 94014
(650) 292-9100 | Fax (650) 552-9012 | Ekiconsult.com

Appendix C
SFPUC 2020 Urban Water Management Plan

2020 URBAN WATER MANAGEMENT PLAN

for the City and County of San Francisco

June 2021

Prepared by:

The San Francisco
Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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TABLE OF CONTENTS

REFERENCES ..... **iv**
List of Appendices iv
List of Figures iv
List of Tables v
Acronyms and Abbreviations vi
SECTION 1: INTRODUCTION AND OVERVIEW **1-1**
SECTION 2: PLAN PREPARATION AND IMPLEMENTATION **2-1**
2.1 Basis for Preparing a Plan 2-1
2.2 Fiscal or Calendar Year and Units of Measure 2-1
2.3 Coordination and Outreach 2-1
2.3.1 Agency Coordination 2-1
2.3.2 Public Participation 2-2
2.4 Accounting for Groveland CSD 2-3
SECTION 3: SYSTEM DESCRIPTION **3-1**
3.1 SFPUC Water System Overview 3-1
3.1.1 Historical Development of the RWS 3-1
3.1.2 Water Distribution 3-2
3.1.3 Water Treatment 3-4
3.1.4 Water Storage 3-6
3.1.5 Other Retail Water Systems 3-8
3.2 Retail Service Area 3-9
3.2.1 Climate 3-9
3.2.2 Population and Demographics 3-11
3.3 Wholesale Service Area 3-12
3.3.1 Climate 3-12
3.3.2 Population and Demographics 3-14
SECTION 4: SYSTEM DEMANDS **4-1**
4.1 Retail Demands 4-2
4.1.1 Current Retail Demands 4-2
4.1.2 Projected Retail Demands 4-3
4.1.3 Retail Distribution System Water Losses 4-7
4.1.4 Onsite Water Reuse Water Savings 4-8
4.1.5 Demands of Lower Income Households 4-10
4.2 Wholesale Demands 4-10

4.2.1 Wholesale Water Contractual Obligations 4-11
4.2.2 Wholesale Demands 4-11
4.3 Climate Change Impacts to Demand 4-12
SECTION 5: RETAIL BASELINES AND TARGETS 5-1
5.1 Gross Per Capita Water Use Baselines & Targets Summary 5-1
5.2 Compliance with 2020 Daily Per Capita Water Use Target 5-1
5.3 Assistance to Wholesale Customers 5-2
SECTION 6: SYSTEM SUPPLIES 6-1
6.1 RWS Supplies for Retail and Wholesale Customers 6-1
6.1.1 Water Rights 6-1
6.1.2 Water Quality of RWS Supplies 6-2
6.1.3 Climate Change Impacts to RWS Supplies 6-2
6.1.4 Summary of Existing and Future RWS Supplies 6-4
6.2 Local Supplies for Retail Customers 6-5
6.2.1 Existing Local Supplies 6-5
6.2.2 Future Local Supplies 6-9
6.2.3 Water Quality of Local Supplies 6-11
6.2.4 Climate Change Impacts to Local Supplies 6-12
6.2.5 Summary of Existing and Future Local Supplies 6-12
6.3 Energy Intensity Analysis 6-14
SECTION 7: WATER SUPPLY RELIABILITY NARRATIVE 7-1
7.1 Water System Improvement Program 7-1
7.2 WSIP Dry-Year Water Supply Projects 7-2
7.3 Factors Affecting Future RWS Supplies 7-3
7.3.1 Adoption of the 2018 Bay-Delta Plan Amendment 7-3
7.3.2 Potential State and Federal Regulations 7-5
7.3.3 Additional Water Supply Decisions 7-5
7.4 Alternative Water Supply Program 7-6
7.4.1 Local Projects 7-7
7.4.2 Regional Projects 7-8
7.5 Bay Area Regional Efforts to Improve Water Supply Reliability 7-10
SECTION 8: WATER SUPPLY RELIABILITY ASSESSMENT 8-1
8.1 Constraints on Supplies 8-1
8.2 Water Supply Modeling 8-1
8.2.1 Data & Methods 8-1
8.2.2 Design Drought 8-2

8.2.3 Definition of Water Supply Scenarios *(Normal, Dry, and Multi-dry Years)* 8-2
8.2.4 Allocating Regional Water System Supply 8-5
8.3 Water Supply and Demand Comparisons, With Bay-Delta Plan Amendment 8-5
8.3.1 Retail Water Service Reliability Assessment – With Bay-Delta Plan Amendment 8-5
8.3.2 Wholesale Water Service Reliability Assessment – With Bay-Delta Plan Amendment 8-6
8.4 Water Supply and Demand Comparisons, Without Bay-Delta Plan Amendment 8-10
8.4.1 Retail Water Service Reliability Assessment – Without Bay-Delta Plan Amendment 8-10
8.4.2 Wholesale Water Service Reliability Assessment – Without Bay-Delta Plan Amendment 8-10
8.5 Drought Risk Assessment 8-13
8.5.1 Data & Methods 8-14
8.5.2 Basis for Supply Shortage Conditions 8-14
8.5.3 DRA Water Source Reliability 8-14
8.5.4 Water Supply and Demand Comparison for 5-Year Drought Sequence 8-14
SECTION 9: WATER SHORTAGE CONTINGENCY PLAN 9-1
SECTION 10: DEMAND MANAGEMENT MEASURES 10-1
10.1 Retail Water Conservation Program 10-1
10.2 Retail DMMs 10-3
10.2.1 Water Waste Prevention Ordinances 10-3
10.2.2 Metering 10-5
10.2.3 Conservation Pricing 10-5
10.2.4 Public Education and Outreach 10-6
10.2.5 Management of System Losses 10-7
10.2.6 Water Conservation Program 10-7
10.2.7 Other DMMs 10-8
10.3 Wholesale DMMs 10-8
10.3.1 Metering 10-9
10.3.2 Public Education and Outreach 10-9
10.3.3 Water Conservation Program Coordination and Staffing Support 10-9
10.3.4 Asset Management 10-9
10.3.5 Assistance to Wholesale Customers 10-10
SECTION 11: PLAN ADOPTION AND UWMP CHECKLIST 11-1
11.1 Plan Adoption, Submittal, and Implementation 11-1
11.2 UWMP Checklist 11-1

LIST OF APPENDICES

Appendix A California Urban Water Management Planning Act of 1983 (Last amended: 2020)
Appendix B UWMP Standardized Tables
Appendix C Evidence of Compliance with Outreach Requirements
Appendix D SB X7-7 Compliance Form
Appendix E 2020 Retail Demand Model and Projections Technical Memorandum
Appendix F In-City Retail Water Audit Worksheet (Draft)
Appendix G Conservation Tracking Model Summary
Appendix H Estimation of Sunol Population with DWR Population Tool
Appendix I Energy intensity analysis
Appendix J Supply Reliability Assessment Based on Level of Service Objective
Appendix K Water Shortage Contingency Plan
Appendix L Resolution to Adopt the 2020 Urban Water Management Plan
Appendix M UWMP Requirements Checklist

LIST OF FIGURES

Figure 3-1. Regional Water System 3-3
Figure 3-2. In-City Distribution System 3-5
Figure 3-3. Retail Service Area 3-10
Figure 3-4. Wholesale Service Area 3-13
Figure 4-1. Total Deliveries and In-City Retail Water Use in 2020 4-1
Figure 4-2. Trends in Retail Demands, Population, and Per Capita Use between 2005 and 2020 4-2
Figure 4-3. Projected Retail Demands, Population, and Per Capita Water Use. 4-7
Figure 10-1. Summary of SFPUC's Water Conservation Achievements 10-2

LIST OF TABLES

Note: Primary table numbers and titles are specific to the body of this 2020 UWMP. Secondary table numbers and titles that are shown in brackets (e.g., [Standardized Table 3-1 Retail: Population – Current and Projected]) indicate the corresponding standardized table that is required to be submitted to DWR in a prescribed format. Standardized tables are provided in Appendix B, and SB X7-7 Verification Form tables are provided in Appendix D.

Table 3-1. Regional Water System Storage Capacity 3-7
Table 3-2. In-City Potable Water System Storage Capacity 3-7
Table 3-3. Retail Service Area Population 3-11
Table 3-4. Wholesale Service Area Population 3-14
Table 4-1. Retail Demands (mgd) 4-6
Table 4-2. Onsite Water Reuse Program Potable Offsets (mgd) 4-10
Table 4-3. Wholesale Purchase Requests (mgd) 4-13
Table 4-4. Wholesale Contractual Obligations (mgd) 4-14
Table 5-1. Gross Per Capita Water Use Baselines and Targets Summary (GPCD) 5-1
Table 6-1. Regional Water System Normal Year Supplies (mgd) 6-4
Table 6-2. Groundwater Pumped (mgd) 6-7
Table 6-3. Projected and Actual Recycled Water Use for 2020 (mgd) 6-8
Table 6-4. Wastewater Operations within Retail Service Area 6-9
Table 6-5. Retail Supplies (mgd) 6-13
Table 8-1. WSIP Project Assumptions for RWS Supply Modeling 8-3
Table 8-2. Retail Groundwater and Recycled Water Supply Availability During Normal and Dry Years Using 2025 Base Year 8-4
Table 8-3. Regional Water System Supply Availability During Normal and Dry Years for Base Years 2025 through 2045 – With and Without Bay-Delta Plan Amendment 8-4
Table 8-4. Retail Supply and Demand Comparison for Projected Normal & Dry Year Scenarios With Bay-Delta Plan Amendment (mgd) 8-7
Table 8-5. Wholesale Supply and Demand Comparison for Projected Normal and Dry Year Scenarios With Bay-Delta Plan Amendment (mgd) 8-9
Table 8-6. Retail Supply and Demand Comparison for Projected Normal & Dry Year Scenarios Without Bay-Delta Plan Amendment (mgd) 8-11
Table 8-7. Wholesale Supply and Demand Comparison for Projected Normal and Dry Year Scenarios Without Bay-Delta Plan Amendment (mgd) 8-13
Table 8-8. Retail Supply and Demand Comparison for Five-Year Drought Risk Assessment – With Bay-Delta Plan Amendment (mgd) 8-15
Table 8-9. Retail Supply and Demand Comparison for Five-Year Drought Risk Assessment – Without Bay-Delta Plan Amendment (mgd) 8-16
Table 10-1. Summary of SFPUC Retail Educational and Outreach Activities Over Five Years (Conducted between FY15-16 and FY19-20) 10-6
Table 10-2. Summary of Key Water Conservation Programs Over Five Years (Conducted between FY15-16 and FY19-20) 10-8

ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
ABAG	Association of Bay Area Governments
AF	acre-feet (volume of water, equivalent to 325,851 gallons)
Act	California Urban Water Management Planning Act
ACWD	Alameda County Water District
AWWA	American Water Works Association
AMI	advanced metering infrastructure
BACWA	Bay Area Clean Water Agencies
BAIRWMP	Bay Area Integrated Regional Water Management Plan
BARR	Bay Area Regional Reliability
BAWSCA	Bay Area Water Supply and Conservation Agency
BDPL	Bay Division Pipeline
BG	billion gallons
BMP	Best Management Practice
CalWEP	California Water Efficiency Partnership
Castlewood CSA	Castlewood County Service Area
CCF	hundred cubic feet (volume of water, equivalent to 748 gallons)
CCWD	Contra Costa Water District
CEQA	California Environmental Quality Act
cfs	cubic feet per second (flow rate of water)
CII	commercial, industrial, and institutional
Cordilleras MWC	Cordilleras Mutual Water Company
City	City and County of San Francisco
CUWA	California Urban Water Agencies
CUWCC	California Urban Water Conservation Council
CWC	California Water Code
DMMs	demand management measures
DPR	direct potable reuse
DRA	drought risk assessment
DSOD	Division of Safety of Dams
DWR	California Department of Water Resources
EBMUD	East Bay Municipal Utility District
EIR	Environmental Impact Report
EOP	Emergency Operations Plan
ERRP	Emergency Response and Recovery Plan
FERC	Federal Energy Regulatory Commission
FY	fiscal year
GPCD	gallons per capita per day

gpm	gallons per minute
Groveland CSD	Groveland Community Services District
GSR	Groundwater Storage and Recovery
HET	high-efficiency toilet
HHLSM	Hetch Hetchy and Local Simulation Model
HTWTP	Harry Tracy Water Treatment Plant
IRWM	Integrated Regional Water Management
ISG	Individual Supply Guarantee
JPA	Joint Powers Authority
LCSD	Lower Crystal Springs Dam
LOS	Level of Service
LVE	Los Vaqueros Reservoir Expansion
MG	million gallons
mgd	million gallons per day (flow or usage rate of water)
MID	Modesto Irrigation District
MMWD	Marin Municipal Water District
MOU	Memorandum of Understanding
MW	megawatt
NSMCSD	North San Mateo County Sanitation District, a subsidiary of the City of Daly City
PEIR	Programmatic Environmental Impact Report
PREP	Potable Reuse Exploratory Plan
RWS	San Francisco Regional Water System
RWSAP	Retail Water Shortage Allocation Plan
SB	Senate Bill
SB X7-7	Senate Bill Seven of the Senate's Seventh Extraordinary Session of 2009 (a.k.a., Water Conservation Act of 2009)
SCVWD	Santa Clara Valley Water District
SFDBI	San Francisco Department of Building Inspection
SFDPH	San Francisco Department of Public Health
SFDPH-EH	San Francisco Department of Public Health-Environmental Health
SFPUC	San Francisco Public Utilities Commission
SFUSD	San Francisco Unified School District
SFO	San Francisco International Airport
State	State of California
SVCW	Silicon Valley Clean Water
SVWTP	Sunol Valley Water Treatment Plant
SWAP	Shared Water Access Program
SWRCB	State Water Resources Control Board
SWRCB DDW	SWRCB Division of Drinking Water, formerly the California Department of Public Health Drinking Water Program

TID	Turlock Irrigation District
U.S.	United States
USD	Union Sanitary District
USEPA	U.S. Environmental Protection Agency
UV	ultraviolet
UWMP	Urban Water Management Plan
WPCP	water pollution control plant
WQC	Clean Water Act section 401 Water Quality Certification for the Turlock Irrigation District and Modesto Irrigation District Don Pedro Hydroelectric Project and La Grange Hydroelectric Project
WSA	2009 Water Supply Agreement between SFPUC and its Wholesale Customers
WSAP	Water Shortage Allocation Plan
WSCP	Water Shortage Contingency Plan
WSIP	Water System Improvement Program
WTP	water treatment plant
WUEdata	DWR Water Use Efficiency data online submittal tool
Zone 7	Zone 7 Water Agency

SECTION 1: INTRODUCTION AND OVERVIEW

The San Francisco Public Utilities Commission (SFPUC) is pleased to present this 2020 update to the Urban Water Management Plan (UWMP) for the City and County of San Francisco (City).

The City owns and operates the San Francisco Regional Water System (RWS), a public asset that plays a key role in delivering high-quality drinking water to more than 2.7 million residents and businesses in the San Francisco Bay Area. The system collects water from the Tuolumne River in the Sierra Nevada and from protected local watersheds in the East Bay and Peninsula.

With the RWS, the SFPUC delivers water to 28 wholesale customers in Alameda, Santa Clara, and San Mateo Counties, as well as the Groveland Community Services District (Groveland CSD) in Tuolumne County and Cordilleras Mutual Water Company (MWC) in Redwood City. The Bay Area Water Supply and Conservation Agency (BAWSCA) represents the interests of 26 of the wholesale customers (not including Cordilleras MWC and Groveland CSD), generally referred to collectively as the Wholesale Customers, and coordinates their water conservation programming. The SFPUC also provides retail water service to customers in San Francisco (generally referred to as in-City retail customers) and a number of customers outside of San Francisco that are located along the RWS transmission system (generally referred to as suburban retail customers). Additionally, some retail customers are supplied with local groundwater and recycled water supplies.

This 2020 UWMP update presents the latest information on the SFPUC's retail and wholesale service areas; the RWS and other water systems operated by the SFPUC; system supplies and demands; water supply reliability; Water Conservation Act of 2009 compliance; and demand management. In addition, this update includes the SFPUC's current (Fiscal Year 2019-20) and projected demands and supplies for its retail and wholesale customers over the next 25 years. Retail demand projections have been updated to reflect population and employment growth, socioeconomic factors, and the latest conservation forecasts. This 2020 UWMP update coincides with additional planning efforts conducted by the SFPUC, including its 2020 Retail Water Conservation Plan update. When the UWMP was last updated in 2015, the State of California (State) was in the fourth year of a severe drought. During the drought, the unprecedented dry weather conditions prompted the implementation of Statewide conservation mandates; the SFPUC's customers met the call and continue to be among the lowest water consumers in the State. Consumption reached a historic low in 2015 and has remained low since. The SFPUC remains committed to comprehensive water efficiency efforts that will help sustain a continued reduction in water use.

In December 2018, the State Water Resources Control Board (SWRCB) adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) to establish water quality objectives with the stated goal of increasing salmonid populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay-Delta. It remains unclear how or if the Bay-Delta Plan Amendment will be implemented. In acknowledgment of the uncertainty of whether and when the Bay-Delta Plan Amendment will come into effect, this UWMP presents future supply scenarios both with and without it. The two scenarios provided are intended to bookend the potential future supply conditions for the RWS. If the Bay-Delta Plan Amendment is implemented, the SFPUC will be able to meet the projected water use demands presented in this UWMP in normal years but would experience significant supply shortages in single dry years and multiple dry years. Without the implementation of the Bay-Delta Plan Amendment, the SFPUC will not experience shortages until the 4th and 5th year of a multi-year drought at 2045 levels of projected demand.

The SFPUC has initiated an Alternative Water Supply Planning Program to ensure that San Francisco can meet its retail and Wholesale Customer water needs, address projected dry year shortages, and limit rationing to a maximum of 20 percent system-wide in accordance with adopted SFPUC policies. This program is in early planning stages and is intended

to meet future water supply challenges and vulnerabilities such as environmental flow needs and other regulatory changes; earthquakes, disasters, and emergencies; increases in population and employment; and climate change. As the region faces future challenges – both known and unknown – the SFPUC is considering a suite of diverse non-traditional supplies and leveraging regional partnerships to meet retail and Wholesale Customer needs through 2045.

In 2020, water suppliers are also required by the State of California to develop and adopt a Water Shortage Contingency Plan (WSCP). The WSCP contained herein describes the SFPUC's approach to meeting six standard water shortage stages, ranging from 10% to greater than 50% shortages. The WSCP includes a description of the SFPUC's annual Water Supply and Demand Assessment whereby total system water storage is compared to demands to evaluate the likelihood of a shortage in the coming year. Should a shortage be identified, the WSCP identifies appropriate shortage response actions, such as voluntary and mandatory rationing. The WSCP also describes the SFPUC's extensive emergency preparedness and planned response in the event of catastrophic interruptions of water supplies.

SECTION 2: PLAN PREPARATION AND IMPLEMENTATION

This section summarizes the actions taken by the SFPUC to assure agency coordination and public participation throughout the development of this 2020 UWMP.

2.1 BASIS FOR PREPARING A PLAN

The SFPUC has prepared this 2020 UWMP for the City and County of San Francisco (City) in accordance with the requirements of the 1983 California Urban Water Management Planning Act (Act), California Water Code (CWC) Division 6, Part 2.6, Sections 10610 through 10656, as last amended in 2020. A copy of the Act is provided in Appendix A. The purpose of the Act is to assure that water suppliers plan for long-term reliability, conservation, and efficient use of California's water supplies to meet existing and future demands. The Act requires that planning projections extend at least 20 years beyond the year of the UWMP, i.e., through 2040 for the 2020 UWMP cycle. The planning horizon for the SFPUC's 2020 UWMP is 25 years, i.e., through 2045.

The Act requires all urban water suppliers to prepare an UWMP every five years. The 2020 UWMPs are due to the California Department of Water Resources (DWR) by July 1, 2021. As defined by CWC Section 10617, an urban water supplier is a supplier (either publicly or privately owned) that provides water for municipal purposes to more than 3,000 customers (either directly or indirectly) or that supplies more than 3,000 acre-feet (AF) of water annually. The SFPUC meets these criteria as both a retail and wholesale supplier of water.

The SFPUC has prepared this individual UWMP specifically for the City and is not participating in the preparation of a regional UWMP.

2.2 FISCAL OR CALENDAR YEAR AND UNITS OF MEASURE

The data provided throughout this 2020 UWMP and the accompanying standardized tables are reported on a fiscal year (FY) basis. The SFPUC operates on a fiscal year that starts on July 1 and ends on June 30. The "current" fiscal year reported in this 2020 UWMP corresponds to FY 2019-2020, which represents the period from July 1, 2019 through June 30, 2020. Similarly, the projected year of 2025 denotes FY 2024-2025; 2030 denotes FY 2029-2030; and so on. Best efforts are made to convert data that are originally collected on a calendar year basis to a fiscal year basis. However, in a few cases, fiscal year quantities are approximated based on calendar year quantities and are noted as such.

The SFPUC's water supply planning, contracts, and related documents primarily use units of million gallons per day (mgd) when quantifying volumes of water. However, the standardized tables prescribed by DWR only allow volumetric water data to be reported in units of acre-feet (AF), million gallons (MG), or hundred cubic feet (CCF) per year. Therefore, the SFPUC has reported volumetric water data in this 2020 UWMP's standardized tables in units of acre-feet (AF) rounded to the nearest 10 AF (see Appendix B). The corresponding data in the body of this 2020 UWMP, however, are reported in units of mgd unless otherwise noted. Although reported in different units of measure, the quantities in both sets of data are equal. This approach has been discussed with and accepted by DWR staff in 2015 and is being carried forward in the 2020 plan.

2.3 COORDINATION AND OUTREACH

2.3.1 Agency Coordination

2.3.1.1 Coordination with City Agencies

The SFPUC coordinated with City agencies in developing elements of this 2020 UWMP and the documents referenced herein. The SFPUC consulted with the San Francisco Planning Department in developing water demand projections

based on the City's growth projections for housing and employment. City agencies were notified of the SFPUC's intent to prepare the 2020 UWMP. The notice included instructions for viewing the draft 2020 UWMP, as well as the date, time, and location of the public hearing on the draft 2020 UWMP. Comments received from these agencies on the proposed 2020 UWMP were reviewed and addressed, as appropriate. Documentation relating to these efforts and communications is provided in Appendix C.

2.3.1.2 Regional Interagency Coordination

The SFPUC coordinated the development of this 2020 UWMP with its wholesale customers and BAWSCA, a public agency representing 26 member agencies—24 cities and water districts, as well as two private utilities—in Alameda, Santa Clara, and San Mateo Counties that purchase water on a wholesale basis from the SFPUC. The SFPUC has individual water sales contracts with 27 wholesale customers, 26 of which are members of BAWSCA. Cordilleras Mutual Water Company (Cordilleras MWC) is a wholesale customer of the SFPUC but not a member of BAWSCA. Groveland Community Services District (Groveland CSD) is considered a retail customer by the SFPUC, but for the purposes of this 2020 UWMP, is recognized as a wholesale customer. Throughout this document, references to Wholesale Customers generally mean the 26 wholesale customers that are members of BAWSCA. For more information about the SFPUC's wholesale customers, see Section 3.3.

The SFPUC provided water supply reliability information for distribution to all BAWSCA members. Supplies were projected in five-year increments from 2020 through 2045 for normal, single dry, and multiple dry years. These projections are provided in Appendix C. The SFPUC also worked with all of its wholesale customers, either individually or through BAWSCA, to obtain population and water supply purchase projections in five-year increments through the year 2045. Wholesale customers that are urban water suppliers are concurrently preparing their own 2020 UWMPs; therefore, the data provided for use in the SFPUC's 2020 UWMP are subject to change.

In addition to coordinating with its wholesale customers, the SFPUC also communicated with other Bay Area water agencies, including the East Bay Municipal Utility District (EBMUD), Santa Clara Valley Water District (SCVWD), Contra Costa Water District (CCWD), and Zone 7 Water Agency (Zone 7); and counties in which the SFPUC provides water, which are the counties of San Francisco, San Mateo, Alameda, Santa Clara, San Joaquin, and Tuolumne.

All wholesale customers, Bay Area water agencies, and counties in which SFPUC provides water were notified of the SFPUC's intent to prepare the 2020 UWMP. The notice included instructions for viewing the draft 2020 UWMP, as well as the date, time, and location of the public hearing on the draft 2020 UWMP. Comments received from these agencies on the proposed 2020 UWMP were reviewed and addressed, as appropriate. Documentation relating to these efforts and communications is provided in Appendix C.

2.3.2 Public Participation

The SFPUC has always actively encouraged public participation in its urban water management planning efforts. Public outreach activities for the 2020 UWMP update are listed below. Further documentation is included in Appendix C. Notification of the 2020 UWMP update was electronically mailed on February 8, 2021, with an additional mailing on March 8, 2021, to all cities and counties within which the SFPUC provides water, as well as to other interested parties. The notification letter served as both (1) a notice to cities and counties about the 2020 UWMP update, and (2) a notice of the time and place of the corresponding public hearing, as required by the CWC. A list of notified organizations and individuals is provided in Appendix C.

The draft 2020 UWMP was made available for review between April 5th and May 5th, 2021 at **www.sfpuc.org/uwmp**. The SFPUC met with the Citizens Advisory Committee (CAC) and the CAC Water Subcommittee on April 20th, 2021 and April 27th, 2021, respectively, to present on the draft 2020 UWMP update. The Citizens Advisory Committee meetings were publicly noticed on the SFPUC website at www.sfpuc.org.

A public hearing was held on April 13, 2021 during an SFPUC Commission meeting. A notice of the hearing was advertised in the local newspaper on March 29, 2021 and April 5, 2021 in accordance with California Government Code Section 6066. Copies of newspaper advertisements of the public hearing are provided in Appendix C. Public comments on the draft 2020 UWMP were taken during the public hearing, as well as throughout the 30 day public comment period. An adoption hearing was held at a the June 8th, 2021 SFPUC Commission meeting. For 2020 UWMP adoption, submittal, and implementation, see Section 11.1.

2.4 ACCOUNTING FOR GROVELAND CSD

Groveland CSD, located in a semi-rural area of southern Tuolumne County, serves approximately 3,500 customers in Groveland, Big Oak Flat, and Pine Mountain Lake that are primarily residential and commercial water users. Prior to 2015, the SFPUC's UWMP had reported Groveland CSD as a retail customer since Groveland CSD had not prepared its own UWMP until 2010. The SFPUC also considers Groveland CSD a retail customer and accounts for it as such in its contractual obligations and supply planning. However, for the purposes of the 2015 UWMP update, DWR directed the SFPUC to report Groveland CSD as a wholesale customer. In order to accommodate both the SFPUC's planning needs and DWR's requirements, this 2020 UWMP accounts for Groveland CSD differently (either as a retail customer or a wholesale customer) depending on the context:

- For the purposes of describing the SFPUC's wholesale service area, population, demands, and supplies as directed by DWR, and to avoid potential double counting during regional or Statewide aggregation of UWMP data, Groveland CSD is considered a wholesale customer and reported as such in Section 3 of the body of this UWMP and the standardized tables in Appendix B.

- For the purposes of describing contractual obligations and RWS supply allocations between the SFPUC and its Wholesale Customers, Groveland CSD is considered a retail customer and is reported as such in the body of this 2020 UWMP, specifically Sections 4, 6, 7, and 8.

- For the purposes of calculating per capita baselines and targets in accordance with the Water Conservation Act of 2009, also known as Senate Bill (SB) X7-7, Groveland CSD is considered a wholesale customer. Therefore, Section 5 of the body of this 2020 UWMP and the corresponding SB X7-7 Verification Form tables in Appendix D do not include Groveland CSD.

The SFPUC obtained actual and projected population and demand data from Groveland CSD. As Groveland CSD is currently preparing its 2020 UWMP update, the data provided for use in the SFPUC's 2020 UWMP are subject to change.

Any discrepancies between corresponding tables in the body of this 2020 UWMP and Appendix B resulting from the difference in Groveland CSD accounting will be noted. This approach has been discussed with and deemed appropriate by DWR staff.

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SECTION 3: SYSTEM DESCRIPTION

This section describes the SFPUC's water system (including the RWS and in-City distribution system), retail and wholesale service areas, climate, and demographic features.

3.1 SFPUC WATER SYSTEM OVERVIEW

Over 2.7 million people in San Francisco and throughout the Bay Area rely on water supplied by the SFPUC to meet their daily water needs. The RWS is municipally-owned infrastructure operated by the SFPUC, a department of the City and County of San Francisco, and serves both retail and wholesale customers. The RWS supplies high-quality drinking water from the Tuolumne River watershed and from local reservoirs in the Alameda and Peninsula watersheds. The RWS draws an average of 85% of its supply from the Tuolumne River watershed, collected in Hetch Hetchy Reservoir in Yosemite National Park. This water feeds into an aqueduct system delivering water 167 miles by gravity to Bay Area reservoirs and customers. The remaining 15% of the RWS supply is drawn from local surface waters in the Alameda and Peninsula watersheds. The split between these resources varies from year to year depending on the water year hydrology and operational circumstances.

Separate from the RWS, the in-City distribution system is also owned and operated by the SFPUC and serves a population of nearly 900,000 in San Francisco. In-City retail customers are primarily served with RWS supply, but a few customers also receive groundwater and recycled water. Similarly, the SFPUC's suburban retail customers[1], outside of San Francisco, are primarily served with RWS supply, but a few customers also receive groundwater. The RWS, in-City distribution system, and other localized systems are described in the following sections.

3.1.1 Historical Development of the RWS

The RWS evolved through the development of two separate water systems: the Spring Valley Water Company system and the Hetch Hetchy Project. The Spring Valley Water Company was established in 1858 as it developed a spring and several creeks in San Francisco into a local water system. It expanded over the next few decades with the construction of the Pilarcitos, San Andreas, and Upper and Lower Crystal Springs Dams on the Peninsula. Further expansions included the development of the Pleasanton Well Field, the Sunol Filter Gallery, and Calaveras Dam in southern Alameda County.

Very early in San Francisco's development, it was recognized that the local water resources would be inadequate to support a burgeoning metropolis; thus, plans for importing water from the Sierra Nevada were born. In the late 1800s, the City's decision to develop its own water supply system culminated in the planning, financing, and construction of the Hetch Hetchy Project. Because many of the Hetch Hetchy Project facilities were to be located on public land within Yosemite National Park and Stanislaus National Forest, Congressional approval of the use of federal land was required. That approval was granted by the Raker Act of 1913 (38 Stat. 242). For more information about the Raker Act and the City's water rights under State law, see Section 3.1.4.

The construction of the Hetch Hetchy Project began in earnest in 1914. After almost 20 years of construction (including the building of Hetch Hetchy Reservoir and the 1930 acquisition of the Spring Valley Water Company by the City), Tuolumne River water began flowing into Upper Crystal Springs Reservoir in October 1934. Through the coordinated operation of the two systems, the SFPUC has been able to provide the residents of the City and its neighboring communities with a supply of high-quality potable water from high-quality sources.

[1] Suburban retail customers are retail customers located outside of SFPUC's retail service area. More information on suburban retail customers is provided in Section 3.1.5.2.

Since the 1930s, the major additions to the RWS have included the raising of O'Shaughnessy Dam and the development of Lake Lloyd (a.k.a., Cherry Lake); the construction of additional pipelines across the San Joaquin Valley; and the local construction of San Antonio Reservoir in Alameda County and Bay Division Pipelines (BDPL) Nos. 2, 3, and 4. Other local projects have included Crystal Springs Pipeline No. 3, Sunol Valley and San Andreas (now Harry Tracy) Water Treatment Plants, the Crystal Springs Bypass Tunnel and Balancing Reservoir, and the Tesla Treatment Facility.

3.1.2 Water Distribution

This section further describes how water is distributed by the RWS and the in-City distribution system.

3.1.2.1 Regional Water System

The RWS, shown in Figure 3-1, consists of more than 280 miles of pipelines, 60 miles of tunnels, 11 reservoirs, five pump stations, and two water treatment plants. It includes the Hetch Hetchy Project and the Bay Area water system facilities. The Hetch Hetchy Project is generally composed of the reservoirs, hydroelectric generation and transmission facilities, and water transmission facilities from the Hetch Hetchy Valley west to the Alameda East Portal of the Coast Range Tunnel in Sunol Valley. Water system components of the Hetch Hetchy Project are also referred to as the Hetch Hetchy System. The local Bay Area water system is comprised of two parts—the Alameda System and the Peninsula System—generally consisting of the facilities west of the Alameda East Portal of the Coast Range Tunnel, including the 63,000-acre Alameda and Peninsula watersheds, storage reservoirs, two water treatment plants, and the distribution system that delivers water to both retail and wholesale customers. The Hetch Hetchy, Alameda, and Peninsula Systems are described in more detail below.

- **Hetch Hetchy System:** In the Hetch Hetchy System, water is diverted from Hetch Hetchy Reservoir into a series of tunnels and aqueducts from the Sierra Nevada to the San Joaquin Pipelines that cross the San Joaquin Valley to the Coast Range Tunnel, which connects to the Alameda System at the Alameda East Portal. Hetch Hetchy System water is disinfected at the Tesla Treatment Facility.

- **Alameda System:** The Alameda System includes two reservoirs, San Antonio Reservoir and Calaveras Reservoir, which collect water from the San Antonio Creek, Upper Alameda Creek, and Arroyo Hondo watersheds in Alameda County. San Antonio Reservoir also receives water from the Hetch Hetchy System. Conveyance facilities in the Alameda System connect the Hetch Hetchy System and Alameda water sources to the Peninsula System. The BDPLs cross the South Bay to the Peninsula System delivering water to customers along the pipeline route. The Sunol Valley Water Treatment Plant (SVWTP) filters and disinfects water supplied from San Antonio Reservoir and Calaveras Reservoir.

- **Peninsula System:** The Peninsula System includes conveyance facilities connecting the BDPLs to the in-City distribution system and to other customers on the Peninsula. Two reservoirs, Crystal Springs Reservoir and San Andreas Reservoir, collect runoff from the San Mateo Creek watershed. Crystal Springs Reservoir also receives water from the Hetch Hetchy System. A third reservoir, Pilarcitos Reservoir, collects runoff from the Pilarcitos Creek watershed and directly serves one of the Wholesale Customers, the Coastside County Water District (which includes the City of Half Moon Bay), along with delivering water to Crystal Springs and San Andreas Reservoirs. The Harry Tracy Water Treatment Plant (HTWTP) filters and disinfects water supplied from Crystal Springs Reservoir and San Andreas Reservoir before it is delivered to customers on the Peninsula and the in-City distribution system.

Figure 3-1. Regional Water System

a Three pump stations on Treasure Island are not depicted.

b The water service area shown is approximate and for illustrative purposes only. For more accurate boundaries of the retail and wholesale service areas, see Figures 3-3 and 3-4, respectively.

3.1.2.2 In-City Distribution System

San Francisco's in-City distribution system (Public Water System No. CA3810011) was originally developed during the 100-year period between 1860 and 1960, reflecting the patterns and rates of growth in the City. Several major pipelines convey RWS supply from the Peninsula System to the City. Water to the eastside of the in-City distribution system is fed by two pipelines that terminate at University Mound Reservoir. Water to the westside of the in-City distribution is fed by two pipelines that terminate at Sunset Reservoir and one that terminates at Merced Manor Reservoir. As shown in Figure 3-1, the in-City distribution system also includes ten reservoirs and eight water tanks that store water supplied by the RWS. Seventeen pump stations[2] and approximately 1,250 miles of pipelines move water throughout the system and deliver water to homes and businesses in the City.

3.1.3 Water Treatment

The Hetch Hetchy Reservoir is the largest unfiltered water supply on the West Coast, and one of only a few large unfiltered municipal water supplies in the nation. The water originates from well-protected wilderness areas in Yosemite National Park, which flows down the Tuolumne River to Hetch Hetchy Reservoir. This water meets or exceeds all federal and State criteria for watershed protection. Water from Hetch Hetchy Reservoir is protected in pipes and tunnels as it is conveyed to the Bay Area, and requires pH adjustment to control pipeline corrosion and disinfection for bacteria control. Based on the SFPUC's disinfection treatment practice, extensive bacteriological quality monitoring, and high operational standards, the U.S. Environmental Protection Agency (USEPA) and the SWRCB Division of Drinking Water (DDW) determined that the Hetch Hetchy water source meets federal and State drinking water quality requirements without the need for filtration.

A new USEPA regulation took effect in 2012 requiring secondary disinfection for all unfiltered drinking water systems to control the waterborne parasite cryptosporidium. To comply with this regulation, the SFPUC completed construction of a new ultraviolet (UV) treatment facility in 2011. The Tesla Treatment Facility is a key component of the Water System Improvement Program (WSIP) and enhances the high-quality water from the RWS. The facility has a capacity of 315 mgd, making it the third largest UV drinking water disinfection facility in the U.S.

All water derived from sources other than Hetch Hetchy Reservoir is treated at one of two treatment plants: the SVWTP or the HTWTP. The SVWTP primarily treats water from the Alameda System reservoirs and has both a peak capacity and sustainable capacity of 160 mgd. Treatment processes include coagulation, flocculation, sedimentation, filtration, disinfection, fluoridation, corrosion control treatment, and chloramination. Fluoridation, chloramination, and corrosion control treatment can also be provided for the combined Hetch Hetchy System and SVWTP water at the Sunol Valley Chloramination Facility. The HTWTP treats water from the Peninsula System reservoirs and has a peak capacity of 180 mgd and a sustainable capacity of 140 mgd. Treatment processes include ozonation, coagulation, flocculation, filtration, disinfection, fluoridation, corrosion control treatment, and chloramination. Major upgrades to the SVWTP were completed in 2013 and to the HTWTP in 2015.

[2] This number of pump stations does not include three pump stations on Treasure Island, which are not operated by the SFPUC.

Figure 3-2. In-City Distribution System

3.1.4 Water Storage

The majority of the water delivered by the SFPUC is supplied by runoff from the upper Tuolumne River watershed on the western slope of the central Sierra Nevada. Three major reservoirs collect runoff: Hetch Hetchy Reservoir, Lake Lloyd (a.k.a., Cherry Lake), and Lake Eleanor. The storage capacity of these three reservoirs is included in Table 3-1. A "water bank" in Don Pedro Reservoir is also integrated into system operations.[3] Don Pedro Reservoir, which is jointly owned and operated by Modesto Irrigation District and Turlock Irrigation District (the Districts), is located on the Tuolumne River downstream of the Hetch Hetchy System.

As a by-product of water delivery and water supply management, hydroelectric power is generated by the Hetch Hetchy Water and Power System. Water stored in Hetch Hetchy Reservoir is used for hydroelectric generation and also satisfies instream flow requirements when released downstream. Normally, only Hetch Hetchy Reservoir water supplies are exported to the Bay Area, while releases from Lake Eleanor and Lake Lloyd are used to satisfy instream flow requirements, satisfy Raker Act entitlements to the Districts downstream, and produce hydroelectric power. The Hetch Hetchy Water and Power System includes three major hydroelectric powerhouses along the Tuolumne River—Holm, Kirkwood, and Moccasin—that have a collective generating capacity of nearly 400 megawatts.

Downstream of the Hetchy Hetchy System, the SFPUC utilizes local watersheds in the Bay Area. Crystal Springs, San Andreas, and Pilarcitos Reservoirs, located in San Mateo County, capture local runoff in the Peninsula watershed, and Calaveras and San Antonio Reservoirs, located in Alameda Country, capture local runoff in the Alameda watershed. In addition to capturing local runoff, San Andreas, San Antonio, and Crystal Springs Reservoirs also provide storage for water from the Hetch Hetchy System and, along with Calaveras Reservoir, are an important water supply in the event of an interruption to Hetch Hetchy System deliveries. The storage capacity of each of these Bay Area reservoirs is included in Table 3-1.

Calaveras Reservoir had been operating in recent years at one-third of its capacity due to restrictions imposed by the DWR Division of Safety of Dams (DSOD). The Calaveras Dam Replacement Project, which took place from 2011 to 2019, involved the construction of a new dam downstream of the existing dam. The SFPUC began impounding water behind the new dam in the winter of 2018/2019 and continued the initial fill of the reservoir during the 2019/2020 winter season.

The in-City reservoirs and tanks collectively have the capacity to hold approximately 413 MG of water. The SFPUC estimates this capacity to be a five-day supply at the current average water consumption rate for the City. In addition, there is an emergency supply of existing non-potable water immediately available within the City at Lake Merced. Lake Merced currently holds approximately 1.9 billion gallons of water.

Table 3-2 summarizes the storage capacity of in-City reservoirs and storage tanks, not including Lake Merced.

[3] The Turlock Irrigation District and Modesto Irrigation District (Districts) have senior water rights to the City for the Tuolumne River water and are provided the first increment of flow in the Upper Tuolumne River watershed according to the apportionment set forth in the Raker Act of 1913 (38 Stat. 242). The water bank at Don Pedro Reservoir provides a credit and debit system, which allows the City to divert water upstream while meeting its obligations to the Districts. Through this mechanism, the SFPUC may pre-deliver the Districts' entitlements and credit the water bank so that at other times the SFPUC may retain water upstream while the Districts debit the water bank.

Table 3-1. Regional Water System Storage Capacity

[Standardized Table: Not Applicable]

RWS Reservoir	Storage	
	Acre-Feet (AF)	Billions of Gallons (BG)
Up-Country[a]		
Hetch Hetchy	360,360	117.4
Lake Lloyd[b]	273,300	89.1
Lake Eleanor	27,100	8.8
Subtotal Up-Country	660,760	215.3
Local		
Calaveras (East Bay)[c]	96,800	31.5
San Antonio (East Bay)	50,500	16.5
Crystal Springs (Peninsula)[d]	69,300	22.6
San Andreas (Peninsula)	19,000	6.2
Pilarcitos (Peninsula)	3,100	1.0
Subtotal Local	238,700	77.8
Total RWS Storage[e]	899,460	293.1

a Three other regulating reservoirs are also part of the RWS: Early Intake, Priest, and Moccasin Reservoirs.

b Storage capacity shown includes flashboards, which are structures placed in a spillway to increase the capacity of a reservoir.

c Calaveras Reservoir was constructed with a storage capacity of 96,800 AF. Since December 2001, in response to safety concerns about the seismic stability of the dam and a directive from the Division of Safety of Dams (DSOD), the SFPUC held the maximum water level at approximately 37,800 AF (roughly 40% of its maximum capacity). The construction of a new replacement dam downstream was completed in 2019 to restore the dam's full storage capacity and the dam was continuing to be filled over the 2019/2020 winter season.

d Crystal Springs Reservoir has a maximum storage capacity of 22.6 BG (at 291.8 feet). Based on permit conditions, , the reservoir is currently operated at 287.8 feet (4 feet below capacity).

e This includes 63,700 AF in dead storage (i.e., the volume in a reservoir below the lowest controllable level). In addition, the SFPUC may draw against a credit of up to 570,000 AF in storage in a water bank account in Don Pedro Reservoir, for total storage for planning purposes of 1,469,460 AF.

Table 3-2. In-City Potable Water System Storage Capacity

[Standardized Table: Not Applicable]

In-City Reservoir	Storage	
	Acre-Feet (AF)	Millions of Gallons (MG)
Sunset	542	177
University Mound	432	141
Sutro	96	31
Summit	43	14
College Hill	41	13
Stanford Heights	40	13
Merced Manor	29	10
Lombard	8	3
Potrero	3	1
Hunters Point	3	1
Storage Tanks	29	9
Total In-City Storage	1,267[a]	413

a Rows above do not sum to total due to rounding.

3.1.5 Other Retail Water Systems

3.1.5.1 Groundwater and Recycled Water Systems

While the in-City distribution system is the primary system serving San Francisco retail customers, several customers also receive groundwater or recycled water. The San Francisco Recreation and Park Department (RPD) operates and maintains groundwater wells serving irrigation and other non-potable uses (e.g., lake filling, water exhibits) at Golden Gate Park, the San Francisco Zoo, and landscaped medians along the Great Highway. More information about this groundwater supply is provided in Section 6.2.1.1.

The City's golf courses at Harding Park (which includes Fleming Golf Course) and a portion of Sharp Park are provided recycled water for irrigation. Harding Park, an in-City retail customer, is served recycled water by the North San Mateo County Sanitation District (NSMCSD) in Daly City. Sharp Park, a suburban retail customer, is served recycled water by the North Coast County Water District (NCCWD) in Pacifica. The SFPUC neither owns nor operates either of these recycled water systems, except for a portion of the Harding Park recycled water transmission line that is within City limits, and an onsite 700,000-gallon underground storage tank and above-ground pump station at Harding Park. More information about these recycled water supplies is provided in Section 6.2.1.2.

3.1.5.2 Suburban Retail Water Systems

The SFPUC serves a number of retail customers outside the City. These customers are collectively referred to as suburban retail customers or customers in the suburban retail service area. These customers are generally located right off of RWS transmission pipelines and do not form one contiguous service area. More information about the suburban retail service area is provided in Section 3.2. However, there are two small water systems in unincorporated Alameda County that are operated by the SFPUC as permitted by the SWRCB DDW: the Castlewood Well System and the Town of Sunol domestic water system.

- **Castlewood Well System:** The SFPUC owns and operates the Pleasanton Well Field Water System[4] (Public Water System No. CA0110018; herein referred to as the Castlewood Well System), which in FY 2019-2020 supplied approximately 0.3 mgd of treated (potable) groundwater to the Castlewood County Service Area (CSA), a community comprised of the Castlewood Country Club and approximately 190 homes located in unincorporated Alameda County. The Castlewood community water system itself is owned and operated by the CSA and the California Water Service Company, respectively.

  The SFPUC serves the Castlewood CSA through one metered connection with groundwater pumped from the Castlewood Well System. This system consists of two wells, a 3,000-gallon control tank, and a 1.0-million gallon treated water reservoir. The supply is disinfected via sodium hypochlorite injection into the transmission main between the control tank and reservoir. Water quality is monitored weekly by the SFPUC.

- **Town of Sunol Domestic Water System:** The SFPUC owns and operates the domestic water system for the Town of Sunol (Public Water System No. CA0110012), which typically serves less than 0.1 mgd to approximately 120 metered and unmetered connections in unincorporated Alameda County. These connections are primarily residential customers and are supplied with potable water from the RWS. After RWS supply is fully treated, fluoridated, and chloraminated, the supply enters the Town of Sunol transmission pipeline downstream of Sunol Valley Mixing Manifold. The supply is then piped to a pump station at the SFPUC's Sunol Yard. The supply is pumped to two 130,000-gallon storage tanks. Water quality is overseen by the SFPUC.

[4] The Castlewood wells are the last remnant of Spring Valley's Pleasanton well system, which were last used to export water to San Francisco for 15 months in 1948-49.

3.2 RETAIL SERVICE AREA

Retail customers include the residents, businesses, and industries located within City limits, referred to as the in-City retail service area. Retail service is also provided to a patchwork of customers located outside the City, such as the Town of Sunol, San Francisco International Airport (SFO), Lawrence Livermore National Laboratory, and Castlewood CSA. These areas are not contiguous and are collectively referred to as the suburban retail service area. Both the in-City and suburban retail service areas are shown **in** Figure 3-2.

3.2.1 Climate

The San Francisco Bay Area as a whole has a Mediterranean climate. In the City and its vicinity, summers are cool and winters are mild with infrequent rainfall. Temperatures average 57 degrees Fahrenheit annually, ranging from the mid-40s in the winter to the upper 60s in the late summer. Strong onshore flow of wind in the summer keeps the air cool, generating fog through September. The warmest temperatures generally occur in September and October. Rainfall averages about 22 inches per year and is generally confined to the “wet” season from late October to early May.[5] Except for occasional light drizzles from thick marine stratus clouds, summers are nearly dry.

For a discussion of climate change and potential impacts, see Section 6.1.3.

[5] Average maximum and minimum temperatures and average monthly rainfall data obtained from Western Regional Climate Center, 1981-2010 data from two San Francisco monitoring stations (Mission Dolores/SF#047772 and Richmond/SF#047767). Accessed from: **www.wrcc.dri.edu**.

Figure 3-3. Retail Service Area

In-City Retail Service Area

1 City and County of San Francisco

Suburban Retail Service Area

2 Residential and Non-residential Customers in Daly City
3 Cemeteries in Colma
4 Golden Gate National Cemetery
5 San Francisco County Jail #5
6 Sharp Park Golf Course
7 San Francisco International Airport
8 SFPUC Millbrae Headquarters
9 Crystal Springs Golf Course
10 Penninsula Golf and Country Club
11 Residential Customers in Redwood City
12 Filoli Center
13 Menlo Country Club
14 NASA Ames Research Center
15 Cargill Salt
16 Residential and Non-residential Customers in Sunol
17 GE Hitachi Nuclear
18 Castlewood Country Club
19 Lawrence Livermore National Laboratory (two sites)

The suburban customers shown above represent the majority of water use in the suburban retail service area, but are not comprehensive. For the purposes of the 2020 UWMP, Groveland Community Services District is considered a retail customer in the context of the Water Supply Agreement and allocating Regional Water System supplies between retail and Wholesale Customers. Groveland is shown in Figure 3-4.

3.2.2 Population and Demographics

As shown in Table 3-3 the total population in the retail service area is currently estimated to be 897,806 and is projected to increase to nearly 1.3 million by 2045. Retail population projections are provided here; however, when future retail water demands are forecast, they are based on actual demand from existing households and new demand from projected housing growth rather than projected population growth. See Section 4.1 for further discussion of retail demand forecasting.

Table 3-3. Retail Service Area Population

[Standardized Table 3-1 Retail: Population - Current and Projected]

Retail Service Area	Actual	Projected				
	2020	2025	2030	2035	2040	2045
In-City Retail[a]	897,806	1,002,873	1,064,477	1,126,081	1,187,684	1,249.288
Suburban Retail[b]	1,926	1,926	1,926	1,926	1,926	1,926
Total Retail	899,732	1,004,799	1,066,403	1,128,007	1,189,610	1,251,214

a County of San Francisco population for January 1, 2020 obtained from the California Department of Finance Report E-5, released April 1, 2020. County of San Francisco population projections obtained from the San Francisco Planning Department consistent with their Housing Element 2022 Update.

b Actual and projected population based on the number of retail residential service connections in Redwood City, Daly City, Fremont, and Millbrae; the number of homes in Castlewood CSA; inmate population of the San Francisco County Jail #5 in San Bruno; Department of Water Resources (DWR) Population Tool for Town of Sunol; and 2000 and 2010 U.S. Census data. Methodology used to estimate population in the suburban retail service area was approved through pre-review with DWR and is detailed in Section 5.1. Population for Groveland CSD is not included as retail, but reported as wholesale in Table 3-4 instead.

The retail service area, particularly the in-City portion, is highly urbanized, dense, and experiencing infill development. Open space and landscaped areas are limited, as are lot sizes. Build-out is planned or already under construction at the few, large undeveloped or redevelopment areas that remain, such as Candlestick Point/Hunters Point Shipyard, Treasure Island/Yerba Buena Island, Mission Bay, and Pier 70. Most of these areas are located along the eastern shoreline of the City. The majority of current and planned development is comprised of mixed-use, multi-family residential, and commercial high-rise buildings.

Housing unit estimates for San Francisco are based on the Housing Element 2022 Update objective, which plans to add an average of 5,000 housing units per year, or an approximate growth in housing units of 1.3% per year. It is projected that the number of single family detached houses will not increase, and it is anticipated that nearly all of the new housing built in San Francisco will be multi-family buildings. Currently, the ratio of multi-family households to single family households in the City is approximately 2:1 (i.e., one third of total housing is single family). As new housing is built, the majority of which will be multi-family units, the ratio will increase to over 3:1 (i.e., one fourth of total housing is single family) by 2040.

Retail demand projections presented in this 2020 UWMP (Section 4.1) are based on housing projections provided by the San Francisco Planning Department for the in-City retail service area and employment forecasts from the Association of Bay Area Governments (ABAG). Additional information about demographic data sources and assumptions supporting the retail demand projections can be found in Appendix E.

3.3 WHOLESALE SERVICE AREA

The SFPUC sells water to 26 wholesale customers (collectively referred to as the Wholesale Customers) under the terms of a 25-year contract known as the Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County (WSA). The SFPUC also sells water to two additional wholesale customers, Cordilleras MWC and Groveland CSD. These customers are further described below:

- **Wholesale Customers and BAWSCA:** Enabled by Assembly Bill (AB) 2058, BAWSCA was established on May 27, 2003 to represent the interests of 24 cities and water districts, as well as two other utilities, in Alameda, Santa Clara, and San Mateo Counties that purchase water on a wholesale basis from the RWS. The SFPUC sells water to these Wholesale Customers under the terms of the WSA and the individual water sales contracts that each of the Wholesale Customers have with the SFPUC. Since 1970, the SFPUC has supplied approximately 65% of the total Wholesale Customers' demand. Some of the Wholesale Customers are entirely reliant on the SFPUC for their supply.

- **Cordilleras MWC:** Cordilleras MWC serves a community of 18 single family homes in Emerald Hills, located in unincorporated San Mateo County. It is not considered an urban water supplier as defined by CWC Section 10617. It is not a member of BAWSCA, and not subject to the terms of the WSA. However, Cordilleras MWC has a water supply contract with the SFPUC for 3,007 CCF annually (about 0.006 mgd).

- **Groveland CSD:** As described in Section 2.4, Groveland CSD primarily serves residential and commercial customers in Groveland, located in a semi-rural area of southern Tuolumne County. Although Groveland CSD is considered a retail customer of the SFPUC and is accounted as such in the SFPUC's contractual obligations and supply planning, the SFPUC was directed by DWR to report Groveland CSD as a wholesale customer for the 2015 UWMP and maintains this distinction in the 2020 UWMP update. Therefore, Groveland CSD is included in the wholesale service area for the remainder of this section. It is not a member of BAWSCA, and not subject to the terms of the WSA.

The wholesale service area encompassing the Wholesale Customers, Cordilleras MWC, and Groveland CSD is shown in Figure 3-4.

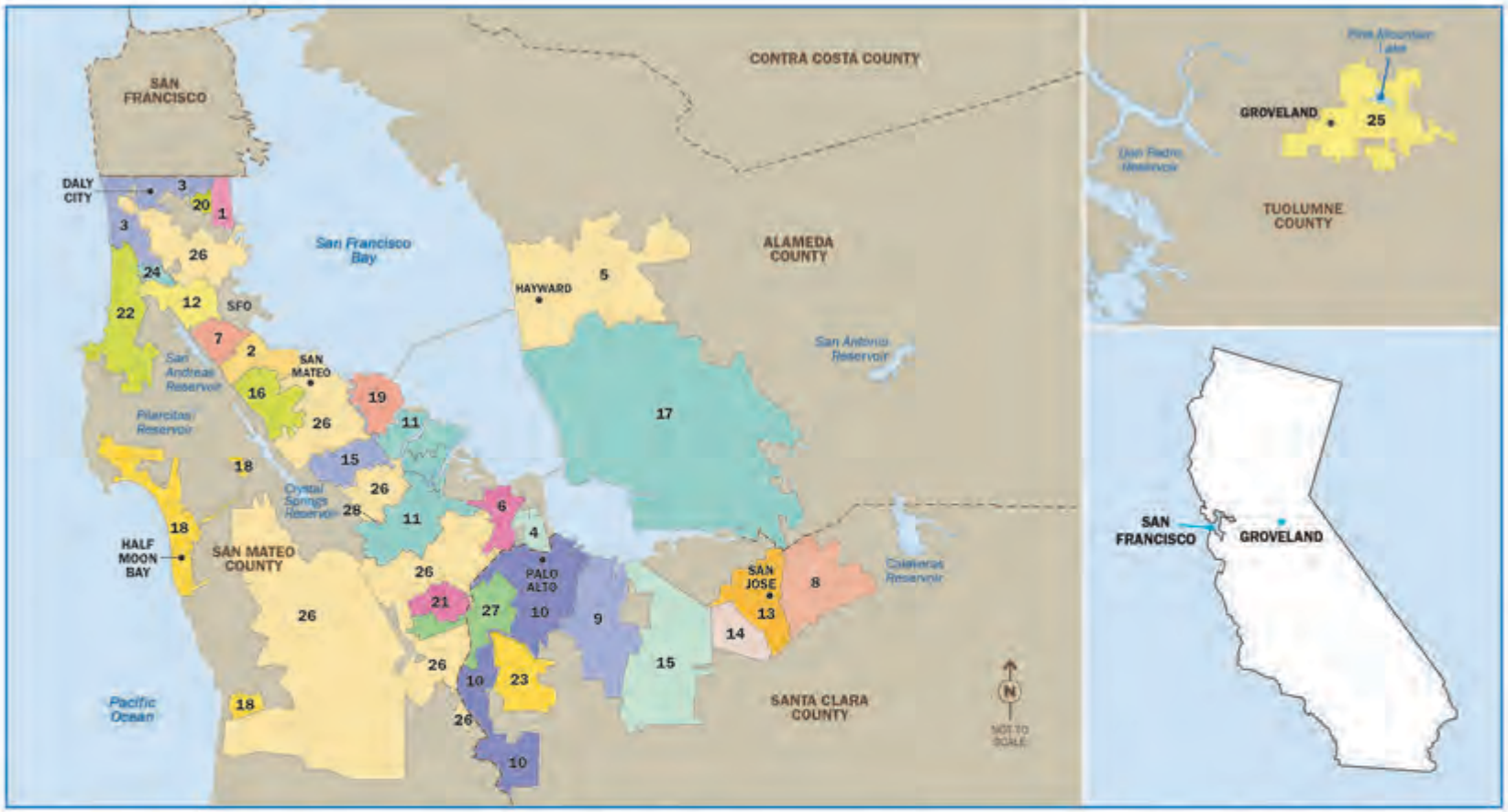
3.3.1 Climate

As described in Section 3.2.1 for the retail service area, the San Francisco Bay Area as a whole has a Mediterranean climate. Varied topography throughout the Bay Area creates numerous microclimates dependent upon elevation, proximity to the Bay or coast, orientation with respect to the ocean, and wind patterns. These microclimates also result in different rainfall amounts and evapotranspiration rates. However, in general, the Wholesale Customers and Cordilleras MWC experience a climate similar to the in-City retail service, except for customers located in the southern and inland regions that tend to experience warmer temperatures in the summer months with less incidence of fog.

Further inland in the Sierra Nevada foothills, Groveland CSD experiences hot, dry summers and mild winters. Most of Groveland CSD's service area is located at elevations of 2,800 to 3,300 feet, so is not subjected to the long, severe winters and heavy snowfall that are experienced at higher elevations above 5,000 feet.

For a discussion of climate change and potential impacts, see Section 6.1.3.

Figure 3-4. Wholesale Service



MUNICIPALITIES

1 City of Brisbane
2 City of Burlingame
3 City of Daly City
4 City of East Palo Alto
5 City of Hayward
6 City of Menlo Park
7 City of Millbrae
8 City of Milpitas
9 City of Mountain View
10 City of Palo Alto
11 City of Redwood City
12 City of San Bruno
13 City of San Jose[a]
14 City of Santa Clara[a]
15 City of Sunnyvale
16 Town of Hillsborough

WATER PURVEYING DISTRICTS

17 Alameda County Water District
18 Coastside County Water District
19 Estero Municipal Improvement District
20 Guadalupe Valley Municipal Improvement District
21 Mid-Peninsula Water District
22 North Coast County Water District
23 Purissima Hills Water District
24 Westborough Water District
25 Groveland Community Services District[b]

OTHER ENTITIES

26 California Water Service Company[c]
27 Stanford University
28 Cordilleras Mutual Water Company[d]

a The SFPUC provides water on an interruptible basis to fixed service areas in the northern portions of the Cities of San Jose and Santa Clara.

b Groveland Community Services District is not a member of BAWSCA. For the purposes of the 2020 UWMP, Groveland is considered a retail customer in the context of the Water Supply Agreement and allocating Regional Water System supplies between retail customers and Wholesale Customers. However, Groveland is accounted for as a wholesale customer in the standardized tables provided in **Appendix B**.

c California Water Service Company, an investor-owned utility, provides water service to four separate districts: Bear Gulch (Atherton vicinity), San Carlos/San Mateo, South San Francisco, and Skyline County Water District.

d Cordilleras Mutual Water Company is not a member of BAWSCA.

3.3.2 Population and Demographics

As shown in Table 3-4, the total population in the wholesale service area is currently estimated to be about 1.86 million and is projected to increase to over 2.4 million by 2045. This corresponds to an average growth rate of about 1.2% per year.

Compared to the retail service area, the majority of which is the City of San Francisco, the wholesale service area is less dense and populated, but still fairly urbanized and built out. Single family homes are more prevalent and lot sizes are larger.

Table 3-4. Wholesale Service Area Population

[Standardized Table 3-1 Wholesale: Population - Current and Projected]

Wholesale Service Area	Actual	Projected				
	2020	2025	2030	2035	2040	2045
BAWSCA Member Agencies[a]	1,858,392	1,941,725	2,032,304	2,187,849	2,311,562	2,438,515
Cordilleras MWC[b]	64	64	64	64	64	64
Groveland CSD[c]	3,027	3,065	3,104	3,143	3,182	3,222
Total Wholesale	1,861,483	1,944,854	2,035,472	2,191,056	2,314,808	2,441,801

a Data provided by BAWSCA and published in BAWSCA's Regional Water Demand and Conservation Projections Report, June 2020.

b Data provided by Cordilleras MWC.

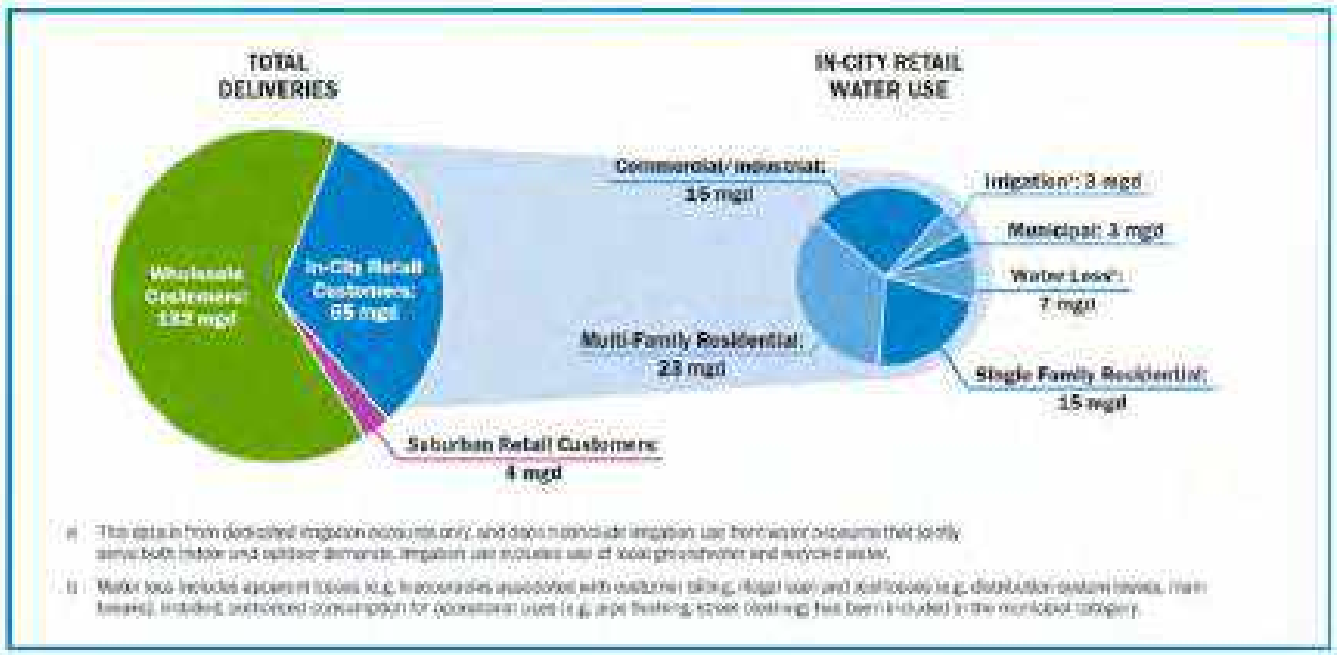
c Data provided by Groveland CSD (subject to change) and population projections are from Groveland CSD's 2015 UWMP and are according to a 0.25 percent annual growth rate estimate within the Groveland CSD service area through 2045.

SECTION 4: SYSTEM DEMANDS

This section describes and quantifies the current and projected water uses within the SFPUC's retail and wholesale service areas. Retail demand projections are based on recent demographic information and a detailed analysis of water use characteristics. Wholesale demand projections for RWS supplies were developed by the wholesale customers. Note that the terms "use," "demand," and "consumption" are used interchangeably. Additionally, water loss is included in total retail demands unless otherwise noted.

As described previously, approximately two thirds of the SFPUC's water supply is delivered to wholesale customers, and the remaining one third is delivered to retail customers. In 2020, the SFPUC delivered approximately 198 mgd of RWS supplies to its entire water service area, with an additional 2.3 mgd in local groundwater and recycled water provided to retail customers. Figure 4-1 shows the total volumes of water delivered to wholesale customers, in-City retail customers, and suburban retail customers. Approximate water use by sector in the in-City retail service area is also shown in Figure 4-1.

Figure 4-1. Total Deliveries and In-City Retail Water Use in 2020



Note that Groveland CSD is accounted for differently between this section of the 2020 UWMP and the corresponding standardized tables in Appendix B. This section includes Groveland CSD in the estimation of retail demands because, in the context of RWS supply allocations between the SFPUC and its Wholesale Customers, Groveland CSD is a retail customer. Where retail demands are subsequently compared to retail supplies in Section 8. Groveland CSD is accounted for in both the retail demand and retail supply projections. In contrast, the standardized tables in Appendix B include Groveland CSD in the estimation of wholesale demands, as directed by DWR and explained in Section 2.4.

4.1 RETAIL DEMANDS

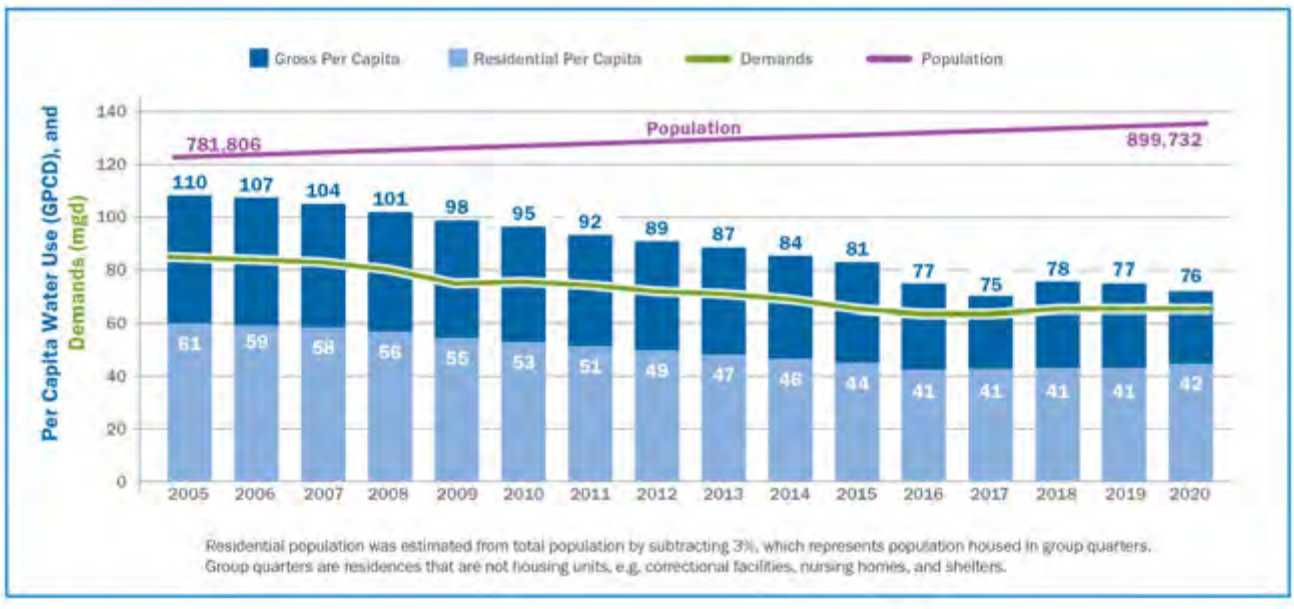
4.1.1 Current Retail Demands

Water use within San Francisco (i.e., the in-City retail service area) continues to be among the lowest in the State and below historical consumption. Both total consumption and per capita water use (i.e., gallons of water consumed per person per day [GPCD]) have been on a general decline since the mid-1970s. Many factors have contributed to this reduction in water use, including significant changes to the mix of industrial and commercial businesses and their associated water demand, and the general characteristics of water use by San Franciscans. In particular, the severe droughts of 1976-77 and 1987-92, changes in plumbing codes, and conservation programs (either voluntarily embraced by residents and businesses or mandated by the City) have affected water demands. During the most recent drought in 2012 – 2016 per capita water use further declined.

As illustrated in Figure 4-2, per capita water use and deliveries for all retail customers (i.e., in-City and suburban) have declined over the past decade and have remained consistently low over the past five years. Figure 4-2 presents per capita water use on both a gross basis (i.e., water use by all sectors) and a residential basis (i.e., water use by the residential sector only). Currently, gross and residential per capita water use by in-City retail customers are 73 and 42 GPCD, respectively. Taking suburban retail customers into account, gross and residential per capita water use by all retail customers are 76 and 42 GPCD, respectively. These per capita rates are among the lowest in the State.

Since the summer of 2014, the SFPUC has reported total water production and residential per capita water use on a monthly basis to the SWRCB in compliance with its emergency conservation regulations. The SFPUC continued to report this data voluntarily to the SWRCB after the emergency conservation regulations adopted during the last drought ended. In April 2020, the SWRCB adopted a regulation making the monthly reporting permanent, and effective October 2020, it again became mandatory. The SFPUC monthly per capita rates have consistently been among the lowest reported by urban water suppliers in the State.

Figure 4-2. Trends in Retail Demands, Population, and Per Capita Use between 2005 and 2020



Total retail demand (including both in-City and suburban retail) in 2020 was 69 mgd, which is much lower than anticipated in the 2015 UWMP update. Of this demand, in-City retail customers used approximately 65.3 mgd (95% of total retail demand), of which 1.9 mgd was met with groundwater, 0.1 mgd was met with recycled water, and the remainder was met with RWS supplies. Suburban retail customers used approximately 3.7 mgd (5% of total retail demand), of which 0.3 mgd was met with groundwater and the remainder was met with RWS supplies. Total retail water loss, including both real and apparent losses, was estimated to be 7.18 mgd.

The SFPUC's retail demands are generally tracked and projected by each of the major sectors outlined below. Current retail demands for each of these sectors are shown alongside projected demands in Table 4-1.

- **Single Family Residential:** Single family households currently comprise approximately one third of the total households in the City, though this proportion is declining. This sector represents approximately 20% of total retail demand. Due to the Bay Area's moderate climate and high-density housing, especially in the City, residential water use is primarily indoors. Outdoor water use is estimated to be about 20% of single family residential use, on average.

- **Multi-Family Residential:** Multi-family households include apartments, condominiums, and townhouses. This sector comprises approximately two thirds of the total households in the City, and this proportion is increasing. This sector represents approximately 30% of total retail demand. Average outdoor water use is limited since outdoor space for many multi-family households are generally limited to patios and shared spaces, if any.

- **Non-residential:** This sector includes all sectors of water users not designated as residential and includes commercial, industrial, institutional, and municipal uses, as well as irrigation through dedicated meters. Non-residential water use represents approximately 40% of total retail demand.

- **Water Loss:** Water loss is defined as the difference between the quantity of water supplied to customers and the quantity of water actually consumed by customers. It is comprised of both apparent losses and real losses. Water loss typically represents less than 10% of total retail demand. For more information on water loss, see Section 4.1.3 and Appendix G.

One factor that impacted demands in FY 19-20 was the COVID-19 pandemic and the shelter in place order that was issued in March 2020. There was a shift in water demand as a result of people remaining at home and office building occupancy decreasing. As part of the retail demand forecasting, the impact of COVID-19 on water demand was estimated by sector. For the residential sectors, there was an estimated increase of 9% for the single-family and 6% for multi-family sectors. In the commercial and industrial sectors, the estimated change was a decrease of 40 - 57%. These changes may account for a lower level of retail demand than would otherwise have occurred.

4.1.2 Projected Retail Demands

4.1.2.1 Methodology Used to Project Retail Demands

Beginning in 2015, the SFPUC transitioned away from an end use-based model to an econometric model for demand forecasts. Econometric models incorporate socioeconomic factors to project demands and are able to capture a more complete demand picture. This demand forecasting methodology is becoming more prevalent among urban water utilities and managers. The demand forecasts shown in Table 4-1 below are comprised of the following components:

- **In-City Single Family, Multi-Family, and Commercial/Industrial Demands**: Econometric models are used to project the demands for these sectors. Detailed information about these models is provided in Appendix E.

  - Active conservation savings are savings achieved through SFPUC conservation program activities, such as fixture incentives and leak alerts. The models explicitly incorporate active conservation savings. These savings were estimated by the SFPUC using an end-use-based water savings accounting model. This model is customized for the SFPUC from the Alliance for Water Efficiency Water Conservation Tracking Tool. Additional information about this customized model, referred to as the SFPUC Water Conservation Tracking Model, is provided in Appendix G.
  - Passive conservation savings are savings that are achieved through natural fixture replacement and tightening of the plumbing code over time. In an effort to avoid double-counting of passive conservation savings, the passive savings estimated by the SFPUC Water Conservation Tracking Model were not subtracted from the modeled demands. It is assumed that some passive savings are accounted for in the response of demands to changes in water rates, e.g., when water rates increase, people may respond by replacing inefficient fixtures to reduce water consumption. Single family, multi-family, and commercial and industrial sectors all show a strong relationship between increasing water rates and decreasing water demands. Although all passive savings may not be accounted for in this rates impact, subtracting passive savings that were estimated separately would likely result in a double counting of conservation savings. For an estimate of both the passive and active conservation savings, refer to SFPUC's Retail Water Conservation Plan[6].
  - The models incorporate savings from onsite water reuse. These savings were estimated by SFPUC staff. Additional information about this estimate can be found in Section 4.1.4.

- **Other in-City Non-Residential Retail Demands (i.e., irrigation and municipal) and Suburban Retail Demands**: These demands are estimated based on historical consumption and supplement the demands projected by the econometric models described above. These demands are assumed to be constant through 2040 since no significant growth is anticipated among these sectors.

- **Water Loss**: Water loss is forecasted separately and is described in Section 4.1.3.

A key new aspect of the retail demand projections in this 2020 UWMP update is that the econometric models were calibrated using 10 years (2010-2020) of historical San Francisco account-level water usage data. This data was combined with property characteristics, demographic characteristics, and historical climate data to create an econometric model that evaluates the impact of several factors on household-level demands. Demands are then projected based on the growth assumptions discussed below, along with expected future changes in rates and climate.

The new set of models relies on household and employment forecasts provided by the San Francisco Planning Department. The Planning Department is currently updating the city's General Plan Housing Element (Housing Element 2022 Update). The housing element update is required to be adopted by the city and submitted to the state Department of Housing and Community Development by January 2023. One of the primary goals of the Housing Element 2022 Update is to improve housing affordability by increasing the rate of housing production compared with the past several decades. The housing projections are based on the Housing Element 2022 Update objective of producing an average of 5,000 housing units per year with adjustments for certain large development plans. The employment forecasts are from the Planning Department's Land Use Allocation (LUA) 2017, which is a City-specific refinement of ABAG's growth forecasts, ABAG Projections 2017, which reflect the growth that is assumed in ABAG's Plan Bay Area and Sustainable Communities Strategy Jobs-Housing Connections Scenario.

[6] The Retail Water Conservation Plan provides an overview of the retail water conservation program, the factors that shaped the program, estimated water savings, and the program's effect on the overall retail water demand forecast. The Conservation Plan is a key element of the SFPUC's water supply management and planning, and is updated every five years to coincide with each UWMP update. The Conservation Plan may be accessed online at **https://sfpuc.org/learning/conserve-water**.

In the 2015 UWMP's demand projections, commercial and industrial demands were aggregated and based only on total employment, not sector-specific characteristics. In the updated models for this 2020 UWMP, the commercial and industrial sector model accounts for employment distributed across a variety of sectors, such as office/professional, manufacturing, health, and education.

The demand forecasts for the three sectors modeled with an econometric model (single family, multi-family, and commercial/industrial) were grown from a normalized base year, i.e. the FY19-20 demands were normalized to represent an average year. The impacts of the COVID-19 pandemic were removed, and the demands were adjusted to reflect average temperature conditions. Normalizing the base year for demand forecasting removes the impact of idiosyncrasies that make any given year different from the average year, rather than assuming that these idiosyncrasies will continue in all future years.

Separately, Groveland CSD prepared its own demand projections for use in its 2020 UWMP update. The projected demands were estimated by multiplying projected population by the 2020 target daily per capita water use (107 GPCD) as reported in Groveland CSD's 2015 UWMP. Groveland CSD provided these projections to the SFPUC to report as part of the SFPUC's wholesale demands in the standardized tables of this 2020 UWMP update (see Appendix B). However, in the body of this 2020 UWMP, Groveland CSD's demands are included in retail demands. These demand projections are subject to change as part of Groveland CSD's UWMP process.

4.1.2.2 Retail Demand Projections by Sector

Table 4-1 presents the updated retail demand projections by sector for 2025 through 2045. The updated projections result in a total retail demand of 77.5 mgd in 2040, which is 12.9 mgd lower than the corresponding projection in the 2015 UWMP. (The 2015 UWMP did not include projections for 2045.)

Table 4-1. Retail Demands (mgd)

[Standardized Table 4-1 Retail: Demands for Potable and Raw Water - Actual]
[Standardized Table 4-2 Retail: Demands for Potable and Raw Water - Projected]
[Standardized Table 4-3 Retail: Total Water Demands]
[Standardized Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area]

Retail Sector or Use Type	Actual[a]	Projected[b]				
	2020	2025	2030	2035	2040	2045
In-City Retail						
Single Family Residential	14.5	13.7	13.5	13.4	13.5	13.5
Multi-Family Residential	*22.9*	*23.7*	*25.6*	*27.9*	*30.3*	*33.0*
Non-residential	20.9	22.9	22.9	22.8	23.1	23.6
Water Loss[c]	7.2	6.0	6.0	6.0	6.0	6.0
Subtotal In-City Retail Demand	65.3	66.3	68.0	70.0	72.9	76.2
Suburban Retail						
Single Family Residential[d]	0.1	0.1	0.1	0.1	0.1	0.1
Non-residential	3.1	4	4	4	4	4
Groveland CSD[e]	0.3	0.3	0.3	0.3	0.3	0.3
Water Loss[c]	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal Suburban Retail Demand	3.5	4.4	4.4	4.4	4.4	4.4
Total Retail Demand	**68.8**	**70.7**	**72.4**	**74.5**	**77.4**	**80.6**

a Actual consumption data are obtained from customer billing data.

b Single family residential and multi-family residential demand projections are from an econometric model developed for the SFPUC. Non-residential demands include commercial/industrial demands, which are also from an econometric model, as well as municipal and irrigation demands, which are assumed to remain constant at the previous five-year average level.

c Water losses include both apparent and real losses. Suburban retail water losses are considered to be negligible. Estimate of actual water loss in 2020 is based on a draft audit under review as of the publication of this 2020 UWMP.

d Suburban retail residential demands are for single family only as no multi-family residential buildings are served.

e Groveland CSD is accounted for as a retail customer for the purpose of this table and subsequent retail supply and demand comparisons. Demand projections were provided by Groveland CSD based on its population projections and assumed per capita water use of 107 GPCD (projections are subject to change as part of its UWMP process). In the corresponding standardized tables in Appendix B, Groveland CSD is not reported as retail, but rather wholesale.

Demand is forecasted to increase steadily through 2045, with more rapid growth happening in the later years of the projection period. After accounting for the projected conservation savings, the total retail demand (excluding water loss) is projected to increase by about 21%, from 61.6 mgd in 2020 to 74.6 mgd in 2045. Although population and total retail water demand are projected to increase, gross and residential per capita water usage are both forecasted to decrease (see Figure 4-3).

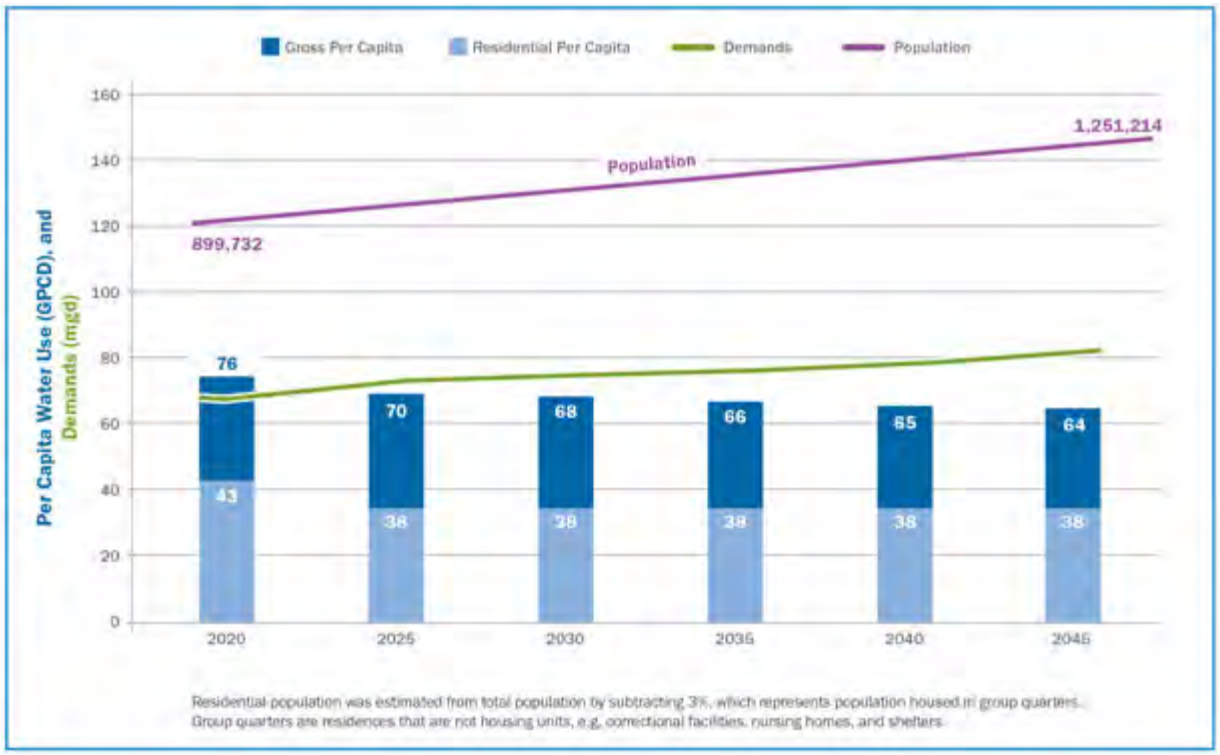
Both the projected demands and conservation savings are conservative as unanticipated new building codes, standards, and programs that increase water efficiency and reduce water use will likely be implemented. A closer analysis of the estimated conservation savings is provided in the Retail Water Conservation Plan. Sector-specific observations are summarized below:

- **Single Family Residential:** Single family residential water use is projected to decrease by 7% between 2020 and 2045. Unlike the 2015 UWMP, the 2020 demand forecasts assume that no new single family homes will be constructed in the retail service area over the planning horizon. In-City single family residential demands are modeled as a function of socioeconomic factors that include water price, precipitation, and temperature. Single

family per household usage is expected to decline as a result of conservation savings and responses to rate increases.

- **Multi-Family Residential:** Multi-family residential water use is projected to increase by 44% between 2020 and 2045. In-City multi-family residential demands are modeled as a function of the price of water, temperature, and precipitation. Compared to single family residential demands, multi-family residential demands are more responsive to price, but less responsive to increases in temperature or decreases in precipitation. Multi-family households have relatively little outdoor water use.
- **Non-residential:** Non-residential water use is projected to increase by 13% between 2020 and 2045. While the growth in in-City non-residential demands is directly related to the growth in employment, commercial and industrial water demands also reflect socioeconomic factors including price, precipitation, and temperature. As the price of water increases, the amount of water consumed per employee decreases.
- **Water Loss:** Water loss is projected to be a constant 6.0 mgd between 2020 and 2045 for planning purposes. More information on water loss projections is provided in the next section.

Figure 4-3. Projected Retail Demands, Population, and Per Capita Water Use.



4.1.3 Retail Distribution System Water Losses

Water loss is defined as the difference between the quantity of water supplied to customers and the quantity of water actually consumed by customers or other authorized uses. It is comprised of (1) apparent losses, which include inaccuracies associated with customer metering, estimated systematic data handling errors, and theft or illegal use; and (2) real losses, which include all water physically lost due to distribution system leaks, breaks, or overflows. In short, real losses are equivalent to distribution system water losses. Water loss in the retail service area ranges from 5 to 7 mgd annually, which is typically less than 10% of total retail demand.

The SFPUC has conducted water loss audits of its retail water system in accordance with the methods in AWWA's Manual of Water Supply Practices - M36, "Water Audits and Loss Control Programs" and Free Water Audit Software, pursuant to section 10608.34 of the Water Code. The water loss audits were validated following the California Water Code of Regulations and submitted annually to DWR. The results of the water loss audits from the past five years are reported in Table 4-2; these include both apparent and real losses, as calculated in the AWWA worksheet. Water loss in FY19 audit, water loss in FY 2019-20 was determined to be 7.18 mgd, of which 6.0 mgd was attributed to real losses. The AWWA worksheet is provided in Appendix G.

Table 4-2: Retail Annual Water Losses over the Past Five Years

Submittal Table 4-4 Retail: 12 Month Water Loss Audit Reporting

Reporting Period Start Date (mm/yyyy)	Volume of Water loss (MG/yr)
07/2015	2,200.13
07/2016	1,899.82
07/2017	2,199.14
07/2018	2,253.01
07/2019	2,628.01

For planning purposes, the SFPUC projects total water loss in its in-City retail service area to be a flat 6.0 mgd through 2045. This estimate reflects, among other things, the anticipation of leaks and breaks due to aging infrastructure, continuance of system flushing as necessary, and active management of losses (described below). Because apparent losses are not projected separately, the SFPUC's total projection for in-City water loss is a conservative estimate and reported as such in this 2020 UWMP.

Nearly all of the SFPUC's suburban retail customers are located immediately off of RWS transmission pipelines. Therefore, real losses in the suburban retail service area are assumed to be negligible and reported as such in this 2020 UWMP. As described in Section 3.1.5.2, the SFPUC operates the Castlewood Well System and the Town of Sunol domestic water system. However, the extent of distribution in the Castlewood Well System is limited from the well field to the control tank and reservoir; the system is not connected to the RWS. There is no master meter to the Town of Sunol, so loss in the Town of Sunol system cannot be directly measured. The primary source of water loss in the Town of Sunol is system maintenance flushing, which would occur regularly at a rate of 10,000 gallons per week for 50 weeks per year, or roughly 0.001 mgd (1.5 AF). These losses in the suburban retail service area are considered to be negligible.

The SFPUC manages real losses through its Automated Water Meter Program and Linear Assets Management Program. Deployment of the Automated Water Meter Program began in the spring of 2010 to upgrade all in-City retail water meters with wireless advanced metering technology. By 2013, 96% of meters were converted to Advanced Metering Infrastructure (AMI), and by 2020, 99.5% have been converted. The Linear Assets Management Program replaces and renews distribution system pipelines and customer service connections for approximately 1,250 miles of drinking water mains in the City. More information about management of retail system losses is provided in Section 10.2.5.

4.1.4 Onsite Water Reuse Water Savings

This 2020 UWMP update accounts for the water supply savings from buildings that install and operate onsite water reuse systems as a type of conservation savings. The water supplies produced by these systems are not municipally-supplied by the SFPUC, and they serve to reduce demands on SFPUC's system.

In September 2012, the City adopted the Onsite Water Reuse for Commercial, Multi-family, and Mixed Use Development Ordinance (Ordinance 195-12[7]). Commonly known as the Non-potable Water Ordinance, this ordinance added Article 12C to the San Francisco Health Code, allowing for the collection, treatment, and use of alternate water sources for non-potable applications. The ordinance also established the Non-potable Water Program, since re-named the Onsite Water Reuse Program, which provides grant funding for projects meeting specific eligibility criteria.

In October 2013, the ordinance was amended to allow district-scale water systems consisting of two or more buildings sharing non-potable water. Article 12C was further amended in July 2015 to mandate the installation of onsite water systems in new developments meeting specified criteria. Beginning November 1, 2015, all new development projects of 250,000 square feet or more of gross floor area located within the boundaries of San Francisco's designated recycled water use areas, as defined by the Recycled Water Ordinance, must install onsite water systems to treat and reuse available alternate water sources for toilet and urinal flushing and irrigation. This requirement expanded to the entire City the following year, on November 1, 2016. While not required to install an onsite water system under Article 12C, developments between 40,000 and 250,000 square feet of gross floor area must submit a water budget application and accompanying Water Use Calculator to the SFPUC. Additional guidelines and rules were published in 2017 for development projects implementing district-scale non-potable water systems.

Onsite water systems are operated, maintained, and monitored by the property owner. Under the Onsite Water Reuse Program, the San Francisco Department of Public Health-Environmental Health (SFDPH-EH) has established ongoing monitoring requirements and water quality standards that are protective of public health. Different treatment levels are required depending on the alternate water source and end use. The frequency of monitoring and reporting also vary depending on the alternate water source, and they are identified in the SFDPH's *Director's Rules and Regulations Regarding the Operation of Alternate Water Source Systems* and the operating permit for the onsite water system issued by the SFDPH-EH.

In addition to projects that install mandatory onsite water reuse systems in accordance with the Non-Potable Ordinance, there are several projects that have voluntarily implemented onsite reuse. Some of these have received grants from the SFPUC. The SFPUC also offers grant funding to breweries to collect, treat, and reuse process water (e.g. water used in the brewing process for applications such as rinsing bottles and cleaning equipment) generated onsite. The grant program includes water quality, treatment, and monitoring standards for brewery process water reuse systems.

The SFPUC received 21 water budget applications to install onsite water systems in FY 2019-2020, with a total of 119 water budget applications reviewed by the SFPUC since the beginning of the Onsite Water Reuse Program. SFPUC staff also maintain a database of future projects that have not yet submitted water budget applications, but will have to comply with the Non-Potable Water Ordinance based on their proposed gross square footage. Using existing water budget applications and the assumptions in the SFPUC's Water Use Calculator, staff have estimated the future potable offsets that will be achieved by all known onsite water reuse projects, as shown in Table 4-2. Note that this is a conservative estimate of future savings because it does not include savings from future unknown projects that are assumed in the demand forecasts; as these projects do not yet exist, no information about them is available to estimate the offsets from their potential onsite water reuse systems.

It is estimated that the Onsite Water Reuse Program (both mandatory and voluntary projects) will generate a total potable water offset of approximately 1.3 mgd by 2040, which will be sustained through 2045.

[7] San Francisco Health Code, Article 12C, Sections 850-861. Note that this ordinance was amended in October 2013 by Ordinance 208-13 to allow district-scale water systems, and in July 2015 by Ordinance 109-15 to mandate installation of onsite water systems in new development meeting specified criteria.

Table 4-2. Onsite Water Reuse Program Potable Offsets (mgd)

	Actual[a]	Projected[b]				
	2020	2025	2030	2035	2040	2045
Onsite Water Reuse Savings	0.1	0.3	0.5	0.9	1.3	1.3

a Actual onsite water reuse potable offsets are obtained from existing onsite water reuse projects water budget applications.

b Projected potable offsets are based on water budget applications submitted to the SFPUC, as well as assumptions about future projects that have not yet submitted water budget applications but are known to need to comply with the Non-Potable Water Ordinance.

4.1.5 Demands of Lower Income Households

The Act requires water suppliers to separately estimate future demands for lower income households (i.e., those with less than 80% of the area median income). This section documents the SFPUC's best effort to do so. However, please note that the SFPUC does not use this estimate for any planning purposes. The demands of lower income households are included in the demand projections presented about in Table 4-1.

Projected water use by lower income households is estimated by multiplying the planned future housing units for lower income residents by the estimated per household water use. This analysis, detailed below, is only performed for the in-City retail service area as lower income demands are primarily located in the City.

As described above, the demand projections presented here are based on housing growth projections from the 2022 update to the Housing Element of the San Francisco General Plan. The assumption used in the Housing Element is that 33% of future housing growth will be in lower income housing. Projected household growth between 2020 and 2025 is 25,805 new multi-family units. Based on the Housing Element's assumptions, that translates to 8,516 lower income households.

Based on the multi-family sector model (for additional information, see Appendix E), per household water use for future multi-family households is projected to be 78.7 gallons per household per day in 2025 (at an assumed occupancy rate of 2.3 persons per household, this translates to a per capita rate of about 34 gpcd). At this rate of household use, the demand in 2025 from 8,516 new lower income housing units will be an estimated 0.7 mgd.

This estimate of lower income water demand is reflected in the retail demand projections presented in Table 4-1. Lower income housing growth and demands have always been included in the SFPUC's retail demand projections and, subsequently, its related planning efforts.

4.2 WHOLESALE DEMANDS

As noted above and discussed in further detail below, the SFPUC sells water to 26 wholesale customers (collectively referred to as the Wholesale Customers) under the terms of a 25-year contract known as the Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County (WSA) and associated individual water sales contracts with each Wholesale Customer. Collectively, the Wholesale Customers receive over two thirds of the SFPUC's supply. Of the 26 Wholesale Customers, 10 rely on the SFPUC for 100% of their total supply. The remaining 16 Wholesale Customers rely on the SFPUC for a portion of their supply, but also use other local and imported supplies to meet their water customers' needs, including, but not limited to local groundwater and surface water, and purchases from the Santa Clara Valley Water District and the State Water Project.

In addition to the 26 Wholesale Customers, the SFPUC also provides water on a wholesale basis to Cordilleras MWC in San Mateo County and Groveland CSD in Tuolumne County. Cordilleras MWC relies entirely on the SFPUC for its supply, and

Groveland CSD relies on the SFPUC for the majority of its supply. The demands of these two additional wholesale customers are small compared to the collective demands of the other Wholesale Customers.

4.2.1 Wholesale Water Contractual Obligations

The following section describes the water supply contracts that the SFPUC has with the Wholesale Customers.

4.2.1.1 Water Supply Agreement and Individual Water Sales Contracts

The WSA became effective on July 1, 2009, as its predecessor agreement, the 1984 Settlement Agreement and Master Water Sales Contract between the SFPUC and the Wholesale Customers (1984 Agreement), expired. The WSA, as amended and restated in December 2018, describes the current contractual relationship between the SFPUC and the Wholesale Customers.

The WSA carries forward many components of the 1984 Agreement, including the SFPUC's "Supply Assurance" of 184 mgd to the Wholesale Customers. The SFPUC has agreed to deliver water to the Wholesale Customers up to the amount of the Supply Assurance, and this agreement is perpetual and survives the expiration of the WSA. The Supply Assurance is, however, subject to reduction due to water shortage, drought, scheduled RWS maintenance activities, and emergencies.

The Supply Assurance is shared among 24 of the 26 Wholesale Customers (all Wholesale Customers, except the Cities of San Jose and Santa Clara, as discussed in Section 4.2.1.2 below). Twenty-three of these 24 Wholesale Customers have an "Individual Supply Guarantee" (ISG), which represents their dedicated individual share of the 184 mgd Supply Assurance. The ISGs are also perpetual and survive the expiration of the WSA. The City of Hayward is the 24th Wholesale Customer, and it does not have an ISG due to the terms of its 1962 individual water supply contract with the SFPUC that did not contain a fixed allocation of water. The City of Hayward's unspecified water supply allocation is included in the Supply Assurance as the difference between 184 mgd and the sum of the other 23 Wholesale Customers' ISGs. In the event that Hayward's water use exceeds its unspecified water supply allocation, the 23 Wholesale Customers with ISGs would be required to reduce their individual ISGs to accommodate the demands of Hayward.

Each of the 26 Wholesale Customers also has an individual water sales contract with the SFPUC that describes the service area of the customer, identifies the location and size of service connections between the RWS and the customer's distribution systems, and in some instances contain additional specific provisions unique to the particular customer. The individual water sales contracts may be amended from time to time by the SFPUC and the applicable Wholesale Customers pursuant to the terms of the WSA.

4.2.1.2 Interruptible Customers

As noted above, the Cities of San Jose and Santa Clara are not included in the Supply Assurance, and they do not have an ISG, because the SFPUC has provided water to them on a temporary and interruptible basis under the 1984 Agreement and the WSA. While the SFPUC has never interrupted water supply to San Jose and Santa Clara, the WSA allows the SFPUC to issue a conditional notice of termination of supply if sufficient long-term water supplies from the RWS are not available. The SFPUC has committed to making a decision by 2028 about whether or not to make San Jose and Santa Clara permanent customers of the RWS. Additional discussion about the San Jose and Santa Clara and the 2028 decision can be found in Section 7.3.3.

4.2.2 Wholesale Demands

Wholesale demands reached a historic low during the most recent drought and have increased slightly since the end of the drought. As shown in Table 4-3, RWS supplies purchased by the SFPUC's wholesale customers in 2020 totaled 132.1 mgd.

In 2020, BAWSCA updated the demand projections of its member agencies (26 of the SFPUC's 28 wholesale customers) using a combination of two different models: (1) an econometric (or statistical) model developed for each member agency and (2) the Demand Side Management Least Cost Planning Decision Support System (a.k.a., DSS Model). BAWSCA's population projections for its member agencies are based on each member agency's population projections, ABAG Plan Bay Area 2040 data, California Department of Finance, the U.S. Census, and agency planning documents. The forecast methodology and resulting projections are documented in BAWSCA's 2020 report titled "Regional Water Demand and Conservation Projections," and they support BAWSCA's Long-Term Reliable Water Supply Strategy (Strategy). The Strategy's projections indicate that demands by the Wholesale Customers for RWS supplies through 2045 will be significantly less than anticipated at the time the Phased WSIP was adopted in 2008. BAWSCA's member agencies that are urban water suppliers preparing an individual 2020 UWMP are in some cases using the projections developed for the Strategy, and in other cases using their own set of projections. Table 4-3 provides each Wholesale Customer's projected purchase requests for RWS supplies through 2045 provided to the SFPUC by BAWSCA.

Given the SFPUC's Supply Assurance to the Wholesale Customers described above, this 2020 UWMP also presents the wholesale demands based on contract obligations in Table 4-4.

Regarding the SFPUC's two additional wholesale customers, the demand projections for Cordilleras MWC shown in Table 4-3 are based on the SFPUC's knowledge of the small, residential-only service area for that customer where no growth is anticipated. As noted earlier, the demand projections for Groveland CSD are presented as part of retail demands in Table 4-1 in the body of this 2020 UWMP, but as part of wholesale demands in the corresponding standardized tables in Appendix B.

4.3 CLIMATE CHANGE IMPACTS TO DEMAND

The retail demand modeling included a sensitivity analysis that modeled a range of future temperature and precipitation conditions. The baseline assumptions for temperature and precipitation were an increase in average temperature of 1.1°C by 2045 and no change in average annual precipitation. The two other scenarios considered were a "hot and dry" scenario, which assumed a 1.7°C increase in temperature and an 8.3% decline in precipitation by 2045 relative to 2020; and a "wet and slower warming" scenario where average temperature increased by 0.5 °C and precipitation increased by 8.3% by 2045 relative to 2020. The demand forecasts for these three scenarios were not significantly different. For example, in the single-family sector model—where we might expect the biggest impact due to more outdoor water use—the unadjusted per-unit demand forecast (i.e. the forecast before being adjusted for conservation savings) in 2045 under the baseline conditions is 109.9 gallons per day (gpd). In the "hot and dry" scenario, the per-unit forecast in 2045 is 110.3 gpd, and in the "wet and slower warming" scenario it is 109.8 gpd. The impacts in the multi-family and commercial and industrial sector models are similarly small (see Appendix E for additional information).

The fact that the SFPUC's projected retail demands are not significantly impacted by future changes in temperature and precipitation as described above is likely primarily due to the fact that irrigation demands in the SFPUC's retail service area are relatively low due to the dense urban environment, especially in the City. Therefore, the potential increase in irrigation demand as a result of increased temperature or decreased precipitation is low.

Table 4-3. Wholesale Purchase Requests (mgd)

[Standardized Table 4-1 Wholesale: Demands for Potable and Raw Water - Actual]

[Standardized Table 4-2 Wholesale: Demands for Potable and Raw Water - Projected]

[Standardized Table 4-3 Wholesale: Total Water Demands]

Wholesale Customer	ISG[a]	Actual 2020 Purchases[b]	Purchase Request[c]				
			2025	2030	2035	2040	2045
Alameda County Water District	13.76	7.76	7.68	7.68	7.68	7.68	9.11
City of Brisbane / Guadalupe Valley Municipal Improvement District[d]	0.98	0.63	0.89	0.89	0.88	0.89	0.89
City of Burlingame	5.23	3.48	4.33	4.40	4.47	4.58	4.69
California Water Service Company	35.68	29.02	29.99	29.74	29.81	30.27	30.70
Coastside County Water District	2.18	0.88	1.40	1.38	1.36	1.33	1.33
City of Daly City	4.29	3.92	3.57	3.52	3.49	3.46	3.43
City of East Palo Alto	1.96	1.57	1.88	1.95	2.10	2.49	2.89
Estero Municipal Improvement District	5.90	4.34	4.07	4.11	4.18	4.23	4.38
City of Hayward	22.08	14.20	17.86	18.68	19.75	20.82	22.14
Town of Hillsborough	4.09	2.57	3.26	3.25	3.26	3.26	2.26
City of Menlo Park	4.46	2.82	3.55	3.68	3.87	4.06	4.29
Mid-Peninsula Water District	3.89	2.66	2.86	2.84	2.88	2.89	2.93
City of Millbrae	3.15	1.90	2.29	2.50	2.45	2.82	3.20
City of Milpitas	9.23	6.06	6.59	6.75	7.03	7.27	7.53
City of Mountain View	13.46	7.60	8.60	8.90	9.20	9.51	9.93
North Coast County Water District	3.84	2.28	2.34	2.33	2.34	2.34	2.34
City of Palo Alto	17.08	9.75	10.06	10.15	10.28	10.51	10.79
Purissima Hills Water District	1.63	1.71	2.09	2.09	2.12	2.13	2.15
City of Redwood City	10.93	8.75	8.46	8.49	8.64	8.74	8.90
City of San Bruno	3.25	0.96	3.24	3.22	3.20	3.20	3.21
Stanford University	3.03	1.43	2.01	2.18	2.35	2.53	2.70
City of Sunnyvale	12.58	9.43	9.16	9.3	10.70	11.44	12.10
Westborough County Water District	1.32	0.87	0.86	0.85	0.85	0.84	0.84
Cordilleras Mutual Water Company[e]	—	0.01	0.01	0.01	0.01	0.01	0.01
Subtotal Permanent Customer Purchase Requests	**184.0**	**124.6**	**137.05**	**138.89**	**142.90**	**147.30**	**153.74**
City of San Jose	0.00	4.23	4.50	4.50	4.50	4.50	4.50
City of Santa Clara	0.00	3.29	4.50	4.50	4.50	4.50	4.50
Total Wholesale Purchase Requests	**—**	**132.1**	**146.05**	**147.89**	**151.90**	**156.30**	**162.74**

a Individual Supply Guarantee (ISG) refers to each Wholesale Customer's share of the Supply Assurance as defined in the Water Supply Agreement (WSA). The Supply Assurance is the 184 mgd maximum annual average metered supply of water dedicated by San Francisco to public use in the Wholesale Customer service area (not including the Cities of San Jose and Santa Clara). The City of Hayward's ISG is calculated as 184 mgd less the total of permanent customer ISGs (161.92 mgd).

b Actual demands are equivalent to purchases as reported in customer billing data.

c Purchase requests for RWS supplies as anticipated to be reported in each agency's individual 2020 UWMP if one is to be prepared (estimates are subject to change). Projections were provided to the SFPUC by BAWSCA in January 2021. See each agency's 2020 UWMPs for their most up to date purchase request projections.

d The City of Brisbane and Guadalupe Valley Municipal Improvement District are two Wholesale Customers that are jointly operated.

e Cordilleras MWC is not a member of BAWSCA or a party to the WSA, and therefore does not have an ISG.

Note: Groveland CSD is not accounted for as a wholesale customer for the purpose of this table and subsequent wholesale supply and demand comparisons. Refer to Table 4-1 for Groveland CSD's current and projected demands. However, in the corresponding standardized tables in Appendix B, Groveland CSD is reported as wholesale rather than retail.

Table 4-4. Wholesale Contractual Obligations (mgd)

[Standardized Table Not Applicable]

Wholesale Customer	ISG[a]	Actual 2020 Purchases[b]	Contractual Obligation[c]				
			2020	2025	2030	2035	2040
Alameda County Water District	13.76	7.76	13.76	13.76	13.76	13.76	13.76
City of Brisbane / Guadalupe Valley Municipal Improvement District[d]	0.98	0.63	0.98	0.98	0.98	0.98	0.98
City of Burlingame	5.23	3.48	5.23	5.23	5.23	5.23	5.23
California Water Service Company	35.68	29.02	35.68	35.68	35.68	35.68	35.68
Coastside County Water District	2.18	0.88	2.18	2.18	2.18	2.18	2.18
City of Daly City	4.29	3.92	4.29	4.29	4.29	4.29	4.29
City of East Palo Alto	1.96	1.57	1.96	1.96	1.96	1.96	1.96
Estero Municipal Improvement District	5.90	4.34	5.90	5.90	5.90	5.90	5.90
City of Hayward	22.08	14.20	22.08	22.08	22.08	22.08	22.08
Town of Hillsborough	4.09	2.57	4.09	4.09	4.09	4.09	4.09
City of Menlo Park	4.46	2.82	4.46	4.46	4.46	4.46	4.46
Mid-Peninsula Water District	3.89	2.66	3.89	3.89	3.89	3.89	3.89
City of Millbrae	3.15	1.90	3.15	3.15	3.15	3.15	3.15
City of Milpitas	9.23	6.06	9.23	9.23	9.23	9.23	9.23
City of Mountain View	13.46	7.60	13.46	13.46	13.46	13.46	13.46
North Coast County Water District	3.84	2.28	3.84	3.84	3.84	3.84	3.84
City of Palo Alto	17.08	9.75	17.08	17.08	17.08	17.08	17.08
Purissima Hills Water District	1.63	1.71	1.63	1.63	1.63	1.63	1.63
City of Redwood City	10.93	8.75	10.93	10.93	10.93	10.93	10.93
City of San Bruno	3.25	0.96	3.25	3.25	3.25	3.25	3.25
City of San Jose[e]	0.00	4.23	0.00	0.00	0.00	0.00	0.00
City of Santa Clara[e]	0.00	3.29	0.00	0.00	0.00	0.00	0.00
Stanford University	3.03	1.43	3.03	3.03	3.03	3.03	3.03
City of Sunnyvale	12.58	9.43	12.58	12.58	12.58	12.58	12.58
Westborough County Water District	1.32	0.87	1.32	1.32	1.32	1.32	1.32
Subtotal BAWSCA Member Agency Demand	**184.0**	**132.1**	**184.0**	**184.0**	**184.0**	**184.0**	**184.0**
Cordilleras Mutual Water Company[f]	—	0.01	0.01	0.01	0.01	0.01	0.01
Total Wholesale Demand[i]	**—**	**132.1**	**184.0**	**184.0**	**184.0**	**184.0**	**184.0**

a Individual Supply Guarantee (ISG) refers to each Wholesale Customer's share of the Supply Assurance as defined in the Water Supply Agreement (WSA). The Supply Assurance is the 184 mgd maximum annual average metered supply of water dedicated by San Francisco to public use in the Wholesale Customer service area (not including the Cities of San Jose and Santa Clara). The City of Hayward's ISG is calculated as 184 mgd less the total of permanent customer ISGs (161.92 mgd).

b Actual demands are equivalent to purchases as reported in customer billing data.

c Wholesale Customer ISGs are shown in lieu of purchase request projections, which are shown in Table 4-3.

d The City of Brisbane and Guadalupe Valley Municipal Improvement District are two Wholesale Customers that are jointly operated.

e No contractual obligations are shown for the Cities of San Jose and Santa Clara, as they do not have an allocated share of the Supply Assurance due to their temporary, interruptible status under the WSA.

f Cordilleras MWC is not a member of BAWSCA or a party to the WSA, and therefore does not have an ISG. Cordilleras MWC has a water supply contract with the SFPUC for 3,007 CCF annually (about 0.006 mgd).

Note: Groveland CSD is not accounted for as a wholesale customer for the purpose of this table and subsequent wholesale supply and demand comparisons. Refer to Table 4-1 for Groveland CSD's current and projected demands. However, in the corresponding standardized tables in Appendix B, Groveland CSD is reported as wholesale rather than retail.

SECTION 5: RETAIL BASELINES AND TARGETS

With the adoption of the Water Conservation Act of 2009, also known as SB X7-7, the State was required to set a goal of reducing urban water use by 20% by the year 2020. Each retail urban water supplier was required to determine its baseline water use, expressed in gallons per capita per day (GPCD) during its baseline period, as well as its target water use for the years 2015 and 2020 in order to help the State achieve the 20% reduction.

In its 2010 UWMP, the SFPUC first established the baseline per capita water use, as well as the interim (i.e. 2015) and 2020 water use targets. In the 2015 UWMP, the SFPUC performed a detailed analysis to update the baselines and targets per capitas based on in-City retail service area population and water use, by (1) revising the population of the in-City retail service area to reflect the 2010 U.S. Census rather than the 2000 U.S. Census, and (2) including the population and water use of the suburban retail service area. The narrative of the 2015 baseline and targets analysis and the SB X7-7 2020 Compliance Form tables are included in Appendix D. This section provides a summary of the 2015 analysis and shows the SFPUC's compliance with the 2020 target.

Additionally, Groveland CSD is not included in this section, as explained in Section 2.4.

5.1 GROSS PER CAPITA WATER USE BASELINES & TARGETS SUMMARY

As described in DWR's *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (For the Consistent Implementation of the Water Conservation Act of 2009)*, the SFPUC calculated its per capita urban retail water use five-year baseline, 10-year baseline, 2015 interim target and 2020 compliance target in compliance with the Water Conservation Act of 2009. The SFPUC used Method 3 of the four approved methods provided by the Water Conservation Act of 2009 for determining urban water use targets, and adjusted them to meet the minimum water use reduction requirement, of 95% of the five-year baseline. Table 5-1 includes a summary of the baselines and targets calculated in the 2015 UWMP.

Table 5-1. Gross Per Capita Water Use Baselines and Targets Summary (GPCD)

[Standardized Table 5-1: Baselines and Targets Summary]

Baseline Period	Start Year	End Year	Average Baseline	Interim 2015 Target	Confirmed 2020 Target
10–Year Baseline	2001	2010	107	102	96
Five-Year Baseline	2006	2010	101	—	—

5.2 COMPLIANCE WITH 2020 DAILY PER CAPITA WATER USE TARGET

The 2020 gross water use includes the water from the RWS and the groundwater sources supplied by SFPUC to the In-city and suburban retail customers. No deductions for indirect recycled water, agricultural water use or process water was applied. All water sources are metered and meters are calibrated on an annual basis. Note that water use reflects gross water use (i.e., water use by all sectors, including water loss).

The 2020 service area population includes In-City population and suburban retail population. For the in-City retail service area, population data were obtained from the California Department of Finance for the County of San Francisco. However, the same method could not be used for the suburban retail service area since the service area does not align with municipal boundaries. The population estimates for the connections in Redwood City, Daly City, Fremont and Millbrae were calculated using persons-per-household data. Therefore, the SFPUC consulted with DWR (i.e., pre-review) on an appropriate, alternate methodology based on U.S. Census data at the census block level and persons-per-household data. Use of persons-per-

household data was deemed adequate since it is assumed that all residential accounts serve single family homes in the suburban retail service area, and no multi-family residences are served. Therefore, the number of connections can be considered equivalent to number of households. For the Town of Sunol specifically, the SFPUC used the web-based DWR Population Tool since the corresponding service area was difficult to define at the census block level (output provided in Appendix H).

The base daily per capita water use was calculated by dividing the annual gross water use by population and averaging the value per day.

As shown in Error! Reference source not found., with a 2020 per capita water use of 76 GPCD, the SFPUC is in compliance with its 2020 target of 96 GPCD. No adjustments were needed.

Table 5-2. Gross Per Capita Water Use Baselines and Targets Summary (GPCD)

[SB X7-7 2020 Compliance Form Table 5: 2020 Gallons Per Capita Per Day (GPCD)]

2020 Gross Water Use (mgd)	2020 Service Area Population	2020 Daily Per Capita Water Use (GPCD)
68.5	899,732	76

Taking into consideration the impact of population and employment growth, as well as passive and active conservation efforts, the SFPUC initially projected in 2015 that its 2020 daily per capita water use would be approximately 86 GPCD. With its continued water conservation program, the SFPUC has achieved a lower than initially predicted per capita water use with a 2020 per capita water use of 76 GPCD, in compliance with the final 2020 target of 96 GPCD.

5.3 ASSISTANCE TO WHOLESALE CUSTOMERS

As a wholesale supplier, the SFPUC is required to provide an assessment of present and proposed future measures, programs, and policies that will help the retail water suppliers in their wholesale service area to achieve their water use reduction targets. This is further discussed in Section 10.3.

SECTION 6: SYSTEM SUPPLIES

This section describes current and projected water supplies, as well as the various sources of supplies available to meet retail and wholesale water demands. Potential recycled water uses and supply availability are addressed. This section also summarizes the options used, or being considered, by the SFPUC to maximize resources and minimize the need to import water from the RWS watersheds.

As explained in Section 2.4, Groveland CSD is accounted for as a retail customer in this section, but as a wholesale customer in the corresponding standardized tables in Appendix B.

6.1 RWS SUPPLIES FOR RETAIL AND WHOLESALE CUSTOMERS

The SFPUC serves its retail and wholesale customers through the integrated operation of local Bay Area water production facilities and the Hetch Hetchy System. The local watershed facilities are operated to conserve local runoff for delivery and to maintain enough stored water to meet demands in the event of an emergency that affects the supply of water from Hetch Hetchy. Demands that are not met by local runoff are met with water diverted from the Tuolumne River through the Hetch Hetchy System. On average, the Hetch Hetchy System provides approximately 85% of the water delivered by the SFPUC. During dry years, the water received from the Hetch Hetchy System can amount to over 90% of the total water delivered.

The amount of water available to the SFPUC is constrained by hydrology, physical facilities, and the institutional parameters that allocate the water supply of the Tuolumne River. Due to these constraints, the SFPUC depends on reservoir storage to maximize the reliability of its water supplies. More importantly, reservoir storage provides water supply carry-over capability. During dry years, a very small share of the Tuolumne River supply is available to the SFPUC and the local watersheds produce very little water. Reservoir storage is critical during drought cycles because it enables the SFPUC to carry over water supply from wet years to dry years.

As discussed further in Section 7.1, deliveries from the RWS to both retail and wholesale customers are limited by the WSIP Phased Variant adopted by the Commission to an average annual of 265 mgd from the watersheds. The allocation between wholesale and retail customers is described in the Water Supply Agreement. It provides for 184 mgd to the Wholesale Customers consistent with the Supply Assurance and 81 mgd to the retail customers. Although SFPUC can take up to 265 mgd annual average from the RWS, for the purposes of the tables in this section and those in Chapter 8, supplies shown will be those projected to be utilized by the retail and wholesale customers. Given that the SFPUC has a Level of Service objective, based on its contractual obligations to its Wholesale Customers, to provide 265 mgd in normal years, an analysis of our ability to meet this objective in normal, single dry, and multiple dry years is provided in Appendix J.

6.1.1 Water Rights

The City and County of San Francisco holds both pre-1914 appropriative water rights and post-1914 water rights to store and deliver water from the Tuolumne River and local watersheds. Appropriative water rights allow the holder to divert water from a particular water source without regard to the contiguity of the location of use to the source. These rights are based on seniority and the use of water must be reasonable, beneficial, and not wasteful. In 1914, California established a formal water rights permit system (by the 1913 Water Commission Act) administered by the SWRCB. The SWRCB does not have permitting jurisdiction over pre-1914 appropriative water rights.

With the Raker Act of 1913 (38 Stat. 242), Congress granted San Francisco rights of way for the construction and operation of Hetch Hetchy facilities, which are predominantly located on federally owned land in Yosemite National Park and Stanislaus National Forest. The Raker Act recognized the senior water rights of Turlock Irrigation District (TID) and Modesto Irrigation District (MID)

(collectively, the Districts) to divert water from the Tuolumne River, and specified conditions for the release of water to the Districts and other conditions imposed by Congress for the protection of recreation in Yosemite and other purposes.

Under Raker Act Section 9(c) and the subsequent Fourth Agreement between San Francisco and the Districts, the Districts are entitled to the natural flow of the Tuolumne River (2,416 cubic feet per second [cfs] between June 13 and April 15 of each year and 4,066 cfs between April 15 and June 13, the spring snowmelt period). These flows are computed on a daily basis based on unimpaired conditions at La Grange Dam below Don Pedro. During multiple drought years, the SFPUC's water diversions from the Tuolumne River may be limited to previously stored (carry-over) water in system reservoirs and the water bank account in Don Pedro reservoir.[8]

6.1.2 Water Quality of RWS Supplies

As described in Section 3.1, the RWS delivers high-quality water. The current surface water supplies available to the RWS include the Tuolumne River and supplies from local Bay Area reservoirs. The majority of the water supply originates in the upper Tuolumne River watershed high in the Sierra Nevada, remote from human development and pollution. This water from the Hetch Hetchy reservoir is protected in pipes and tunnels as it is conveyed to the Bay Area, requiring only primary disinfection and pH adjustment to control corrosion in the pipelines. In addition, this water undergoes UV disinfection at the Tesla Treatment Facility, further ensuring high water quality.

The USEPA and SWRCB DDW have approved the use of this drinking water source without requiring filtration at a treatment plant. However, local water from the local watersheds requires filtration to meet drinking water quality requirements. The filtered and treated water from the local watersheds is blended with water from the Hetch Hetchy reservoir, and most customers receive this blended water supply. System water quality, including both raw water and treated water, is continuously monitored and tested to assure that water delivered to customers meets or exceeds federal and State drinking water and public health requirements.

The SFPUC will continue to rely on these high-quality water sources. No degradation of water quality is anticipated in the future.

The SFPUC prepares an annual water quality report (i.e., Consumer Confidence Report) for its customers each spring, which is available at **www.sfpuc.org/accounts-services/water-quality/annual-water-quality-reports**.

6.1.3 Climate Change Impacts to RWS Supplies

Climate change has become an important factor in water resources planning in the State and is frequently considered in urban water management planning, although the extent and precise effects of climate change remain uncertain. There is convincing evidence that increasing concentrations of greenhouse gases have caused and will continue to cause a rise in temperatures around the world, which will result in a wide range of changes in climate patterns. Moreover, observational data shows that a warming trend occurred during the latter part of the 20th century and will likely continue through the 21st century. These changes will have a direct effect on water resources in California, and numerous studies have been conducted to determine the potential impacts to water resources. Based on these studies, climate change could result in the following types of water resource impacts, some of which are likely to affect the Tuolumne River watershed and local watersheds in the Bay Area:

- Reductions in the average Sierra Nevada annual snowpack due to a rise in the snowline elevation and a shallower snowpack at lower elevations, and a shift in snowmelt runoff to earlier in the year;

[8] The Districts have senior water rights to the City for the Tuolumne River water and are provided to the first increment of flow in the Upper Tuolumne River watershed according to the apportionment set forth in the Raker Act of 1913. The water bank at Don Pedro Reservoir provides a credit and debit system which allows the City to divert water upstream while meeting its obligations to the Districts. Through this mechanism the SFPUC may pre-deliver the Districts entitlements and credit the water bank so that at other times the SFPUC may retain water upstream while the Districts debit the water bank.

- Changes in the timing, annual average, intensity, and variability of precipitation, and an increased amount of precipitation falling as rain instead of as snow;
- Long-term changes in watershed vegetation and increased incidence of wildfires that could affect water quantity and quality;
- Sea level rise and an increase in saltwater intrusion;
- Increased water temperatures with accompanying potential adverse effects on some fisheries and water quality;
- Increases in evaporation and concomitant increased irrigation need; and
- Changes in urban and agricultural water demand.

Both the SFPUC and BAWSCA participated in the 2019 update of the Bay Area Integrated Regional Water Management Plan (BAIRWMP), which includes an assessment of the potential climate change vulnerabilities of the region's water resources and identifies climate change adaptation strategies. In addition, the SFPUC has studied and continues to study the effects of climate change on the RWS. These works are summarized below.

6.1.3.1 Bay Area Integrated Regional Water Management Plan

Climate change adaptation was established as an overarching theme for the 2019 BAIRWMP update. As stated in the BAIRWMP, identification of watershed characteristics that could potentially be vulnerable to future climate change is the first step in assessing vulnerabilities of water resources in the Bay Area Region (Region). Vulnerability is defined as the degree to which a system is exposed to, susceptible to, and able to cope with or adjust to, the adverse effects of climate change. A vulnerability assessment was conducted in accordance with the DWR's *Climate Change Handbook for Regional Water Planning* and using the most current science available for the Region. The vulnerability assessment provides the main water planning categories applicable to the Region—including demand, supply, and water quality, ecosystems and habitat, and sea-level rise—and a general overview of the qualitative assessment of each category with respect to anticipated climate change impacts.

6.1.3.2 SFPUC Climate Change Studies

The SFPUC views assessment of the effects of climate change as an ongoing project requiring regular updating to reflect improvements in climate science, atmospheric/ocean modeling, and human response to the threat of greenhouse gas emissions. Climate change research by the SFPUC began in 2009 and continues to be refined. In its 2012 report "Sensitivity of Upper Tuolumne River Flow to Climate Change Scenarios," the SFPUC assessed the sensitivity of runoff into Hetch Hetchy Reservoir to a range of changes in temperature and precipitation due to climate change. Key conclusions from the report include the following:

- With differing increases in temperature alone, the median annual runoff at Hetch Hetchy would decrease by 0.7-2.1% from present-day conditions by 2040 and by 2.6-10.2% from present-day conditions by 2100. Adding differing decreases in precipitation on top of temperature increases, the median annual runoff at Hetch Hetchy would decrease by 7.6-8.6% from present-day conditions by 2040 and by 24.7-29.4% from present-day conditions by 2100.
- In critically dry years, these reductions in annual runoff at Hetch Hetchy would be significantly greater, with runoff decreasing up to 46.5% from present day conditions by 2100 utilizing the same climate change scenarios.
- In addition to the total change in runoff, there will be a shift in the annual distribution of runoff. Winter and early spring runoff would increase, and late spring and summer runoff would decrease.
- Under all scenarios, snow accumulation would be reduced and snow would melt earlier in the spring, with significant reductions in maximum peak snow water equivalent under most scenarios.

Currently, the SFPUC is conducting a Long-term Vulnerability Assessment which assesses the potential effects of climate change on water supply using a wide range of plausible increases in temperature and changes in precipitation to address the wide uncertainty in climate projections over the planning horizon 2020 to 2070. There are many uncertain factors such as climate change, changing regulations, water quality, growth and economic cycles that may create vulnerabilities for the RWS's ability to meet levels of service. The uncertainties associated with the degree to which these factors will occur and how much risk they present to the water system are difficult to predict, but nonetheless they need to be considered in SFPUC planning. To address this planning challenge, the assessment uses a vulnerability-based planning approach to explore a range of future conditions to identify vulnerabilities, and to assess the risks associated with these vulnerabilities, that could lead to developing an adaptation plan that is flexible and robust to a wide range of future outcomes. This study is expected to be completed in the Summer of 2021.

6.1.4 Summary of Existing and Future RWS Supplies

As discussed further in Section 7.1, deliveries from the RWS to both retail and wholesale customers are limited by the WSIP Phased Variant adopted by the Commission to an average annual of 265 mgd for the watersheds. The allocation between wholesale and retail customers is described in the Water Supply Agreement. It provides for 184 mgd to the Wholesale Customers consistent with the Supply Assurance and 81 mgd to the retail customers. In the context of this document, normal year RWS supply is defined as the supply that will be used to meet the full demands on the RWS in a normal year. Current and projected normal year RWS supplies for both retail and wholesale customers are shown in Table 6-1.

Table 6-1. Regional Water System Normal Year Supplies (mgd)

[Standardized Table 6-9 Retail: Water Supplies – Projected]

[Standardized Table 6-9 Wholesale: Water Supplies – Projected]

RWS Supply[a]	Actual	Projected				
	2020	2025	2030	2035	2040	2045
Retail Customers[b, c]	66.5	67.2	67.5	68.6	70.5	73.7
Wholesale Customers[d, e, f]	132.1	146.0	147.9	151.9	156.3	162.8
Total RWS Supplies	198.6	213.2	215.4	220.5	226.8	236.5

a In the context of this document, normal year RWS supply is defined as the supply that will be used to meet the full demands on the RWS in a normal year.

b Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if these alternative supplies are not available, up to 81 mgd of RWS supply could be used in normal years.

c Groveland CSD is reported as a wholesale customer for the purposes of this 2020 UWMP, but it is considered a retail customer of the SFPUC solely for purposes of allocating RWS supplies between retail customers and Wholesale Customers. Its demands would be met by the retail supply allocation of 81 mgd.

d Projected RWS supplies to be used by Wholesale Customers are based on the purchase request projections provided to the SFPUC by BAWSCA in January 2021. These purchase requests are subject to change in each individual agency's UWMP.

e Projected Wholesale Customer deliveries are limited to 184 mgd. 184 mgd includes the demands of the Cities of San Jose and Santa Clara, which are supplied on a temporary and interruptible basis, with their total supply not exceeding 9 mgd assuming supply is available (decision to be made by end of 2028).

f Cordilleras MWC is not a party to the WSA, and it is not included in the wholesale supply allocation of 184 mgd. The demands of Cordilleras MWC are minor (projected to be less than 0.01 mgd) and are anticipated to be met with RWS supplies through 2045.

6.2 LOCAL SUPPLIES FOR RETAIL CUSTOMERS

The RWS comprises about 97% of total retail water supplies, while the remaining portion is from locally produced groundwater, recycled water, and non-potable water. These local supplies are described in the following sections.

6.2.1 Existing Local Supplies

Existing supplies of groundwater, recycled water, and non-potable water are described below. Future supplies are described in Section 6.2.2.

6.2.1.1 Local Groundwater and the San Francisco Groundwater Supply Project

San Francisco overlies all or part of seven un-adjudicated groundwater basins. These groundwater basins include the Westside, Lobos, Marina, Downtown, Islais Valley, South San Francisco, and Visitacion Valley basins. The Lobos, Marina, Downtown, and South San Francisco basins are located wholly within City limits, while the remaining three extend south into San Mateo County. The portion of the Westside Basin aquifer located within the City is referred to as the North Westside Groundwater Basin (or North Westside Basin). With the exception of the Westside and Lobos basins, the basins are generally inadequate to supply groundwater for municipal supply due to low yield, contamination, or potential subsidence concerns.

Early in its history, the City made use of local groundwater, springs, and spring-fed surface water ranging from approximately 6.0 to 8.5 mgd prior to 1934. After imports of water from the Hetch Hetchy Reservoir began in October 1934, municipal supplies began to rely almost exclusively on surface water from the RWS. Local groundwater use, however, has continued in the City. In addition, groundwater has been used and continues to be used in the suburban retail service area.

The local groundwater basins are described below.

Westside Groundwater Basin. With an area of about 40 square miles, the Westside Groundwater Basin is the largest groundwater basin in San Francisco and is currently used to meet water demands for both irrigation and municipal uses. The Westside Groundwater Basin is separated from the Lobos Basin to the north by a northwest-trending bedrock ridge through the northeastern part of Golden Gate Park. San Bruno Mountain and San Francisco Bay form the eastern boundary, and the San Andreas Fault and Pacific Ocean form the western boundary. The southern limit of the Westside Groundwater Basin is defined by a bedrock high that separates it from the San Mateo Plain Groundwater Basin. The basin opens to the Pacific Ocean on the northwest and San Francisco Bay on the southeast. The Westside Groundwater Basin contains three relatively distinct aquifer zones referred to as the Shallow Aquifer, Primary Production Aquifer, and Deep Aquifer. The clayey aquitards that separate these aquifers become discontinuous or absent north of Lake Merced. The basin has not been adjudicated nor has it been identified by DWR as overdrafted, or as projected to be overdrafted in the future.

The Westside Groundwater Basin is subdivided for management purposes into northern and southern portions by the county line separating San Francisco and San Mateo Counties. The county-line boundary between the North and South Westside Groundwater Basins does not have hydrogeological significance other than influencing the jurisdictional distribution of groundwater pumping. No geologic features restrict groundwater flow between the northern and southern parts of the groundwater basin.

Within San Mateo County, the South Westside Groundwater Basin (or South Westside Basin) encompasses 25 square miles and extends southeast across the San Francisco Peninsula south of San Bruno Mountain from the ocean near Daly City to San Francisco Bay in Burlingame. It is described in the South Westside Basin Groundwater Management Plan.[9] Municipal water demand within the South Westside Basin is served by the City of San Bruno, California Water Service Company, City of Daly City, and the SFPUC as a wholesaler to those entities.

The North Westside Basin has a land surface area of 15 square miles encompassing much of the western third of the City, including Lake Merced and most of Golden Gate Park. The North Westside Basin is largely residential, with residential and

[9] City of San Bruno, California Water Service Company, Daly City, and Hetch Hetchy Regional Water System. 2012. *South Westside Basin Groundwater Management Plan*.

commercial land uses accounting for about 75%, including the Sunset and Parkside districts; and at least 25% park and open space, most notably Golden Gate Park, Lake Merced, golf clubs, and hilltop parks along the basin's eastern boundary. The North Westside Basin land surface extends from sea level along Ocean Beach to nearly 1,000 feet above sea level along a bedrock ridge three to four miles inland. The North Westside Basin is bounded on the north by a mostly buried bedrock ridge extending from Point Lobos southeast through Golden Gate Park and northeast through Lone Mountain. The basin boundary encompasses the panhandle of Golden Gate Park, then extends south-southwest through Twin Peaks and Mount Davidson, crossing south into San Mateo County a little more than a mile east of Lake Merced. The San Andreas Fault Zone trends offshore to the northwest of Daly City and is interpreted to bound the basin on the west. Existing retail groundwater sources are pumped from the North Westside Basin.

The SFPUC leads the basin-wide Westside Basin Groundwater Monitoring Program. It provides information summarizing groundwater pumping, groundwater levels, and groundwater quality, along with Lake Merced water elevations. This program publishes an annual monitoring report, which may be accessed at **www.sfpuc.org/programs/water-supply-planning/groundwater**. Monitoring in the North Westside Basin is accomplished by wells constructed in either single, nested, or clustered configurations at approximately 21 locations. Groundwater levels in all wells are measured quarterly by hand and supplemented by continuous monitoring using pressure transducers at select locations. Based on regular groundwater monitoring conducted in the North Westside Basin since 2004, static groundwater levels along the Pacific Coast and north of Lake Merced have generally remained above sea level in the Shallow and Primary Production Aquifers.

Within the City, the SFPUC samples groundwater at 13 monitoring well locations semiannually to monitor general water quality in the groundwater basin, including locations in Golden Gate Park, coastal wells located in the vicinity of the Great Highway, lake-aquifer monitoring wells in the vicinity of Lake Merced, and one at the West Sunset Playground. The monitored parameters include total alkalinity, calcium, magnesium, sodium, potassium, bicarbonate, hardness, chloride, nitrate, sulfate, TDS, pH, and specific conductance.

Since 1872, groundwater has been pumped from wells located in Golden Gate Park, and by the San Francisco Zoo since the 1930s. Based on flow meter data, about 1.5 mgd is produced by these wells on an average annual basis. The groundwater is mostly used by the San Francisco Recreation and Parks Department for irrigation and other non-potable uses (e.g., lake filling, water exhibits) at Golden Gate Park, the San Francisco Zoo, and landscaped medians along the Great Highway.

The San Francisco Groundwater Supply Project (SFGW) constructed or rehabilitated six groundwater supply wells and their associated pump stations, and more than five miles of pipelines to distribute groundwater to in-City reservoirs for blending with the municipal drinking water supply. Construction began in 2014 and was completed in 2020. These wells pump groundwater from 120 to 460 feet below ground within the San Francisco portion of the Westside Basin. Before entering the in-City distribution system, the pumped groundwater is disinfected and then blended in relatively small quantities in Sunset and Sutro Reservoirs with water supplied by the RWS. During calendar year 2020, the SFGW wells supplied an average of 0.5 mgd to the reservoirs. Once the Westside Recycled Water Project is completed and the project's wells in Golden Gate Park are no longer needed for irrigation, the project will add an average of up to 1 mgd to the local water system for one or more years. Over the following several years, with continued monitoring and testing, production will step up to an average of 4 mgd. Given approximately 1.3 mgd of existing groundwater use for irrigation, this project represents approximately 2.7 mgd of net new supply. Two of the six wells are capable of serving as emergency drinking water supplies following an earthquake or other natural disaster, and include filling stations for emergency water tankers.

The SFPUC developed a draft Groundwater Management Plan (GMP) for the North Westside Basin in 2005 in response to the 1992 California Groundwater Management Act (AB 3030). Following passage of the 2014 California Sustainable Groundwater Management Act (SGMA), the SFPUC established itself in March 2015 as the Groundwater Sustainability Agency (GSA) for all of San Francisco. The SFPUC then completed a draft Groundwater Sustainability Plan (GSP) for the North Westside Basin in 2016. This plan has guided the implementation of the SFGW Project to ensure sustainable groundwater management in the northern portion of the Basin. The plan summarizes the Basin hydrogeology and defines

measurable objectives and actions for protecting groundwater yield and quality, such as avoiding salt water intrusion, land subsidence, and impacts to interconnected surface water resources. Because DWR designated the Westside Basin and San Francisco's other groundwater basins as very low priority in early 2019, the SFPUC is not required to submit a GSP to the State, but will sustainably manage the northern portion of the Westside Basin consistent with SGMA. Currently, the SFPUC is updating the 2016 plan and will finalize it as a GMP under AB 3030. Adherence to this plan will ensure a long-term, high quality, local water supply for current and future uses.

Livermore Valley Basin, Central Groundwater Sub Basin. In the suburban retail service area, about 0.4 mgd of groundwater is delivered to the Castlewood CSA from the Castlewood Well System operated by the SFPUC (this system is described in Section 3.1.5.2). Groundwater is drawn from the Central Groundwater Sub Basin in the Livermore Valley Basin. DWR has not identified this basin as overdrafted, nor as projected to be overdrafted in the future. These wells are metered and have been in operation for several decades. The system serving Castlewood is not connected to the RWS.

The volumes of groundwater pumped between 2016 and 2020 from the three sources described above are shown in Table 6-2.

Table 6-2. Groundwater Pumped (mgd)

[Standardized Table 6-1 Retail: Groundwater Volume Pumped]

Groundwater Source	2016	2017	2018	2019	2020
Westside Groundwater Basin[a]	1.2	1.3	1.7	1.7	2.0
Livermore Valley Basin, Central Groundwater Sub Basin[b]	0.4	0.4	0.3	0.4	0.3

a Data from 2016-2019 are obtained from the 2019 Annual Groundwater Monitoring Report, Westside Basin (SFPUC, April 2020), 2020 data are from verbal communications with SFPUC groundwater staff. Pumping volumes are reported on a calendar year basis, but are used to approximate fiscal year data for this table.

b This basin is the source of water for the Castlewood Well System. Pumping volumes are assumed to be equivalent to billed consumption for Castlewood CSA; obtained from customer billing data.

6.2.1.2 Other Surface Water

The Sunol Filter Gallery (Gallery) is located adjacent to Alameda Creek in Sunol, south of the SFPUC's Sunol Pump Station. The supplies are from subsurface flows directly tied to flow in the creek and creek bed. As such, it is considered to be surface water and is subject to surface water permitting. This supply source provided approximately 0.3 mgd of water for irrigation purposes to the Sunol Valley Golf Club until January 2016, when the golf course ceased operating and thus the source production was substantially reduced. Since 2016, the Gallery diversions from Alameda Creek have been limited to maintenance water supply and emergency fire water for the golf course property. The SFPUC is currently evaluating options to make the Sunol Filter Gallery fully operational and use the source to its full capacity

6.2.1.3 Local Recycled Water

From 1932 to 1981, the City's McQueen Treatment Plant provided recycled water to Golden Gate Park for irrigation and flow augmentation of its streams and lakes. Due to changes in State regulations, the plant could no longer meet required standards. Subsequently, the City closed the McQueen Treatment Plant and discontinued the use of recycled water in Golden Gate Park; however, a limited volume of recycled water is currently used in the retail service area as described below.

Southeast Water Pollution Control Plant. Disinfected secondary-treated recycled water from the Southeast WPCP was provided to construction contractors, City departments, and other interested parties for use within the City via the truck-

fill station through 2015. The facility has not been operational since 2015. The SFPUC is exploring resuming recycled water production dedicated to onsite uses at the plant.

Harding Park. The Harding Park Recycled Water Project, a partnership between the SFPUC and NSMCSD, was completed in October 2012 and provides tertiary-treated recycled water for irrigating the Harding Park and Fleming Golf Courses in San Francisco. The project replaces the use of potable water from the RWS for golf course irrigation and has an average capacity of 0.23 mgd. However, in 2020, the system was offline for most of the year due to infrastructure upgrades. The system therefore supplied approximately 5 MG (0.01 mgd) to Harding Park, a retail customer of the SFPUC.

Sharp Park. The Pacifica Recycled Water Project provides recycled water to several irrigation customers in Pacifica including a portion of the Sharp Park Golf Course, a retail customer of the SFPUC. This project was developed and constructed through a partnership between the SFPUC and NCCWD. An automated irrigation system was installed on the east side of the golf course, and recycled water delivery began in October 2014. In 2020, the Sharp Park operation was fully online and recycled water deliveries were estimated to be 0.1 mgd.

Projections of recycled water use in the retail service area were provided in the 2015 UWMP. At that time, it was estimated that 0.3 mgd of recycled water would be used in 2020. Actual use in 2020 was approximately 0.1 mgd, since the Harding Park Recycled Water Project was offline during most of 2020. A comparison of projected and actual recycled water uses is shown in Table 6-3.

Table 6-3. Projected and Actual Recycled Water Use for 2020 (mgd)

[Standardized Table 6-5 Retail: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual]

Use Type	2015 Projection for 2020	Actual Use in 2020
Golf Course Irrigation[a]	0.3	0.1

a Golf course irrigation includes Harding Park, Fleming and Sharp Park golf courses.

6.2.1.4 Wastewater Assessment

The SFPUC's Wastewater Enterprise operates the City's wastewater collection, treatment, and disposal system, which consists of a combined sewer system (which collects both sewage and stormwater), three water pollution control plants, and outfalls to San Francisco Bay and the Pacific Ocean. The collection and conveyance system consists of over 900 miles of various sizes of underground sewer pipes, transport/storage structures, and pump stations located throughout the City. The Southeast WPCP and Oceanside WPCP provide secondary treatment and operate year-round; while the North Point Wet Weather Facility operates only during wet weather and provides primary treatment. Ultimate disposal of treated wastewater effluent is currently through outfalls to both San Francisco Bay and the Pacific Ocean. The Treasure Island Wastewater Treatment Plant provides secondary treatment of domestic and commercial wastewater from Treasure Island and Yerba Buena Island, located in the San Francisco Bay. The plant's effluent is discharged to Central San Francisco Bay. The Mel Leong Treatment Plan is located at the San Francisco International Airport and treats domestic and industrial wastewater from the airport facilities. The plant's effluent is eventually discharged to the Lower San Francisco Bay[10]. Table 6-4 summarizes the current volumes of wastewater collected, treated and discharged within the retail service area.

[10] The effluent of the Mel Leong Treatment Plant is discharged to the North Bayside System Unit forcemain, which conveys the treated wastewater to dechlorination facilities prior to its discharge to the Lower San Francisco Bay.

As mentioned previously, suburban retail water use in 2020 was 3.5 mgd, which was about 5% of total retail demand. As such, the volume of wastewater generated within the SFPUC's suburban water retail service area is assumed to be small compared to in-City wastewater generation. However, notable large suburban retail customers are included in Table 6-4.

Table 6-4. Wastewater Operations within Retail Service Area
[Standardized Table 6-2 Retail: Wastewater Collected Within Service Area]
[Standardized Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2020]

Treatment Plant	Operator	Location	Volume of Wastewater in 2020 (mgd)				Recycled Water Delivered within Retail Service Area in 2020 (mgd)
			Collected	Treated (Level)	Discharged	Recycled	
Southeast WPCP[a,b]	SFPUC	San Francisco	56.2	56.2 (secondary, disinfected)	52.1[c]	0	0
Oceanside WPCP[b]	SFPUC	San Francisco	14.5	14.5 (secondary, undisinfected)	15.0[d]	0	0
Treasure Island Wastewater Treatment Plant	US Navy and Treasure Island Development Authority	Treasure Island	0.33	0.33 (secondary disinfected)	0.30	0	0
Mel Leong Treatment Plant[e,f,]	City and County of San Francisco	San Francisco International Airport	0.38	0.38 (secondary, disinfected)	0.38	0	0

a The Southeast Water Pollution Control Plant (WPCP) and North Point Wet Weather Facility are grouped together as one facility because they are hydraulically connected (both plants receive influent from the same collection system) and their discharges are covered by the same permit.

b At the Southeast and Oceanside WPCPs, metered effluent flows include both primary-only and secondary treated effluent (the bulk of which is secondary treated) and flows include treated combined wastewater and stormwater because the collection systems are predominantly combined systems.

c The volume discharged is less than the volume collected because a small volume of the discharged wastewater is treated to secondary, disinfected-23 level and used for other purposes.

d The volume discharged is higher than the volume collected because the discharged volume includes additional plant recycle streams.

e The Mel Leong Treatment Plant is the only wastewater facility that treats and discharges wastewater generated by a suburban retail water customer within the suburban retail service area. Wastewater utilities serving other suburban retail customers do not treat or dispose of wastewater within the suburban retail service area.

f Volumes of wastewater treated at and discharged from the Mel Leong Treatment Plant correspond to calendar year 2020.

6.2.2 Future Local Supplies

The SFPUC anticipates that the existing local supplies described above will be available in the future. However, to reliably and sustainably meet the future water needs of its retail customers, the SFPUC is supplementing and diversifying its water supply portfolio through the further development of local water supplies, such as increasing groundwater and recycled water production. These projects are critical to reducing impacts associated with any one supply being disrupted, reduced, or interrupted. Projects related to these efforts are described below, and projected volumes are later provided in Table 6-5. Additional water supply projects being developed under the new Alternative Water Supply Program are described in Section 7-4.

6.2.2.1 Westside Recycled Water Project

The Westside Recycled Water Project includes construction of a tertiary recycled water plant and associated pipelines to replace RWS and groundwater supplies currently used to irrigate Golden Gate Park, Lincoln Park and Golf Course, the

San Francisco Zoo, and the Presidio Golf Course, as well as other landscaping in the Presidio. The plant is currently under construction on the west side of the City at the Oceanside WPCP. For planning purposes, deliveries from the Westside project are estimated to be 1.6 mgd in 2025 and 1.8 mgd in 2030 and beyond. The project is designed to deliver an annual average of up to 2 mgd.

The project Environmental Impact Report (EIR) was certified by the San Francisco Planning Commission and approved by the SFPUC's Commission in September 2015. The construction of the recycled water pipeline began in early 2017 and was completed in July 2018. The treatment facility and pump station are currently under construction, which began in late 2017 and mid-2019, respectively. Work is currently underway to retrofit the irrigation systems in Golden Gate Park and Lincoln Park and bring them into compliance with California recycled water regulations.

The SFPUC is currently in the early design phase of the San Francisco Zoo Recycled Water Project, which will extend recycled water service from the Westside Recycled Water Treatment Facility to the San Francisco Zoo. The recycled water pipeline that currently extends from the RWTF to Golden Gate Park includes a turnout to the Zoo. Extending a new pipeline from the turnout to the non-potable reservoir on Zoo grounds will allow RPD to switch from groundwater to recycled water to meet the Zoo's non-potable water demands, while supporting groundwater management goals for the Westside groundwater basin.

Recycled water deliveries to Golden Gate Park and Lincoln Park (annual average of 1.3 mgd) are expected to begin in early 2022. Deliveries to the San Francisco Zoo (annual average of 0.3 mgd) are expected to begin in 2023. SFPUC is also currently planning for deliveries to the Presidio (annual average of 0.2 mgd) beginning by 2030.

6.2.2.2 Treasure Island Recycled Water Project

The Treasure Island Water Resource Recovery Facility (TIWRRF) will be located on the northeast corner of Treasure Island (TI) in San Francisco, California on a geotechnically improved "greenfield" site of approximately 10 acres. The TIWRRF will provide tertiary wastewater treatment and wetlands to achieve an average dry weather flow (ADWF) capacity of at least 1.3 mgd and peak wet weather flow (PWWF) of 3.9 mgd. The TIWRRF will support the redevelopment of Treasure Island and Yerba Buena Island and the 8,000 new homes currently under construction.

The TIWRRF will include liquid treatment processes, solids handling, odor control, a wetland, and produce Title 22 disinfected tertiary quality of treated wastewater effluent. It is anticipated that the TI development will use an average of 0.4 MGD and a peak of 1.0 MGD of recycled water for uses that include dual plumbing in buildings and outdoor urban agriculture and irrigation. The TIWRRF and associated wetlands are consistent with the open space vision for the Development. Construction is anticipated to start in early to mid-2022 and be completed in early to mid-2024.

6.2.2.3 Other Actions to Expand Recycled Water Use

The SFPUC is actively involved in encouraging and expanding recycled water use and onsite water reuse. These efforts are described below.

Projects and Partnerships. As demonstrated by the Harding Park and Pacifica Recycled Water Projects, the SFPUC has and will continue to explore opportunities for regional recycled water partnerships with other Bay Area agencies. Through these partnerships, the SFPUC aims to develop recycled water projects that will benefit the SFPUC and partners by reducing demands for RWS supplies and/or freeing up groundwater that could be used for potable supplies.

Ordinances, Programs, and Services. The SFPUC administers or helps to administer the following ordinances, programs, and services in the City related to recycled water and water reuse. The majority of these ordinances, programs, and services have been established for many years and are ongoing, resulting in increased water reuse.

- **Recycled Water Program and Ordinance:** To encourage the use of recycled water in San Francisco, the City adopted Ordinances 390-91 and 391-91, collectively referred to as the Recycled Water Ordinance.[11] This ordinance requires the installation of dual-plumbed systems within designated areas of the City for new, remodeled or converted buildings; all subdivisions of 40,000 square feet or more; and for new, modified, or existing irrigated areas of 10,000 square feet or more. The number of dual-plumbed systems installed as required by the ordinance continues to increase with the increase of new construction and rehabilitation projects in the City.

- **Soil Compaction and Dust Control Ordinance:** In 1991, the City also passed Ordinance 175-91[12], which restricts the use of potable water for soil compaction and dust control activities for construction and demolition projects. To facilitate the use of non-potable water for these activities, the SFPUC installed a recycled water truck-fill station at its Southeast WPCP. Construction contractors, City departments, and other interested parties may fill water trucks at the station after receiving a permit from the SFPUC.

- **Large Landscape Grant Program:** The SFPUC initiated a Large Landscape Grant Program in 2009. In-City retail customers with 1/4 acre or more (originally 2.5 acres or more when the program started) of irrigated landscape are eligible to apply. Grant funding is available for water-saving and recycled water retrofits that reduce potable water use for landscape irrigation. The SFPUC also provides technical assistance in implementing retrofits. The recycled water irrigation system retrofits at both Harding Park and Sharp Park received grant funding through this program.

- **Non-potable Water Program and Ordinance:** As described in Section 4.1.4, the City adopted the Non-potable Water Ordinance in 2012 to allow for the collection, treatment, and use of alternate water sources for non-potable applications. The Non-potable Water Program outlines the oversight of the SFPUC, the SFDPH-EH, and the San Francisco Department of Building Inspection (SFDBI) during the review process. The ordinance was amended in 2015 to mandate the installation of onsite water systems in new development meeting specified criteria.

- **Public Outreach:** The SFPUC actively promotes its programs to conserve, diversify, and supplement RWS supplies. Marketing campaigns, factsheets, and articles are developed and shared with media, customers, and public officials.

Research and Knowledge Sharing. The SFPUC is a member of the Bay Area Clean Water Agencies (BACWA) Recycled Water Committee. BACWA is composed of Bay Area wastewater agencies that discharge into the San Francisco Bay estuary. The purpose of the Recycled Water Committee is to provide a forum to share recycled water information and expertise to support and advance regional water recycling efforts. SFPUC is also an active member of the national WateReuse Association and the California Section., SFPUC is also an active member of the Water Research Foundation.. In addition, SFPUC participates on the California Urban Water Association (CUWA) water reuse committee.

6.2.3 Water Quality of Local Supplies

Local groundwater, recycled water, and non-potable water supplies are primarily used for irrigation and other non-potable uses. The SFPUC strives to meet or exceed the quality standards established by State agencies for these end uses, and works closely with regulatory agencies and partners to achieve the highest standards. Water quality of each supply is further described below.

[11] San Francisco Public Works Code, Article 22, Sections 1200-1210. Note that this ordinance was amended in 1994 by Ordinance 393-94, which expanded the designated recycled water use area to include Treasure Island, Yerba Buena Island, and Hunters Point Shipyard.
[12] San Francisco Public Works Code, Article 21, Sections 1100-1107.

6.2.3.1 Local Groundwater Quality

This section describes the water quality of existing and future groundwater supplies.

Westside Groundwater Basin. Groundwater from the Westside Groundwater Basin has been supplying drinking water to Daly City, San Bruno, and South San Francisco for over 60 years, and in 2017 was incorporated into the drinking water supply for San Francisco. The pumped groundwater is disinfected and blended with RWS supplies before entering the in-City distribution system. Disinfection with sodium hypochlorite and pH adjustment for corrosion control is performed. The quality of the blended water satisfies all health-based drinking water standards set forth by the SWRCB DDW.

As described in Section 6.2.1.1, the SFPUC conducts the Westside Basin Groundwater Monitoring Program. It includes monitoring groundwater quality to provide early warning for potential saltwater intrusion and other potential sources of contamination. The SFPUC will continue to monitor these wells and add additional wells to the network as needed to assess how the basin is responding to SFGW and other related project operations.

Castlewood Well System. Groundwater supplies from the Castlewood Well System are disinfected via sodium hypochlorite injection and are potable when delivered to Castlewood CSA. Water quality is monitored weekly by the SFPUC.

6.2.3.2 Local Recycled Water Quality

This subsection describes the water quality of existing and future recycled water supplies.

Harding Park. Recycled water produced by NSMCSD's wastewater treatment plant in Daly City is used for irrigation at the Harding Park and Fleming Golf Courses. This tertiary-treated recycled water meets the Title 22 California Code of Regulations (Title 22) requirements for approved non-potable uses.

Sharp Park. Recycled water produced by the City of Pacifica's Calera Creek Water Recycling Plant and delivered by NCCWD is used to irrigate a portion of the Sharp Park Golf Course. This tertiary-treated recycled water meets the Title 22 requirements for approved non-potable uses.

Westside Recycled Water Project. Recycled water produced by the Westside Recycled Water Project treatment facility will undergo tertiary treatment, followed by reverse osmosis and UV, resulting in water quality that meets Title 22 requirements and the needs of the project's planned end uses, including irrigation at Golden Gate Park, Lincoln Park and Golf Course, the Presidio Golf Course, and other landscaped areas at the Presidio.

6.2.4 Climate Change Impacts to Local Supplies

The SFPUC's primary concern related to climate change is the potential impact to RWS supplies, as addressed in Section 6.1.3. Implementation of the Groundwater Sustainability Plan for the North Westside Basin will ensure that in-City groundwater supplies are maintained for current and future uses. Recycled water is considered a drought-resistant supply that is not impacted by precipitation or hydrologic year type.

6.2.5 Summary of Existing and Future Local Supplies

Table 6-5 provides a breakdown of current and projected water supply sources for meeting retail water demand through 2045. Up to 81 mgd of RWS supplies are available to retail customers in normal years. The SFPUC is also committed to developing local supplies to meet retail demands; therefore, the SFPUC would use local groundwater and recycled water supplies before using RWS supplies to meet retail demands.

Table 6-5. Retail Supplies (mgd)

[Standardized Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial uses Within Service Area]

[Standardized Table 6-8 Retail: Water Supplies – Actual]

[Standardized Table 6-9 Retail: Water Supplies – Projected]

Retail Supply	Actual	Projected				
	2020	2025	2030	2035	2040	2045
RWS Supply Utilized by Retail Customers[a]	66.5	67.2	67.5	68.6	70.5	73.7
Groundwater						
In-City Potable [b]	0.4	1.0	2.0	3.0	4.0	4.0
In-City Irrigation[b,c]	1.5	0.0	0.0	0.0	0.0	0.0
Castlewood Well System[d]	0.3	0.4	0.4	0.4	0.4	0.4
Subtotal Groundwater	2.2	1.4	2.4	3.4	4.4	4.4
Recycled Water						
Westside Recycled Water Project[e]	—	1.6	1.8	1.8	1.8	1.8
Harding Park Recycled Water Project[f]	0.0	0.2	0.2	0.2	0.2	0.2
Sharp Park Recycled Water Project[g]	0.1	0.1	0.1	0.1	0.1	0.1
Treasure Island Recycled Water Project[h]	0.0	0.2	0.4	0.4	0.4	0.4
Subtotal Recycled Water	0.1	2.1	2.5	2.5	2.5	2.5
Total Retail Supply	68.8	70.7	72.4	74.5	77.4	80.6

a Assuming that the retail supply allocation remains 81 mgd through 2045, up to 81 mgd of RWS supply may be used.

b The San Francisco Groundwater Supply Project will ramp up potable water production from 1 mgd in 2025 to 4 mgd by 2030. About 1.5 mgd of groundwater currently serves irrigation at Golden Gate Park, the San Francisco Zoo, and the Great Highway medians. This 1.5 mgd of groundwater will be converted to potable supply under the San Francisco Groundwater Supply Project.

c No groundwater will be used for in-city irrigation once the Westside Recycled Water Project comes online.

d Castlewood CSA is served by the Castlewood Well System.

e The Westside Recycled Water Project will supply Golden Gate Park (1.2 mgd), Lincoln Park (0.1 mgd) and the Zoo (0.3 mgd) by 2025, and the Presidio (0.2 mgd) by 2030.

f Irrigation at Harding Park and Fleming Golf Courses is provided recycled water from NSMCSD. The Harding Park Recycled Water Project was not operational in 2020 and is planned to be back online by 2025.

g Irrigation at Sharp Park Golf Course is provided recycled water from NCCWD. The Sharp Park Recycled Water Project was fully online in 2020 and approximately 0.1 mgd was provided in 2020.

h Recycled water operations will begin in 2025, but the full infrastructure for delivery will not be built out at that time; the full capacity of 0.4 mgd annual average is anticipated to be reached by 2030.

6.3 ENERGY INTENSITY ANALYSIS

As mandated by Section 10631.2(a) of the CWC, energy intensity data for FY19-20 for the SFPUC system is included in the following section and in Appendix I.

Based on the SFPUC's water delivery system, it is not possible to separate the energy data for the retail and wholesale water deliveries. The Total Utility Approach is therefore used to report the system's available energy intensity information. While the total volume of water delivered includes both retail and wholesale usage, SFPUC does not have access to electricity meter records for the electricity usage of its wholesale customers to distribute water within their own service areas, and is therefore not included in this analysis. In addition, the electricity consumed by other entities to produce recycled water is not included.

The reported energy consumed includes the consequential hydropower produced as a result of the water delivery through the RWS. The RWS is almost entirely gravity-driven from its Sierra Reservoirs to the Bay Area; no electricity is used for pumping at wholesale customer turnouts. Electricity usage taken into account in this analysis primarily represents pumping to off-stream storage in the Bay Area, in-city pumping for water distribution, and usage at the SFPUC's two water treatment plants (Sunol and Harry Tracy WTPs). The electricity usage also includes administrative and support facilities. The Hetch Hetchy Regional Power System is composed of three (3) hydroelectric powerhouses, which account for a total hydroelectric generating capacity of 385 MW: Moccasin Powerhouse, Kirkwood Powerhouse and Holm Powerhouse.

SECTION 7: WATER SUPPLY RELIABILITY NARRATIVE

This section describes the reliability of the RWS and local supplies to meet retail and wholesale demands through the year 2045. As described previously, supplies to meet retail demands come from the RWS and local water supply sources, including groundwater and recycled water. Approximately one third of the SFPUC's RWS supply is delivered to retail customers, and the remaining two thirds is delivered to wholesale customers.

Reliability of the RWS is expressed in terms of the system's ability to deliver water during droughts. Reliability may be quantified by the amount and frequency of water delivery reductions (i.e., deficiencies) required to balance customer demands with available supplies. The SFPUC plans deliveries under the premise that a drought more severe than the worst drought on record may occur. This section describes the SFPUC's nearly-completed Water System Improvement Program (WSIP), new and continued factors that are impacting supply reliability, and the SFPUC's new Alternative Water Supply Planning Program whose aim is to address future potential supply shortfalls.

7.1 WATER SYSTEM IMPROVEMENT PROGRAM

The WSIP is a $4.8 billion, multi-year capital program to upgrade the RWS and is approximately 96% complete to date. The SFPUC undertook the WSIP to ensure the ability of the RWS to meet Level of Service (LOS) goals and objectives for water quality, seismic reliability, delivery reliability, and water supply. The Water Supply LOS goal, stated in the WSIP and adopted in 2008, is to meet customer water needs in non-drought and drought periods.

As required under the California Environmental Quality Act (CEQA), the San Francisco Planning Department prepared a Programmatic Environmental Impact Report (PEIR) for the WSIP, which was certified in October 2008. The PEIR evaluated the potential environmental impacts of the proposed WSIP projects and identified potential mitigations to those impacts. The PEIR also evaluated several alternatives to meet the SFPUC service area's projected increase in water demand through 2030. The water supply improvement options that were evaluated included 10 alternatives using various water supply combinations from the local watersheds; the Tuolumne and Lower Tuolumne River; ocean desalination; and additional recycled water, groundwater, and conservation.

The Phased WSIP Variant includes the following water supply elements:

- Cap on RWS deliveries at 265 mgd annual average, referred to as the Interim Supply Limitation (ISL). This includes 184 mgd for the Wholesale Customers and 81 mgd for retail customers.[13]
- Water supply sources include 265 mgd average annual from the RWS and 20 mgd of water conservation[14], recycled water, and local groundwater developed within the SFPUC's service area (10 mgd in the retail service area and 10 mgd in the wholesale service area);
- Water supply projects to meet dry-year demands with no greater than 20% system-wide rationing in any one year. For a discussion of the WSIP dry-year projects and their current status, see Section 7.2 below.
- Reevaluation of 2030 demand projections, potential RWS purchase requests, and water supply options by December 31, 2018 and a separate SFPUC decision no later than 2018 regarding RWS future water deliveries after 2018. As discussed further below in Section 7.3.3, this process has been postponed to 2028 to allow for the necessary supply assessments and environmental review.

[13] As explained in Section 2.4, Groveland CSD is considered a retail customer of the SFPUC. Thus, RWS supplies to Groveland CSD are accounted for in the retail supply allocation of 81 mgd.
[14] Water conservation is accounted for as a demand reduction.

7.2 WSIP DRY-YEAR WATER SUPPLY PROJECTS

The SFPUC undertook a number of water supply projects through WSIP to meet dry-year demands with no greater than 20 percent system-wide rationing in any one year.

Calaveras Dam Replacement Project. Calaveras Dam is located in the East Bay near a seismically active fault zone and was determined to be seismically vulnerable. The SFPUC operated Calaveras Reservoir at 39 percent of its capacity as a result of a California Division of Safety of Dams (DSOD) order from 2001 to 2018. The reduced capacity significantly affected the ability of the SFPUC to carryover dry-year water supplies from one year to the next and, therefore, impacted the SFPUC's dry-year water supplies. To address the dam's vulnerability, the SFPUC constructed a new dam of equal height downstream of the existing dam. Construction of the embankment dam was completed in Fall 2018; at that time, the SFPUC began impounding water behind the new dam in accordance with DSOD guidance. As of December 2020, reservoir storage was at 55% of total capacity. Maximum reservoir storage since refill began was 67% of capacity, in May of 2019. Storage has declined since then due to dry hydrologic conditions. The project reached final completion in July 2019 and has been in the closeout phase since 2019 without the Calaveras Reservoir reaching sufficient level to fulfill Initial Fill Plan inspections. The project team continues to monitor and is ready to resume reservoir initial fill inspections in 2021.

Alameda Creek Recapture Project. The Alameda Creek Recapture Project[15] will recapture the water system yield that is either lost due to instream flow releases at Calaveras Reservoir or bypassed around the Alameda Creek Diversion Dam and return this yield to the RWS through facilities in the Sunol Valley. Water that naturally infiltrates from Alameda Creek will be recaptured into an existing quarry pond known as SMP (Surface Mining Permit)-24 Pond F2. The project will be designed to allow the recaptured water to be pumped to the Sunol Valley Water Treatment Plant or to San Antonio Reservoir. Construction of this project will occur from spring 2021 to spring 2023.

Lower Crystal Springs Dam Improvements Project. The Lower Crystal Springs Dam (LCSD) Improvements Project was completed in May 2012. The related joint San Mateo County/SFPUC Bridge Replacement Project to replace the bridge across the Lower Crystal Springs Dam was completed in January 2019. A WSIP follow up project to modify the LCSD Stilling Basin for fish habitat and upgrade the fish water release and other valves started in April 2019. While the main improvements to the dam have been completed, environmental permitting issues for reservoir operation remain significant. When the reservoir elevation was lowered due to DSOD restrictions, habitat for Fountain Thistle, an endangered plant species, was discovered in areas formerly inundated by the reservoir. Raising the reservoir elevation now requires that new plant populations be reinstated incrementally before the reservoir elevation is restored. The result is that it may be several years before pre-project water storage volumes can be realized.

Regional Groundwater Storage and Recovery Project. The Regional Groundwater Storage and Recovery (GSR) Project is a strategic partnership between the SFPUC and three San Mateo County agencies: the California Water Service Company (serving South San Francisco and Colma), the City of Daly City, and the City of San Bruno. The project sustainably manages groundwater and surface water resources in order to provide the RWS with additional supplies during times of drought. During years of normal or heavy rainfall, the project would provide additional surface water to the partner agencies in San Mateo County, allowing them to reduce the amount of groundwater that they pump from the South Westside Groundwater Basin. Over time, the reduced pumping would allow the aquifer to naturally recharge and result in increased groundwater storage of up to 61,000 acre feet of new water supply available during dry years.

Phase 1 of this project, which includes constructing of thirteen well sites, is over 99 percent complete. Testing of the groundwater delivery system took place in 2020. Construction of Phase 1 is expected to be complete in 2021. Phase 2 of this project consists of completing construction of the well station at the South San Francisco Main site that was delayed due to access restrictions, and also various carryover work at the other well sites that were not completed during Phase 1.

[15] The project formerly known as the Upper Alameda Creek Filter Gallery Project in the WSIP was later reconfigured as the Alameda Creek Recapture Project.

Phase 2 design work began in early 2020. The 95% design has been completed and submitted to fellow partner agencies for review, and the 100% design package is being drafted.

A new project called "Regional Groundwater Treatment Improvements" was approved in the 10-Year Water Enterprise Capital Improvement Program for FY 2021-2030 and includes treatment facilities for several of the GSR wells to address groundwater quality issues that have emerged since the wells were constructed. This project will be initiated in 2021.

Water Transfers. During the planning and implementation of the Phased WSIP, the SFPUC pursued a long-term agreement to transfer 2 mgd from Modesto Irrigation District (MID) to the SFPUC in drought years. Negotiations with MID ended in 2012 when an agreement could not be reached. The dry-year transfer project is now being included as part of the new SFPUC Alternative Water Supply Program and is described in further detail in Section 7.3.9.

7.3 FACTORS AFFECTING FUTURE RWS SUPPLIES

There are several factors that may impact future RWS supplies; these factors are described below.

7.3.1 Adoption of the 2018 Bay-Delta Plan Amendment

In December 2018, the State Water Resources Control Board (SWRCB) adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) to establish water quality objectives to maintain the health of the Bay-Delta ecosystem. The SWRCB is required by law to regularly review this plan. The adopted Bay-Delta Plan Amendment was developed with the stated goal of increasing salmonid populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay-Delta. The Bay-Delta Plan Amendment requires the release of 30-50% of the "unimpaired flow"[16] on the three tributaries from February through June in every year type. In SFPUC modeling of the new flow standard, it is assumed that the required release is 40% of unimpaired flow.

If the Bay-Delta Plan Amendment is implemented, the SFPUC will be able to meet the projected water demands presented in this UWMP in normal years but would experience supply shortages in single dry years or multiple dry years. Implementation of the Bay-Delta Plan Amendment will require rationing in all single dry years and multiple dry years.

The SWRCB has stated that it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, assuming all required approvals are obtained by that time. But implementation of the Plan Amendment is uncertain for multiple reasons.

- Since adoption of the Bay-Delta Plan Amendment, over a dozen lawsuits have been filed in both state and federal courts, challenging the SWRCB's adoption of the Bay-Delta Plan Amendment, including a legal challenge filed by the federal government, at the request of the U.S. Department of Interior, Bureau of Reclamation. This litigation is in the early stages and there have been no dispositive court rulings as of this date.
- The Bay-Delta Plan Amendment is not self-implementing and does not automatically allocate responsibility for meeting its new flow requirements to the SFPUC or any other water rights holders. Rather, the Bay-Delta Plan Amendment merely provides a regulatory framework for flow allocation, which must be accomplished by other regulatory and/or adjudicatory proceedings, such as a comprehensive water rights adjudication or, in the case of the Tuolumne River, may be implemented through the water quality certification process set forth in section 401

[16] "Unimpaired flow represents the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds." (Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Dec. 12, 2018) p.17, fn. 14, available at https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf.)

of the Clean Water Act as part of the Federal Energy Regulatory Commission's (FERC) licensing proceedings for the Don Pedro and La Grange hydroelectric projects.

- On January 15, 2021, the SWRCB released the Clean Water Act section 401 Water Quality Certification for the Turlock Irrigation District and Modesto Irrigation District Don Pedro Hydroelectric Project and La Grange Hydroelectric Project, FERC Project Nos. 2299 and 14581 (WQC). The WQC includes the 40% unimpaired flow objective from the Bay Delta Plan Amendment, as well as additional conditions that, if incorporated into FERC licenses for the Don Pedro and La Grange Projects, would severely impact SFPUC's water supply; the WQC's requirements differ significantly from the recommended flows and conditions that FERC has analyzed in the Staff Alternative of its Final Environmental Impact Statement for the licenses. To date, FERC has not taken action to incorporate the WQC into the licenses or to finalize the licenses for issuance. At this time, it is highly uncertain whether the WQC will be implemented by either the state or federal government for several reasons:

    - On February 16, 2021, multiple parties, including the City, Modesto and Turlock Irrigation Districts, and BAWSCA, filed with the SWRCB Petitions for Reconsideration of the WQC. Those petitions are currently pending before the SWRCB. In its March 15, 2021 order denying the Districts' request for a stay of the WQC, SWRCB stated that "[i]t is not the State Water Board's practice to seek enforcement while a petition for reconsideration of a certification is pending" and that "the State Water Board has *never* sought to enforce a certification before [a FERC] license is issued." (SWRCB, Order No. WQ 2021-0007-EXEC.) SWRCB emphasized that there was further "no information to support the conclusion that FERC will imminently issue licenses incorporating some or all of the certification." (Id.)

    - If the SWRCB denies the pending petitions for reconsideration or otherwise fails to revise or rescind the WQC, litigation is expected. In addition, the Districts filed a petition for declaratory order at FERC alleging that the SWRCB has waived its authority to issue the WQC, and they sought rehearing of FERC's January 19, 2021 order denying that petition. On March 22, 2021, FERC issued a Notice of Denial of Rehearing by Operation of Law and Providing for Further Consideration. The Districts have the option to appeal FERC's decision. These legal challenges could take years to resolve and may result in temporary or permanent stays of implementation of the WQC. FERC's policy is not to issue a license when a WQC has been stayed pending appeal within a state process. *See Alcoa Power Generating Inc.*, 130 FERC ¶ 61,037, P 15 (2010).

    - Aside from legal challenges, there are additional steps to complete in the licensing process before FERC is likely to issue the licenses: (a) completion of Endangered Species Act consultation, and (b) additional environmental review under NEPA to evaluate the WQC conditions. FERC also cannot issue the licenses without making a determination that the terms and conditions, including the requirements of the WQC, meet the statutory criteria of the Federal Power Act.

    - If FERC were to issue license(s) for the Don Pedro and La Grange Projects incorporating the current WQC, the Districts and other parties to the licensing proceeding would have the option to seek rehearing of FERC's licensing order, and depending on the outcome of that process, then challenge the license(s) in the court and seek a stay. The Districts would also have the option to refuse to accept the license(s).

Due to the above, it is speculative whether the current WQC will be placed in the FERC licenses and when these licenses will be issued. Accordingly, this UWMP does not model projections of SFPUC water supply under the WQC.

In recognition of the obstacles to implementation of the Bay-Delta Plan Amendment, the SWRCB Resolution No. 2018-0059 adopting the Bay-Delta Plan Amendment directed staff to help complete a "Delta watershed-wide agreement, including potential flow measures for the Tuolumne River" by March 1, 2019, and to incorporate such agreements as an

"alternative" for a future amendment to the Bay-Delta Plan to be presented to the SWRCB "as early as possible after December 1, 2019." In accordance with the SWRCB's instruction, on March 1, 2019, the SFPUC, in partnership with other key stakeholders, submitted a proposed project description for the Tuolumne River that could be the basis for a voluntary substitute agreement with the SWRCB ("March 1st Proposed Voluntary Agreement"). On March 26, 2019, the SFPUC adopted Resolution No. 19-0057 to support the SFPUC's participation in the Voluntary Agreement negotiation process. To date, those negotiations are ongoing under the California Natural Resources Agency and the leadership of the Newsom administration.[17]

Because of the uncertainty surrounding implementation of the Bay-Delta Plan Amendment, the water service reliability assessment presented in Section 8 of this draft UWMP looks at two future supply scenarios, both with and without implementation of the Bay-Delta Plan Amendment. Although the SWRCB has stated it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, given the current level of uncertainty, it is assumed for the purposes of this draft UWMP that the Bay-Delta Plan Amendment will be fully implemented starting in 2023.

7.3.2 Potential State and Federal Regulations

The SFPUC's operation of the RWS is subject to numerous State and federal agency permits designed to protect drinking water quality and the environment. Some permit requirements have been in place for decades and influence the way water supply is managed. Requirements for instream flows, for example, may increase the releases or bypass flow from SFPUC facilities. In the Tuolumne River watershed, the SFPUC currently maintains a specific flow release schedule downstream of Hetch Hetchy Reservoir, Cherry Lake, and Lake Eleanor. When the WSIP was analyzed in the PEIR, local system reservoirs had no formal flow release requirements, so no instream flow release and bypass requirements were reflected in the water supply program for the Calaveras Dam Replacement and Lower Crystal Springs Dam Improvement Projects. However, as noted earlier, changes to the flow schedules for dams on Alameda and San Mateo Creeks that resulted from project permitting impacted the water supply reliability of the RWS. Permitting for future projects may further impact water supply reliability through additional instream flow release or bypass requirements.

As described in Section 3.1.4, the SFPUC uses a portion of Don Pedro Reservoir as a water bank under agreement with the Districts. The re-licensing of the Don Pedro reservoir by FERC may require additional water released from the reservoir for the preservation of aquatic species in the lower Tuolumne River, potentially affecting the yield of the RWS by reducing the balance of water stored in the water bank. The final Environmental Impact Statement was released by FERC on July 7, 2020. There is no schedule for when FERC will issue the relicense.

7.3.3 Additional Water Supply Decisions

In the 2009 WSA, the SFPUC committed to make two decisions before the end of 2018 that affect water supply development:

- Whether or not to make the Cities of San Jose and Santa Clara permanent customers of the RWS, and
- Whether or not to increase Supply Assurance above 184 mgd to meet future Wholesale Customer demands.

The SFPUC determined prior to 2018 that it needed to reevaluate water system demands and supply options, and conduct additional supply reliability studies and environmental reviews necessary to address the water supply decisions. As a result, instead of arriving at a decision point in 2018, the SFPUC and the Wholesale Customers updated the WSA and deferred the supply decisions to 2028 to allow the SFPUC to conduct the necessary water supply planning and CEQA analysis.

[17] California Natural Resources Agency, "Voluntary Agreements to Improve Habitat and Flow in the Delta and its Watersheds," available at **https://files.resources.ca.gov/voluntary-agreements/**.

The SFPUC's planning efforts to fulfill the water supply needs for the Cities of San Jose and Santa Clara are included in the Alternative Water Supply Program as described further below in Section 7.4.

7.4 ALTERNATIVE WATER SUPPLY PROGRAM

The SFPUC is increasing and accelerating its efforts to acquire additional water supplies and explore other projects that would increase overall water supply resilience through the Alternative Water Supply Planning Program. The drivers for the program include: (1) the adoption of the Bay-Delta Plan Amendment and the resulting potential limitations to RWS supply during dry years, (2) the net supply shortfall following the implementation of WSIP, (3) San Francisco's perpetual obligation to supply 184 MGD to the Wholesale Customers, (4) adopted Level of Service (LOS) Goals and Objectives to limit rationing to no more than 20 percent system-wide during droughts, and (5) the potential need to identify water supplies that would be required to offer permanent status to interruptible customers. Developing additional supplies through this program would reduce water supply shortfalls and reduce rationing associated with such shortfalls. The planning priorities guiding the Alternative Water Supply Program are as follows:

1. Offset instream flow needs and meet regulatory requirements
2. Meet existing obligations to existing permanent customers
3. Make interruptible customers permanent
4. Meet increased demands of existing and interruptible customers

In conjunction with these planning priorities, the SFPUC considers how the new framework fits within the LOS Goals and Objectives related to water supply and sustainability when considering new water supply opportunities. The SFPUC adopted LOS Goals and Objectives in 2008, in conjunction with the adoption of WSIP. The key LOS Goals and Objectives relevant to this effort can be summarized as:

- Meet dry-year delivery needs while limiting rationing to a maximum of 20 percent system-wide reduction in water service during extended droughts;
- Diversify water supply options during non-drought and drought periods;
- Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers;
- Meet, at a minimum, all current and anticipated legal requirements for protection of fish and wildlife habitat;
- Maintain operational flexibility (although this LOS Goal was not intended explicitly for the addition of new supplies, it is applicable here).

Together, the planning priorities and LOS Goals and Objectives provide a lens through which the SFPUC considers water supply options and opportunities to meet all foreseeable water supply needs.

In addition to the Daly City Recycled Water Expansion project[18], which was a potential project identified in the 2015 UWMP and had committed funding at that time, the SFPUC has taken action to fund the study of several other potential additional water supply projects. Capital projects under consideration to develop additional water supplies include surface

[18] While this potential project was identified in the 2015 UWMP, it has since been approved by Daly City following environmental review and has a higher likelihood of being implemented.

water storage expansion, recycled water expansion, water transfers, desalination, and potable reuse projects. A more detailed list and descriptions of these efforts are provided below.

The capital projects that are under consideration would be costly and are still in the early feasibility or conceptual planning stages. Because these water supply projects would take 10 to 30 years to implement, and because required environmental permitting negotiations may reduce the amount of water that can be developed, the yield from these projects are not currently incorporated into the SFPUC's supply projections. State and federal grants and other financing opportunities would be pursued for eligible projects, to the extent feasible, to offset costs borne by ratepayers.

If all the projects identified through the current planning process could be implemented, there would still be a supply shortfall to meet projected needs. Furthermore, each of the supply options being considered has its own inherent challenges and uncertainties that may affect the SFPUC's ability to implement it.

Given the limited availability of water supply alternatives - unless the supply risks are significantly reduced or the SFPUC's needs change significantly - the SFPUC will continue to plan, develop, and implement all project opportunities that can help bridge the anticipated water supply gaps during droughts. In 2019, the SFPUC completed a survey among water and wastewater agencies within the SFPUC's service area to identify additional opportunities for purified water. Such opportunities remain limited, but the SFPUC continues to pursue all possibilities.

The SFPUC will prepare an Alternative Water Supply Plan by July 2023, which will include a planning framework that will consider water supply needs and related tradeoffs, guide the decisions to proceed with environmental review, and continue the development of projects that can best meet anticipated water supply needs. In the meantime, the SFPUC has been preparing quarterly reports that provide an update on the status of planning efforts regarding the regional and local water supply, storage, and related infrastructure planned projects.

The following capital projects are the alternative local and regional water supply and storage projects that represent the SFPUC's early planning to meet future water supply challenges and vulnerabilities, such as environmental flow needs and other regulatory changes, earthquakes, disasters and emergencies, population and employment increases, and climate change.

7.4.1 Local Projects

San Francisco Purified Water. The San Francisco Purified Water Project envisions providing a new, local drinking water supply in San Francisco. The project would treat secondary effluent sourced from the SFPUC's Southeast Treatment Plant or Oceanside Treatment Plant through a multi-stage, multi-barrier advanced treatment process to produce water that meets state and federal drinking water standards. The treated water would then be blended at one or more of San Francisco's drinking water reservoirs. Before engaging at a project-level, the SFPUC will participate in research and data collection around water quality and process reliability for purified water opportunities.

With the successful completion of PureWaterSF, San Francisco's initial research and demonstration of a small-scale Direct Potable Reuse (DPR) project, the SFPUC is beginning to plan next steps for the development of purified water. SFPUC staff has begun putting together a scope of work to consider the size and scope of purified water opportunities in San Francisco, as well as identify research, training and outreach needs.

Satellite Recycled Water. A potential Satellite Recycled Water Project would provide a tertiary recycled water supply to meet the demands of dual plumbed buildings in San Francisco that do not currently have a non-potable water supply source. This project would provide an appropriate water supply source for non-potable irrigation, as well as commercial and industrial uses not addressed by the Non-Potable Water Ordinance.

Innovations Program. This program supports the development of new technologies and initiatives. Included in the Innovations Program are demonstrations of new technologies and grant funds to support partnership opportunities. Examples of projects within the Innovations Program include a grant program to treat process in breweries, and grants to support onsite reuse projects with heat recovery systems. The SFPUC is also pursuing a prospective project to expand leak detection and a project to test atmospheric water generation technology.

Potable Offset Potential. The purpose of this project is to explore the potential to offset the incremental water demand associated with large new developments in San Francisco. Through coordination with other City departments such as Planning and the Department of Building Inspection, the SFPUC will identify options and potable water thresholds that may result in policy recommendations. The first step in the planning process will be to survey proposed developments to determine the volume and characteristics of incremental demand that are not already being offset by the Non-Potable Water Ordinance or other existing requirements. An initial review of existing potable offset programs has been conducted.

7.4.2 Regional Projects

Daly City Recycled Water Expansion. This project has been designed to produce up to 3 mgd of tertiary recycled water during the irrigation season (~7 months). On an average annual basis, this is equivalent to 1.25 mgd or 1,400 acre-feet per year. The project is envisioned to provide recycled water to 13 cemeteries and other smaller irrigation customers, offsetting existing groundwater pumping from the South Westside Groundwater Basin; this will increase groundwater storage, enhancing the reliability of the GSR Project in the Basin. The project is a regional partnership between the SFPUC the City of Daly City, and the California Water Service Company, whose service area includes numerous irrigators using a combination of groundwater and surface water from the RWS. RWS customers will benefit from the increased reliability of the South Westside Basin for additional drinking water supply during droughts.

ACWD-USD Purified Water Partnership. This project could provide a new purified water supply to the RWS utilizing Union Sanitary District's (USD) treated wastewater. Purified water produced by advanced water treatment at USD in the East Bay could be transmitted to the Quarry Lakes Groundwater Recharge Area to supplement recharge into the Niles Cone Groundwater Basin as part of an indirect potable reuse project or be put to other uses in ACWD's service area. With the latter option, providing additional water supply to ACWD as part of an in-lieu exchange with the SFPUC would result in more water left in the RWS. Additional water supply could also be directly transmitted to the SFPUC through a new intertie between ACWD and the SFPUC.

Crystal Springs Purified Water. The Crystal Springs Purified Water Project, also referred to as the Potable Reuse Exploratory Plan (PREP) is a purified water project (indirect potable reuse) that could provide 6-12 mgd of water supply through reservoir water augmentation at Crystal Springs Reservoir, which is a facility of the RWS. Treated wastewater from Silicon Valley Clean Water (SVCW) and/or the City of San Mateo would go through an advanced water treatment plant to produce purified water that meets state and federal drinking water quality standards. The purified water would then be transmitted 10-20 miles (depending on the alignment) to Crystal Springs Reservoir, blended with regional surface water supplies, and treated again at Harry Tracy Water Treatment Plant.

Los Vaqueros Reservoir Expansion. The Los Vaqueros Reservoir Expansion (LVE) Project is a multi-agency storage project that will enlarge the existing reservoir located in northeastern Contra Costa County from 160,000 acre-feet to 275,000 acre-feet. While the existing reservoir is owned and operated by Contra Costa Water District (CCWD), the expanded reservoir will have regional benefits for numerous water agencies and their customers and will be managed by a Joint Powers Authority (JPA) that will be set up prior to construction. Meanwhile, CCWD is leading the planning, design and environmental review efforts. CCWD's Board certified the EIS/EIR and approved the LVE Project on May 13, 2020.

The additional storage capacity from the LVE Project would provide a dry year water supply benefit to the SFPUC. However, the challenges of securing a water supply to store in the SFPUC's portion of reservoir and ensuring there is an

available path for conveyance of that water supply to and from the reservoir may both be significant barriers to realizing the full water supply potential of storage for SFPUC customers. In particular, issues related to conveyance must be better understood before the SFPUC can determine the extent of its participation in the LVE project. As such, this project is being planned in conjunction with the following projects described below: Conveyance Alternatives, the Bay Area Regional Reliability (BARR) Shared Water Access Program, and the Bay Area Brackish Water Desalination Project.

Conveyance Alternatives. The SFPUC is considering two main pathways to move water from storage in a prospective LVE Project to the SFPUC's service area: either directly to RWS facilities or indirectly via an exchange with partner agencies. The SFPUC is evaluating potential alignments for conveyance.

The Bay Area Regional Reliability (BARR) Shared Water Access Program. As part of the BARR Partnership, a consortium of 8 Bay Area water utilities (including ACWD, BAWSCA, CCWD, East Bay Municipal Utility District (EBMUD), Marin Municipal Water District (MMWD), SFPUC, Valley Water, and Zone 7 Water Agency) are exploring opportunities to move water across the region as efficiently as possible, particularly during times of drought and emergencies. The BARR agencies are proposing two separate pilot projects in 2020-2021 through the Shared Water Access Program (SWAP) to test conveyance pathways and identify potential hurdles to better prepare for sharing water during a future drought or emergency. A strategy report identifying opportunities and considerations will accompany these pilot projects and will be completed in 2021.

Bay Area Brackish Water Desalination. The Bay Area Brackish Water Desalination (Regional Desalination) Project is a partnership between CCWD, SFPUC, Valley Water, and Zone 7 Water Agency. EBMUD and ACWD may also participate in the project. The project could provide a new drinking water supply to the region by treating brackish water from CCWD's existing Mallard Slough intake in Contra Costa County. While this project has independent utility as a water supply project, for the current planning effort the SFPUC is considering it as a source of supply for storage in LVE. While the allocations remain to be determined among partners, the SFPUC is considering the project would provide a water supply benefit to its customers of between 5 and 15 mgd during drought conditions when combined with storage at LVE.

Calaveras Reservoir Expansion. This storage project envisions the expansion of the existing Calaveras Reservoir to create up to 289,000 AF of additional capacity to store excess RWS supplies or other source water in wet and normal years. In addition to reservoir enlargement, the project would involve infrastructure to pump water to the reservoir, such as pump stations and transmission facilities. Unlike the other regional projects under review in this program, no external partners are anticipated for this project. The SFPUC has conducted a preliminary analysis reviewing potential dam raise scenarios, which indicated that an expansion of the dam at various elevations is technical feasible. Water supply, conveyance, and capacity constraints at related facilities will be evaluated.

Groundwater Banking. Groundwater banking in the Modesto Irrigation District (MID) and Turlock Irrigation District (TID) service areas could be used to provide some additional water supply to meet instream releases in dry years, reducing water supply impacts to the SFPUC service area. For example, additional surface water could be provided to irrigators in wet years, which would offset the use of groundwater, thereby allowing the groundwater to remain in the basin rather than be consumptively used. The groundwater that remains in the basin can then be used in a subsequent dry year for irrigation, freeing up surface water that would have otherwise been delivered to irrigators to meet instream flow requirements.

Feasibility study of this option is included in the proposed Tuolumne River Voluntary Agreement. Progress on this potential water supply option will depend on the negotiations of the Voluntary Agreement.

Inter-Basin Collaborations. Inter-Basin Collaborations could provide net water supply benefits in dry years by sharing responsibility for in-stream flows in the San Joaquin River and Delta more broadly among several tributary reservoir systems. One mechanism by which this could be accomplished would be to establish a partnership between interests on

the Tuolumne River and those on the Stanislaus River, which would allow responsibility for streamflow to be assigned variably based on the annual hydrology.

As is the case with Groundwater Banking, feasibility of this option is included in the proposed Tuolumne River Voluntary Agreement.

Dry-Year Transfers. WSIP included a water transfer between the SFPUC and other water users on the Tuolumne River. In 2012, staff of the SFPUC and MID developed a term sheet for a 2 mgd dry-year water supply transfer for approval by their governing boards. The SFPUC and MID were ultimately unable to reach agreement on mutually beneficial terms and the water transfer negotiations were terminated. Subsequently, the SFPUC began discussions with the Oakdale Irrigation District (OID) for a one-year transfer agreement with the SFPUC for 2 mgd. No progress towards agreement on a transfer was made in 2020, but the irrigation districts recognize the SFPUC's continued interest, and the SFPUC is continuing to pursue transfers in conjunction with ongoing discussions associated with the implementation of the Bay-Delta Plan Amendment.

7.5 BAY AREA REGIONAL EFFORTS TO IMPROVE WATER SUPPLY RELIABILITY

The following projects and efforts are currently underway or completed and will help the RWS meet its water supply reliability needs. Some of these projects are reflected in the SFPUC's current strategy for meeting water supply needs described above. As the remainder of these projects move through the planning stages, they will continue to inform the SFPUC's water supply strategy.

Bay Area Regional Reliability. The SFPUC is continuing to work with seven water agencies in the Bay Area (ACWD, BAWSCA, CCWD, EBMUD, MMWD, Valley Water and Zone 7 Water Agency) to investigate opportunities for collaboration, particularly during future droughts. The purpose of this planning effort, known as Bay Area Regional Reliability (BARR), is to identify projects and processes to enhance water supply reliability across the region, leverage existing infrastructure investments, facilitate water transfers during critical shortages, and improve climate change resiliency. In 2017, with funding support from the U.S. Bureau of Reclamation, the BARR partner agencies completed a Drought Contingency Plan. The Plan identified short-term response actions and longer-term projects that could facilitate the sharing of infrastructure for the benefit of the region including interties, expanded storage, new water supply and operational improvements. To further evaluate the potential for building regional resilience, in 2019 the BARR partners (with the exception of MMWD) initiated development of the Bay Area Shared Water Access Program (Bay Area SWAP). The Bay Area SWAP effort has also received funding support from the U.S. Bureau of Reclamation and is ongoing. The goal of Bay Area SWAP is to develop a Strategy Report outlining an implementation plan to facilitate transfers to and exchanges within the Bay Area, leveraging existing infrastructure and institutional agreements and identifying new components that may be needed. Through the Drought Contingency Plan and Bay Area SWAP efforts, the BARR partner agencies have convened a Stakeholder Task Force to provide stakeholders, interested parties and BARR partners an opportunity for meaningful engagement and input.

Regional Interties. Regional interties help increase the reliability of the RWS by allowing for water exchanges during emergencies, water shortages, or maintenance.

- **EBMUD-Hayward-SFPUC Emergency Intertie:** In 2002, the SFPUC formed a partnership with EBMUD and the City of Hayward to construct Skywest Pump Station and 1.5 miles of pipeline to link their systems. These facilities can convey up to 30 mgd among these three agencies to boost water supply reliability when needed. EBMUD and the SFPUC own these facilities jointly, while the City of Hayward maintains and operates them in coordination with EBMUD and the SFPUC.

- **SFPUC-Valley Water Emergency Intertie:** The SFPUC and Valley Water maintain a 40-mgd intertie between their two systems at Milpitas to exchange water during emergencies and planned maintenance. The intertie has been used on several occasions during maintenance of Valley Water's system.

- **South Bay Aqueduct Interties:** In the 1990s, the SFPUC used a temporary intertie from the South Bay Aqueduct into San Antonio Reservoir for water a two-year water transfer. To enable deliveries from the Los Vaqueros Reservoir Expansion project, the SFPUC is evaluating the potential for a new intertie.

Bay Area Integrated Regional Water Management Plan. The SFPUC chairs the nine-county Bay Area Integrated Regional Water Management Plan Coordinating Committee. The BAIRWMP was first completed in November 2006 and was updated in 2013 and 2019. The BAIRWMP describes the region's water supply and water quality, wastewater and water recycling, storm water and flood protection, and habitat protection and ecosystem restoration objectives and efforts. The BAIRWMP also identifies integrated and collaborative projects among Bay Area agencies. To date, the Bay Area has received $148.5 million in Propositions 50 and 84 Integrated Regional Water Management (IRWM) implementation grant funding. More recently, the Bay Area received $65 million in Proposition 1 IRWM grant funding for implementation, planning, and disadvantaged community involvement efforts.

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SECTION 8: WATER SUPPLY RELIABILITY ASSESSMENT

8.1 CONSTRAINTS ON SUPPLIES

The list below summarizes the legal, environmental, water quality, climatic, and other factors potentially resulting in inconsistent supply.

- **RWS:** As described previously, there may be shortfalls of RWS supplies in dry years as a result of several factors, including required instream flow releases (see Section 7.3) as well as climate change (see Section 6.1.3).

- **Retail Groundwater:** Groundwater supplies are typically limited by the quality and quantity of available supplies. However, the probability of these impacts occurring is low with proper management of the Westside Groundwater Basin as described in Section 6.2.1.1.

- **Retail Recycled Water:** Recycled water is limited by water quality requirements that legally restrict recycled water supply for some uses. However, recycled water supplies discussed herein are treated, or are planned to be treated, to the standards established by State agencies that are required for each designated end use. As a result, no limitations on use of recycled water for designated purposes are expected to occur.

The adoption of the Bay-Delta Plan Amendment may significantly impact the supply available from the RWS. The SFPUC recognizes that the Bay-Delta Plan Amendment has been adopted and that, given that it is now state law, we must plan for a future in which it is fully implemented. The SFPUC also acknowledges that the plan is not self-implementing and therefore does not automatically go into effect. The SFPUC is currently pursuing a voluntary agreement as well as a lawsuit which would limit implementation of the Plan. With both of these processes occurring on an unknown timeline, the SFPUC does not know at this time when the Bay-Delta Plan Amendment is likely to go into effect. As a result, it makes sense to conduct future supply modeling for a scenario that doesn't include implementation of the Bay-Delta Plan Amendment, as that represents a potential supply reliability scenario.

Because of the uncertainty surrounding implementation of the Bay-Delta Plan Amendment, the following water service reliability assessment includes two sets of tables: (1) a scenario in which the Bay-Delta Plan Amendment is fully implemented in 2023, and (2) a scenario that considers the SFPUC system's current situation without the Bay-Delta Plan Amendment. The two scenarios provide a bookend for the possible future scenarios regarding RWS supplies. The standardized tables associated with this UWMP contain the future scenario that assumes implementation of the Bay-Delta Plan Amendment starting in 2023.

8.2 WATER SUPPLY MODELING

8.2.1 Data & Methods

The SFPUC used the Hetch Hetchy and Local Simulation Model (HHLSM) to perform the water supply analyses for the supply reliability assessment and the drought risk assessment. HHLSM combines a historical record of hydrology from 1920 through 2017 with a current representation of SFPUC RWS infrastructure and operations. The simulated operations include decisions on water supply rationing during droughts. The use of those results is described below.

A key input for the HHLSM model is the anticipated level of demand on the RWS. Supply modeling results presented in the text of this plan reflect an input of projected demands on the RWS consisting of (1) projected retail demands on the RWS (total retail demands minus local groundwater and recycled water supplies, see Table 4-1 and Table 6-5), and (2) projected Wholesale Customer purchases (see Table 4-3). The SFPUC has a Level of Service objective of meeting average annual water demand of 265 mgd from the SFPUC watersheds for retail and Wholesale Customers during non-

drought years, as well as a contractual obligation to supply 184 mgd to the Wholesale Customers. Therefore, the SFPUC has also conducted modeling based on a demand of 265 mgd in order to facilitate planning that supports meeting this Level of Service goal and our contractual obligations. The results of this modeling can be found in Appendix J.

Note that, as shown in Appendix J, in a normal year the SFPUC can provide up to 265 mgd of supply from the RWS. However, as described previously in Section 6.1.4, within the context of this document, normal year RWS supply is defined as the supply that will be used to meet the full demands on the RWS in a normal year.

8.2.2 Design Drought

In the six-year period from 1987-92, a shortfall developed between the SFPUC's supplies and its customers' demands such that significant rationing of water supply became necessary. Other than during the drought of 1976-77, drought sequences in the past did not seriously affect the ability of the RWS to sustain full deliveries to its retail and wholesale customers. Following the 1987-92 drought experience, the SFPUC includes the concept of its "firm" capability in water supply planning, which is defined as the amount of water the RWS can be expected to deliver during drought periods.

The SFPUC uses a hypothetical drought that is more severe than what the RWS has historically experienced. This drought sequence is referred to as the "design drought" and serves as the basis for planning and modeling of future scenarios. The design drought consists of the 1987-92 drought, followed by an additional 2.5 years of dry conditions from the hydrologic record that include the 1976-77 drought. While the latest drought (2012-2015) consists of some of the driest years on record for the SFPUC's watersheds, the design drought still represents a more severe drought in duration and overall water supply deficit.

More specifically, the design drought sequence used by the SFPUC for reliability planning is an 8.5-year period composed of the following elements:

- **Historical Hydrology:** A six-year sequence of hydrology from the historical drought that occurred from July 1986 to June 1992;
- **Prospective Drought:** A 2.5-year period that includes the 1976-77 drought (to represent a drought sequence worse than historical); and
- **System Recovery Period:** The last six months of the design drought are the beginning of the system recovery period. The precipitation begins in the fall, and by approximately the month of December, inflow to RWS reservoirs exceeds customer demands and SFPUC system storage begins to recover.

8.2.3 Definition of Water Supply Scenarios *(Normal, Dry, and Multi-dry Years)*

The total amount of water the SFPUC can deliver to retail and wholesale customers depends on several factors, including the amount of water that is available to the SFPUC from natural runoff, the amount of water in reservoir storage, and the amount of that water that must be released from the RWS for purposes other than customer deliveries (e.g., required instream flow releases below RWS reservoirs). For planning purposes, the SFPUC "normal year" is based on historical hydrology under conditions that allow the reservoirs to be filled over the course of the snowmelt season, allowing full deliveries to customers.

For dry-year supply scenarios, the SFPUC plans its water deliveries using indicators for water supply rationing that are developed through analysis with the design drought sequence described above. As a result, the SFPUC system operations are designed to provide sufficient carry-over water in SFPUC reservoirs to continue delivering water, although at reduced levels, during and after multiple-year droughts.

The supply reliability assessment presented herein assumed the statuses of the ongoing WSIP projects shown in Table 8-1. The WSIP projects will contribute to reducing the anticipated RWS supply reductions in a multi-dry year event.

The levels of water supply deficiency presented for this 2020 UWMP were estimated using the design drought methodology discussed above. The five-consecutive-year dry sequence shown in the tables below represents years 2 through 6 of the design drought; this sequence was chosen because year 2 is the first year when system-wide rationing would come into effect. The results are presented in the standardized format prescribed by DWR for use in the 2020 UWMPs.

Table 8-2 and Table 8-3 summarize the expected availability of local groundwater, recycled water, and RWS supplies under normal, single dry, and multiple dry year conditions. These are the bases for the retail and wholesale supply reliability assessments presented in Sections 8.3 and 8.4. The SFPUC currently operates under a plan that anticipates multiple stages of response to water supply shortages, ranging from use of dry year water supplies (when available) and voluntary customer demand reductions to enforced mandatory water use reductions.

For RWS supplies, supply modeling both with and without the implementation of the Bay-Delta Plan Amendment is included here. The two modeled scenarios show significantly different supply reliability projections for the RWS:

- **With Full Implementation of the Bay-Delta Plan Amendment:** Under the Bay-Delta Plan Amendment conditions, it is anticipated that the RWS supplies will experience a reduction of up to 49% from normal year supplies through the multiple dry-year sequence. The implementation of the Alternative Water Supply Program and associated potential projects will help reduce the anticipated supply shortfalls.

- **Without Implementation of the Bay-Delta Plan Amendment:** Assuming the availability of existing supplies at current demand levels, the SFPUC system can expect to experience no RWS supply reductions until the level of demand anticipated in 2045 is reached. At that level of demand, 10% shortages of RWS supply would occur in years 4 and 5 of the five-consecutive dry year sequence.

Table 8-1. WSIP Project Assumptions for RWS Supply Modeling

Projects	Base Year 2020	Base Year 2025 and Beyond
Calaveras Dam Replacement Project	Calaveras Reservoir partially refilled at spring 2020 level of 63,900 AF	Calaveras Reservoir fully refilled
Lower Crystal Springs Dam Improvements	Crystal Springs storage not fully restored	Crystal Springs storage not fully restored
Regional Groundwater Storage and Recovery (GSR) Project	GSR account partially filled at spring 2020 level of 23,500 AF; GSR recovery rate of 6.2 mgd[a]	GSR account fully filled; GSR recovery rate of 6.2 mgd[a]
Alameda Creek Recapture Project	Project not built	Project built
Dry-year Transfers	Not in effect	Not in effect

[a] The GSR Project was intended to provide 7.2 mgd over 7.5 years, however current limitations on the number of wells available will result in deliveries less than 7.2 mgd over 7.5 years.

Table 8-2. Retail Groundwater and Recycled Water Supply Availability During Normal and Dry Years Using 2025 Base Year

[Standardized Table 7-1 Retail: Bases of Water Year Data]

Water Supply	Normal Year	Single Dry Year	Multiple Dry Years				
			Year 1	Year 2	Year 3	Year 4	Year 5
Projected Years 2025 through 2045 (post-WSIP completion) – both with and without Bay-Delta Plan Amendment							
Local Groundwater[a]	100%	100%	100%	100%	100%	100%	100%
Local Recycled Water[a]	100%	100%	100%	100%	100%	100%	100%

Normal, single dry, and multiple dry year conditions are on a water year basis. Dry year availability is presented in terms of percentage of normal year availability. Groundwater and recycled water availability are not impacted by the implementation of the Bay-Delta Plan Amendment.

a Local supplies are available only to meet retail demands.

Table 8-3. Regional Water System Supply Availability During Normal and Dry Years for Base Years 2025 through 2045 – With and Without Bay-Delta Plan Amendment

Base Year	Normal Year[a]	Single Dry Year	Multiple Dry Years				
			Year 1	Year 2	Year 3	Year 4	Year 5
With Bay-Delta Plan Amendment							
2020[b]	100%	100%	100%	100%	60%	60%	60%
2025	100%	70%	70%	60%	60%	60%	60%
2030	100%	70%	70%	60%	60%	60%	60%
2035	100%	70%	70%	60%	60%	60%	55%
2040	100%	70%	70%	60%	60%	53%	53%
2045	100%	60%	60%	60%	60%	51%	51%
Without Bay-Delta Plan Amendment							
2020	100%	100%	100%	100%	100%	100%	100%
2025	100%	100%	100%	100%	100%	100%	100%
2030	100%	100%	100%	100%	100%	100%	100%
2035	100%	100%	100%	100%	100%	100%	100%
2040	100%	100%	100%	100%	100%	100%	100%
2045	100%	100%	100%	100%	100%	90%	90%

Normal, single dry, and multiple dry year conditions are on a water year basis. Dry year availability is presented in terms of percentage of normal year availability.

RWS supplies are available to meet both retail and wholesale demands. Retail and wholesale allocations are provided in Section 8.3 and Section 8.4(Table 8-4 and Table 8-6 for retail, and Table 8-5 and Table 8-7 for wholesale)

a Normal year supply corresponds to supply that will be used to meet the full demands on the RWS in a normal year, as shown in Table 6-1.

b For base year 2020, the Bay-Delta Plan Amendment is assumed to come into effect in 2023, which is shown here as Year 3 of the multiple dry year sequence.

8.2.4 Allocating Regional Water System Supply

In order to compare retail and wholesale supplies and demands, the available RWS supply in a dry year must first be allocated between the Retail and Wholesale Customers. Procedures to allocate RWS supplies between Retail and Wholesale Customers during system shortages are specified in the SFPUC's Water Shortage Allocation Plan (WSAP), which is an appendix to the Water Supply Agreement. The WSAP is further described in Appendix K. The WSAP defines a percentage split between Retail and Wholesale Customers at different RWS system-wide shortage levels. For example, at a 10% RWS shortage, 36% of available RWS supply is allocated to the Retail Customers, and 64% to the Wholesale Customers. Appendix K presents the percentage splits between Wholesale and Retail Customers at different shortage levels. Per the WSAP, in the event that the retail share of the available water supply results in retail customers having a positive allocation (i.e. a supply of additional water rather than a percentage reduction in water use), the share of the available water supply for retail customers shall be reduced to eliminate any positive allocation, with a corresponding increase in the percentage share of the available water supply allocated to the Wholesale Customers.

In addition, as amended in 2018, the WSAP requires Retail Customers to conserve a minimum of 5% during droughts. If retail demands on the RWS are lower than the retail allocation in a dry year, it is assumed that the retail customers will achieve a 5% demand reduction.

8.3 WATER SUPPLY AND DEMAND COMPARISONS, WITH BAY-DELTA PLAN AMENDMENT

The following sections summarize the projected retail and wholesale supplies and demands during normal, single dry, and multiple dry years for the scenario with full implementation of the Bay-Delta Plan Amendment. The demand assumptions for this analysis are as follows:

- Total retail demands are presented in Section 4.1 and reflect active and passive conservation, onsite water reuse savings, and water loss.
- Wholesale Customer purchase request projections as presented in Table 4-3. A reliability assessment for the Level of Service objective of 265 mgd, which includes the Supply Assurance of 184 mgd, is presented in Appendix J.

Supplies are listed by source: RWS, groundwater (retail only) and recycled water (retail only). The difference between supply and demand, resulting in either a supply surplus or deficit, is also provided for each scenario. As noted earlier, Groveland CSD is accounted for as a retail customer in this section, but, but as a wholesale customer in the corresponding standardized tables in Appendix B.

8.3.1 Retail Water Service Reliability Assessment – With Bay-Delta Plan Amendment

The instream flow requirements of the Bay-Delta Plan Amendment would impact the RWS supplies in the dry-year and multi-dry scenarios. The comparison of retail demands and supplies under the Bay-Delta Plan Amendment is presented in Table 8-4 and demonstrates the following:

- **Normal Years:** During normal hydrologic years, the SFPUC will have adequate supplies to meet its projected retail water demands.

- **Single Dry Year:** During single dry years, there would be an anticipated 30 - 40% shortage of RWS supplies, as described in Table 8-2. When the available RWS supply is allocated between retail and Wholesale Customers (described in Section 8.2.4), and the supplies available to retail customers (RWS plus local supplies) are compared to the projected retail demands (as shown in Table 8-4), a retail supply shortfall of 14% to 25% (11 – 20 mgd) is expected in single dry year conditions.

- **Multiple Dry Years:** If a multiple dry year event occurs, there would be anticipated shortages in RWS supplies of 30 to 49%, depending on demand levels. When the available RWS supply is allocated between retail and Wholesale Customers (described in Section 8.2.4), and the supplies available to retail customers (RWS plus local supplies) are compared to the projected retail demands (as shown in Table 8-4), there is an anticipated shortfall of up to 35%, or almost 29 mgd, by the fifth dry year at 2045 projected levels of demand.

8.3.2 Wholesale Water Service Reliability Assessment – With Bay-Delta Plan Amendment

The comparison of wholesale demands and supplies under the Bay-Delta Plan Amendment presented in Table 8-5 demonstrates the following:

- **Normal Years:** During normal hydrologic years, the SFPUC will have adequate supplies to meet its projected wholesale water demands.

- **Single Dry Year:** During single dry years, there would be an anticipated 30 - 40% shortage of RWS supplies, as described in Table 8-2. When the available RWS supply is allocated between retail and Wholesale Customers (described in Section 8.2.4), and the Wholesale Customer allocation is compared to the projected Wholesale Customer demand (as shown in Table 8-5), this would result in a 36 to 46% (53 – 74 mgd) shortfall for the Wholesale Customers.

- **Multiple Dry Years:** In a multiple dry year event, there would be anticipated shortages in RWS supplies for all projected years, ranging from 30 to 49% shortages. When the available RWS supply is allocated between retail and Wholesale Customers (described in Section 8.2.4), and the Wholesale Customer allocation is compared to the projected Wholesale Customer demand (as shown in Table 8-5), these RWS shortages would result in up to 54% shortfalls for the Wholesale Customers.

Table 8-4. Retail Supply and Demand Comparison for Projected Normal & Dry Year Scenarios With Bay-Delta Plan Amendment (mgd)

[Standardized Table 7-2 Retail: Normal Year Supply and Demand Comparison]

[Standardized Table 7-3 Retail: Single Dry Year Supply and Demand Comparison]

[Standardized Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison]

Year	Retail Supply and Demand	Normal Year	Single Dry Year[a]	Multiple Dry Years[b]				
				Year 1	Year 2	Year 3	Year 4	Year 5
2025	Total Retail Demand	70.7	70.7	70.7	70.7	70.7	70.7	70.7
	Baseline Retail Demand[c]	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*
	WSA 5% Demand Reduction	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	70.7	59.5	59.5	51.5	51.5	51.5	51.5
	Retail Groundwater[e]	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*
	Retail Recycled Water[f]	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*
	RWS Supply Utilized by Retail[g]	*67.2*	*56.0*	*56.0*	*48.0*	*48.0*	*48.0*	*48.0*
	Difference (Supply Surplus or Shortfall)	0.0	-11.2	-11.2	-19.2	-19.2	-19.2	-19.2
	Difference as Percentage of Demand	0.0%	-15.9%	-15.9%	-27.2%	-27.2%	-27.2%	-27.2%
2030	Total Retail Demand	72.4	72.4	72.4	72.4	72.4	72.4	72.4
	Baseline Retail Demand[c]	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*
	WSA 5% Demand Reduction	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	72.4	61.4	61.4	53.4	53.4	53.4	53.4
	Retail Groundwater[e]	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Utilized by Retail[g]	*67.5*	*56.5*	*56.5*	*48.5*	*48.5*	*48.5*	*48.5*
	Difference (Supply Surplus or Shortfall)	0.0	-11.0	-11.0	-19.0	-19.0	-19.0	-19.0
	Difference as Percentage of Demand	0.0%	-15.1%	-15.1%	-26.3%	-26.3%	-26.3%	-26.3%
2035	Total Retail Demand	74.5	74.5	74.5	74.5	74.5	74.5	74.5
	Baseline Retail Demand[c]	*74.5*	*74.5*	*74.5*	*74.5*	*74.5*	*74.5*	*74.5*
	WSA 5% Demand Reduction	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	74.5	63.8	63.8	55.5	55.5	55.5	51.4
	Retail Groundwater[e]	*3.4*	*3.4*	*3.4*	*3.4*	*3.4*	*3.4*	*3.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Utilized by Retail[g]	*68.6*	*57.9*	*57.9*	*49.6*	*49.6*	*49.6*	45.5
	Difference (Supply Surplus or Shortfall)	0.0	-10.7	-10.7	-19.0	-19.0	-19.0	-23.1
	Difference as Percentage of Demand	0.0%	-14.4%	-14.4%	-25.5%	-25.5%	-25.5%	-31.0%
2040	Total Retail Demand	77.4	77.4	77.4	77.4	77.4	77.4	77.4
	Baseline Retail Demand[c]	*77.4*	*77.4*	*77.4*	*77.4*	*77.4*	*77.4*	*77.4*
	WSA 5% Demand Reduction	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	77.4	66.4	66.4	57.9	57.9	52.0	52.0
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*

Year	Retail Supply and Demand	Normal Year	Single Dry Year[a]	Multiple Dry Years[b]				
				Year 1	Year 2	Year 3	Year 4	Year 5
	RWS Supply Utilized by Retail[g]	*70.5*	*59.5*	*59.5*	*51.0*	*51.0*	45.1	45.1
	Difference (Supply Surplus or Shortfall)	0.0	-11.0	-11.0	-19.5	-19.5	-24.5	-25.4
	Difference as Percentage of Demand	0.0%	-14.2%	-14.2%	-25.2%	-25.2%	-32.8%	-32.8%
2045	Total Retail Demand	80.6	80.6	80.6	80.6	80.6	80.6	80.6
	Baseline Retail Demand[c]	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*
	WSA 5% Demand Reduction	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	80.6	60.1	60.1	60.1	60.1	52.1	52.1
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Utilized by Retail[g]	*73.7*	*53.2*	*53.2*	*53.2*	*53.2*	45.2	45.2
	Difference (Supply Surplus or Shortfall)	0.0	-20.5	-20.5	-20.5	-20.5	-28.5	-28.5
	Difference as Percentage of Demand	0.0%	-25.4%	-25.4%	-25.4%	-25.4%	-35.4%	-35.4%

Normal, single dry, and multiple dry year conditions are on a water year basis.

a During a single dry year, system-wide shortages of 30 – 40% are in effect (see Table 8-3). For this analysis, shortages greater than 20% are considered to have the same retail/wholesale allocation as the maximum Stage 4, 16-20% system-wide shortage in the WSAP.

b During multiple dry years, system-wide shortages of 30 – 55% are in effect (see Table 8-3). For this analysis, shortages greater than 20% are considered to have the same retail/wholesale allocation as the maximum Stage 4, 16-20% system-wide shortage in the WSAP.

c Total retail demands correspond to those in Table 4-1, and reflect passive and active conservation, onsite water reuse savings, and water loss. Demands for Groveland CSD is included in the table above. However, in the corresponding standardized tables in Appendix B, Groveland CSD is accounted for as a wholesale customer instead of a retail customer, as explained in Section 2.4.

d As amended in 2018, the WSAP Tier One Allocation Plan requires retail customers to conserve a minimum of 5% during droughts. If, during a declared water shortage, retail demands on the Regional Water System are lower than the retail allocation in a dry year, retail demands on the RWS will be reduced by 5%. An N/A on this row means that either this 5% rationing requirement doesn't apply (i.e. no declared water shortage), or retail customers are already rationing greater than 5%.

e Groundwater supplies are assumed to be equivalent to projected demands for the San Francisco Groundwater Supply Project (ramping up to 4 mgd by 2040) and Castlewood CSA (0.4 mgd). Groundwater availability would not be affected by dry year conditions.

f Recycled water supplies are assumed to be equivalent to projected demands related to the Westside Recycled Water Project (1.6 mgd by 2021 and 1.8 mgd by 2030), Harding Park and Fleming Golf Courses (0.23 mgd), and Sharp Park Golf Course (up to 0.1 mgd) and Treasure Island (0.2 mgd by 2025 and 0.4 mgd by 2030). Recycled water availability would not be affected by dry year conditions.

g Procedures for RWS allocations and the WSAP are described in Section 8.3. Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, in normal years, if groundwater and recycled water supplies are not available, up to 81 mgd of RWS supply could be used.

Table 8-5. Wholesale Supply and Demand Comparison for Projected Normal and Dry Year Scenarios With Bay-Delta Plan Amendment (mgd)

[Standardized Table 7-2 Wholesale: Normal Year Supply and Demand Comparison]

[Standardized Table 7-3 Wholesale: Single Dry Year Supply and Demand Comparison]

[Standardized Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison]

Year	Wholesale Supply and Demand	Normal Year	Single Dry Year[a]	Multiple Dry Years[b]				
				Year 1	Year 2	Year 3	Year 4	Year 5
2025	Total Wholesale Demand[c]	146.0	146.0	146.0	146.0	146.0	146.0	146.0
	Total Wholesale RWS Supply[d]	146.0	93.3	93.3	80.0	80.0	80.0	80.0
	Difference (Surplus or Shortfall)	0.0	-52.7	-52.7	-66.0	-66.0	-66.0	-66.0
	Difference as % of Demand	0.0%	-36.1%	-36.1%	-45.2%	-45.2%	-45.2%	-45.2%
2030	Total Wholesale Demand[c]	147.9	147.9	147.9	147.9	147.9	147.9	147.9
	Total Wholesale RWS Supply[d]	147.9	94.2	94.2	80.8	80.8	80.8	80.8
	Difference (Surplus or Shortfall)	0.0	-53.7	-53.7	-67.1	-67.1	-67.1	-67.1
	Difference as % of Demand	0.0%	-36.3%	-36.3%	-45.4%	-45.4%	-45.4%	-45.4%
2035	Total Wholesale Demand[c]	151.9	151.9	151.9	151.9	151.9	151.9	151.9
	Total Wholesale RWS Supply[d]	151.9	96.5	96.5	82.7	82.7	82.7	75.8
	Difference (Surplus or Shortfall)	0.0	-55.4	-55.4	-69.2	-69.2	-69.2	-76.1
	Difference as % of Demand	0.0%	-36.5%	-36.5%	-45.6%	-45.6%	-45.6%	-50.1%
2040	Total Wholesale Demand[c]	156.3	156.3	156.3	156.3	156.3	156.3	156.3
	Total Wholesale RWS Supply[d]	156.3	99.2	99.2	85.1	85.1	75.1	75.1
	Difference (Surplus or Shortfall)	0.0	-57.1	-57.1	-71.2	-71.2	-81.2	-81.2
	Difference as % of Demand	0.0%	-36.5%	-36.5%	-45.6%	-45.6%	-52.0%	-52.0%
2045	Total Wholesale Demand[c]	162.8	162.8	162.8	162.8	162.8	162.8	162.8
	Total Wholesale RWS Supply[d]	162.8	88.7	88.7	88.7	88.7	75.4	75.4
	Difference (Surplus or Shortfall)	0.0	-74.1	-74.1	-74.1	-74.1	-87.4	-87.4
	Difference as % of Demand	0.0%	-45.5%	-45.5%	-45.5%	-45.5%	-53.7%	-53.7%

Normal, single dry, and multiple dry year conditions are on a water year basis.

Groveland CSD is not accounted for as a wholesale customer for the purpose of this table. Refer to Table 8-4 for the retail supply and demand comparison including Groveland CSD. However, in the corresponding standardized tables in Appendix B, Groveland CSD is reported as wholesale rather than retail.

a During a single dry year, system-wide shortages of 30 – 40% are in effect (see Table 8-3). For this analysis, shortages greater than 20% are considered to have the same retail/wholesale allocation as the maximum Stage 4, 16-20% system-wide shortage in the WSAP.

b During multiple dry years, system-wide shortages of 30 – 55% are in effect (see Table 8-3). For this analysis, shortages greater than 20% are considered to have the same retail/wholesale allocation as the maximum Stage 4, 16-20% system-wide shortage in the WSAP.

c Total wholesale demands correspond to projected purchase requests shown in Table 4-3, including those of the Cities of San Jose and Santa Clara.

d Procedures for RWS allocations and the WSAP are described in Section 8.3.

8.4 WATER SUPPLY AND DEMAND COMPARISONS, WITHOUT BAY-DELTA PLAN AMENDMENT

The following sections summarize the projected retail and wholesale supplies and demands during normal, single dry, and multiple dry years for the scenario without implementation of the Bay-Delta Plan Amendment.

8.4.1 Retail Water Service Reliability Assessment – Without Bay-Delta Plan Amendment

In general, the comparison of retail demands and supplies presented in Table 8-6 demonstrates the following:

- **Normal Years:** During normal hydrologic years, the SFPUC will have adequate supplies to meet its projected retail water demands.
- **Single Dry Year:** During single dry years, there are no anticipated shortages of RWS supplies.
- **Multiple Dry Years:** In the multiple dry year scenario, the SFPUC would only experience shortages in RWS supplies of 10% during years 4 and 5 of an extended drought at 2045 levels of demand. In a 10% shortage, retail customers are allocated 36% of available supplies, which results in a positive allocation to retail (i.e. allocation greater than demand). The allocation above the retail demand level would be re-allocated to the Wholesale Customers, and retail customers would reduce their demands by 5% as required by the WSA.

8.4.2 Wholesale Water Service Reliability Assessment – Without Bay-Delta Plan Amendment

In general, the comparison of wholesale demands and supplies presented in Table 8-7 demonstrates the following:

- **Normal Years:** During normal hydrologic years, the SFPUC will have adequate supplies to meet its projected wholesale water demands.
- **Single Dry Year:** During single dry years, there are no anticipated shortages of RWS supplies.
- **Multiple Dry Years:** In a multiple dry year event, there would only be anticipated shortages in RWS supplies for years 4 and 5 of an extended drought at 2045 levels of demand. In a 10% shortage, the Wholesale Customers are allocated 64% of available supplies, and as described above, they receive any allocation above the retail demands. This would result in a 15% shortage (about 23 mgd) for the Wholesale Customers.

Table 8-6. Retail Supply and Demand Comparison for Projected Normal & Dry Year Scenarios Without Bay-Delta Plan Amendment (mgd)

Year	Retail Supply and Demand	Normal Year	Single Dry Year[a]	Multiple Dry Years[b]				
				Year 1	Year 2	Year 3	Year 4	Year 5
2025	Total Retail Demand	70.7	70.7	70.7	70.7	70.7	70.7	70.7
	Baseline Retail Demand[c]	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*
	WSA 5% Demand Reduction	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	70.7	70.7	70.7	70.7	70.7	70.7	70.7
	Retail Groundwater[e]	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*
	Retail Recycled Water[f]	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*
	RWS Supply Utilized by Retail[g]	*67.2*	*67.2*	*67.2*	*67.2*	*67.2*	*67.2*	*67.2*
	Difference (Supply Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Difference as Percentage of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2030	Total Retail Demand	72.4	72.4	72.4	72.4	72.4	72.4	72.4
	Baseline Retail Demand[c]	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*
	WSA 5% Demand Reduction	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	72.4	72.4	72.4	72.4	72.4	72.4	72.4
	Retail Groundwater[e]	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Utilized by Retail[g]	*67.5*	*67.5*	*67.5*	*67.5*	*67.5*	*67.5*	*67.5*
	Difference (Supply Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Difference as Percentage of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2035	Total Retail Demand	74.5	74.5	74.5	74.5	74.5	74.5	74.5
	Baseline Retail Demand[c]	*74.5*	*74.5*	*74.5*	*74.5*	*74.5*	*74.5*	*74.5*
	WSA 5% Demand Reduction	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	74.5	74.5	74.5	74.5	74.5	74.5	74.5
	Retail Groundwater[e]	*3.4*	*3.4*	*3.4*	*3.4*	*3.4*	*3.4*	*3.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Utilized by Retail[g]	*68.6*	*68.6*	*68.6*	*68.6*	*68.6*	*68.6*	*68.6*
	Difference (Supply Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Difference as Percentage of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2040	Total Retail Demand	77.4	77.4	77.4	77.4	77.4	77.4	77.4
	Baseline Retail Demand[c]	*77.4*	*77.4*	*77.4*	*77.4*	*77.4*	*77.4*	*77.4*
	WSA 5% Demand Reduction	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	77.4	77.4	77.4	77.4	77.4	77.4	77.4
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Utilized by Retail[g]	*70.5*	*70.5*	*70.5*	*70.5*	*70.5*	*70.5*	*70.5*
	Difference (Supply Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Year	Retail Supply and Demand	Normal Year	Single Dry Year[a]	Multiple Dry Years[b]				
				Year 1	Year 2	Year 3	Year 4	Year 5
	Difference as Percentage of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2045	Total Retail Demand	80.6	80.6	80.6	80.6	80.6	76.6	76.6
	Baseline Retail Demand[c]	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*
	WSA 5% Demand Reduction	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*-4.0*	*-4.0*
	Total Retail Supply	80.6	80.6	80.6	80.6	80.6	80.6	80.6
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Utilized by Retail[g]	*73.7*	*73.7*	*73.7*	*73.7*	*73.7*	*73.7*	*73.7*
	Difference (Supply Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	4.0	4.0
	Difference as Percentage of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	5.3%	5.3%

Normal, single dry, and multiple dry year conditions are on a water year basis.

a During all single dry years, no RWS system-wide shortages are in effect.

b During multiple dry years, no RWS system-wide shortages are in effect until years 4 and 5 at 2045 levels of demand. During those years, a 10% system-wide shortage is in effect.

c Total retail demands correspond to those in Table 4-1, and reflect passive and active conservation, onsite water reuse savings, and water loss. Demands from Groveland CSD are included in the table above. However, in the corresponding standardized tables in Appendix B, Groveland CSD is accounted for as a wholesale customer instead of a retail customer, as explained in Section 2.4.

d As amended in 2018, the WSAP Tier One Allocation Plan requires retail customers to conserve a minimum of 5% during droughts. If, during a declared water shortage, retail demands on the Regional Water System are lower than the retail allocation in a dry year, retail demands on the RWS will be reduced by 5%. An N/A on this row means that either this 5% rationing requirement doesn't apply (i.e. no declared water shortage), or retail customers are already rationing greater than 5%.

e Groundwater supplies are assumed to be equivalent to projected demands for the San Francisco Groundwater Supply Project (ramping up to 4 mgd by 2040) and Castlewood CSA (0.4 mgd). Groundwater availability would not be affected by dry year conditions.

f Recycled water supplies are assumed to be equivalent to projected demands related to the Westside Recycled Water Project (1.6 mgd by 2021 and 1.8 mgd by 2030), Harding Park and Fleming Golf Courses (0.23 mgd), and Sharp Park Golf Course (up to 0.1 mgd) and Treasure Island (0.2 mgd by 2025 and 0.4 mgd by 2030). Recycled water availability would not be affected by dry year conditions.

g Procedures for RWS allocations and the WSAP are described in Section 8.3. Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if groundwater and recycled water supplies are not available, up to 81 mgd of RWS supply could be used.

Table 8-7. Wholesale Supply and Demand Comparison for Projected Normal and Dry Year Scenarios Without Bay-Delta Plan Amendment (mgd)

Year	Wholesale Supply and Demand	Normal Year	Single Dry Year[a]	Multiple Dry Years[b]				
				Year 1	Year 2	Year 3	Year 4	Year 5
2025	Total Wholesale Demand[c]	146.0	146.0	146.0	146.0	146.0	146.0	146.0
	Total Wholesale RWS Supply[d]	146.0	146.0	146.0	146.0	146.0	146.0	146.0
	Difference (Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2030	Total Wholesale Demand[c]	147.9	147.9	147.9	147.9	147.9	147.9	147.9
	Total Wholesale RWS Supply[d]	147.9	147.9	147.9	147.9	147.9	147.9	147.9
	Difference (Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2035	Total Wholesale Demand[c]	151.9	151.9	151.9	151.9	151.9	151.9	151.9
	Total Wholesale RWS Supply[d]	151.9	151.9	151.9	151.9	151.9	151.9	151.9
	Difference (Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2040	Total Wholesale Demand[c]	156.3	156.3	156.3	156.3	156.3	156.3	156.3
	Total Wholesale RWS Supply[d]	156.3	156.3	156.3	156.3	156.3	156.3	156.3
	Difference (Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2045	Total Wholesale Demand[c]	162.8	162.8	162.8	162.8	162.8	162.8	162.8
	Total Wholesale RWS Supply[d]	162.8	162.8	162.8	162.8	162.8	139.1	139.1
	Difference (Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	-23.7	-23.7
	Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	-14.6%	-14.6%

Normal, single dry, and multiple dry year conditions are on a water year basis.

Groveland CSD is not accounted for as a wholesale customer for the purpose of this table. Refer to Table 8-6.

for the retail supply and demand comparison including Groveland CSD. However, in the corresponding standardized tables in Appendix B, Groveland CSD is reported as wholesale rather than retail.

a During all single dry years, no RWS system-wide shortages are in effect.

b During multiple dry years, no RWS system-wide shortages are in effect until years 4 and 5 at 2045 levels of demand. During those years, a 10% system-wide shortage is in effect.

c Total wholesale demands correspond to projected purchase requests shown in Table 4-3, including those of the Cities of San Jose and Santa Clara.

d Procedures for RWS allocations and the WSAP are described in Section 8.3.

8.5 DROUGHT RISK ASSESSMENT

The SFPUC developed the following Drought Risk Assessment (DRA) in compliance with Water Code Section 10635(b). The analysis presents a methodical assessment of water supplies and water uses under a hypothetical five-year drought scenario that extends from 2021 to 2025.

8.5.1 Data & Methods

The data and methods used to determine the RWS supply for the DRA dry-year sequence are the same as those described in Section 8.2. The SFPUC used the HHLSM model with the design drought sequence to perform the water supply analyses and simulate the water supply shortage conditions over the five-year drought period.

As with the supply reliability assessment, the DRA includes two scenarios, with and without the implementation of the Bay-Delta Plan Amendment, to show the drought conditions under two potential regulatory scenarios that may occur over the 2021-2025 period. The Bay-Delta Plan Amendment implementation scenario considers the implementation of the full Bay-Delta Plan Amendment in 2023.

The DRA takes into consideration the roll-out of recycled water and groundwater supply projects that the SFPUC has planned to be implemented by 2025. In addition, the retail demands for the DRA are based on linear interpolation between the current 2020 retail demands of 68.8 mgd and the projected 2025 retail demands of 70.7, as presented in Section 4.

8.5.2 Basis for Supply Shortage Conditions

The DRA analysis uses 2020 as a base year and considers the current status of the ongoing supply WSIP projects, as shown in Table 8-1.

The anticipated supply availabilities for the five-year drought period were presented above in Table 8-2 and Table 8-3. The overall impacts for the two scenarios are as follows:

- **With Full Implementation of the Bay-Delta Plan Amendment:** In this dry-year sequence, there would not be anticipated reductions in RWS supplies prior to the implementation of the Bay-Delta Plan Amendment in 2023. The RWS supply reductions would reach 40% upon the implementation of the Bay-Delta Plan Amendment in 2023 until the end of the drought sequence in 2025. The split between wholesale and retail customers (see Section 8.2.4) at this shortage level informs the available retail RWS supplies considered in this analysis.

- **Without Implementation of the Bay-Delta Plan Amendment:** Assuming the availability of existing supplies at current demand levels, there are no anticipated reductions in RWS supply.

8.5.3 DRA Water Source Reliability

The DRA takes into account the supplies from the RWS, local groundwater, and local recycled water. The recycled water and groundwater projects that the SFPUC has planned for implementation within the next 5 years are integrated into the available supply portfolio for this five-year drought scenario. The SFPUC plans to increase recycled water supplies from 0.1 mgd in 2021 to 2.1 mgd in 2025, through the implementation of the Westside Recycled Water Project, the Treasure Island Recycled Water Project, and the restoration of the Harding Park Recycled Water Project. It is assumed that the Westside Recycled Water Project will supply approximately 1.3 mgd to Golden Gate Park and Lincoln Park in 2022 and will serve approximately 0.3 mgd to the San Francisco Zoo by 2023. In addition, the groundwater supplies used for irrigation in 2022 will be replaced by recycled water from the Westside Recycled Water Project. The groundwater production from 2022 to 2024 includes the in-city potable use (~0.5 mgd) and the Castlewood well system (~0.4 mgd). The in-City potable groundwater use is assumed to increase from 0.5 mgd to 1 mgd in 2025.

8.5.4 Water Supply and Demand Comparison for 5-Year Drought Sequence

The supply and demand comparisons for the hypothetical drought sequence from 2021 to 2025 are presented below in Table 8-8 and Table 8-9 for scenarios with and without the implementation of the Bay-Delta Plan Amendment, respectively. Where a shortage condition is identified, the tables reflect actions that would be taken in accordance with the Water Shortage Contingency Plan (WSCP), as shown in Appendix K.

With Implementation of the Bay-Delta Plan Amendment. Table 8-8 compares the total water supply sources available with the total projected water demand through the 2021-2025 drought scenario, assuming the full implementation of the Bay-Delta Plan Amendment starting in 2023. As such, the years 2021 and 2022 are not affected by upcoming regulatory changes and show no supply shortfall.

The implementation of the Bay-Delta Plan Amendment in 2023 is expected to result in a 40% shortage of RWS supplies. The WSAP does not address shortages above 20%; therefore, for the purposes of this analysis it was assumed that the 20% shortage allocations would apply for the 40% shortage scenario. Based on this split, starting in the third year of this drought sequence, the retail allocation from the RWS drops to 44.7 mgd. This reduction in RWS supplies for retail would lead to a supply shortfall of up to 32%, or 22.5 mgd in 2024 and 2025. As detailed in the WSCP, the supply shortfall will be addressed through mandatory water use rationing.

Without Implementation of the Bay-Delta Plan Amendment. Table 8-9 compares the total water supply sources available with the total projected water use through this 2021-2025 drought scenario without the Bay-Delta Plan Amendment. Without implementation of the Bay-Delta Plan Amendment, the SFPUC has sufficient supplies to serve its retail demands in the event of a five-year drought starting in 2021.

Table 8-8. Retail Supply and Demand Comparison for Five-Year Drought Risk Assessment – With Bay-Delta Plan Amendment (mgd)

[Standardized Table 7-5 Five-Year Drought Risk Assessment to address Water Code Section 106359b)]

	2021	2022	2023	2024	2025
Gross Water Use[a]	69.2	69.6	69.9	70.3	70.7
Supply Sources					
RWS Supply[b]	66.9	67.3	44.7	44.7	44.7
Groundwater[c]	2.2	0.9	0.9	0.9	1.4
Recycled Water[d]	0.1	1.4	1.7	1.7	2.1
Total Supplies	65.8	66.2	47.3	47.3	48.2
Surplus/(Shortfall) w/o WSCP Action	0.0	0.0	(22.6)	(23.0)	(22.5)
Planned WSCP Actions (use reduction and supply augmentation)					
WSCP - supply augmentation benefit	-	-	-	-	-
WSCP - use reduction savings benefit[f]	-	-	22.6	23.0	22.5
Revised Surplus/(Shortfall)	-	-	0.0	0.0	0.0
Resulting % Use Reduction from WSCP action[e]	-	-	32.4%	32.07	31.8%

a. Total retail demands reflect active and passive conservation, onsite water reuse savings, and water loss and demands are linearly interpolated between 2020 and 2025.
b. Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if these alternative supplies are not available, up to 81 mgd of RWS supply could be used in normal years.
c. Assuming that the in-city irrigation groundwater capacity accounts for approximately 1.5 mgd , the in-city potable groundwater use is 0.5 mgd and Castlewood CSA uses 0.3 mgd in 2021. When the Westside Recycled Water Project comes online in 2022 and the irrigation groundwater use is phased out. The groundwater production from 2022 to 2024 assumes 0.5 mgd production for in-city potable use and 0.4 mgd supplied by the Castlewood Well System. The potable groundwater production is anticipated to increase to 1.4 mgd in 2025.
d. Assuming that the Westside Recycled Water Project will provide 1.3 mgd to Golden Gate Park and Lincoln Park by 2022, and 0.3 mgd to the San Francisco Zoo by 2023.
e. The demand rationing actions and respective shortage levels are detailed in the WSCP.

Table 8-9. Retail Supply and Demand Comparison for Five-Year Drought Risk Assessment – Without Bay-Delta Plan Amendment (mgd)

	2021	2022	2023	2024	2025
Gross Water Use[a]	69.2	69.6	69.9	70.3	70.7
Supply Sources					
RWS Supply[b]	66.9	67.3	67.3	67.7	67.2
Groundwater[c]	2.2	0.9	0.9	0.9	1.4
Recycled Water[d]	0.1	1.4	1.7	1.7	2.1
Total Supplies	69.2	69.6	69.9	70.3	70.7
Surplus/(Shortfall) w/o WSCP Action	0	0	0	0	0
Planned WSCP Actions (use reduction and supply augmentation)					
WSCP - supply augmentation benefit	-	-	-	-	-
WSCP - use reduction savings benefit	-	-	-	-	-
Revised Surplus/(Shortfall)	-	-	-	-	-
Resulting % Use Reduction from WSCP action	-	-	-	-	-

a. Total retail demands reflect active and passive conservation, onsite water reuse savings, and water loss and demands are linearly interpolated between 2020 and 2025.

b. Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if these alternative supplies are not available, up to 81 mgd of RWS supply could be used in normal years.

c. Assuming that the in-city irrigation groundwater capacity accounts for approximately 1.5 mgd , the in-city potable groundwater use is 0.5 mgd and Castlewood CSA uses 0.3 mgd in 2021. When the Westside Recycled Water Project comes online in 2022 and the irrigation groundwater use is phased out. The groundwater production from 2022 to 2024 assumes 0.5 mgd production for in-city potable use and 0.4 mgd supplied by the Castlewood Well System. The potable groundwater production is anticipated to increase to 1.4 mgd in 2025.

d. Assuming that the Westside Recycled Water Project will provide 1.3 mgd to Golden Gate park and Lincoln Park by 2022, and 0.3 mgd to the San Francisco Zoo by 2023

SECTION 9: WATER SHORTAGE CONTINGENCY PLAN

The Water Shortage Contingency Plan is included as Appendix K.

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SECTION 10: DEMAND MANAGEMENT MEASURES

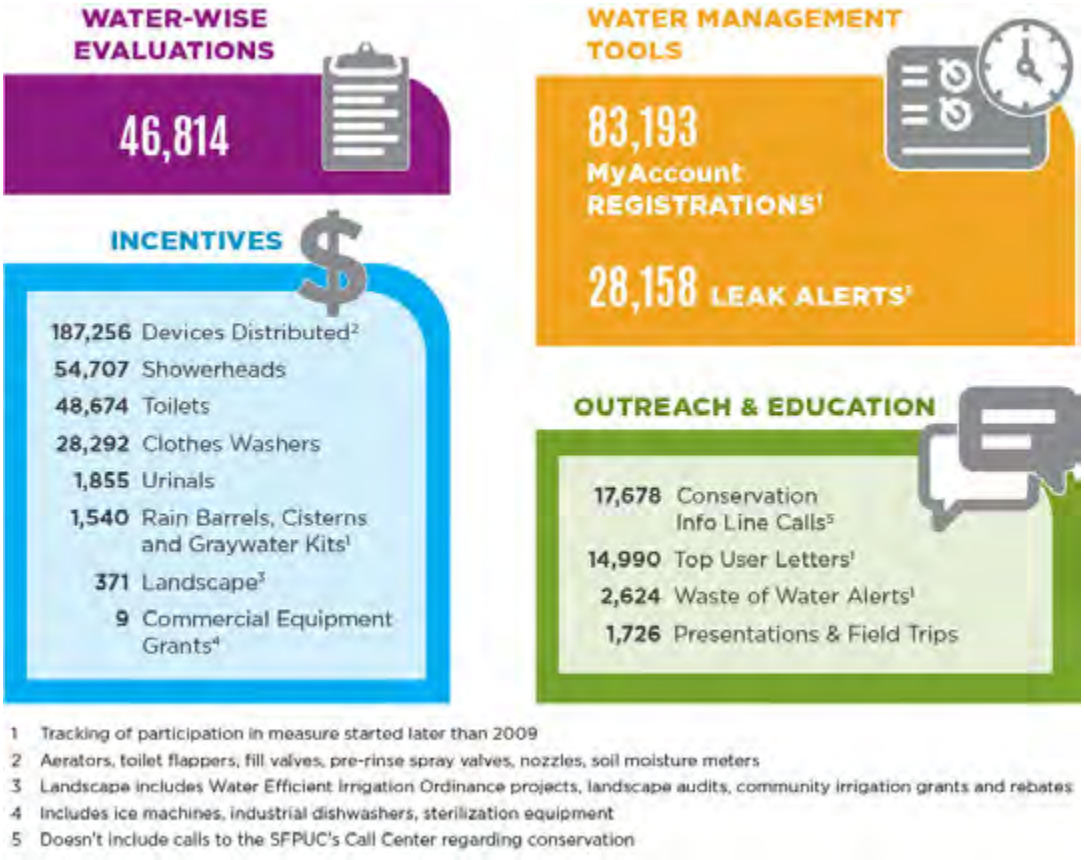
This section describes the SFPUC's efforts to promote conservation and to reduce demand on water supply. Several demand management measures (DMMs)—including metering, public education and outreach, and water conservation program coordination—are addressed.

10.1 RETAIL WATER CONSERVATION PROGRAM

The SFPUC's retail water conservation program has historically consisted of a mix of financial incentives, technical assistance, water management tools, education and outreach, and mandates. These offerings are planned to continue over the next five years and beyond. Between 2005 and 2025, the SFPUC will have evaluated and implemented over 80 different conservation measures and mandates, providing extensive customer water-savings assistance that has played a major role in the significant decline in water use occurring over this period. These include conservation best management practices found successful by major water utilities and efficiency experts across the nation; measures demonstrated by third-party studies to have water savings and customer benefits; and measures that make sense for the site conditions and characteristics unique to San Francisco water use. During its Retail Water Conservation Plan updates in 2011, 2015 and 2020, the SFPUC conducted thorough analyses of all measures in place at the time of each plan, potential new measures not implemented before, and measures previously offered and discontinued.

The SFPUC estimates its conservation program and efficient plumbing codes have a "past savings" of approximately 86,385 AF (28,149 MG or 5.5 mgd) between 2005 (the year the SFPUC developed its first conservation forecast model) and 2019. "Future savings" are estimated at 117,221 AF (38,197 MG or 4.2 mgd) between 2020 and 2045. This estimate does not reflect water savings from conservation measures the SFPUC offers but does not model or from SFPUC efforts that are not part of its conservation program but may generate potable water savings, including its supply-side water loss program. The SFPUC has provided water-saving assistance to many thousands of residential and non-residential customers. Figure 10-1 highlights the SFPUC's water conservation accomplishments between 2010 and 2020.

Figure 10-1. Summary of SFPUC's Water Conservation Achievements



The SFPUC's conservation measures can be broadly characterized as foundational customer assistance measures and water efficiency mandates that the SFPUC anticipates continuing through the 2045 planning horizon with no definite end date, such as evaluations, site usage reports and tools, free devices, education and outreach, and mandates or incentive-based measures that have specific and varying end dates, depending on factors such as plumbing code impacts and market saturation rates. Collectively, the measures proposed for 2020 and beyond support the SFPUC's strategies for tapping into anticipated remaining water-saving opportunities, specifically:

- Maintaining efficiency among customers, properties and sites that already have water-wise use.
- Improving efficiency among residential customers with over average water use due to leaks, old fixtures, inefficient irrigation, or other forms of water waste.
- Increasing commercial property compliance with requirements for efficient plumbing fixtures and awareness of opportunities for equipment retrofits, reuse technologies, and efficiency audits and action plans.
- Increasing commercial customer awareness of constant and/or abnormally high-water use, with focus on hotels, restaurants, office buildings, and schools that represent the non-residential sectors with the overall highest water use.
- Promoting compliance with new efficiency standards among large landscapes served by dedicated irrigation meters and smaller sites with inefficient irrigation
- Maximizing opportunities for onsite reuse in new development.

Moving forward, the SFPUC will continue to utilize a mix of demand-side, customer water-saving strategies, including voluntary incentives, assistance services, tools to help customers understand and manage their water use, education and outreach, and mandates that require indoor and outdoor water efficiency.

10.2 RETAIL DMMs

The SFPUC's conservation program is now guided by a mix of agency and City policy directives and state and local water efficiency requirements that have evolved over time. On the state level, these requirements have shifted from meeting Best Management Practices (BMPs) to meeting the state per capita water reduction targets set by the Water Conservation Action of 2009 (SB x7-7) to meeting new water efficiency targets mandates by AB 1668 and SB 606 that urban suppliers will need to meet starting in 2023 based on standards for efficient indoor, outdoor water use, and supply side water loss. Locally, San Francisco has adopted state requirements for mandating water-efficient plumbing fixtures, landscapes and irrigation systems, as well as restrictions against outdoor water waste and sub-metering in new multi-family construction. The SFPUC also continues to set its own Level of Service (LOS) goals that promote efficiency and sustainability, including maintaining average residential per capita use under 50 gallons a day. The SFPUC met state BMP goals for the many years they were in effect; is well below its state-imposed SB x7-7 per capita use target for 2020; and is on track to meet California's new efficiency targets.

The SFPUC has been implementing conservation measures for decades. Through the SFPUC's longstanding, intensive efforts to promote conservation and educate San Franciscans and its other retail customers on efficient and appropriate uses of water, San Francisco has had one of the lowest per capita water uses in the State. As stated in Section 4.1, gross and residential per capita consumption by in-City retail water customers are 73 and 42 GPCD, respectively. Taking suburban retail use into account, gross and residential per capita consumption by all retail water customers are 76 and 42 GPCD, respectively.

The SFPUC voluntarily prepares a conservation plan for its retail service area, which includes more details on DMMs planned over the next five to 25 years. The 2020 conservation plan can be viewed on or downloaded from the SFPUC's website at **www.sfpuc.org/learning/conserve-water**.

The SFPUC was a signatory of the California Urban Water Conservation Council (CUWCC)'s Memorandum of Understanding (MOU) for the duration of its existence from 1991 to 2016, agreeing to voluntarily meet and report on conservation BMPs. During that time, the SFPUC implemented conservation measures in accordance with CUWCC BMP compliance goals and met requirements for biannual BMP reporting. In 2016, the CUWCC underwent an organizational transformation and decided to sunset in response to social, economic, environmental, regulatory and political conditions that changed substantially over its 25 years of existence, including passage of California's Water Conservation Act of 2009 mandating a 20 percent reduction in statewide urban per capita water use by 2020 followed by new state water conservation mandates (Executive Order B-37-16) and reporting requirements. In 2017, it relaunched as a new organization, the California Water Efficiency Partnership (CalWEP), dedicated to advancing water efficiency in the state through research, assistance, tools, and education but not through a MOU requiring member compliance with specific BMPs. The SFPUC is a member of CalWEP and continues to implement numerous DMMs in the form of conservation programs, most of which builds from and meet the goals of the last iteration of the CUWCC's foundational and programmatic BMPs.

10.2.1 Water Waste Prevention Ordinances

10.2.1.1 Past Implementation

Permanent water use restrictions were first established in Section E of the SFPUC Rules and Regulations Governing Water Service to Customers. During the 1987-92 drought, the SFPUC enacted numerous additional water use restrictions and prohibitions in response to the severe water shortage. With the end of the drought in 1993, the SFPUC elected to

continue certain restrictions to promote long-term conservation. These restrictions are also included as part of the WSCP's water waste prohibitions (see Appendix K).

Violation of any water use restriction may result in the installation of a flow-restricting device in the service line of the customer, and continued violation could result in termination of service. The customer bears the cost of any enforcement action.

Section F of the SFPUC Rules and Regulations Governing Water Service to Customers, which is implemented as part of the City's Water Efficient Irrigation Ordinance, took effect in 2010 and was updated in 2015. Section F establishes water efficient irrigation rules, which prohibit water runoff from landscapes of any size due to low head drainage, overspray, broken irrigation hardware, or other conditions where water flows onto adjacent property, walks, roadways, parking lots, or other structures.

In 2016, the SFPUC adopted expanded permanent water waste restrictions as part of Section E, Rule 12 of its Rules and Regulations Governing Water Service to Customers. These rules restrict the following uses of water:

- Application of potable water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots or structures
- Use of hoses for any purpose without a positive shut off valve
- Use of potable water to wash sidewalks, driveways, plazas and other outdoor hardscapes for reasons other than health, safety, or to meet City of San Francisco standards for sidewalk cleanliness (per the Department of Public Works Streets and Sidewalks Maintenance Manual as required by City Charter Section F, 102) and in a non-water-efficient manner that causes runoff to storm drains and sewer catch basins
- Use of single-pass cooling systems, fountains, decorative water features, and commercial car washes
- Application of potable water to outdoor landscapes during and within 48 hours after measurable rainfall
- Irrigation with potable water of ornamental turf on public street medians
- Use of potable water for consolidation of backfill, dust control, or other nonessential construction purposes if foundation drainage or recycled water is available and approved by the Department of Public Health
- Serving drinking water other than upon request at eating or drinking establishments, including restaurants, hotels, cafes, cafeterias, bars or other public places where food or drink are served
- To promote conservation, hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily and display notice of this option in guestrooms

Members of the public are encouraged to report incidents of water waste online or by phone through the City of San Francisco's 311 system, and the SFPUC Water Conservation Section investigates and responds to all reports.

10.2.1.2 Planned Implementation

The SFPUC will continue to implement the water use restrictions and water efficient irrigation rules in its Rules and Regulations Governing Water Service to Customers and continue to monitor and respond to public reports of water waste.

10.2.2 Metering

10.2.2.1 Past Implementation

All in-City retail customers have been metered since 1916 and are billed by volume. All suburban retail customers are also fully metered and are billed by volume. There are approximately 181,000 existing water meters in the City and approximately 225 in the suburban retail service area.

By 2018, the SFPUC completed substantial deployment of its Automated Water Meter Program to upgrade in-City and suburban retail water meters with wireless advanced metering technology. The SFPUC was the first major water utility in the State to implement a system of this scale. As of 2020, 99% of retail system meters are automated.

The automated water meter reading system enabled the launch of tools to help monitor customer water use and identify potential high or unusual usage: My Account and the Leak Alert Program. My Account, a bill management system and web portal for viewing water use, was launched in May 2014 and upgraded since and allows customers to view their hourly and daily water use data provided by the automated water meter reading system. The SFPUC also launched a Leak Detection Program in April 2015 to notify single family residential customers about potential plumbing leaks that may be occurring at their homes. Since then, the SFPUC has expanded its program to include multi-family, commercial and irrigation account customers. Hourly water consumption data collected through the automated water meter reading system are analyzed, and if continuous water use is observed, automated courtesy alerts via email, text message, phone message and letter are sent to the account holder, property owner and site occupant.

Existing sub-metering requirements are established in the San Francisco Green Building Code and Section F of the SFPUC Rules and Regulations Governing Water Service to Customers. Per the Green Building Code, new non-residential buildings must install a separate sub-meter for each individual building tenant that would consume more than 1,000 gallons per day. For new non-residential buildings over 50,000 square feet, a sub-meter must be installed for each tenant that consumes more than 100 gallons per day. Section F of the SFPUC Rules and Regulations Governing Water Service to Customers, which is implemented as part of the Water Efficient Irrigation Ordinance, requires dedicated irrigation meters for landscape areas greater than 5,000 square feet. In 2016, California passed Senate Bill 7 (SB 7), which requires new multi-family residential buildings in California constructed after January 1, 2018 to include a submeter for each dwelling unit and to bill tenants in apartment buildings accordingly for their water use. In response, the SFPUC, in coordination with the San Francisco Department of Building Inspection (DBI) and Department of Public Health (DPH), began requiring proof of sub-metering before approving requests for water service from new multi-family residential buildings.

10.2.2.2 Planned Implementation

Replacement of a small number of remaining old meters is ongoing. The SFPUC will be continuing and expanding its Leak Alert Program.

10.2.3 Conservation Pricing

10.2.3.1 Past Implementation

For many years, the SFPUC has used conservation pricing as an incentive to conserve water. To promote the installation of efficient plumbing fixtures, the SFPUC implemented an incentive rate structure for its retail customers. Under the four-year rate schedule for FY2018-2019 through FY 2021-2022, water rates for both single family and multi-family residential accounts were set with a two-tier increasing block rate structure, where the Tier 1 threshold was 4 CCF for single family and 3 CCF for multi-family. Non-residential (i.e., commercial) water rates were set with a uniform rate structure. Water rates across all customer sectors were scheduled to increase annually.

The rate schedule also addresses violation of water use restrictions. Violations may result in the installation of flow-restricting devices, and continued violation may result in discontinuance of water service. The costs of these actions are borne by the customer.

The SFPUC's current rate schedule, effective for FY 2018-2019 through FY2021-2021, may be accessed at: . **www.sfpuc.org/accounts-services/water-power-and-sewer-rates**.

10.2.3.2 Planned Implementation

The current rate schedule is in effect through FY2021-2022. The SFPUC conducts an independent rate study every four to five years to inform the next rate schedule.

10.2.4 Public Education and Outreach

10.2.4.1 Past Implementation

Throughout the year, the SFPUC markets its conservation services and assistance measures through numerous means, including social media, digital and print newsletters, bill inserts, email blasts, direct mailings, local media and trade publications, and its website. For example, the SFPUC periodically contacts top residential water users to encourage them to improve efficiency, alert them to the possibility of plumbing leaks, and offer free Water Wise Evaluations. The SFPUC's newsletters issued in print and digitally to customers and stakeholders almost always feature a conservation-related article or water-saving tips in each issue.

The SFPUC also participates in community events and presentations that reach residents and businesses, as well as events that target specific audiences and industry trade groups. Water conservation staff, along with education partners, conduct in-class and virtual (during the COVID pandemic) presentations during the school year. Program offerings are aligned with State curriculum standards, and many focus on providing placed-based or outdoor learning opportunities to supplement students' classroom work. The SFPUC also participates in local festivals, street fair events, and community presentations. The SFPUC offers a variety of free teacher resources, including guides, lesson plans, fact sheets and activity sheets. The SFPUC maintains and offers public access and organized adult and youth programming at several demonstration gardens that promote water-efficient gardening and irrigation practices.

Below is a summary of some of the key educational and outreach activities conducted between FY 2015-2016 and FY 2019-2020.

Table 10-1. Summary of SFPUC Retail Educational and Outreach Activities Over Five Years (Conducted between FY15-16 and FY19-20)

Activity	Total
School Presentations & Field Trips	374
Community Events, & Presentations	209
Conservation Information Line Calls	13,441
Waste of Water Reports	1,383
Leak Incidents Notified by Alerts	28,158
Top User Letters	5,788
MyAccount Online Portal Users	Over 86,000 customers

10.2.4.2 Planned Implementation

The SFPUC plans to continue conducting a wide range of public education and outreach efforts over the next five years and beyond to promote water efficiency among residents, businesses and customers.

10.2.5 Management of System Losses

10.2.5.1 Past Implementation

The SFPUC controls system losses primarily through asset and leak management. The SFPUC's Linear Assets Management Program replaces and renews distribution system pipelines and customer service connections for approximately 1,250 miles of drinking water mains in the City. Planning analysis has demonstrated an annual pipeline improvement rate of 15 miles per year is needed to meet customer Level of Service goals for uninterrupted service. Improvements include replacement, rehabilitation, re-lining, and cathodic protection of all pipe size categories to extend or renew pipeline useful life.

A renew service program renews assets at the end of their useful life between the water main and the customer's service connection. These assets include 1-inch to 8-inch diameter service pipes made of cast iron, galvanized steel, and plastic, to be replaced with copper or ductile iron; broken meter boxes; outdated or undersized meters and associated piping; and subsequent associated sidewalk and roadway restoration.

The SFPUC's proactive leak management employs acoustic leak detection to accurately pinpoint leaks in mains of all material types. In addition, the SFPUC prioritizes leak repairs to meet Level of Services goals for uninterrupted service and to reduce real water losses.

The SFPUC also collects and compiles main break data throughout its system. A study analyzed historic main break data to determine what types of pipes are statistically prone to failure due to natural causes. A geographical hot-spot analysis was also conducted to identify areas in the City that are especially prone to high occurrences of main breaks. This information is used to target high risk pipes for prioritized replacement or improvement.

In addition, the SFPUC's Automated Water Meter Program (described previously in Section 10.2.2) enables improved management of system losses.

10.2.5.2 Planned Implementation

The SFPUC is developing a Water Loss Control Master Plan to reduce water loss and to comply with California Senate Bill 555 (SB 555), Water Loss Management.

10.2.6 Water Conservation Program

10.2.6.1 Past Implementation

The SFPUC Water Conservation Section has 13 full-time time staff under the direction of a Water Conservation Section Manager. Conservation staff coordinate implementation of various residential, landscape, and CII conservation programs. The SFPUC's retail water conservation program consists of an extensive mix of measures, including incentives, services, and educational assistance. Incentives include rebates for high-efficiency fixtures, free toilets and installations for qualifying customers, discounts for graywater and rainwater systems, grants for large landscape irrigation efficiency improvements, and free efficient devices. Services include conservation surveys, landscape plan review, and school education programs. The SFPUC also provides a host of tools to help customers understand and manage their water use, including the previously mentioned My Account feature, leak alerts, and a bill adjustment program for leak repair. Below is a summary of key activities accomplished between FY 2015-2016 and FY 2019-2020.

Table 10-2. Summary of Key Water Conservation Programs Over Five Years (Conducted between FY15-16 and FY19-20)

Activity	Total
Surveys	15,409
Toilet Installations	4,326
Toilet Rebates	8,765
Washer Rebates	4,579
Urinal Rebate / Installations	642
Showerheads Distributed	15,884
Landscape and Irrigation Meter Grants	19
Laundry-to-Landscape Kit Discounts	37
Rain Barrel Discounts	1,330
Cistern Discounts	64
Water-Saving Devices Distributed	44,119

10.2.6.2 Planned Implementation

The SFPUC will continue to evaluate and adapt its conservation measures to respond to changing conditions and regulations. This dynamic approach to conservation has contributed to significant reductions in water demand, despite population growth. Moving forward, the SFPUC will continue to utilize a mix of demand-side, customer water-saving strategies, including voluntary incentives, assistance services, tools to help customers understand and manage their water use, education and outreach, and mandates that require indoor and outdoor water efficiency. Foundational customer assistance measures will continue to include water evaluation surveys, site usage reports and tools, free devices, landscape water budgets, and public education and outreach. Fixture incentive measures will continue to include toilets, clothes washers, rainwater barrels and cisterns, residential outdoor graywater system parts, and large commercial equipment over the next five years. Several new incentives are planned to launch within the next five years, including rebates for residential on-demand recirculating hot water pumps and weather-based irrigation controllers.

10.2.7 Other DMMs

In addition to DMMs administered through its water conservation section, the SFPUC also implements several other programs expected to contribute to potable water savings. These include its onsite reuse program that requires new construction over a certain size to use available graywater, rainwater, and foundation drainage for toilet and urinal flushing and irrigation; its stormwater management program that mandates and incentivizes use of rainwater for irrigation; and a high bill adjustment and water and sewer lateral insurance program that may reduce water waste through faster leak repair.

10.3 WHOLESALE DMMs

As described in Section 5.3, BAWSCA coordinates water conservation programs and services for its member agencies. Under the terms of the WSA, the SFPUC cannot provide direct financial assistance for conservation programs to a single Wholesale Customer. For details about BAWSCA-coordinated conservation measures provided in the SFPUC's wholesale service area, visit **https://bawsca.org**. However, the SFPUC's past and planned implementation of wholesale DMMs, to the extent allowed under the WSA, are described below.

10.3.1 Metering

10.3.1.1 Past Implementation

The SFPUC's wholesale customers are fully metered. Approximately 91% of wholesale meters were outfitted with a wireless transmitter so they can transmit hourly water consumption through a cellular endpoint that does not require a fixed network infrastructure. The water consumption is analyzed and recorded in advanced metering software, allowing SFPUC and its wholesale customers to view hourly and daily water consumption rather than waiting for a monthly billing meter read. The software also provides custom alerts for issues in the system or unusual consumption patterns, such as leaks.

10.3.1.2 Planned Implementation

SFPUC's ongoing preventative maintenance program ensures that the meters are regularly inspected, maintained and calibrated. The SFPUC is currently in the process of evaluating the calibration, maintenance and replacement procedures of the wholesale meters and will update the current practices of the annual meter calibration program.

10.3.2 Public Education and Outreach

The SFPUC provides technical and administrative assistance for public information and school education to its Wholesale Customers as requested. The last such assistance was a regional drought awareness marketing and media campaign that covered some of Wholesale Customers' service areas that started in 2014 and continued into 2017.

10.3.3 Water Conservation Program Coordination and Staffing Support

As previously described in Section 5.3, BAWSCA manages a Regional Water Conservation Program (see http://bayareaconservation.org) and represents the interests of the Wholesale Customers. The program is composed of several different conservation measures and is designed to support and augment its member agencies' customer efforts to use water more efficiently.

Under the terms of the WSA with its Wholesale Customers, the SFPUC cannot provide direct financial assistance for conservation programs to an individual Wholesale Customer and add this expense to the wholesale revenue requirement for that year. The SFPUC can provide staff to assist Wholesale Customer conservation efforts and, through agreement with BAWSCA, can develop service area-wide conservation programs that can be funded as a joint expense by its retail customers and Wholesale Customers.

10.3.4 Asset Management

The SFPUC initiated a Pipeline Inspection Program in the early 1990s for the 350 miles of water transmission lines in the RWS. Routine inspections are considered preventive maintenance measures, but they also provide information on pipeline leaks. These inspections are usually conducted year-round with no more than one section of a major pipeline out of service at any time. The Pipeline Inspection Program covers the entire water transmission system over a 20-year period and then repeats. The SFPUC has a goal to inspect one section per quarter, averaging 10 to 12 miles per year. In 2018 and 2019, 13 and 12 miles of pipe were inspected, respectively. Due to the COVID-19 pandemic, the rate of inspection decreased in 2020 (approximately 3.6 miles), and is expected to return to normal in 2021. Technically, the RWS does not have any distribution system components, only transmission system components. In addition to inspections, SFPUC staff also regularly compare production volumes with customer consumption to help identify the leakage rate.

10.3.4.1 Past Implementation

The major focus of asset management for the wholesale system in the past decade has been the WSIP. To date, the program is at approximately 96% completion. Within the last five years, system improvements included significant pipeline

and tunnel construction, rehabilitation and replacement. Since 2016, the completed WSIP projects include the completion of the new 3.52 mile-long steel-lined Irvington Tunnel (now IT2), the implementation of seismic upgrades and pipeline improvements along the BDPL Nos. 3 and 4, the completion of the new 5-mile long steel-line Bay Tunnel under the San Francisco Bay, and targeted pipeline replacements and seismic upgrades along the San Andreas Pipeline Nos. 2 and 3, and the Sunset Supply Pipeline. The implemented improvements provide additional system redundancy, increased system capacity and improved seismic resiliency. Two additional major projects were completed within the last five years, which included key seismic upgrades, such as the addition of isolation valves and the upgrade of existing appurtenances, and pipeline replacements along the San Andreas Pipeline No.2.

10.3.4.2 Planned Implementation

Major pipeline rehabilitation and replacement projects are planned within the next 5 to 10 years. Key pipeline replacements will be implemented along the Crystal Springs Pipeline No.2, which will involve the replacement of welded steel pipe, the replacement of coal tar lining, the addition of new access manholes and isolation valves, and improvements to appurtenances. The SFPUC also plans to conduct internal lining repairs (removing corrosion accumulation at pipe joints and spalled mortar lining, cleaning metal surfaces, applying new mortar lining, and cleaning debris and sediment found inside the pipe) at the Bay Division Pipeline Nos 1-4 and will implement targeted repairs, rehabilitation or replacement of the pre-stressed concrete pipe of the Bay Division Pipeline No.4, as needed. Sections of the Bay Division Pipelines Nos. 3 and 4 will be relocated in the Santa Clara area.

During implementation of the WSIP, about half of the wholesale system transmission pipelines were replaced. The transmission lines that were not replaced under the WSIP are subject to a prioritization program based on findings from the Pipeline Inspection Program and additional factors such as material type, age, redundancy, leak history, and water quality issues. The program is informed by ongoing inspections to determine when pipelines need to be replaced and the SFPUC has been focusing on unmanned-type inspections. As part of the Safe Pipeline Entry Program, the SFPUC initiated considering the installation of additional valves to be included as part of pipeline replacement projects.

10.3.5 Assistance to Wholesale Customers

BAWSCA is the only entity of its kind to have authority to perform regional water supply reliability planning for its member agencies. Among other services, it also has the authority to coordinate water conservation programs and services for its member agencies. BAWSCA manages a Regional Water Conservation Program that is composed of several different conservation measures and is designed to support and augment its member agencies' customer efforts to use water more efficiently. These efforts include the administration of several regional water conservation measures, including measures designed to educate member agency customers about water-efficient landscaping and incentivize irrigated turf removal.

As previously stated, under the terms of the WSA with its Wholesale Customers, the SFPUC cannot provide direct financial assistance for conservation programs to an individual Wholesale Customer and subsequently adds this expense to the wholesale revenue requirement for that year. The SFPUC can provide staff to assist Wholesale Customer conservation efforts and, through agreement with BAWSCA, can develop service area-wide conservation programs that can be funded as a joint expense by its retail customers and Wholesale Customers. To this end, the SFPUC works closely with BAWSCA as opportunities arise to jointly develop outreach and communications related to the RWS and conservation. Refer to Section 10.3.2 for information on the SFPUC's collaborative efforts with BAWSCA on public education and outreach efforts. The SFPUC also provides technical and administrative assistance to the Wholesale Customers on preparing information to the public as requested.

SECTION 11: PLAN ADOPTION AND UWMP CHECKLIST

This section describes the adoption, submittal, and implementation of this 2020 UWMP. A checklist is also provided to facilitate DWR's review of the 2020 UWMP.

11.1 PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

The SFPUC prepared this draft 2020 UWMP and presented it to the SFPUC Commission for adoption at the regular meeting on June 8, 2021. The plan was adopted at a special meeting of the Commission on June 11, 2021. A copy of the SFPUC resolution adopting this 2020 UWMP update is provided in Appendix L.

Within 30 days of SFPUC Commission approval, the adopted 2020 UWMP will be submitted electronically to the DWR via its Water Use Efficiency data online submittal tool (WUEdata). Electronic copies will also be provided on compact disc to the California State Library and via e-mail to cities and counties within which the SFPUC provides water. The SFPUC will implement the adopted 2020 UWMP in accordance with the California Urban Water Management Planning Act.

Following adoption, the SFPUC will continue to implement water supply planning programs and projects identified in this 2020 UWMP, including those related to conservation, groundwater, recycled water, and Alternative Water Supply Planning.

11.2 UWMP CHECKLIST

The UWMP 2020 checklist is provided in Appendix M to facilitate DWR's review of the completeness of this document and is organized by subject matter. In addition, complete sets of standardized tables and SB X7-7 Verification Form tables prescribed by DWR are provided in Appendices B and D, respectively.

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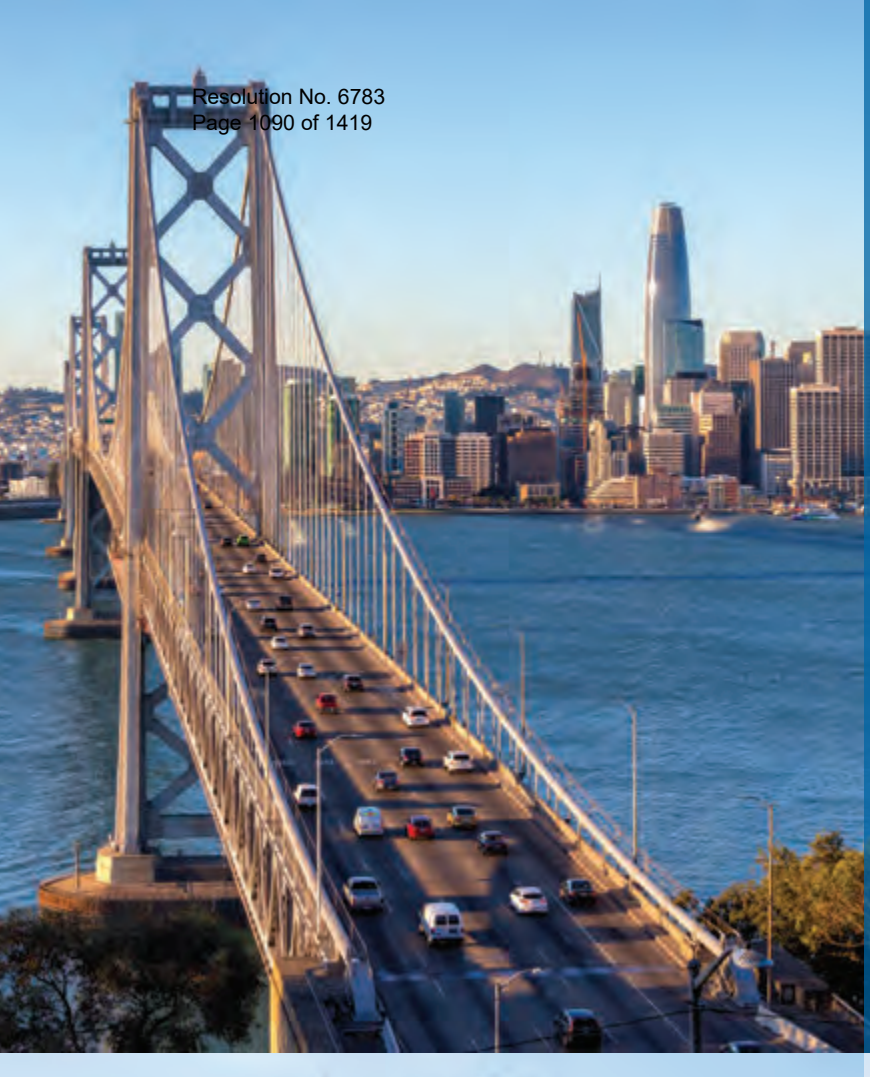

2020 URBAN WATER MANAGEMENT PLAN

for the City and County of San Francisco

APPENDICES

June 2021

Prepared by:

The San Francisco
Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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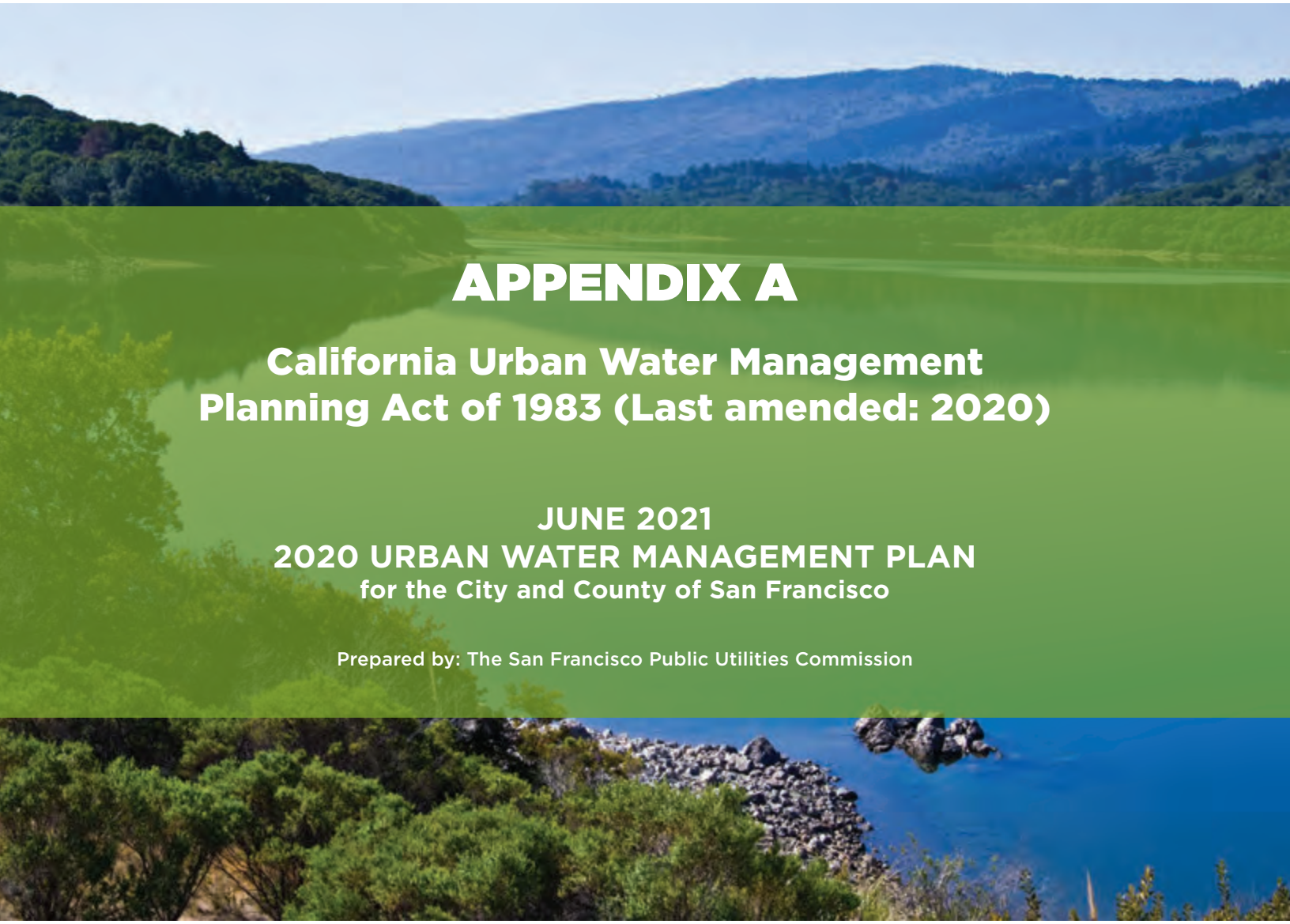

APPENDIX A

California Urban Water Management Planning Act of 1983 (Last amended: 2020)

JUNE 2021
2020 URBAN WATER MANAGEMENT PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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Urban Water Management Planning Act, Water Code Division 6, Part 2.6

All Codes have been updated to include the 2020 Statues, as of January 1, 2020.

PART 2.6. URBAN WATER MANAGEMENT PLANNING [10610 – 10657]

CHAPTER 1. General Declaration and Policy [10610 – 10610.4]

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate, and increasing long-term water conservation among Californians, improving water use efficiency within the state's communities and agricultural production, and strengthening local and regional drought planning are critical to California's resilience to drought and climate change.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years now and into the foreseeable future, and every urban water supplier should collaborate closely with local land-use authorities to ensure water demand forecasts are consistent with current land-use planning.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

10610.4. The Legislature finds and declares that it is the policy of the state as follows:

(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.

(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.

(c) Urban water suppliers shall be required to develop water management plans to achieve the efficient use of available supplies and strengthen local drought planning.

CHAPTER 2. Definitions [10611 – 10618]

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.3. “Customer” means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10611.5. “Demand management” means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. “Drought risk assessment” means a method that examines water shortage risks based on the driest five-year historic sequence for the agency’s water supply, as described in subdivision (b) of Section 10635.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

10617.5. “Water shortage contingency plan” means a document that incorporates the provisions detailed in subdivision (a) of Section 10632 and is subsequently adopted by an urban water supplier pursuant to this article.

10618. “Water supply and demand assessment” means a method that looks at current year and one or more dry year supplies and demands for determining water shortage risks, as described in Section 10632.1.

CHAPTER 3. Urban Water Management Plans

ARTICLE 1. General Provisions [10620 – 10621]

10620. (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d) (1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation, efficient water use, and improved local drought resilience.

(2) Notwithstanding paragraph (1), each urban water supplier shall develop its own water shortage contingency plan, but an urban water supplier may incorporate, collaborate, and otherwise share information with other urban water suppliers or other governing entities participating in an areawide, regional, watershed, or basinwide urban water management plan, an agricultural management plan, or groundwater sustainability plan development.

(3) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10621. (a) Each urban water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) An urban water supplier regulated by the Public Utilities Commission shall include its most recent plan and water shortage contingency plan as part of the supplier's general rate case filings.

(d) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

(e) Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.

(f) Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.

ARTICLE 2. Contents of Plans [10630 – 10634]

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied, while accounting for impacts from climate change.

10630.5. Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.

10631. A plan shall be adopted in accordance with this chapter that shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other social, economic, and demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available. The description shall include the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following:

(1) A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.

(2) When multiple sources of water supply are identified, a description of the management of each supply in correlation with the other identified supplies.

(3) For any planned sources of water supply, a description of the measures that are being undertaken to acquire and develop those water supplies.

(4) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information:

(A) The current version of any groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720), any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management for basins underlying the urban water supplier's service area.

(B) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater.

For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For a basin that has not been adjudicated, information as to whether the department has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to coordinate with groundwater sustainability agencies or groundwater management agencies listed in subdivision (c) of Section 10723 to maintain or achieve sustainable groundwater conditions in accordance with a groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720).

(C) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(D) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(d) (1) For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following: (A) Single-family residential.

(B) Multifamily. (C)

Commercial. (D)

Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

Resolution No. 0783
Page 1099 of 1419

(I) Agricultural.

(J) Distribution system water loss.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(3) (A) The distribution system water loss shall be quantified for each of the five years preceding the plan update, in accordance with rules adopted pursuant to Section 10608.34.

(B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.

(C) In the plan due July 1, 2021, and in each update thereafter, data shall be included to show whether the urban retail water supplier met the distribution loss standards enacted by the board pursuant to Section 10608.34.

(4) (A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.

(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:

(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.

(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.

(e) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:

(i) Water waste prevention ordinances.

(ii) Metering.

(iii) Conservation pricing.

(iv) Public education and outreach.

(v) Programs to assess and manage distribution system real loss.

(vi) Water conservation program coordination and staffing support.

(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.

(2) For an urban wholesale water supplier, as defined in Section 10608.12, a narrative description of the items in clauses (ii), (iv), (vi), and (vii) of subparagraph (B) of paragraph (1), and a narrative description of its distribution system asset management and wholesale supplier assistance programs.

(f) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in normal and single-dry water years and for a period of drought lasting five consecutive water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(g) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

(h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five- year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).

10631.1. (a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirement under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

10631.2. (a) In addition to the requirements of Section 10631, an urban water management plan shall include any of the following information that the urban water supplier can readily obtain:

(1) An estimate of the amount of energy used to extract or divert water supplies.

(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.

(3) An estimate of the amount of energy used to treat water supplies. (4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.

(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.

(6) An estimate of the amount of energy used to place water into or withdraw from storage.

(7) Any other energy-related information the urban water supplier deems appropriate.

(b) The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.

(c) The Legislature finds and declares that energy use is only one factor in water supply planning and shall not be considered independently of other factors.

10632. (a) Every urban water supplier shall prepare and adopt a water shortage contingency plan as part of its urban water management plan that consists of each of the following elements:

(1) The analysis of water supply reliability conducted pursuant to Section 10635.

(2) The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:

(A) The written decision making process that an urban water supplier will use each year to determine its water supply reliability.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

(iii)Existing infrastructure capabilities and plausible constraints.

(iv)A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of water supply.

(3) (A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.

(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross- reference relating its existing categories to the six standard water shortage levels.

(4) Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions. (B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state- mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

(5) Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications.

(6) For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.

(7) (A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(A) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(B) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

(8) A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

(9) For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.

(10) Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.

(b) For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

(c) The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.

10632.1. An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.

10632.2. An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan, as identified in subdivision (a) of Section 10632, or reasonable alternative actions, provided that descriptions of the alternative actions are submitted with the annual water shortage assessment report pursuant to Section 10632.1. Nothing in this section prohibits an urban water supplier from taking actions not specified in its water shortage contingency plan, if needed, without having to formally amend its urban water management plan or water shortage contingency plan.

10632.3. It is the intent of the Legislature that, upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the board defer to implementation of locally adopted water shortage contingency plans to the extent practicable.

10632.5. (a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

CHAPTER 3. Urban Water Management Plans

ARTICLE 2.5. Water Service Reliability [10635]

10635. (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following:

(1) A description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted.

(2) A determination of the reliability of each source of supply under a variety of water shortage conditions. This may include a determination that a particular source of water supply is fully reliable under most, if not all, conditions.

(3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.

(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.

(d) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(e) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(f) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

ARTICLE 3. Adoption and Implementation of Plans [10640 – 10645]

10640. (a) Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

(b) Every urban water supplier required to prepare a water shortage contingency plan shall prepare a water shortage contingency plan pursuant to Section 10632. The supplier shall likewise periodically review the water shortage contingency plan as required by paragraph

(10) of subdivision (a) of Section 10632 and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan or a water shortage contingency plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644. (a) (1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1) shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

(b) If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its water shortage contingency plan prepared pursuant to subdivision (a) of Section 10632 no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.

(c) (1) (A) Notwithstanding Section 10231.5 of the Government Code, the department shall prepare and submit to the Legislature, on or before July 1, in the years ending in seven and two, a report summarizing the status of the plans and water shortage contingency plans adopted pursuant to this part. The report prepared by the department shall identify the exemplary elements of the individual plans and water shortage contingency plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan and water shortage contingency plan to the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans and water shortage contingency plans submitted pursuant to this part.

(B) The department shall prepare and submit to the board, on or before September 30 of each year, a report summarizing the submitted water supply and demand assessment results along with appropriate reported water shortage conditions and the regional and statewide analysis of water supply conditions developed by the department. As part of the report, the department shall

provide a summary and, as appropriate, urban water supplier specific information regarding various shortage response actions implemented as a result of annual supplier-specific water supply and demand assessments performed pursuant to Section 10632.1.

(C) The department shall submit the report to the Legislature for the 2015 plans by July 1, 2017, and the report to the Legislature for the 2020 plans and water shortage contingency plans by July 1, 2022.

(2) A report to be submitted pursuant to subparagraph (A) of paragraph (1) shall be submitted in compliance with Section 9795 of the Government Code.

(d) The department shall make available to the public the standard the department will use to identify exemplary water demand management measures.

10645. (a) Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

(b) Not later than 30 days after filing a copy of its water shortage contingency plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

CHAPTER 4. Miscellaneous Provisions [10650 – 10657]

10650. Any actions or proceedings, other than actions by the board, to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan or a water shortage contingency plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan or water shortage contingency plan, or action taken pursuant to either, does not comply with this part shall be commenced within 90 days after filing of the plan or water shortage contingency plan or an amendment to either pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan or a water shortage contingency plan, or an action taken pursuant to either by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the board and the Public Utilities Commission, for the preparation of water management plans, water shortage contingency plans, or conservation plans; provided, that if the board or the Public Utilities Commission requires additional information concerning water conservation, drought response measures,

or financial conditions to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan that complies with analogous federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its urban water management plan, its drought risk assessment, its water supply and demand assessment, and its water shortage contingency plan and implementing the reasonable water conservation measures included in either of the plans.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier is not eligible for a water grant or loan awarded or administered by the state unless the urban water supplier complies with this part.

10657. The department may adopt regulations regarding the definitions of water, water use, and reporting periods, and may adopt any other regulations deemed necessary or desirable to implement this part. In developing regulations pursuant to this section, the department shall solicit broad public participation from stakeholders and other interested persons.

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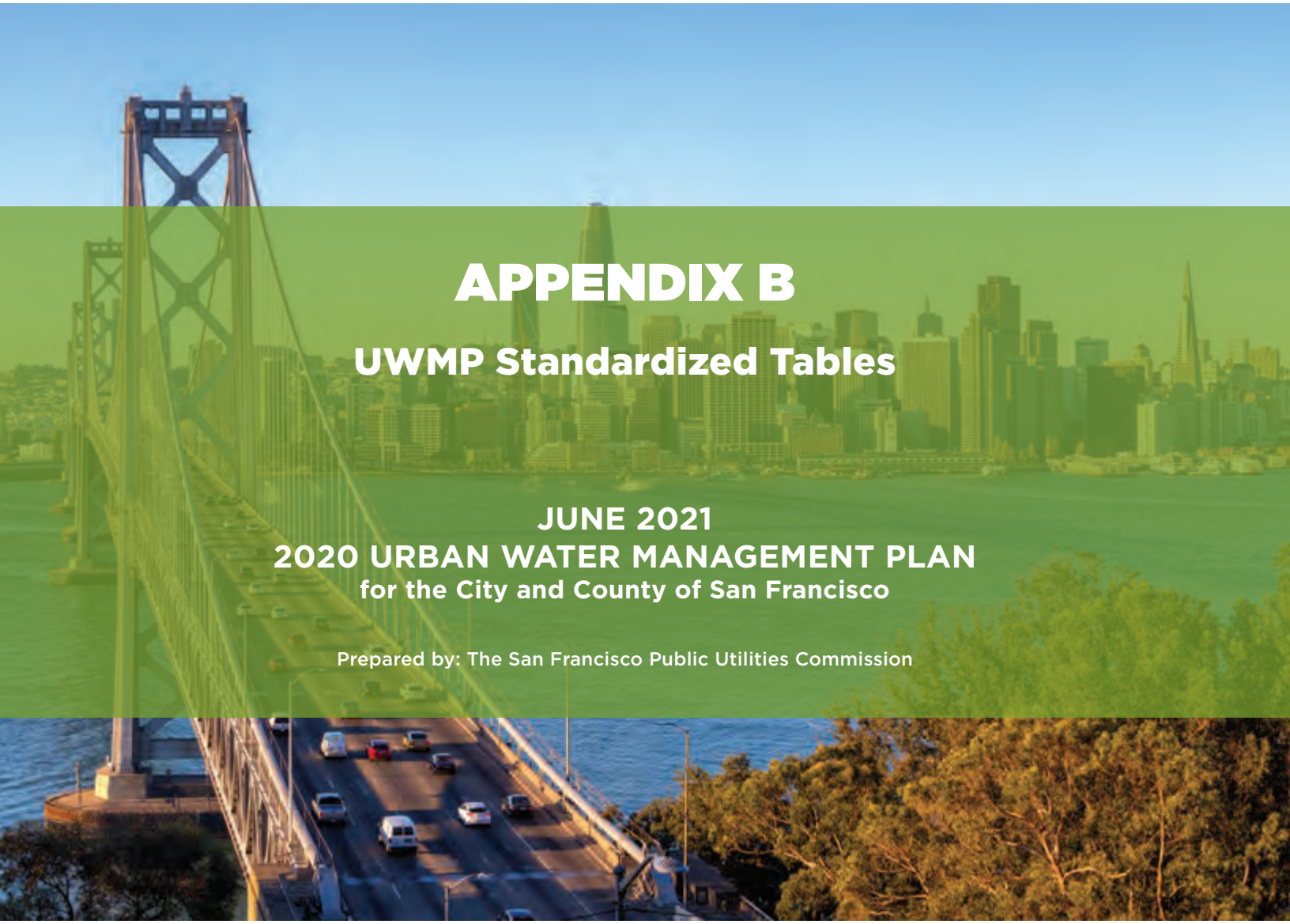

APPENDIX B

UWMP Standardized Tables

JUNE 2021

2020 URBAN WATER MANAGEMENT PLAN

for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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Submittal Table 2-1 Retail Only: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020 *
Add additional rows as needed			
CA3810011	SFPUC - CITY DISTRIBUTION DIVISION	181,011	73,150
CA0110018	SFPUC - PLEASANTON WELLS	1	340
CA0110012	SFPUC - TOWN OF SUNOL	141	470
	TOTAL	181,153	73,960

**** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:
Some suburban retail water connections served by the SFPUC are not included in this list, as they are covered under the San Francisco Regional Water System PWS (CA3810001), which primarily serves wholesale connections.

Submittal Table 2-2: Plan Identification			
Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance** *if applicable* (select from drop down list)
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☐	Water Supplier is also a member of a Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**		
NOTES:			

Submittal Table 2-3: Supplier Identification	
Type of Supplier (select one or both)	
☑	Supplier is a wholesaler
☑	Supplier is a retailer
Fiscal or Calendar Year (select one)	
☐	UWMP Tables are in calendar years
☑	UWMP Tables are in fiscal years
If using fiscal years provide month and date that the fiscal year begins (mm/dd)	
7/1	
Units of measure used in UWMP * (select from drop down)	
Unit	AF
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*	
NOTES: Values are rounded to the nearest 10 AF in the standardized tables. The units of measure used in the body of the UWMP are millions of gallons per day (mgd).	

Submittal Table 2-4 Retail: Water Supplier Information Exchange
The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.
Wholesale Water Supplier Name
Add additional rows as needed
Not applicable. The SFPUC does not receive water from any wholesale supplier.
NOTES:

Submittal Table 2-4 Wholesale: Water Supplier Information Exchange (select one)	
☑	Supplier has informed more than 10 other water suppliers of water supplies available in accordance with Water Code Section 10631. Completion of the table below is optional. If not completed, include a list of the water suppliers that were informed.
	Provide page number for location of the list.
☐	Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with Water Code Section 10631. **Complete the table below.**
Water Supplier Name	
Add additional rows as needed	
City of Brisbane	
City of Burlingame	
City of Daly City	
City of East Palo Alto	
City of Hayward	
City of Menlo Park	
City of Millbrae	
City of Milpitas	
City of Mountain View	
City of Palo Alto	
City of Redwood City	
City of San Bruno	
City of San Jose	
City of Santa Clara	
City of Sunnyvale	
Town of Hillsborough	
Alameda County Water District	
Coastside County Water District	
Cordilleras Mutual Water Company	
Estero Municipal Improvement District	
Guadalupe Valley Municipal Improvement District	
Mid-Peninsula Water District	
North Coast County Water District	
Purissima Hills Water District	
Westborough Water District	
California Water Service Company	
Stanford University	
Groveland Community Services District [1]	
NOTES: 1. Groveland Community Services District (CSD) is contractually defined as a retail customer of the SFPUC and is accounted as such in SFPUC's previous planning documents. However, for the purpose of the 2020 UWMP update, SFPUC was directed by DWR to report Groveland CSD as a wholesale customer.	

Submittal Table 3-1 Retail: Population - Current and Projected						
Population Served	2020	2025	2030	2035	2040	2045*(opt)*
	899,732	1,004,799	1,066,403	1,128,007	1,189,610	1,251,214
NOTES: Population projections reflect the total population of in-City and suburban retail customers. Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is therefore reported in Table 3-1W instead of this table.						

Submittal Table 3-1 Wholesale: Population - Current and Projected						
Population Served	2020	2025	2030	2035	2040	2045*(opt)*
	1,861,643	1,944,854	2,035,472	2,191,056	2,314,808	2,441,801
NOTES: Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is included this table.						

Submittal Table 4-1 Retail: Demands for Potable and Non-Potable[1] Water - Actual			
Use Type	2020 Actual		
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool	Additional Description (as needed)	Level of Treatment When Delivered Drop down list	Volume[2]
Add additional rows as needed			
Single Family		Drinking Water	16,350
Multi-Family		Drinking Water	25,650
Other	Non-residential: commercial, industrial and institutional	Drinking Water	26,880
Losses	Includes both apparent losses and real losses (See Appendix F for AWWA audit worksheet)	Drinking Water	8,070
		TOTAL	76,950

[1] Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.
[2] Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.

NOTES: Per DWR direction, Groveland CSD is not accounted for as a retail customer, but rather wholesale customer in all the standardized tables. Their demand is included in Table 4-1W. However, the corresponding retail table in the UWMP includes Groveland CSD.

Submittal Table 4-1 Wholesale: Demands for Potable and Non-Potable[1] Water - Actual			
Use Type	2020 Actual		
Drop down list May select each use multiple times These are the only use types that will be recognized by the WUE data online submittal tool	Additional Description (as needed)	Level of Treatment When Delivered Drop down list	Volume[2]
Add additional rows as needed			
Sales to other agencies		Drinking Water	148,310
		TOTAL	148,310

[1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.*
[2] *Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is included in this table. However, the corresponding wholesale table in the UWMP excludes Groveland CSD.

Submittal Table 4-2 Retail: Use for Potable and Non-Potable[1] Water - Projected						
Use Type	Additional Description (as needed)	Projected Water Use[2] *Report To the Extent that Records are Available*				
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool		2025	2030	2035	2040	2045 (opt)
Add additional rows as needed						
Single Family		15,460	15,240	15,120	15,240	15,230
Multi-Family		26,550	28,680	31,260	33,940	36,970
Other	All non-residential [1]	27,780	27,330	27,220	27,670	28,230
Losses		6,720	6,720	6,720	6,720	6,720
TOTAL		76,510	77,970	80,320	83,570	87,150

[1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.*
[2] *Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Per DWR direction, Groveland CSD is not accounted for as a retail customer, but rather wholesale customer. Their demand is included in Table 4-2W. However, the corresponding retail table in the UWMP includes Groveland CSD.
1. The "Other" category includes all non-residential water demands (commercial, industrial, irrigation, etc.). Water demands served by recycled water supplies fall under this category and were subtracted from the numbers reported in this table, in accordance with Table 6-4, which provides a separate line item for the "Recycled Water Demands".

Submittal Table 4-2 Wholesale: Use for Potable and Raw Water - Projected						
Use Type	Additional Description (as needed)	Projected Water Use * Report To the Extent that Records are Available				
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool.		2025	2030	2035	2040	2045 (opt)
Add additional rows as needed						
Sales to other agencies	Projected purchase requests	163,940	166,000	170,490	175,420	182,640
TOTAL		163,940	166,000	170,490	175,420	182,640
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*						

NOTES: Per DWR direction, Groveland CSD is accounted for as a wholesale customer in this standardized table. However, the corresponding wholesale table in the UWMP excludes Groveland CSD.

Submittal Table 4-3 Retail: Total Water Use (Potable and Non-Potable)						
	2020	2025	2030	2035	2040	2045 (opt)
Potable Water, Raw, Other Non-potable *From Tables 4-1R and 4-2 R*	76,950	76,510	77,970	80,320	83,560	87,150
Recycled Water Demand[1] *From Table 6-4*	110	2,350	2,800	2,800	2,800	2,800
Optional Deduction of Recycled Water Put Into Long-Term Storage[2]						
TOTAL WATER USE	77,060	78,860	80,770	83,120	86,360	89,950

[1]Recycled water demand fields will be blank until Table 6-4 is complete
*[2] Long term storage means water placed into groundwater or surface storage that is not removed from storage in the same year. Supplier **may** deduct recycled water placed in long-term storage from their reported demand. This value is manually entered into Table 4-3.*

NOTES:
Recycled water use for landscape irrigation in 2020 reflects the recycled water supplied by the Sharp Park Recycled Water Project for golf course irrigation. Future projections reflect recycled water supply served by the planned Westside Recycled Water Project, and the existing Sharp Park Recycled Water Project and the Harding Park Recycled Water Project.
Also note that per DWR direction, Groveland CSD is not accounted for as a retail customer, but rather wholesale customer in all standardized tables. Their demand is included in Table 4-3W. However, the corresponding retail table in the UWMP includes Groveland CSD.

Submittal Table 4-3 Wholesale: Total Water Use (Potable and Non-Potable)						
	2020	2025	2030	2035	2040	2045 (opt)
Potable and Raw Water From Tables 4-1W and 4-2W	148,310	163,940	166,000	170,490	175,420	182,640
Recycled Water Demand* From Table 6-4W	0	0	0	0	0	0
TOTAL WATER DEMAND	148,310	163,940	166,000	170,490	175,420	182,640
**Recycled water demand fields will be blank until Table 6-4 is complete.*						

NOTES:
Wholesale demands are based on purchase requests projections.
Per DWR direction, Groveland CSD is accounted for as a wholesale customer in all the standardized tables and is therefore included in this table. However, the corresponding wholesale table in the UWMP excludes Groveland CSD.

Submittal Table 4-4 Retail: Last Five Years of Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss [1,2]
07/2015	6,750
07/2016	5,830
07/2017	6,750
07/2018	6,910
07/2019	8,070
[1] Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet. ***[2] Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*	
NOTES:	

Submittal Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) *Drop down list (y/n)*	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, or otherwise are utilized in demand projections are found.	Appendix G
Are Lower Income Residential Demands Included In Projections? *Drop down list (y/n)*	Yes
NOTES:	

Submittal Table 5-1 Baselines and Targets Summary From SB X7-7 Verification Form *Retail Supplier or Regional Alliance Only*				
Baseline Period	Start Year *	End Year *	Average Baseline GPCD*	Confirmed 2020 Target*
10-15 year	*2001*	*2010*	*107*	*96*
5 Year	*2006*	*2010*	*101*	
**All cells in this table should be populated manually from the supplier's SBX7-7 Verification Form and reported in Gallons per Capita per Day (GPCD)*				
NOTES: Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is therefore excluded from SB X7-7 calculations.				

Submittal Table 5-2: 2020 Compliance From SB X7-7 2020 Compliance Form *Retail Supplier or Regional Alliance Only*				
2020 GPCD			2020 Confirmed Target GPCD*	Did Supplier Achieve Targeted Reduction for 2020? Y/N
Actual 2020 GPCD*	2020 TOTAL Adjustments*	Adjusted 2020 GPCD* *(Adjusted if applicable)*		
76	-	-	*96*	*Y*
**All cells in this table should be populated manually from the supplier's SBX7-7 2020 Compliance Form and reported in Gallons per Capita per Day (GPCD)*				
NOTES: Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is therefore excluded from SB X7-7 calculations.				

Submittal Table 6-1 Retail: Groundwater Volume Pumped						
☐	Supplier does not pump groundwater. The supplier will not complete the table below.					
☐	All or part of the groundwater described below is desalinated.					
Groundwater Type ***Drop Down List*** *May use each category multiple times*	Location or Basin Name	2016*	2017*	2018*	2019*	2020*
Add additional rows as needed						
Alluvial Basin	Westside Basin (1)	1340	1460	1900	1904	2240
Alluvial Basin	Livermore Valley Basin, Central Groundwater Sub Basin (2)	450	450	340	450	340
	TOTAL	1,790	1,910	2,240	2,354	2,580

**** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:
(1) Data from 2016-2019 are obtained from the 2019 Annual Groundwater Monitoring Report, Westside Basin (SFPUC, April 2020), 2020 data are from verbal communications with SFPUC groundwater staff. Pumping volumes are reported on a calendar year basis, but are used to approximate fiscal year data for this table.
(2) The Livermore Valley Basin and Central Groundwater Sub Basin are the source of water for the Castlewood Well System. Pumping volumes are assumed to be equivalent to billed consumption for Castlewood CSA.

Submittal Table 6-1 Wholesale: Groundwater Volume Pumped						
☑	Supplier does not pump groundwater. The supplier will not complete the table below.					
☐	All or part of the groundwater described below is desalinated.					
Groundwater Type *Drop Down List* *May use each category multiple times*	Location or Basin Name	2016*	2017*	2018*	2019*	2020*
Add additional rows as needed						
	TOTAL	0	0	0	0	0
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*						
NOTES:						

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area in 2020						
☐	There is no wastewater collection system. The supplier will not complete the table below.					
100%	Percentage of 2015 service area covered by wastewater collection system *(optional)*					
100%	Percentage of 2015 service area population covered by wastewater collection system *(optional)*					
Wastewater Collection			**Recipient of Collected Wastewater**			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? *Drop Down List*	Volume of Wastewater Collected from UWMP Service Area 2020 *	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area? *Drop Down List*	Is WWTP Operation Contracted to a Third Party? *(optional)* *Drop Down List*
SFPUC [1]	Metered	63,350	SFPUC	Southeast Water Pollution Control Plant	Yes	No
SFPUC [1]	Metered	16,410	SFPUC	Oceanside Water Pollution Control Plant	Yes	No
US Navy	Metered	370	US Navy and Treasure Island Development Authority	Treasure Island Wastewater Treatment Plant	Yes	Yes
City and County of San Francisco [2]	Metered	430	City and County of San Francisco	Mel Leong Treatment Plant	Yes	No
Total Wastewater Collected from Service Area in 2020:		80,560				

**** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:
1. At the Southeast and Oceanside WPCPs, metered effluent flows include both primary-only and secondary treated effluent (the bulk of which is secondary treated) and flows include treated combined wastewater and stormwater because the collection systems are predominantly combined systems.
2. Volume of wastewater collected at the Mel Leong Treatment Plant corresponds to calendar year 2020.

Submittal Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2020

☐ **No wastewater is treated or disposed of within the UWMP service area.** The supplier will not complete the table below.

Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)* 2	Method of Disposal ***Drop down list***	Does This Plant Treat Wastewater Generated Outside the Service Area? ***Drop down list***	Treatment Level ***Drop down list***	2020 volumes [1]				
							Waste water Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
Southeast Water Pollution Control Plant and North Point Wet Weather Facility [1,2]	Discharge Point No. 001; Discharge Point No. 002; Discharge Point Nos. 003-006	Lower San Francisco Bay; Islais Creek; Central San Francisco Bay	2 386010001	Bay or estuary outfall	Yes	Secondary, Undisinfected*	62,920	58,310 [4]	0	0	0
Oceanside Water Pollution Control Plant [1]	Discharge Point No. 001	Pacific Ocean, Offshore	2 386009001	Ocean outfall	Yes	Secondary, Undisinfected	16,300	16,790 [5]	0	0	0
Treasure Island Wastewater Treatment Plant [2]	Discharge Point No. 001	Central San Francisco Bay	2 386013001	Bay or estuary outfall	No	Secondary, Undisinfected*	370	330	0	0	0
Mel Leong Treatment Plant [2,3]	North Bayside System Unit	Lower San Francisco Bay	2 417033001	Bay or estuary outfall	No	Secondary, Undisinfected*	430	430	0	0	0
						Total	80,020	75,860	0	0	0

[1]**Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.
[2] If the **Wastewater Discharge ID Number** is not available to the UWMP preparer, access the SWRCB CIWQS regulated facility website at https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet?inCommand=reset&reportName=RegulatedFacility

NOTES: 1. At the Southeast and Oceanside WPCPs, metered effluent flows include both primary-only and secondary treated effluent (the bulk of which is secondary treated) and flows include treated combined wastewater and stormwater because the collection systems are predominantly combined systems.
2. At the Southeast Water Pollution Control Plant, Treasure Island Wastewater Treatment Plant, and Mel Leong Treatment Plant, wastewater are secondary treated and disinfected (that option was not available in the spreadsheet template's original dropdown menu.)
3. Volume of wastewater collected at the Mel Leong Treatment Plant corresponds to calendar year 2020.
4. The volume discharged is less than the volume collected because a small volume of the discharged wastewater is treated to secondary, disinfected-23 level and used for other purposes.
5. The volume discharged is higher than the volume collected because the discharged volume includes additional plant recycle streams.

Submittal Table 6-3 Wholesale: Wastewater Treatment and Discharge Within Service Area in 2020

☑	Wholesale Supplier neither distributes nor provides supplemental treatment to recycled water. The Supplier will not complete the table below.

Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)* [2]	Method of Disposal ***Drop down list***	Does This Plant Treat Wastewater Generated Outside the Service Area? ***Drop down list***	Treatment Level ***Drop down list***	2020 volumes [1]				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
Add additional rows as needed											
						Total	0	0	0	0	0

[1] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.
[2] If the **Wastewater Discharge ID Number** is not available to the UWMP preparer, access the SWRCB CIWQS regulated facility website at https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet?inCommand=reset&reportName=RegulatedFacility

NOTES:

Submittal Table 6-4a Retail: Recycled Water Direct Beneficial Uses Within Service Area
Please see Tables 6-4b and 6-4c below.

☐	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.
Name of Supplier Producing (Treating) the Recycled Water:	SFPUC
Name of Supplier Operating the Recycled Water Distribution System:	SFPUC
Supplemental Water Added in 2020 (volume) *Include units*	0
Source of 2020 Supplemental Water	Not applicable

Beneficial Use Type *Insert additional rows if needed.*	**Potential** Beneficial Uses of Recycled Water (Describe)	Amount of **Potential** Uses of Recycled Water (Quantity) *Include volume units*[1]	General Description of 2020 Uses	Level of Treatment *Drop down list*	2020 [1]	2025 [1]	2030[1]	2035[1]	2040[1]	2045[1] (opt)
Landscape irrigation (exc golf courses)	Irrigation for Golden Gate Park and SF Zoo		No uses in 2020	Advanced	0	1,680	1,680	1,680	1,680	1,680
Landscape irrigation (exc golf courses)	Irrigation for Treasure Island		No uses in 2020	Tertiary	0	220	220	220	220	220
Golf course irrigation	Irrigation for Lincoln Park and Presidio golf courses		No uses in 2020	Advanced	0	120	340	340	340	340
Other (Description Required)	Direct non-potable reuse to serve dual plumbed buildings on Treasure Island		No uses in 2020	Tertiary	0	0	230	230	230	230
				Total:	0	2,020	2,470	2,470	2,470	2,470
				2020 Internal Reuse						

[1] ***Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: The landscape and irrigation recycled water uses included in this table will be supplied by the Westside Recycled Water Project and the Treasure Island Recycled Water Project.

Submittal Table 6-4b Retail: Recycled Water Direct Beneficial Uses Within Service Area											
☐	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.										
Name of Supplier Producing (Treating) the Recycled Water:			North San Mateo County Sanitation District (NSMCSD)								
Name of Supplier Operating the Recycled Water Distribution System:			NSMCSD (portion of transmission line within the City and County of San Francisco is operated by SFPUC)								
Supplemental Water Added in 2020 (volume) *Include units*			0								
Source of 2020 Supplemental Water			Not applicable								
Beneficial Use Type *Insert additional rows if needed.*	**Potential** Beneficial Uses of Recycled Water (Describe)	Amount of **Potential** Uses of Recycled Water (Quantity) *Include volume units*[1]	General Description of 2020 Uses	Level of Treatment *Drop down list*	2020 [1]	2025 [1]	2030[1]	2035[1]	2040[1]	2045[1] (opt)
Golf course irrigation	Harding Park and Fleming Golf Courses irrigation		No uses in 2020	Tertiary	0	220	220	220	220	220
				Total:	0	220	220	220	220	220
				2020 Internal Reuse						
[1] ***Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*										
NOTES:										

Submittal Table 6-4c Retail: Recycled Water Direct Beneficial Uses Within Service Area											
☐	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.										
Name of Supplier Producing (Treating) the Recycled Water:				North Coast County Water District							
Name of Supplier Operating the Recycled Water Distribution System:				North Coast County Water District							
Supplemental Water Added in 2020 (volume) *Include units*				0							
Source of 2020 Supplemental Water				Not applicable							
Beneficial Use Type *Insert additional rows if needed.*	**Potential** Beneficial Uses of Recycled Water (Describe)	Amount of **Potential** Uses of Recycled Water (Quantity) *Include volume units*[1]	General Description of 2020 Uses	Level of Treatment *Drop down list*	2020 [1]	2025 [1]	2030[1]	2035[1]	2040[1]	2045[1] (opt)	
Golf course irrigation	irrigation of Sharp Park Golf Course		irrigation of Sharp Park Golf Course	Tertiary	110	110	110	110	110	110	
				Total:	110	110	110	110	110	110	
				2020 Internal Reuse							
[1] ***Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*											
NOTES:											

Submittal Table 6-4 Wholesale: Current and Projected Retailers Provided Recycled Water Within Service Area							
☑	Recycled water is not directly treated or distributed by the Supplier. The Supplier will not complete the table below.						
Name of Receiving Supplier or Direct Use by Wholesaler	Level of Treatment *Drop down list*	2020*	2025*	2030*	2035*	2040*	2045* *(opt)*
Add additional rows as needed							
	Total	0	0	0	0	0	0
*** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.							
NOTES:							

Submittal Table 6-5 Retail: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual	
☐	Recycled water was not used in 2015 nor projected for use in 2020. The supplier will not complete the table below. If recycled water was not used in 2020, and was not predicted to be in 2015, then check the box and do not complete the table.

Beneficial Use Type	2015 Projection for 2020 [1]	2020 Actual Use[1]
Insert additional rows as needed.		
Agricultural irrigation		
Landscape irrigation (exc golf courses)		
Golf course irrigation	340	110
Commercial use		
Industrial use		
Geothermal and other energy production		
Seawater intrusion barrier		
Recreational impoundment		
Wetlands or wildlife habitat		
Groundwater recharge (IPR)		
Reservoir water augmentation (IPR)		
Direct potable reuse		
Other (Description Required)		
Total	340	110

[1] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.

NOTE:
Golf course irrigation includes Harding Park, Fleming and Sharp Park golf courses. The disparity between the predicted 2020 recycled water use and the actual 2020 recycled water used is approximately 230 acre-feet because the Harding Park Recycled Water Project was offline in 2020 due to necessary infrastructure upgrades.

Submittal Table 6-5 Wholesale: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual		
☑	Recycled water was not used or distributed by the supplier in 2015, nor projected for use or distribution in 2020. The wholesale supplier will not complete the table below.	
Name of Receiving Supplier or Direct Use by Wholesaler	2015 Projection for 2020*	2020 Actual Use*
Add additional rows as needed		
Total	0	0
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*		
NOTES:		

Submittal Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
☐	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
Section 6.2.2	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use *
Add additional rows as needed			
Westside Recycled Water Project	Construction of a Recycled Water Treatment Plant at the Oceanside Water Pollution Control Plant to serve recycled water for landscape irrigation at Golden Gate Park, Lincoln Park Golf Course, Presidio Golf Course, and other irrigated areas in the Presidio.	2025	2,020
Treasure Island Water Resource Recovery Facility	Construction of a wastewater treatment facility that will provide Title 22 disinfected tertiary-level treated effluent that will serve dual-plumbed buildings, and supply water for outdoor urban agriculture and irrigation.	2022	450
Ordinances, Programs, and Services	The SFPUC administers or helps to administer various ordinances, programs, and services in the City related to recycled water and water reuse. The majority of these ordinances, programs, and services have been established for many years and are ongoing, resulting in increased water reuse. These include Soil Compaction and Dust Control Ordinance, Recycled Water Ordinance, Large Landscape Grant Program and Onsite Potable Reuse Program.	2022	0
		Total	2,470
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*			
NOTES: See UWMP Section 6.2.2 for more information.			

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs						
☐	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
☑	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
Sections 6.2.2 & 7.4	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other suppliers?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type *Drop Down List*	Expected Increase in Water Supply to Supplier* *This may be a range*
	Drop Down List (y/n)	*If Yes, Supplier Name*				
Add additional rows as needed						
Westside Recycled Water Project	No			2025	All Year Types	2,020
Treasure Island Recycled Water Project	No			2022	All Year Types	450 - 1120
San Francisco Groundwater Supply Project [1]	No			Existing & Progressive Expansion	All Year Types	Up to 4480
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*						
NOTES: 1. Part of the San Francisco Groundwater Supply Project has been implemented, and currently produces approximately 450 acre-feet of potable water. A progressive expansion is planned, adding 1120 acre-feet of supply at a time, with a total anticipated capacity of 4480 acre-feet.						

Submittal Table 6-7 Wholesale: Expected Future Water Supply Projects or Programs						
☐	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
☑	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
Section 7.4	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other suppliers?		Description *(if needed)*	Planned Implementation Year	Planned for Use in Year Type *Drop Down list*	Expected Increase in Water Supply to Supplier*
	Drop Down Menu	*If Yes, Supplier Name*				
Add additional rows as needed						
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*						
NOTES:						

Submittal Table 6-8 Retail: Water Supplies — Actual				
Water Supply	Additional Detail on Water Supply	2020		
Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool		Actual Volume*	Water Quality Drop Down List	Total Right or Safe Yield* (optional)
Add additional rows as needed				
Surface water (not desalinated)		74,490	Drinking Water	
Groundwater (not desalinated)		450	Drinking Water	
Groundwater (not desalinated)		1,680	Other Non-Potable Water	
Purchased or Imported Water	Sharp Park	110	Recycled Water	
Purchased or Imported Water	Harding Park	0	Recycled Water	
	Total	76,730		0
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*				

NOTES:
Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is therefore reported in Table 6-8 Wholesale instead of this table. However, the corresponding retail table in the UWMP includes Groveland CSD.

Submittal Table 6-8 Wholesale: Water Supplies — Actual				
Water Supply	Additional Detail on Water Supply	2020		
Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool		Actual Volume*	Water Quality Drop Down List	Total Right or Safe Yield* (optional)
Add additional rows as needed				
Surface water (not desalinated)		148,310	Drinking Water	
Total		148,310		0
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*				
NOTES: Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is included in this table. However, the corresponding wholesale table in the UWMP excludes Groveland CSD.				

Submittal Table 6-9 Retail: Water Supplies — Projected											
Water Supply		Projected Water Supply * Report To the Extent Practicable									
Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool	Additional Detail on Water Supply	**2025**		**2030**		**2035**		**2040**		**2045** (opt)	
		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Add additional rows as needed											
Surface water (not desalinated)		74,940		75,280		76,510		78,640		82,220	
Groundwater (not desalinated)		1,570		2,690		3,810		4,930		4,930	
Recycled Water	See Table 6-4R for recycled water supplies	2,350		2,800		2,800		2,800		2,800	
	Total	78,860	0	80,770	0	83,120	0	86,370	0	89,950	0
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*											
NOTES: Per DWR direction, Groveland CSD is reported as a wholesale customer in all standardized tables.											

Submittal Table 6-9 Wholesale: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Projected Water Supply* Report To the Extent Practicable									
		2025		2030		2035		2040		2045 (opt)	
Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Add additional rows as needed											
Surface water (not desalinated)		163,940		166,000		170,490		175,420		182,640	
Total		163,940	0	166,000	0	170,490	0	175,420	0	182,640	0

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment)			
Year Type	**Base Year** If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 2019-2020, use 2020	**Available Supplies if Year Type Repeats**	
		☑	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location: Table 8-2 & Table 8-3
		☐	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available *	**% of Average Supply**
Average Year			100%
Single-Dry Year			
Consecutive Dry Years 1st Year			
Consecutive Dry Years 2nd Year			
Consecutive Dry Years 3rd Year			
Consecutive Dry Years 4th Year			
Consecutive Dry Years 5th Year			

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a Supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 7-1 Wholesale: Basis of Water Year Data (Reliability Assessment)			
Year Type	**Base Year** If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000	**Available Supplies if Year Type Repeats**	
		☑	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location: Table 8-3
		☐	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available *	**% of Average Supply**
Average Year			100%
Single-Dry Year			
Consecutive Dry Years 1st Year			
Consecutive Dry Years 2nd Year			
Consecutive Dry Years 3rd Year			
Consecutive Dry Years 4th Year			
Consecutive Dry Years 5th Year			

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 *(Opt)*
Supply totals *(autofill from Table 6-9)*	78,860	80,770	83,120	86,370	89,950
Demand totals *(autofill from Table 4-3)*	78,860	80,770	83,120	86,370	89,950
Difference	0	0	0	0	0
NOTES: Per DWR direction, Groveland CSD is reported as a wholesale customer in the standardized tables. Their supplies and demands are included in Table 7-2W.					

Submittal Table 7-2 Wholesale: Normal Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 *(Opt)*
Supply totals *(autofill from Table 6-9)*	163,940	166,000	170,490	175,420	182,640
Demand totals *(autofill fm Table 4-3)*	163,940	166,000	170,490	175,420	182,640
Difference	0	0	0	0	0
NOTES: Per DWR direction, Groveland CSD is reported as a wholesale customer in the standardized tables. Their supplies and demands are included in this table.					

Submittal Table 7-3 Retail: Single Dry Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 (Opt)
Supply totals*	66,650	68,780	71,470	74,380	67,320
Demand totals*	79,200	81,100	83,450	86,700	90,290
Difference	(12,550)	(12,320)	(11,980)	(12,320)	(22,970)
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*					

NOTES: Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is therefore included in Table 7-3W.
These tables assume implementation of the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) starting in 2023. The implementation of the Bay-Delta Plan Amendment is uncertain for multiple reasons, including ongoing litigation. The SFPUC recognizes that the Bay-Delta Plan Amendment has been adopted and that, given that it is now state law, we must plan for a future in which it is fully implemented. The SFPUC also acknowledges that the plan is not self-implementing and therefore does not automatically go into effect. The SFPUC is currently pursuing a voluntary agreement as well as a lawsuit which would limit implementation of the Plan. With both of these processes occurring on an unknown timeline, the SFPUC does not know at this time when the Bay-Delta Plan Amendment is likely to go into effect.

Submittal Table 7-3 Wholesale: Single Dry Year Supply and Demand Comparison					
	2025	2030	2035	2040 (Opt)	2045
Supply totals*	104,510	105,520	108,100	111,120	99,360
Demand totals*	163,550	165,680	170,160	175,080	182,370
Difference	(59,040)	(60,160)	(62,060)	(63,960)	(83,010)
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*					

NOTES: Groveland CSD is accounted for as a wholesale customer and is included in this table.
These tables assume implementation of the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) starting in 2023. The implementation of the Bay-Delta Plan Amendment is uncertain for multiple reasons, including ongoing litigation. The SFPUC recognizes that the Bay-Delta Plan Amendment has been adopted and that, given that it is now state law, we must plan for a future in which it is fully implemented. The SFPUC also acknowledges that the plan is not self-implementing and therefore does not automatically go into effect. The SFPUC is currently pursuing a voluntary agreement as well as a lawsuit which would limit implementation of the Plan. With both of these processes occurring on an unknown timeline, the SFPUC does not know at this time when the Bay-Delta Plan Amendment is likely to go into effect.

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison						
		2025*	2030*	2035*	2040*	2045* (Opt)
First year	Supply totals	66,650	68,780	71,470	74,380	67,320
	Demand totals	79,200	81,100	83,450	86,700	90,290
	Difference	(12,550)	(12,320)	(11,980)	(12,320)	(22,970)
Second year	Supply totals	57,690	59,820	62,170	64,860	67,320
	Demand totals	79,200	81,100	83,450	86,700	90,290
	Difference	(21,510)	(21,280)	(21,280)	(21,840)	(22,970)
Third year	Supply totals	57,690	59,820	62,170	64,860	67,320
	Demand totals	79,200	81,100	83,450	86,700	90,290
	Difference	(21,510)	(21,280)	(21,280)	(21,840)	(22,970)
Fourth year	Supply totals	57,690	59,820	62,170	58,250	58,360
	Demand totals	79,200	81,100	83,450	86,700	90,290
	Difference	(21,510)	(21,280)	(21,280)	(28,450)	(31,930)
Fifth year	Supply totals	57,690	59,820	57,580	58,250	58,360
	Demand totals	79,200	81,100	83,450	86,700	90,290
	Difference	(21,510)	(21,280)	(25,870)	(28,450)	(31,930)
Sixth year *(optional)*	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is therefore reported in Table 7-4 Wholesale instead of this table. However, the corresponding retail table in the UWMP includes Groveland CSD.
These tables assume implementation of the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) starting in 2023. The implementation of the Bay-Delta Plan Amendment is uncertain for multiple reasons, including ongoing litigation. The SFPUC recognizes that the Bay-Delta Plan Amendment has been adopted and that, given that it is now state law, we must plan for a future in which it is fully implemented. The SFPUC also acknowledges that the plan is not self-implementing and therefore does not automatically go into effect. The SFPUC is currently pursuing a voluntary agreement as well as a lawsuit which would limit implementation of the Plan. With both of these processes occurring on an unknown timeline, the SFPUC does not know at this time when the Bay-Delta Plan Amendment is likely to go into effect.

Submittal Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison						
		2025*	2030*	2035*	2040*	2045* (Opt)
First year	Supply totals	104,510	105,520	108,100	111,120	99,360
	Demand totals	163,550	165,680	170,160	175,080	182,370
	Difference	(59,040)	(60,160)	(62,060)	(63,960)	(83,010)
Second year	Supply totals	104,180	90,510	92,640	95,330	99,360
	Demand totals	163,550	165,680	170,160	175,080	182,370
	Difference	(59,370)	(75,170)	(77,520)	(79,750)	(83,010)
Third year	Supply totals	89,610	90,510	92,640	95,330	99,360
	Demand totals	163,550	165,680	170,160	175,080	182,370
	Difference	(73,940)	(75,170)	(77,520)	(79,750)	(83,010)
Fourth year	Supply totals	89,610	90,510	92,640	84,130	84,460
	Demand totals	163,550	165,680	170,160	175,080	182,370
	Difference	(73,940)	(75,170)	(77,520)	(90,950)	(97,910)
Fifth year	Supply totals	89,610	90,510	84,910	84,130	84,460
	Demand totals	163,550	165,680	170,160	175,080	182,370
	Difference	(73,940)	(75,170)	(85,250)	(90,950)	(97,910)
Sixth year *(optional)*	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0

Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.

NOTES: Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is included in this table. However, the corresponding wholesale table in the UWMP excludes Groveland CSD.

These tables assume implementation of the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) starting in 2023. The implementation of the Bay-Delta Plan Amendment is uncertain for multiple reasons, including ongoing litigation. The SFPUC recognizes that the Bay-Delta Plan Amendment has been adopted and that, given that it is now state law, we must plan for a future in which it is fully implemented. The SFPUC also acknowledges that the plan is not self-implementing and therefore does not automatically go into effect. The SFPUC is currently pursuing a voluntary agreement as well as a lawsuit which would limit implementation of the Plan. With both of these processes occurring on an unknown timeline, the SFPUC does not know at this time when the Bay-Delta Plan Amendment is likely to go into effect.

Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)	
2021	**Total**
Total Water Use	77,520
Total Supplies	73,710
Surplus/Shortfall w/o WSCP Action	(3,810)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	-3,810
Resulting % Use Reduction from WSCP action	0%
2022	**Total**
Total Water Use	77,960
Total Supplies	74,160
Surplus/Shortfall w/o WSCP Action	(3,800)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	-3,800
Resulting % Use Reduction from WSCP action	0%
2023	**Total**
Total Water Use	78,300
Total Supplies	52,980
Surplus/Shortfall w/o WSCP Action	(25,320)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	25,320
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	32%
2024	**Total**
Total Water Use	78,750
Total Supplies	52,980
Surplus/Shortfall w/o WSCP Action	(25,770)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	25,760
Revised Surplus/(shortfall)	-10
Resulting % Use Reduction from WSCP action	33%

2025	Total
Total Water Use	79,200
Total Supplies	53,990
Surplus/Shortfall w/o WSCP Action	(25,210)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	25,200
Revised Surplus/(shortfall)	-10
Resulting % Use Reduction from WSCP action	32%

NOTE: These tables assume implementation of the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) starting in 2023. The implementation of the Bay-Delta Plan Amendment is uncertain for multiple reasons, including ongoing litigation. The SFPUC recognizes that the Bay-Delta Plan Amendment has been adopted and that, given that it is now state law, we must plan for a future in which it is fully implemented. The SFPUC also acknowledges that the plan is not self-implementing and therefore does not automatically go into effect. The SFPUC is currently pursuing a voluntary agreement as well as a lawsuit which would limit implementation of the Plan. With both of these processes occurring on an unknown timeline, the SFPUC does not know at this time when the Bay-Delta Plan Amendment is likely to go into effect.

Submittal Table 8-1
Water Shortage Contingency Plan Levels

Shortage Level	Percent Shortage Range	Shortage Response Actions (*Narrative description*)
1	Up to 10%	Voluntary retail water use reduction of 5%
2	Up to 20%	Voluntary retail water use reduction of 5%
3	Up to 30%	Voluntary retail water use reduction of 5%
4	Up to 40%	Voluntary or mandatory retail water use reduction of 5% to 18%
5	Up to 50%	Mandatory retail water use reduction of 18% to 32%
6	>50%	Mandatory retail water use reduction of >32%

NOTES:

Submittal Table 8-2: Demand Reduction Actions

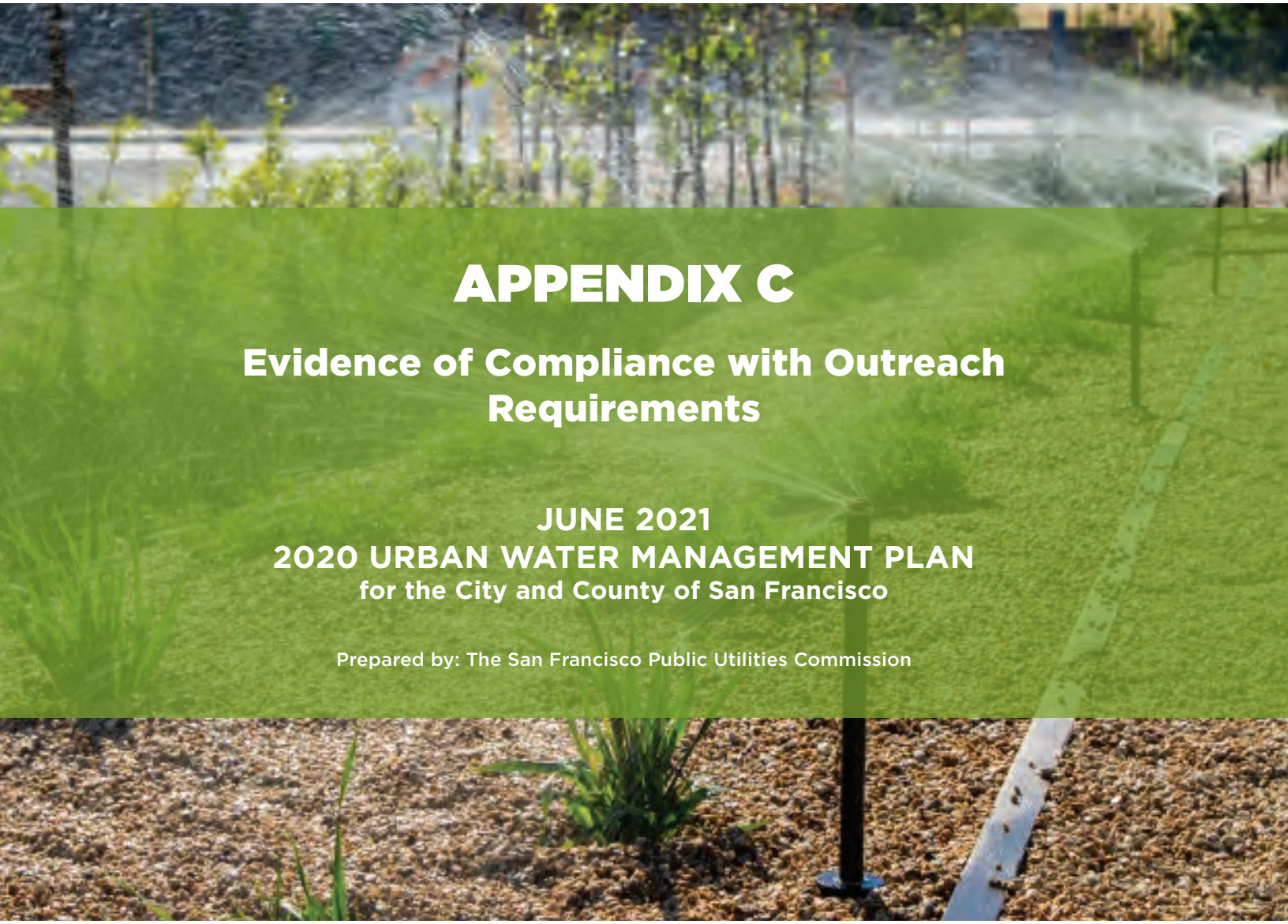
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? ***For Retail Suppliers Only*** *Drop Down List*
Add additional rows as needed				
1, 2, and 3	Other	3.3 mgd	Voluntary call for water use reductions	No
4	Other	6.3 mgd	Mandatory water use reduction	Yes
5	Other	16.2 mgd	Mandatory water use reduction	Yes
6	Other	21.2 mgd	Mandatory water use reduction	Yes

NOTES:
a. Associated volume of reduction is based on 2025 projected unconstrained SFPUC Retail customer demands on the Regional Water System of 65.9 mgd. Volumes shown for each level represent the total shortage that must be met with the associated response action at that shortage level.
b. For Shortage Levels 1-3, the SFPUC expects to have enough supply to meet projected unconstrained retail demands. However, SFPUC has a contractual obligation that for any level of required reduction in system-wide water use during shortages, the SFPUC shall require Retail Customers to conserve a minimum of 5 percent. A 5 percent reduction in retail demand can be achieved with a voluntary call for reductions in water use.
c. The Level 6 shortage (assumed to be 55% system-wide supply reduction) has an associated 21.2 mgd shortage gap in 2025. The demand reductions are assumed to ultimately be met with a demand reduction approach consisting of a 25 gpcd floor for residential accounts, a 50% demand reduction in irrigation accounts, and 30% demand reduction in other non-residential accounts.

Submittal Table 8-3: Supply Augmentation and Other Actions			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*
Add additional rows as needed			
NOTES:			

Submittal Table 10-1 Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
San Francisco	Yes	Yes
County Name *Drop Down List*	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
Alameda County	Yes	Yes
San Mateo County	Yes	Yes
Santa Clara County	Yes	Yes
San Joaquin County	Yes	Yes
Tuolumne County	Yes	Yes
NOTES: In addition to the cities and counties listed above, the SFPUC also notified various private organizations and communities that may be interested in participating in the UWMP process. A complete list of these entities can be found in Appendix C.		

Submittal Table 10-1 Wholesale: Notification to Cities and Counties (select one)		
☑	Supplier has notified more than 10 cities or counties in accordance with Water Code Sections 10621 (b) and 10642. **Completion of the table below is not required. Provide a separate list of the cities and counties that were notified.**	
Appendix C	Provide the page or location of this list in the UWMP.	
☐	Supplier has notified 10 or fewer cities or counties. **Complete the table below.**	
City Name	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
County Name *Drop Down List*	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
NOTES:		



APPENDIX C

Evidence of Compliance with Outreach Requirements

JUNE 2021
2020 URBAN WATER MANAGEMENT PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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Summary Table of SFPUC Compliance with Public Notification Elements of the Urban Water Management Plan Act

Code Section	Code Requirement	Summary of Action Taken	Documentation (Attached after this Table)
Water Code Section 10620	Notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes.	✓ January 29, February 8 and March 12, 2021: Sent notification letters via email to City agencies, wholesale customers of the SFPUC Regional Water System, suburban retail customers (e.g., SFO), large regional water agencies (e.g., EBMUD), Bay Area Water Supply Conservation Agency (BAWSCA), and a larger distribution list of parties known by the SFPUC to be interested in water resources planning issues.	• Example of 2/08/21 letter sent via email • Example of 03/12/2021 letter sent via email • Recipient list
Water Code Section 10642	Encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	✓ February 8 and March 12, 2021: Sent emails to a larger distribution list of parties known by the SFPUC to be interested in water resources planning issues. ✓ Currents hardcopy newsletter included with the March/April 2021 bill ✓ April 5, 2021: Posted the Draft 2020 UWMP on the SFPUC website at www.sfpuc.org ✓ March 29 and April 5, 2021: Posted advertisement in local community newspaper(s) regarding the availability of the Draft 2020 UWMP, as well as the time and location of the public hearing.	• Example of 2/08/21 letter sent via email (same letter sent via email on 03/12/21 to additional recipients) • Declaration of publication of San Francisco Chronicle and copy of advertisement • Copy of Currents newsletter included into customers' hard copy bills in March/April 2021
Water Code Section 10642	Prior to the required hearing, publish the notice of time and place of hearing within the jurisdiction of the supplier pursuant to Section 6066 of the Government Code.	✓ March 29 and April 5, 2021: Posted Notification of Public Hearing in local community newspaper meeting requirement of Section 6066 of the Government Code.	• Declaration of publication in San Francisco Chronicle and copy of advertisement
Water Code Section 10642	Prior to the required hearing, provide notice of time and place of hearing to any city of county within which the supplier provides water.	✓ February 8, March 12, April 5, 2021: Provided notification of public hearing, including time and place of the hearing, in the same notification letter regarding the preparation of the 2020 UWMP Update.	• Example of 2/08/21 letter sent via email (same letter sent via email on 03/12/21 to additional recipients) • Recipient list (same as recipient list listed earlier)

Appendix C – Evidence of Compliance with Outreach Requirements

Code Section	Code Requirement	Summary of Action Taken	Documentation (Attached after this Table)
Water Code Section 10642	Prior to adoption, make the plan available for public inspection.	✓ April 5, 2021: Posted the Draft 2020 UWMP on the SFPUC website at www.sfpuc.org, sent a notification email to announce availability of the Plan for public inspection. ✓ April 5, 2021: Sent emails to all parties listed above regarding the availability of the Draft 2020 UWMP. ✓ April 19, 2021: Sent reminder notification email about availability of the Plan for public inspection.	• Copy of web posting • Example of 4/05/21 letter sent via email • Example of 04/19/2021 letter sent via email • Recipient list (same as recipient list listed earlier)
Water Code Section 10642	Prior to adoption, hold a public hearing.	✓ April 13, 2021: Held a public hearing during the meeting of the San Francisco Public Utilities Commission.	• Copy of Commission Meeting Agenda including public hearing
Water Code Section 10642	After the hearing, the plan shall be adopted as prepared or as modified after the meeting.	✓ June 11, 2021: Adopted the SFPUC 2020 UWMP during the meeting of the San Francisco Public Utilities Commission.	• Resolution to Adopt the 2020 UWMP
Water Code Section 10644(a)	Within 30 days of plan adoption, submit a copy to DWR.	✓ By July 1, 2021 (exact date to be determined): Will submit the adopted 2020 UWMP electronically via the WUEdata Online Submittal Tool.	• *On file with the SFPUC:* Copy of DWR submittal confirmation
Water Code Section 10644(a)	Within 30 days of plan adoption, submit a copy to the California State Library.	✓ By July 11, 2021 (exact date to be determined): Will mail an electronic copy of the adopted 2020 UWMP on compact disc to the California State Library.	• *On file with the SFPUC:* Copy of delivery confirmation to the California State Library
Water Code Section 10644(a)	Within 30 days of plan adoption, submit a copy to any city or county within which the supplier provides water.	✓ By July 11, 2021 (exact date to be determined): Will email the adopted 2020 UWMP to all wholesale customers of the SFPUC Regional Water System, and cities or counties within which the SFPUC provides water.	• *On file with the SFPUC:* Copy of notification email
Water Code Section 10645	Within 30 days of submittal to DWR, make the plan available for public review during normal business hours.	✓ By July 30, 2021 (exact date to be determined): Will provide two copies of the adopted 2020 UWMP to the San Francisco Main Library. ✓ By July 30, 2021 (exact date to be determined): Will post the adopted 2020 UWMP on the SFPUC website at www.sfpuc.org	• *On file with the SFPUC:* Copy of delivery confirmation to the San Francisco Public Library and copy of library catalog record • *On file with the SFPUC:* Copy of web posting

Urban Water Management Plan

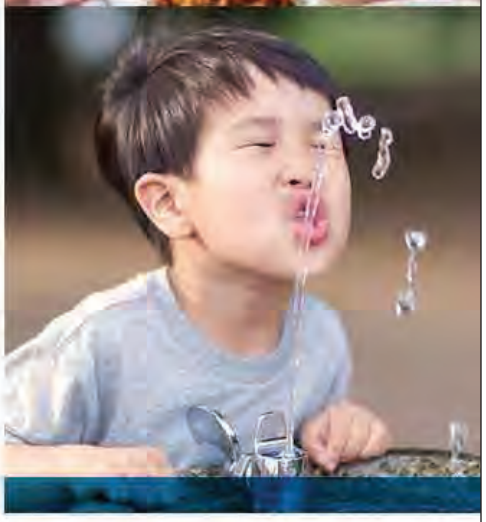
Dear Stakeholders,

The Urban Water Management Planning Act (Water Code Section 10610-10657) requires urban water supplier to **update its Urban Water Management Plan (UWMP)** and submit the completed plan to the California Department of Water Resources (DWR) every 5 years. The City and County of San Francisco is currently reviewing its UWMP and will be considering amendments or changes to the document. The 2020 update to the UWMP is due to DWR by July 1, 2021.

State law requires that urban water suppliers conduct a public hearing during the UWMP update process and that, at least 60 days prior to the public hearing, the City and County of San Francisco provide notice that it intends to update the UWMP to any city and county within which it provides water supplies. This letter serves as the required notification.

The UWMP will **provide an overview of our water deliveries and uses, water supply sources, and water conservation programs.** It will also include discussions on supply and demand projections over a 25-year planning horizon (from 2020 to 2045), available water supplies to meet existing and future demands under a range of water supply conditions, and our water demand management measures to reduce long-term water demand.

Proposed revisions to the UWMP will be available for public review and comment from April 5, 2021 to May 5, 2021. The Draft UWMP 2020 Update will be available on the SFPUC website and available for physical review and/or pick-up at a central location in downtown San Francisco. Additional information on how to access the UWMP will be provided in a later notification, prior to the start of the public review period.



Notice of Public Hearing

A public hearing will be held on April 13, 2021 at 1:30 pm at the meeting of the San Francisco Public Utilities Commission to allow interested members of the public to participate in the review process. All interested parties are invited to attend the public hearing and present their views. The hearing will be held virtually and can be accessed using the following information:

WATCH LIVE MEETING

Call-in number: 1 (415) 655-0001 / **MEETING ID:** 146 929 4145 # #

The final 2020 UWMP will be adopted by the Commission in June.

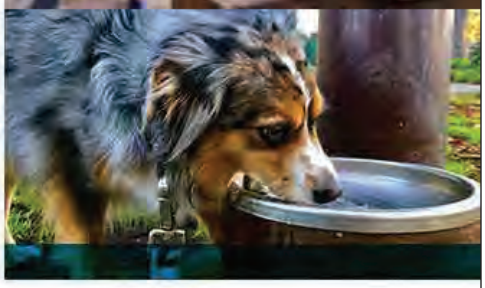
Submission of Comments

Any interested parties may also submit written comments to the City during the public comment period in one of three ways.

1. Written comments can be **e-mailed to Sarah Triolo,** striolo@sfwater.org.
2. Written comments can be **mailed to the address below.** To ensure that comments can be reviewed and incorporated, any mailed comments must be post-marked by **April 30th, 2021.**

   Steve Ritchie, San Francisco Public Utilities Commission
   525 Golden Gate Avenue, 13th Floor
   San Francisco, CA 94102
3. Written comments can be **deposited in the drop box** at 525 Golden Gate Avenue. Comments submitted via the drop box must be in an envelope with the following information clearly printed: "Urban Water Management Plan Comments, c/o Sarah Triolo".

In the meantime, if you have any questions about our UWMP, or the process of updating it, please contact Sarah Triolo at striolo@sfwater.org.



Sincerely,

Paula Kehoe

Director of Water Resources

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

Letter sent on 03/12/2021 via email

Lauppe Rhodes, Betsy

From: Paula Kehoe <PKehoe@sfwater.org>
Sent: Friday, March 12, 2021 11:44 AM
To: Lauppe Rhodes, Betsy
Subject: [Test]:Reminder of Preparation of the City and County of San Francisco Urban Water Management Plan 2020 Update and Public Hearing

CAUTION: This email originated from **outside** of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Dear Stakeholders,

As previously noticed, the City and County of San Francisco is currently reviewing its Urban Water Management Plan (UWMP) and will be considering amendments or changes to the document. The 2020 update to the UWMP is due to the Department of Water Resources by July 1, 2021.

The UWMP will provide an overview of our water deliveries and uses, water supply sources, and water conservation programs. It will also include discussions on supply and demand projections over a 25-year planning horizon (from 2020 to 2045), available water supplies to meet existing and future demands under a range of water supply conditions, and our water demand management measures to reduce long-term water demand.

Proposed revisions to the UWMP will be available for public review and comment from April 5, 2021 to May 5, 2021. The Draft UWMP 2020 Update will be available on the SFPUC website at sfpuc.org/uwmp.

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In the meantime, if you have any questions about our UWMP, or the process of updating it, please contact Sarah Triolo at striolo@sfwater.org.

Sincerely,

Paula Kehoe

Director of Water Resources

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

Contact list of stakeholders

Recipients of 2020 UWMP Update Notification
(Sent via e-mail on January 29, 2021, February 8, 2021 and March 12, 2021)

No.	Organization	Contact
1	City College of San Francisco	Robert Gabriner
2	Mayor - Senior Advisor on Environment	Tyrone Jue
3	Mayor's Office of Neighborhood Services	David Miree
4	Port of San Francisco	Brad Benson
5	Port of San Francisco	Monique Moyer
6	San Francisco Board of Supervisors	Aaron Peskin
7	San Francisco Board of Supervisors	Ahsha Safai
8	San Francisco Board of Supervisors	Catherine Stefani
9	San Francisco Board of Supervisors	Connie Chan
10	San Francisco Board of Supervisors	Dean Preston
11	San Francisco Board of Supervisors	Gordon Mar
12	San Francisco Board of Supervisors	Hillary Ronen
13	San Francisco Board of Supervisors	Rafael Mandelman
14	San Francisco Board of Supervisors	Matt Haney
15	San Francisco Board of Supervisors	Myrna Melgar
16	San Francisco Board of Supervisors	Shamann Walton
17	San Francisco Department of Building Inspection	Lily Madjus-Wu
18	San Francisco Department of Building Inspection	Patrick O'Riordan
19	San Francisco Department of Public Health	June Weintraub
20	San Francisco Department of Public Works	Alaric Degrafinried
21	San Francisco Department of Real Estate	Sachiko Tanikawa
22	San Francisco Department of the Environment	Debbie Raphael
23	San Francisco Fire Department	Janine Nicholson
24	San Francisco International Airport	Erin Cooke
25	San Francisco International Airport	Ivar C Satero
26	San Francisco International Airport	Jennifer Acton
27	San Francisco International Airport	Nupur Sinha
28	San Francisco Municipal Transportation Agency	Jeffrey Tumlin
29	San Francisco Office of Community Investment and Infrastructure	Jose Campos
30	San Francisco Office of Community Investment and Infrastructure	Salley Oerth
31	San Francisco Office of Small Business	Regina Dick-Endrizzi
32	San Francisco Office of the City Attorney	Dennis Herrera
33	San Francisco Planning Department	Chris Kern
34	San Francisco Planning Department	Rich Hillis
35	San Francisco Public Library	Michael Lambert
36	San Francisco Recreation and Park Department	Dennis Kern
37	San Francisco Recreation and Park Department	Phil Ginsburg
38	San Francisco Sheriff's Department	Paul Miyamoto
39	San Francisco Unified School District- Director of Sustainability	Nik Kaestner
40	San Francisco Unified School District- Water Conservation Mgr	Nate Kinsey

Recipients of 2020 UWMP Update Notification
(Sent via e-mail on January 29, 2021, February 8, 2021 and March 12, 2021)

41	Sunshine Ordinance Task Force	General
42	California Water Service Company	Dawn Smithson
43	California Water Service Company	Ken Jenkins
44	California Water Service Company	Ross Moilan
45	City of Brisbane	Jerry Flanagan
46	City of Brisbane/Guadalupe Valley Municipal Improvement District	Randy Breault
47	City of Burlingame	Art Morimoto
48	City of Burlingame	Tim McAuliffe
49	City of Daly City	Greg Krauss
50	City of Daly City	Ward Donnelly
51	City of East Palo Alto	Kamal Fallaha
52	City of East Palo Alto	Patrick Heisinger
53	City of Hayward	Alex Ameri
54	City of Hayward	Cheryl Munoz
55	City of Menlo Park	Christopher Lam
56	City of Menlo Park	Pam Lowe
57	City of Millbrae	Khee Lim
58	City of Millbrae	Shelley Reider
59	City of Milpitas	Tony Ndah
60	City of Mountain View	Elizabeth Flegel
61	City of Mountain View	Lisa Au
62	City of Palo Alto	Karla Dailey
63	City of Palo Alto	Lisa Bilir
64	City of Redwood City, Public Works Services Department	Justin Chapel
65	City of Redwood City, Public Works Services Department	Terrence Kyaw
66	City of San Bruno	Jimmy Tan
67	City of San Bruno	Mark Reinhardt
68	City of San Jose	Henry Louie
69	City of San Jose	Jeff Provenzano
70	City of Santa Clara	Gary Welling
71	City of Santa Clara	Shilpa Mehta
72	City of Sunnyvale	Mansour Nasser
73	City of Sunnyvale	Ramana Chinnakotla
74	Coastside County Water District	Cathleen Brennan
75	Coastside County Water District	Mary Rogren
76	Cordilleras Water District	Rick Thall
77	Estero Municipal Improvement District	Allen Smith
78	Estero Municipal Improvement District	Norm Dorais
79	Groveland Community Service	Peter Kampa
80	Mid-Peninsula Water District	Tammy Rudock
81	Mid-Peninsula Water District	Rene Ramirez

Recipients of 2020 UWMP Update Notification
(Sent via e-mail on January 29, 2021, February 8, 2021 and March 12, 2021)

82	North Coast County Water District	Adrianne Carr
83	Purissima Hills Water District	Phil Witt
84	Purissima Hills Water District	Sam Wu
85	Stanford University	Brian Manning
86	Stanford University	Julia Nussbaum
87	Town of Hillsborough	Paul Willis
88	Westborough Water District	Darryl Barrow
89	Town of Hillsborough	Ed Cooney
90	BAWSCA	Allison Schutte
91	BAWSCA	Christina Tang
92	BAWSCA	Danielle McPherson
93	BAWSCA	Kyle Ramey
94	BAWSCA	Enrique Lourdes
95	BAWSCA	Negin Ashoori
96	BAWSCA	Nicole Sandkulla
97	BAWSCA	Tom Francis
98	California State Assembly, AD12	Heath Flora
99	California State Coastal Conservancy	Moira McEnespy
100	California State Library Government Publications Section	Janet Coles
101	California State Seismic Safety Commission	Rick McCarthy
102	Department of Water Resources Office of Water Use Efficiency & Transfer	David Todd
103	San Francisco Housing Authority	Alicia Sisca
104	San Francisco Housing Authority	Barbara Smith
105	U.S. Environmental Protection Agency, Region 9	Eric Byous
106	U.S. EPA Region 9	David W. Smith
107	U.S. EPA Region 9	Tomas Torres
108	Contra Costa Water District	Steve Welch
109	East Bay Municipal Utility District	Clifford Chan
110	East Bay Municipal Utility District	Priyanka Jain
111	Marin Municipal Water District	Ben Horenstein
112	Santa Clara Valley Water District	Kristen Struve
113	Santa Clara Valley Water District	Rick Callender
114	Turlock Irrigation District	Tou Her
115	Zone 7 Water Agency	Amparo Flores
116	Zone 7 Water Agency	Elke Rank
117	Zone 7 Water Agency	Valerie Pryor
118	Alameda County	Susan S. Muranishi
119	County of San Mateo	Mike Callagy
120	County of Santa Clara	Jeffrey V. Smith
121	San Joaquin County	Matthew Paulin
122	Tuolumne County	Tracie Riggs

Recipients of 2020 UWMP Update Notification
(Sent via e-mail on January 29, 2021, February 8, 2021 and March 12, 2021)

123	Castlewood Country Club	John Vest
124	Golden Gate National Cemetery	Justin Blakeslee
125	Lawrence Livermore National Laboratory	Aaron W.Ward
126	Menlo Country Club	Kip Prahl
127	National Park Service GGNRA	Laura Joss
128	San Francisco State University	Caitlin Steele
129	San Francisco State University	Charles A. Meyer
130	San Francisco State University	General
131	San Francisco Zoo	Tanya Peterson
132	The Villas Parkmerced	General e-mail address
133	American True / True Youth	Daniel Leininger
134	Bay Area Council	Adrian Covert
135	Bayview Merchants Association	Al Norman
136	Building Owner and Management Association (BOMA)	Ken Cleaveland
137	Building Owner and Management Association (BOMA)	
138	California Native Plant Society - Yerba Buena Chapter	Eddie Bartley
139	California Sportfishing Protection Alliance	Chris Shutes
140	California Trout	Patrick Samuel
141	Coalition For San Francisco Neighborhoods	Joan Girardot
142	Coalition for San Francisco Neighborhoods	George Wooding
143	Coalition for San Francisco Neighborhoods	Nancy Wuerfel
144	Environmental Defense Fund	Ann Hayden
145	Environmental Defense Fund	Beth Trask
146	Golden Gate Audubon Society	Dan Murphy
147	Golden Gate Audubon Society	Pam Young
148	Golden Gate Heights Neighborhood Association	Frank Noto
149	Golden Gate Restaurant Association	Donnalyn Murphy
150	Golden Gate Restaurant Association	Laurie Thomas
151	Greater West Portal Neighborhood Association	Thomas Kanaley
152	Greater West Portal Neighborhood Association	Karen Tarantola
153	Greenway Belt- Visitacion Valley	Fran Martin
154	H2O Econ	Brian Browne
155	Hotel Council	Kevin Carroll
156	Joint Venture Silicon Valley	Kara Gross
157	Lakeshore Acres Improvement Club	Jim Stark
158	Natural Resources Defense Council	Ed Osann
159	North of the Panhandle Neighborhood Association	Julian Mackey
160	Oceanview, Merced Heights, Ingleside - Neighbors in Action (OMI-NIA)	Al Harris
161	Oceanview, Merced Heights, Ingleside - Neighbors in Action (OMI-NIA)	Mary Harris
162	Pacific Institute	Heather Cooley
163	Pacific Institute	Peter Gleick

Recipients of 2020 UWMP Update Notification
(Sent via e-mail on January 29, 2021, February 8, 2021 and March 12, 2021)

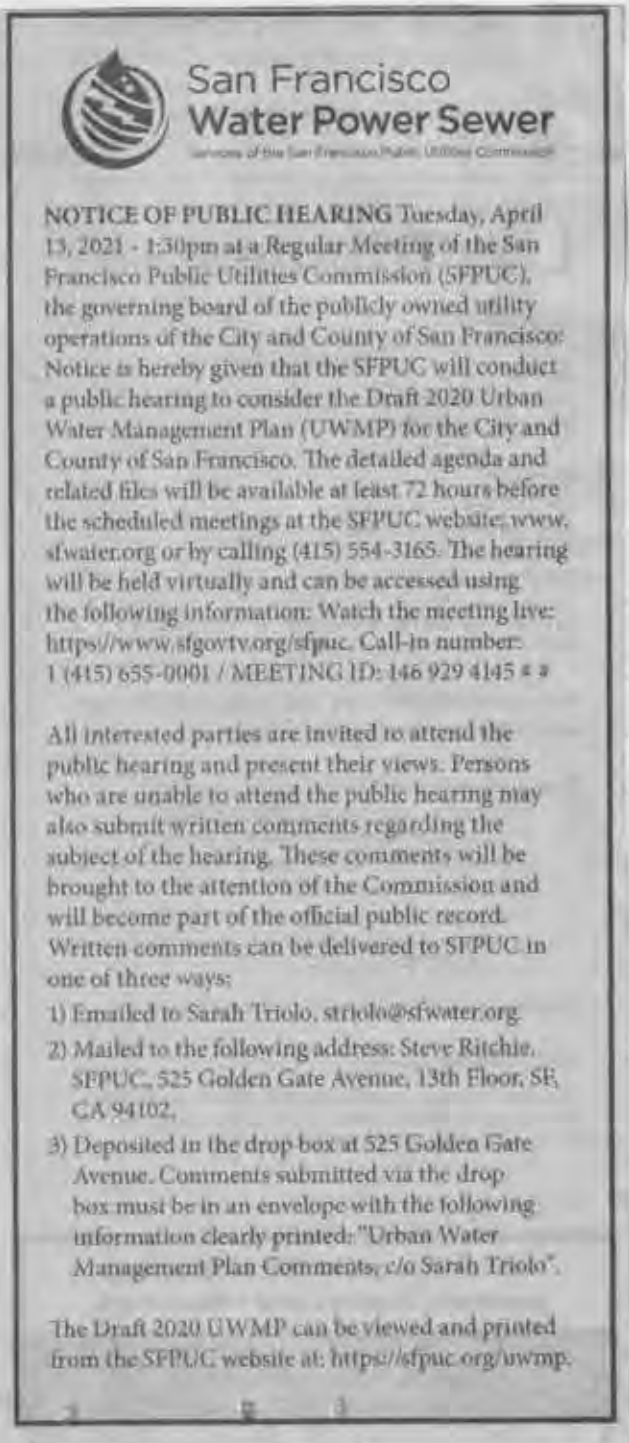
164	People of Parkside Sunset	Wesley Footracer
165	Planning and Conservation League	Jonas Minton
166	Planning Association for the Richmond (PAR)	Ray Holland
167	Planning Association for the Richmond (PAR)	Kate Lazarus
168	Plumbers Union Local 38	Larry Mazzola Jr.
169	Presidio Teachers Night	Lisa Hillstrom
170	Rebuild Together	Karen Nemsick
171	Restore Hetch Hetchy	Spreck Rosekrans
172	San Francisco Beautiful	Darcy Brown
173	San Francisco Chamber of Commerce	Emily Abraham
174	San Francisco Chamber of Commerce	Jay Cheng
175	San Francisco Chamber of Commerce	Rodney Fong
176	San Francisco Council of District Merchants	Maryo Mogannam
177	San Francisco Democratic County Central Committee	General e-mail address
178	San Francisco Neighborhood Parks Council- Exec Director	Meredith Thomas
179	San Francisco Parks Alliance	Drew Becher
180	San Francisco Parks Alliance	Kearstin Krehbiel
181	San Francisco Republican Central Committee	Christian Foster
182	San Francisco Republican County Central Committee	John Dennis
183	San Francisco Small Business Network	Art Swanson
184	San Francisco Tomorrow	Jennifer Clary
185	Save the Bay- Executive Director	David Lewis
186	SF Apartment Association	Janan New
187	SF Apartment Association	Maria Shea
188	SF Council of District Merchants - President	Henry Karnilowicz
189	SF Power	Steven Moss
190	SFPUC Citizens' Advisory Committee (CAC)	Amy Nagengast
191	SFPUC Citizens' Advisory Committee (CAC)	Amy Zock
192	SFPUC Citizens' Advisory Committee (CAC)	Anietie Ekanem
193	SFPUC Citizens' Advisory Committee (CAC)	Eliahu Perszyk
194	SFPUC Citizens' Advisory Committee (CAC)	Moises Garcia
195	SFPUC Citizens' Advisory Committee (CAC)	Jim McHugh
196	SFPUC Citizens' Advisory Committee (CAC)	Misty McKinney
197	SFPUC Citizens' Advisory Committee (CAC)	Mayara Ruski Augusto Sa
198	SFPUC Citizens' Advisory Committee (CAC)	Steven Kight
199	SFPUC Citizens' Advisory Committee (CAC)	Mark Tang
200	SFPUC Citizens' Advisory Committee (CAC)	Ted Lowenberg
201	Sierra Club San Francisco	Minda Berbeco
202	Silicon Valley Leadership Group	Mike Mielke
203	Southeast Community Facility	Emily Rogers-Pharr
204	SPUR	Laura Feinstein

Recipients of 2020 UWMP Update Notification
(Sent via e-mail on January 29, 2021, February 8, 2021 and March 12, 2021)

205	Sunset Beacon/Richmond Review	Paul Kozakiewicz
206	Sunset Heights Associaton of Responsible People	Dennis Minnick
207	Sunset Neighborhood Beacon Center	Matt Pemberton
208	Sunset Parkside Education and Action Committee (SPEAK)	Marc Duffett
209	Sunset-Parkside Education & Action Committee	Mary Anne Miller
210	Tuolumne River Trust	Eric Wesselman
211	Tuolumne River Trust	Peter Drekmeier
212	Tuolumne River Trust & California Sportfishing Protection Alliance	Cindy Charles
213	Twin Peaks Improvement Association	Doris Linnenbach
214	Urban Resource Systems	Isabel Wade
215	West of Twin Peaks Central Council	Dena Aslanian-Williams
216	West of Twin Peaks Central Council	George Wooding
217	Westsdie Observer	Doug Comstock
218	Westwood Park Association	Michael Ahrens
219	City College of San Francisco	Ted Aranas
220	Presidio Trust	Jean S Fraser
221	UCSF, Director Facilities Management	Maric S. Munn
222	University of San Francisco	Richard Hsu
223	Interested Stakeholders	Benny Bleiman
224	Interested Stakeholders	Bry Sarte
225	Interested Stakeholders	David Warner
226	Interested Stakeholders	Paul Collachi
227	Interested Stakeholders	William Martin
228	Interested Stakeholders	Ruth Gravanis
229	Interested Stakeholders	Dick Allen
230	Interested Stakeholders	Kathy Howard
231	Interested Stakeholders	Dick Morten
232	Interested Stakeholders	Steve Lawrence

Declaration of Publication - Notice of public hearing posted in San Francisco Chronicle on 03/29/2021 and 04/05/2021

DECLARATION OF PUBLICATION OF
SAN FRANCISCO CHRONICLE



San Francisco Water Power Sewer
services of the San Francisco Public Utilities Commission

NOTICE OF PUBLIC HEARING Tuesday, April 13, 2021 - 1:30pm at a Regular Meeting of the San Francisco Public Utilities Commission (SFPUC), the governing board of the publicly owned utility operations of the City and County of San Francisco: Notice is hereby given that the SFPUC will conduct a public hearing to consider the Draft 2020 Urban Water Management Plan (UWMP) for the City and County of San Francisco. The detailed agenda and related files will be available at least 72 hours before the scheduled meetings at the SFPUC website, www.sfwater.org or by calling (415) 554-3165. The hearing will be held virtually and can be accessed using the following information: Watch the meeting live: https://www.sfgovtv.org/sfpuc. Call-in number: 1 (415) 655-0001 / MEETING ID: 146 929 4145 # #

All interested parties are invited to attend the public hearing and present their views. Persons who are unable to attend the public hearing may also submit written comments regarding the subject of the hearing. These comments will be brought to the attention of the Commission and will become part of the official public record. Written comments can be delivered to SFPUC in one of three ways:

1) Emailed to Sarah Triolo, striolo@sfwater.org
2) Mailed to the following address: Steve Ritchie, SFPUC, 525 Golden Gate Avenue, 13th Floor, SF, CA 94102,
3) Deposited in the drop box at 525 Golden Gate Avenue. Comments submitted via the drop box must be in an envelope with the following information clearly printed: "Urban Water Management Plan Comments; c/o Sarah Triolo".

The Draft 2020 UWMP can be viewed and printed from the SFPUC website at: https://sfpuc.org/uwmp.

DIANE FITZGIBBON

declares that:

The annexed advertisement has been regularly published in the

SAN FRANCISCO CHRONICLE

which is and was at all times herein mentioned established as newspaper of general circulation in the City and County of San Francisco, State of California, as that term is defined by Section 6000 of the Government Code.

SAN FRANCISCO CHRONICLE
(Name of Newspaper)

901 Mission Street
San Francisco, CA 94103

From 3/29/2021
To 4/5/2021
Namely, on 3/29, 4/5/2021

(Dates of Publication)

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 4/5/2021

at San Francisco, California.

Diane FitzGibbon

DIANE FITZGIBBON

Newsletter of the San Francisco Public Utilities Commission

currents

MARCH/APRIL 2021

CHECK OUT OUR
NEW WEBSITE
FIND US AT SFPUC.ORG

It has been more than **10 years** since we have updated our website. So much has changed over the last decade and it was time for our website to get a full refresh! We've even updated our name! You can now find us at **SFPUC.org**!

Water is still at the very core of everything we do, but it is only a fraction of what we focus on as a City department of more than 2,300 employees across various bureaus and divisions.

Our new site puts user experience first. It's mobile and tablet friendly, and a lot easier to navigate.

Now you can easily find exactly what you are looking for. From Bill Pay to Construction Updates and Start/Stop Services, everything is easily accessible right from the homepage.

If you are a CleanPowerSF customer, you will now find them at **SFPUC.org/CleanPowerSF**.

SCAN THE QR CODE AND EXPLORE THE SFPUC.ORG NOW!

We Want to Hear From You

We are engaging in long-term water supply planning through our update to the Urban Water Management Plan. Public comment on the plan will be accepted between April 5 and May 5, 2021. We invite all interested parties to review and comment. Review the plan and learn about public meeting dates at **SFPUC.org/UWMP**.

"Climate change is one of the great challenges of our day, which is why we prioritize our commitment to sustainability. Whether it is exploring innovative water reuse programs like the Westside Water Recycling Project, providing renewable energy through CleanPowerSF or investing in a new Biosolids Digester facility, we are always guided by responsible environmental standards." - Michael Carlin, Acting General Manager

Combating Climate Change with Clean Energy

Hetch Hetchy Power – San Francisco's publicly owned utility — has been generating 100 percent greenhouse gas-free hydro-electric power for over a century and continues to evolve to meet today's growing clean energy needs. The utility currently manages over 23 publicly-owned solar arrays in San Francisco, and recently constructed and energized its first solar plus battery storage project, which will allow excess solar energy produced during the day to be stored in batteries and used at night. These ongoing local investments are reducing climate change causing greenhouse gas emissions and accelerating San Francisco's transition to a 100% renewable energy future. **SFPUC.org/hetchypower**

Safeguarding Our Vital Infrastructure

San Francisco's Ocean Beach shoreline is being washed away. The City's vital wastewater infrastructure, the Great Highway, and even community access are threatened by the increasing pace of coastal erosion. The Ocean Beach Climate Adaptation Plan is a joint effort between the SFPUC and City, state, and federal agencies as well as beach users and community members. Projects outlined in the Plan will help us adapt to climate-driven changes and protect critical infrastructure while supporting open space, recreation, and natural habitats citywide. Learn more about our various short and long term climate change adaptation efforts at **SFPUC.org/oceanbeach**.

Color Our Bay & Ocean

Keeping key pollutants, like trash, pesticides, and oil from going down our storm drains helps the marine ecosystem stay healthy and safe.

Sharpen your pencils and color away!

CHECK OUT OUR COLORED VERSION AT:
SFPUCNEWSROOM.COM/BY-THE-NUMBERS/PUZZLE/

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

San Francisco Public Utilities Commission
525 Golden Gate Avenue
San Francisco, CA 94102

SFPUC.org

Customer Services **415-551-3000**
TDD Hearing/Speech Impaired **415-551-3052**
Citywide Customer Service **311**

Urban Water Management Plan

The Urban Water Management Planning Act (Water Code Section 10610-10657) requires urban water suppliers to update their Urban Water Management Plan (UWMP) and submit the completed plan to the California Department of Water Resources (DWR) every 5 years. The City and County of San Francisco is currently reviewing its UWMP and will be considering amendments or changes to the document. The 2020 update to the UWMP is due to DWR by July 1, 2021.

The UWMP will provide an overview of our water deliveries and uses, water supply sources, and water conservation programs. It will also include discussions on supply and demand projections over a 25-year planning horizon (from 2020 to 2045), available water supplies to meet existing and future demands under a range of water supply conditions, and our water demand management measures to reduce long-term water demand.

Proposed revisions to the UWMP will be available for public review and comment from April 5, 2021 to May 5, 2021. The Draft UWMP 2020 Update will be available here. Additional information on how to access the UWMP will be provided here prior to the start of the public review period.

Notice of Public Hearing

A public hearing will be held on April 13, 2021 at 1:30 pm at the meeting of the San Francisco Public Utilities Commission to allow interested members of the public to participate in the review process. All interested parties are invited to attend the public hearing and present their views. The hearing will be held virtually and can be accessed using the following information:

Watch the meeting live: https://www.sfgovtv.org/sfpuc (https://www.sfgovtv.org/sfpuc).
Call-in number: 1 (415) 655-0001 / MEETING ID: 146 929 4145 # #

The final 2020 UWMP will be adopted by the Commission in June.

Additional Public Meetings

The SFPUC will also be presenting on the draft UWMP to the SFPUC Citizens Advisory Committee (CAC) on April 20, 2021 and to the CAC Water Subcommittee on April 27, 2021. See the agendas and log in information, which are available approximately 72 hours prior to each meeting at www.sfpuc.org/cac (https://sfpuc.org/about-us/boards-commissions-committees/citizens-advisory-committee).

Interested stakeholders are invited to attend these meetings; however, please note that these meetings are for informational purposes only. To make public comments, please attend the public hearing on April 13th or submit comments as described below.

Submission of Comments

Any interested parties may also submit written comments to the City during the public comment period in one of three ways.

1. Written comments can be e-mailed to Sarah Triolo, **striolo@sfwater.org (mailto:striolo@sfwater.org)**.
2. Written comments can be mailed to the address below. To ensure that comments can be reviewed and incorporated, any mailed comments must be post-marked by April 30th, 2021.
   Steve Ritchie, San Francisco Public Utilities Commission
   525 Golden Gate Avenue, 13th Floor
   San Francisco, CA 94102
3. Written comments can be deposited in the drop box at 525 Golden Gate Avenue. *Comments submitted via the drop box must be in an envelope with the following information clearly printed: "Urban Water Management Plan Comments, c/o Sarah Triolo".*

In the meantime, if you have any questions about our UWMP, or the process of updating it, please contact Sarah Triolo at striolo@sfwater.org (mailto:striolo@sfwater.org).

Other Documents

- 2020 Retail Conservation Plan (Draft)

2015 Urban Water Management Plan Documents:

- 2015 Urban Water Management Plan for San Francisco
- 2015 Urban Water Management Plan for San Francisco Appendices
- 2015 Urban Water Management Plan for San Francisco Errata
- 2009 Water Supply Agreement (/sites/default/files/programs/local-water/WholesaleAgreement_JUL2009.PDF)

Notice of plan availability for public inspection and reminder notice of public hearing - 04/05/2021

Gmail

Lara Egbeola-Martial <lara@srtconsultants.com>

2020 Urban Water Management Plan for the City and County of San Francisco Now Available for Public Review

Paula Kehoe <PKehoe@sfwater.org> Mon, Apr 5, 2021 at 9:00 AM
Reply-To: Betsy Lauppe Rhodes <reply-febb10777d650c75-160_HTML-129025369-7290453-1@sfwateroutreach.org>
To: lara@srtconsultants.com

Dear Stakeholders,

As previously noticed, the City and County of San Francisco has prepared a draft 2020 Urban Water Management Plan (UWMP). The draft 2020 UWMP is now available for public review and comment through May 5th, 2021. The document can be found on our website at sfpuc.org/uwmp. See below for additional details on how to learn more and provide your comments on the document.

Notice of Public Hearing

A public hearing will be held on April 13, 2021 at 1:30 pm at the meeting of the San Francisco Public Utilities Commission to allow interested members of the public to participate in the review process. All interested parties are invited to attend the public hearing and provide formal comment on the draft. The hearing will be held virtually and can be accessed using the following information:

WATCH LIVE MEETING

Call-in number: 1 (415) 655-0001 / **MEETING ID:** 146 929 4145 # #

Additional Public Meetings

The SFPUC will also be presenting on the draft UWMP to the SFPUC Citizens Advisory Committee (CAC) on April 20, 2021 and to the CAC Water Subcommittee on April 27, 2021. See the agendas and log in information at sfpuc.org/cac.

Interested stakeholders are invited to attend these meetings; however, please note that these meetings are for informational purposes only. **To make public comments, please attend the public hearing on April 13th or submit comments as described below.**

Submission of Comments

Any interested parties may also **submit written comments** to the City during the public comment period in one of three ways. **Please do not reply to this email with comments.**

1. Written comments can be **e-mailed to Sarah Triolo,** striolo@sfwater.org.

2. Written comments can be **mailed to the address below.** To ensure that comments can be reviewed and incorporated, any mailed comments must be post-marked by **April 30th, 2021.**

   Steve Ritchie, San Francisco Public Utilities Commission
   525 Golden Gate Avenue, 13th Floor
   San Francisco, CA 94102

3. Written comments can be **deposited in the drop box** at 525 Golden Gate Avenue. Comments submitted via the drop box must be in an envelope with the following information clearly printed: "Urban Water Management Plan Comments, c/o Sarah Triolo".

If you have any questions about our UWMP, or the process of updating it, please contact Sarah Triolo at striolo@sfwater.org.

Sincerely,

Paula Kehoe

Director of Water Resources

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

Facebook Twitter Instagram YouTube LinkedIn

This email was sent by: **San Francisco Public Utilities Commission**
525 Golden Gate Ave. San Francisco, CA, 94102, US

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Gmail

Lara Egbeola-Martial <lara@srtconsultants.com>

Reminder: Draft 2020 Urban Water Management Plan for the City and County of San Francisco Now Available for Public Review

Paula Kehoe <PKehoe@sfwater.org> Mon, Apr 19, 2021 at 9:00 AM
Reply-To: Betsy Lauppe Rhodes <reply-febf107876650374-160_HTML-129025369-7290453-1@sfwateroutreach.org>
To: lara@srtconsultants.com

Dear Stakeholders,
As previously noticed, the City and County of San Francisco has prepared a draft 2020 Urban Water Management Plan (UWMP). The draft 2020 UWMP became available on April 5th, 2021 and remains available for public review and comment through May 5th, 2021. The document can be found on our website at **sfpuc.org/uwmp** . See below for additional details on how to learn more and provide your comments on the document

A public hearing was held on April 13, 2021 at 1:30 pm at the meeting of the San Francisco Public Utilities Commission to allow interested members of the public to participate in the review process. **Any interested parties may still submit written comments** to the City during the public comment period in one of three ways. **Please do not reply to this email with comments.**

1. Written comments can be e-mailed to Sarah Triolo, **striolo@sfwater.org**
2. Written comments can be mailed to the address below. To ensure that comments can be reviewed and incorporated, any mailed comments must be post-marked by April 30th, 2021.

   Steve Ritchie, San Francisco Public Utilities Commission
   525 Golden Gate Avenue, 13th Floor
   San Francisco, CA 94102

3. Written comments can be deposited in the drop box at 525 Golden Gate Avenue. Comments submitted via the drop box must be in an envelope with the following

information clearly printed: “Urban Water Management Plan Comments, c/o Sarah Triolo”.

Additional Public Meetings

The SFPUC will also be presenting on the draft UWMP to the SFPUC Citizens Advisory Committee (CAC) on April 20, 2021 and to the CAC Water Subcommittee on April 27, 2021. Agendas are generally made available on our website approximately 72 hours prior to the meeting date. See the agendas and log in information at **sfpuc.org/cac.**

Interested stakeholders are invited to attend these meetings; however, please note that these meetings are for informational purposes only. **To make public comments, please submit comments as described above.**

If you have any questions about our UWMP, or the process of updating it, please contact Sarah Triolo at **striolo@sfwater.org** .

Sincerely,

Paula Kehoe
Director of Water Resources

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

Facebook Twitter Instagram YouTube LinkedIn

This email was sent by: **San Francisco Public Utilities Commission**
525 Golden Gate Ave. San Francisco, CA, 94102, US

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San Francisco Public Library Process due to COVID 19 pandemic

Urban Water Management Plan Update 2020

Note to file

March 31, 2021

Written by Betsy L. Rhodes

The San Francisco Public Library Government Section is the usual repository of hard copies of public documents that are under public review. This ensures that those without access to computers have access to the documents.

As of this writing, the San Francisco Public Library is closed until further notice due to the COVID 19 pandemic. Please find attached email from Library staff and SF Public Library public Website.

Therefore, SFPUC was not able to provide a hard copy document for public review at this writing.

Should members of the public request hard copies, SFPUC staff will respond on a case by case basis.

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

SAN FRANCISCO PUBLIC UTILITIES COMMISSION

City and County of San Francisco

London N. Breed
Mayor

REGULAR MEETING AGENDA
Tuesday, April 13, 2021
1:30 P.M.

This meeting is being held by Teleconference Pursuant to the Governor's Executive Order N-29-20 and the Twelfth Supplement to Mayoral Proclamation Declaring the Existence of a Local Emergency Dated February 25, 2020

WATCH LIVE:
https://www.sfgovtv.org/sfpuc

PUBLIC COMMENT CALL-IN:
1 (415) 655-0001 / MEETING ID: 146 758 0343 # #

During the Coronavirus Disease (COVID-19) emergency, the San Francisco Public Utilities Commission's (SFPUC) regular meeting room, City Hall, Room 400, is closed. Commissioners and SFPUC staff will convene Commission meetings remotely by teleconference.

Commissioners

Sophie Maxwell, President
Anson Moran, Vice President
Tim Paulson
Ed Harrington
Newsha Ajami

Michael Carlin
Acting General Manager

Donna Hood
Secretary

Accessible Meeting Policy: To obtain meeting materials in alternative format, please contact the Commission Secretary at 415-554-3165 or via email at Commission@sfwater.org. Providing at least 72 hours' notice will help to ensure availability. Written reports or background materials for calendar items are available on-line http://www.sfwater.org/index.aspx?page=167.

Know Your Rights Under the Sunshine Ordinance: Government's duty is to serve the public, reaching its decision in full view of the public. Commissions, boards, councils and other agencies of the City and County exist to conduct the people's business. This ordinance assures that deliberations are conducted before the people and that City operations are open to the people's review. For more information on your rights under the Sunshine Ordinance or to report a violation of the ordinance, contact Administrator, by mail to Sunshine Ordinance Task Force, 1 Dr. Carlton B. Goodlett Place, Room 244, San Francisco, CA 94102.4689; by phone at 554.7724; by fax at 554.7854; or by email at sotf@sfgov.org. Copies of the Sunshine Ordinance can be obtained from the Clerk of the Sunshine Task Force, the San Francisco Public Library and on the City's website at http://www.sfgov.org.

311 Free Language Assistance: 免費語言協助 / Ayuda gratuita con el idioma / Бесплатная помощь переводчиков / Trợ giúp Thông dịch Miễn phí / Assistance linguistique gratuite / 無料の言語支援 / 무료 언어 / 지원 / คว“มชว ่ ยเหลอ ื ท“งภ“ษ“โดยไมเ ่ ส’ยคาใชจ ้ าย / Libreng tulong para sa wikang Tagalog ยเหลอ ื

Lobbyist Registration and Reporting Requirements: Individuals and entities that influence or attempt to influence local legislative or administrative action may be required by the San Francisco Lobbyist Ordinance [SF Campaign & Governmental Conduct Code §2.100] to register and report lobbying activity. For more information about the Lobbyist Ordinance, please contact the San Francisco Ethics Commission at 25 Van Ness Avenue, Suite 220, San Francisco, CA 94102; telephone (415) 252-3100; fax (415) 252-3112; web site at www.sfgov.org/ethics.

CEQA Appeal Rights under Chapter 31 of the San Francisco Administrative Code: If the Commission's action on a project constitutes the Approval Action for that project (as defined in S.F. Administrative Code Chapter 31, as amended, Board of Supervisors Ordinance Number 161-13), then the CEQA determination prepared in support of that Approval Action is thereafter subject to appeal within the time frame specified in S.F. Administrative Code Section 31.16. Typically, an appeal must be filed within 30 calendar days of the Approval Action for a project that has received an exemption or negative declaration pursuant to CEQA. For information on filing an appeal under Chapter 31, contact the Clerk of the Board of Supervisors at City Hall, 1 Dr. Carlton B. Goodlett Place, Room 244, San Francisco, CA 94102, or call (415) 554-5184. If the Planning Department's Environmental Review Officer has deemed a project to be exempt from further environmental review, an exemption determination has been prepared and can be obtained on-line at http://www.sf- planning.org/index.aspx?page=3447.Under CEQA, in a later court challenge, a litigant may be limited to raising only those issues previously raised at a hearing on the project or in written correspondence delivered to the Board of Supervisors, Planning Commission, Planning Department or San Francisco Public Utilities Commission at, or prior to, such hearing, or as part of the appeal hearing process on the CEQA decision.

ORDER OF BUSINESS

1. Call to Order

2. Roll Call

3. Approval of the Minutes:
   a) March 23, 2021 Regular Meeting
   b) March 23, 2021 Special Joint Meeting with the San Francisco Board of Supervisors
   c) March 26, 2021 Special Meeting

4. General Public Comment
   Members of the public may address the Commission on matters that are within the Commission's jurisdiction and are not on today's agenda

5. Communications (discussion only)
   a) Advance Calendar
   b) Contract Advertisement Report
   c) Correspondence Log
   d) Annual Electric Reliability Compliance Program Report
   e) Annual Power Risk Management Update
   f) Peninsula Watershed – Proposed Prescribed Burn Project Update
   g) SFPUC High-Efficiency Direct Toilet Install Map and Installation Totals
   h) Water Pipeline Assessment
   i) Water Supply Conditions Update

6. Report of the General Manager (discussion only)
   a) 2020 Retail Water Conservation Plan which provides a summary of planned conservation measures
   b) Wastewater Enterprise Racial Equity Plan
   c) Report on Recent San Francisco Public Utilities Commission Activities, Events and Announcements

7. New Commission Business (discussion only)

CONSENT CALENDAR

8. *All matters listed hereunder constitute a Consent Calendar are considered to be routine by the San Francisco Public Utilities Commission and will be acted upon by a single vote of the Commission. There will be no separate discussion of these items unless a member of the Commission or the public so requests, in which event the matter will be removed from the Calendar and considered as a separate item.*

   a) Approve an increase of 180 calendar days to the contract duration contingency for **Contract No. DB-129.1** Bay Corridor Transmission and Distribution Phase 2 (2019) North, with Mitchell Engineering; and authorize the General Manager to approve future modifications to the contract for a total contract duration of up to 615 consecutive calendar days (approximately one year and eight months), with no change to the contract amount. (How)

b) Approve an increase of 180 calendar days to the contract duration contingency for **Contract No. DB-129.2** Bay Corridor Transmission and Distribution Phase 2 (2019) South, with Anvil Builders, Inc.; and authorize the General Manager to approve future modifications to the contract for a total contract duration of up to 615 consecutive calendar days (approximately one year and eight months), with no change to contract amount. (How)

c) Approve an increase of 360 calendar days to the contract duration contingency for **Contract No. DB-130** Bay Corridor Transmission and Distribution Phase 3 (2019), with Beta Engineering California, LP.; and authorize the General Manager to approve future modifications to the contract for a total contract duration of up to 795 consecutive calendar days (approximately two years and three months), with no change to the contract amount. (How)

d) Approve the plans and specifications, and award **Contract No. HH-1003R** Moccasin Powerhouse Generator Step Up Transformer Installation, in the amount of $3,321,432, and with a duration of 716 consecutive calendar days (approximately two years), to the responsible bidder submitting the lowest responsive bid, Big Valley Electric, to make improvements to the two transformer bays and install two new City-furnished generator step-up transformers. This action constitutes the Approval Action for the project for the purposes of CEQA, pursuant to Section 31.04(h) of the San Francisco Administrative Code. (How)

e) Approve an increase of 273 calendar days to the contract duration contingency for **Contract No. WD-2729**, Fish Passage Facilities within the Alameda Creek Watershed, a sub-project of the Calaveras Dam Replacement Project; and authorize the General Manager to approve future modifications to the contract for a total duration of up to 1,991 consecutive calendar days (approximately five years and five months), with no change to the contract amount. (How)

REGULAR CALENDAR

9. Approve program rules for the **Customer Affordability and Arrearage Management Plan Pilot Program** and authorize the General Manager to implement the Pilot Program which will provide up to 150 low-income SFPUC residential water and wastewater customers residing in the 94112, 94124, and 94134 zip codes, who have accrued high levels of arrearages on their SFPUC accounts, with a combination of rate discounts and/or debt relief, with a not-to-exceed program budget of $110,000 from SFPUC funds. (Ordikhani/Sandler)

10. Adopt the **2021 Revised Baseline Scope, Schedule, and Budget for the Water Enterprise Capital Improvement Program**, consisting of 36 projects (25 Regional projects and 11 Local projects) within the adopted San Francisco Public Utilities Commission 10-Year Capital Plan for FY 2020-21 through FY 2029-30 that have budgets greater than $5 million and are currently active or intended to be initiated within FY 2020-21 or FY 2021-22. (How)

11. Presentation and discussion only of the **Draft 2020 Urban Water Management Plan**

(UWMP), including the Draft 2020 Water Shortage Contingency Plan, for the City and County of San Francisco pursuant to California Water Code Section 10642. The Commission will consider approval of a Final UWMP at the June 8, 2021 Commission meeting. (Ritchie)

12. Approve Amendment No. 2 to **Agreement No. PRO.0092**, Engineering Services for South Ocean Beach Coastal Erosion and Wastewater Protection, with Moffatt and Nichol-AGS Joint Venture to provide engineering design services for the Ocean Beach Climate Change Adaptation Long-term Improvements Project; and authorize the General Manager to execute this amendment, increasing the agreement amount by $2,000,000 and extending the agreement duration by four years, for a total not-to-exceed agreement amount of $5,750,000, and a total duration of nine years. (How)

13. Approve the selection of Kennedy/Jenks Consultants, Water Resources Engineering, Inc., AECOM Technical Services, Inc., and Hazen-LEE Joint Venture (JV); award **Agreement Nos. PRO.0172.A-D**, As-needed Engineering Design Services, to provide specialized engineering design services on an as-needed basis for SFPUC enterprises and bureaus; and authorize the General Manager to execute these four professional services agreements with Kennedy/Jenks Consultants (PRO.0172.A), Water Resources Engineering, Inc. (PRO.0172.B), AECOM Technical Services, Inc. (PRO.0172.C), and Hazen-LEE Joint Venture (PRO.0172.D), each in an amount not-to-exceed $4,500,000, and each with a term of five years. (How)

14. Approve the plans and specifications, and award **Contract No. WD-2825R**, Alameda Creek Recapture Project in the amount of $19,511,500 and with a duration of 547 consecutive calendar days (approximately one year and six months), to the responsible bidder submitting the lowest responsive bid, Anvil Builders, Inc. to install a barge and pump system, pipelines, valves and valve vault, and control building to recapture and transfer creek flows to the San Francisco Public Utilities Commission's Regional Water System. (How)

15. Approve the plans and specifications, and award **Contract No. WW-711**, Wawona Area Stormwater Improvement and Vicente Street Water Main Replacement Project, in the amount of $29,132,100 and with a duration of 987 consecutive calendar days (approximately two years and eight months), to the responsible bidder submitting the lowest responsive bid, KJ Woods Construction Inc., to construct a stormwater conveyance system in the Wawona area and replace the water mains on Vicente Street. This action constitutes the Approval Action for the project for the purposes of California Environmental Quality Act, pursuant to Section 31.04(h) of the San Francisco Administrative Code. (How)

16. Public comment on matters to be addressed during Closed Session.

17. Motion on whether to assert the attorney-client privilege regarding the matters listed below as Conference with Legal Counsel.

The Commission will go into Closed Session to discuss the following items:

CLOSED SESSION

18. Conference with Legal Counsel – Pursuant to California Government Code, Section 54956.9(a), and San Francisco Administrative Code, Section 67.10(d)(1) (discussion only) (Mueller)

    Conferring with, or receiving advice from, the City Attorney regarding the following existing litigation in which the City is a petitioner and Pacific Gas & Electric Company is an adverse party: In re: PG&E Corporation and Pacific Gas & Electric Company, United States Bankruptcy Court, Northern District of California, Case No. 9-30088-DM, filed January 29, 2019; Federal Energy Regulatory Commission Case No. EL 19-38- 000, filed January 28, 2019; Federal Energy Regulatory Commission Case No. ER18- 1482-000, filed April 30, 2018; Federal Energy Regulatory Commission Case No. ER18-1102-000, filed March 15, 2018; Federal Energy Regulatory Commission Case No. ER18-790-000, filed, February 2, 2018; Federal Energy Regulatory Commission Case No. ER18-768-000, filed January 31, 2018; Federal Energy Regulatory Commission Case No. ER18-198-000, filed October 31, 2017; Federal Energy Regulatory Commission Case No. ER17-2406-000, filed August 31, 2017; Federal Energy Regulatory Commission Case No. ER17-2181-000, filed July 31, 2017; Federal Energy Regulatory Commission Case No. ER17-2204, filed July 31, 2017; Federal Energy Regulatory Commission Case No. ER17-1509-000, filed May 1, 2017; Federal Energy Regulatory Commission Case No. ER17-910-000, filed January 31, 2017; Federal Energy Regulatory Commission Case No. EL 15-3-000, filed October 10, 2014; Federal Energy Regulatory Commission Case No. ER15-702-000, filed December 23, 2014; Federal Energy Regulatory Commission Case No. ER15-703- 000, filed December 23, 2014; Federal Energy Regulatory Commission Case No. ER15-704-000, filed December 23, 2014; Federal Energy Regulatory Commission Case No. ER15-705-000, filed December 23, 2014; Federal Energy Regulatory Commission Case No. ER15-735-000, filed December 23, 2014; California Public Utilities Commission Case No. 1.15-08-019, filed February 25, 2015; California Public Utilities Commission Case No. R.18-10-007, filed October 25, 2018; California Public Utilities Commission Case No. R.19-01-006, filed January 10, 2019; and California Public Utilities Commission Case No. R.19-09-016, filed January 10, 2019.

19. Conference with Legal Counsel – Anticipated Litigation as Petitioner per California Government Code 54956.9(d)(4) and San Francisco Administrative Code Section 67.10(d)(2) (discussion only) (Whipps)

20. Conference with Legal Counsel – Pursuant to California Government Code Section 54965.9 (d)(1) and San Francisco Administrative Code Section 67.10 (d)(1) (discussion only) (Whipps)

    Existing Litigation
    San Joaquin Tributaries Authority, et al v. California State Water Resources Control Board
    Tuolumne Superior Court Case No. CV62094/Date Filed: January 10, 2019
    Coordinated as State Water Board Cases by order filed May 13, 2019 in Sacramento Superior Court, JCCP No. 5013

Following Closed Session, the Commission will reconvene in Open Session.

21. Announcement following Closed Session.

22. Motion regarding whether to disclose the discussions during Closed Session pursuant to San Francisco Administrative Code Section 67.12(a).

Adjournment.

SFPUC UWMP Public Comments

Name	Affiliation	Questions/Comments	Response
SFPUC 2020 UWMP Update - Comments Submitted at Public Hearing, April 13, 2021			
Tom Francis	Water Resources Manager at BAWSCA	Commenter acknowledged that both SFPUC and BAWSCA member agencies have low projected per capita usage but high projected population growth. Commenter expressed concern about the shortfalls created by the implementation of the Bay-Delta Plan, which may cause per capita water use for residents served by BAWSCA agencies to drop below 30 gpcd, which is below health and safety guidelines. Commenter asked that the Commission continue to fight the implementation of the Bay-Delta Plan and continue to move the Alternative Water Supply Program forward.	Comment noted.
Danielle Mcpherson	Senior Water Resources Specialist at BAWSCA	Commenter expressed appreciation for SFPUC staff for their high level of engagement and efforts on the development of the UWMP and the coordination with BAWSCA.	Comment noted.
John Stiefel	WASH Consultant and member of the SF Coalition on Homelessness Human Rights Working Group	Commenter expressed concern that the plan does not take into account the water demands of unhoused San Franciscans, and expressed concern about this population lacking access to water. Additional information is provided in response to the written comments on this topic.	Additional information is provided in response to the written comments on this topic.
Gary Welling	Director of Water and Sewer at the City of Santa Clara	Commenter expressed concern about the impacts resulting from the adoption of the Bay-Delta Plan and the scenarios presented in the UWMP, given that the information must be used for long-term planning including a major arena and housing requirements. Commenter asked the Commission to re-affirm its commitment to meet obligations to the Wholesale Customers and to take actions necessary, including the development of alternative water supply. Commenter also requested that the Commission make Santa Clara a permanent customer.	Comment noted.
Nicole Sandkulla	BAWSCA CEO	Commenter noted that the water supply scenarios with the Bay-Delta Plan involve significant impact to the wholesale water supplies, which would lead to a slow down in the economy, hinder job growth, and impact the health, safety, and economic risk for people and businesses. Commenter noted that BAWSCA supports the objectives of the Bay-Delta Plan and agrees that actions need to be taken to protect the fish and environment of the Tuolumne River. Commenter noted that the Tuolumne River Voluntary Agreement (TRVA) is a science-based alternative, and urged the SFPUC to continue its effort to secure the evaluation of the TRVA by the State Board. Commenter urged the SFPUC to identify additional water supply to meet its legal and contractual water supply reliability obligations to BAWSCA agencies.	Comment noted.
Francisco da Costa		Commenter noted that the SFPUC is supplying water to entities not prioritized in the Raker Act, and that the reservoir and its water belong to the First people. Commenter noted that the Commission is concerned about the degree to which conservation is impacting revenue.	Comment noted.
Peter Drekmeier	Tuolumne River Trust	Commenter asserted that the UWMP is a lobbying tool against the Bay-Delta Plan, showing 53% rationing in a single dry year. Commenter expressed disappointment that staff is trying to turn people against the Bay-Delta Plan. Commenter noted the possibility of shortening the design drought, adding alternative water supplies and getting more realistic about water demands. Commenter noted that the issues may not be able to be covered before the submission of the plan. Commenter noted that the SFPUC uses 5 years from the 8-year design drought, and that in their opinion SFPUC could get through a 5-year drought with no rationing with the Bay-Delta Plan.	The UWMP is prepared every five years and represents a snapshot of the SFPUC's long-term planning. The SFPUC is not precluded from making changes to policy between UWMPs; if the Commission adopts new policies that impact the water supply reliability assessment, new materials could be prepared to support Water Supply Assessments and other documents that rely on the UWMP.
Larry A.	Homeowner and volunteer with the Human Rights Working group of the SF Coalition on Homelessness	Commenter expressed concern about the unhoused population of San Francisco and their access to water. Commenter expressed a desire for the demand of the homeless population to be accounted for in the UWMP.	Additional information is provided in response to the written comments sent on this topic.

Batool Zaro	City of East Palo Alto	Commenter noted that the City of East Palo Alto (City) is almost 100% reliant on SFPUC's Regional Water Sustem supply fore their potable water supply. Commenter noted the City's low per capita water usage of 60 gpcd, and that 70% of the City's demand is residential, and 90% of residential demand is used to meet basic health and safety needs. Commenter noted that the City's contract with the SFPUC includes a Level of Service goal of no more than 20% cutback; in order to reach the projected cutbacks of up to 54%, the City's per capita usage would ahve to reach a dangerous level of 36 gpcd. Commenter noted that the City would have to consider harmful policies because of insufficient supply. Commenter noted that the City feels strongly that the SFPUC should do everything they can to ensure that its wholesale customers and residents have reliable water supply.	Comment noted. The SFPUC will be communicating with our Wholesale Customers collectively on this topic.
David Pilpel		- Does the plan incorporate the BAWSCA analysis that Nicole Sandkulla went through at the last workshop? - How do the UWMP population projections align with the estimates from the city's Planning Department and Plan bay Area? - Is there any additional public engagement planned prior to the Commission in June? Another meeting before the next commission meeting would be helpful. For the UWMP 15 to 20 years ago, there was an in-person meeting, where I met Steve Ritchie for the first time. Could there be a virtual meeting to discuss the UWMP with the public?	The Plan's supply reliability assessment is based on the wholesale customers' projected demands on the Regional Water System, after their local supplies have already been accounted for. The population projections presented in the Plan were provided by the Planning Department. Several notices were sent to stakeholders about the public hearing at the Commission meeting, as well as about SFPUC presentations made at its Citizens Advisory Committee meetings on April 20th and April 27th; this information was also on the SFPUC website.
SFPUC 2020 UWMP Update - Comments Submitted at SFPUC CAC, April 20, 2021			
Anietie Ekanem	SFPUC CAC	Clarification about the distinction between the residential water use, at the wholesale vs. municipal level?	The UWMP addresses residential, irrigation, commercial and instruction so in case of rationing, SFPUC would require rationing across all water usages. For the wholesale customers, the WSA defines how water would be allocated to the wholesale customers and the UWMP analysis does not change any of that.
Anietie Ekanem	SFPUC CAC	Will enforcement of rationing be the same in all districts?	Enforcement of mandatory rationing would be the same for all customers regardless of location in the City.
Eliahu Perszyk	SFPUC CAC	The energy intensity is a new requirement and the energy intensity value calculated is negative. Can you explain why that is?	In this calculation, we can account for the energy generated as part of the water supply, which in this case is hydropower produced by the RWS. Since the RWS is mostly gravity-fed, energy use is mainly for water treatment; our net energy balance is negative, as we are producing more energy than we use.
Jennifer Clary	SFPUC CAC	Largest water users are multi family residential and are the largest anticipated growth in water use. Is the per capita for multi family calculated separated from single family? I am surprised to see that the per capita water use is expected to plateau, if the number of multi family dwellings units will increase and their per capita water use is lower.	The current estimate for average single-family per capita use is about 50 gpcd, and for multi-family is about 36 gpcd. The single-family per capita usage is projected to decrease over the course of the planning horizon, while the multi-family is projected to increase slightly. One potential reason for this is that our estimates of active conservation savings are highest in the next 5-10 years before existing programs expire; there will likely be additional future savings past that as we implement new programs, but those savings are not yet estimated.
Anietie Ekanem	SFPUC CAC	How do you go about estimating water use and savings separately for multi family units? In multi family buildings, it is hard to change behaviors directly, because units don't get individual bills, so they don’t necessarily see directly the monetary consequences meant to deter people from maintaining high water usage.	Our work with conservation savings in multi-family buildings has shown that significant savings can be achieved at the property level; most of the savings come from activities such as maintaining plumbing fixtures, appliances, irrigation; fixing leaks; and replacing old fixtures and equipment.
Emily Agire	SFPUC CAC	You mentioned that rationing programs would be enforced first in the irrigation sector, then residential, then commercial sector. How was this order chosen, and what does an irrigation sector look like in San Francisco?	Irrigation accounts include customers such as large golf courses, HOAs with shared irrigation areas, and parks. The rationale behind asking irrigation customers to conserve first is to cut outdoor irrigation before asking residents to cut indoor water use, while trying to reduce impacts on businesses and economic growth. To maintain green space in the City, irrigation customers would not be asked to completely eliminate their water use. During a declared water shortage, SFPUC would be working with all large water users to help them reduce their water use.

Jennifer Clary	SFPUC CAC	Can you explain water loss - what it entails, how it is measured and why your report estimated no reduction in water loss, despite new state requirements to address this area of water waste. In addition, why is the 2020 value 7.2 mgd and the projections 6 mgd?	Water loss includes both real losses, i.e. physical losses through leaks, and apparent losses, i.e. errors in the metering equipment. SFPUC has an asset management program, as described in Section 10 of the UWMP, and is committed to reducing real and apparent losses. In addition, the 2020 water loss value includes both real and appaent losses; the projected values include real losses only, as we have no way to project apparent losses.
Jennifer Clary	SFPUC CAC	Does water loss include water used for fire fighting?	No; that would be categorized as a municipal water use.
Suki Kott	SFPUC CAC	What happens with population growth in cities like ours - is there ever a concern that the infrastructure won't support the population beyond a certain point? Does it ever get to a point that the water supply won't be able to support population over a certain number of people?	The goal of the UWMP is to describe SFPUC's strategy for long-term water supply planning to meet current and future water demands. This information is used in Water Supply Assessments for large development projects as part of their environmental review process, to evaluate whether there is sufficient water supply to meet future demands.
Amy Nagengast	SFPUC CAC	I am hoping you could frame the "purposes of the UWMP" in terms of how this UWMP impacts the consumer instead of the agency's use? How do I as a consumer relate that to my daily life?	The UWMP is prepared according to specific requirements laid out in the Water Code. It is intended as a high-level planning document; it serves as a roadmap for future planning and decision-making, but does not commit us to any specific project(s). The document can help consumers understand how we are thinking about planning and water supply reliability. It is an opportunity for the public to comment on our approach for rationing, conservation, and other elements of our planning.
SFPUC 2020 UWMP Update - Comments Submitted at SFPUC Water CAC, April 27, 2021			
Eliahu Perszyk	SFPUC CAC	What will happen if the Bay Delta Plan gets implemented? Are there other water supply projects that can be implemented? It seems there is a significant risk that if the Bay Delta Plan gets implemented and there is no additional water supply, SFPUC will get hit by the water surcharge, and will in turn increase water bills for consumers.	The goal is to plan so that we can avoid this situation. SFPUC is exploring all potential opportunities for alternative water supply projects.
Jennifer Clary	SFPUC CAC	The solution seems to be increasing water supply. How realistic is that? What happens on year 8 of a 10-year drought. We have to stop taking water away from nature. The Bay Delta Plan seems pretty reasonable to me right now. We are looking at all those options to get additional water supply, but shouldn't we focus on using the water we have as much as we can, i.e. focusing on direct potable reuse to have any kind of security. I regard the reservoir projects as less reliable than other projects that make the best use of the water we already have.	SFPUC is working on maximizing reuse, which includes direct potable reuse. The alternative water supply project with ACWD, the Crystal Springs project and some of the other options explored for reuse in the city all look at direct potable reuse as a potential alternative. One impediment is that the regulations are for direct potable reuse are not finalized; they are expected to come out in 2023.
Jennifer Clary	SFPUC CAC	Looking at the graphs and data developed by the Pacific institute, it looks like SFPUC is closer than any other agency at estimating water demands. SFPUC is still overestimating water demands, but not as much as other agencies. You want to be conservative in forecasting water demands, but you don't want to overestimate them and put pressure on the planned water supplies. Cost is a big piece of it, and how we charge water. We don't want to be in a position where we have to pay a drought surcharge, even though the Commission has already stated that they would authorize it.	Comment noted. See response to similar comments about demand projections for additional information.
SFPUC 2020 UWMP Update - Comments Submitted via Email between 04/05/2021 and 05/05/2021			
Dick Morten		It would be helpful for the table of content to have an electronic link to each section and Appendix of the plan.	Electronic links to each chapter and the appendices were added in the final PDF version of the document.
Steven Lawrence		The notes of Table 8-3 contain 2 broken section references "Error! Reference source not found" that need to be updated with the correct referenced section numbers.	These errors have been corrected.
Dick Allen	District 7	I strongly encourage the SFPUC staff and Commissioners to add an additional Section 12 to the UWMP, which could be entitled "Tuolumne River Environment". The SFPUC needs to make science-based decisions that comply with (a) the State of California Endangered Species Act, (b) the Federal Endangered Species Act, (c) Public Trust Doctrine, to be authorized to limit water diversions from the Tuolumne River during any year.	This is beyond the scope of the UWMP. The UWMP is structured to meet the requirements in the California Water Code. The SFPUC is engaged in several regulatory processes regarding the Tuolumne River and Bay-Delta environment, including the State Board's Bay-Delta Plan and the FERC relicensing of Don Pedro Dam. These processes have not yet reached conclusions.

Dick Allen	District 7	Will the SF City Attorney issue a legal ruling that the SFPUC UWMP complies with (a) the State of California Endangered Species Act, (b) the Federal Endangered Species Act, (c) Public Trust Doctrine, (d) The 9th Circuit Court of Appeals?	No. The California Water Code is the law that sets forth the requirements for UWMPs~~,~~. The Water Code does not contain a requirement for such a "ruling," nor does the City Attorney's Office issue "rulings." The UWMP is a planning document. The SFPUC consults with the City Attorney's Office as needed regarding compliance with federal and state laws. From time to time, the City Attorney's Office issues public legal opinions on specific matters. We do not see a basis to request that the City Attorney issue a public opinion regarding whether the UWMP complies with the four provisions that you cite in your letter. We also do not agree with your statement that the Mayor issued "conflicting environmental orders" to the SFPUC in 2018 or that she suggested Commissioners "be required to compromise or ignore" the federal or state laws cited in your letter. Of course, you are free to contact the Mayor's Office directly regarding her comments.
Dick Allen	District 7	If the City Attorney refuses to issue a legal ruling that the SFPUC UWMP is in compliance with (a)(b)(c)(d), (1) can the 5-year UWMP be trusted? (2) Should the UWMP be implemented by the SFPUC absent a City Attorney legal ruling that it supports (a)(b)(c)(d)? (3) Would the absence of a legal ruling by the City Attorney that the UWMP is in compliance with (a)(b)(c)(d) invite lawsuits against San Francisco? I would encourage the Commissioners to schedule a public hearing to allow the City Attorney to provide them with legal opinions to resolve the Mayor's November 2018 conflicting environmental orders to the SFPUC.	See response above.
Peter Drekmeier (Tuolumne River Trust), Eric Wesselman (Friends of the River), Heinrich Albert (Sierra Club SF), Chris Shutes (California Sportfishing Proection Alliance), Carol Steinfeld (Sierra Club Loma Prieta), Cindy Charles (Golden West Women Flyfishers), Kristina Pappas (SF League of Conservation Voters), Allison Boucher (Tuolumne River Conservancy), Jeff Miller (Alameda Creek Alliance), Mark Rockwell (Fly Fishers International, Northern California Council), Mike Conroy (Pacific Coast Federation of Fishermen's Associations, Institute for Fisheries Resources), Larry Collins (SF Community Fishing Association, SF Crab Board Owners Association), Dick Allen (Lake Merced Task Force), John Buckley (Central Sierra Environmental Resource Center), Lauren Wetson (Acterra: Action for a Healthy Planet), Stuart Gross (SF Herring Association), Greg Reis (The Bay Institute), Konrad Fisher (Water Climate Trust), Laura Allen (Greywater Action), Bill Uyeki (Peninsula Fly Fishers), Elizabeth Dougherty (Wholly H2O)	The following actions are immediately requested from the SFPUC Commissioners: - Direct staff to produce an appendix that analyzes the impact of reducing the Design Drought to 7.5 years.	The UWMP reflects the use of the 8.5-year design drought, which is what SFPUC currently uses for water supply planning purposes and has been adopted through the Water System Improvement Program. If the Commission adopts a different policy, the SFPUC will produce an updated supply reliability analysis which will then be used in Water Supply Assessments. This information would be clearly communicated and transmitted to the Wholesale Customers for their use as well.
	- Commit to developing alternative water supplies and incorporate approximate yield into the UWMP water supply projections (with a focus on recycled water).	The UWMP describes extensively the alternative water supply (AWS) projects that are currently in the planning stages in Section 7. Given the early stages of these projects, SFPUC has determined it would not be prudent to include the estimated yield of these projects in its supply modeling for the purposes of the supply and demand analysis presented in Section 8. However, that does not mean that SFPUC is not making significant investments in moving these projects forward. Feasibility studies are still underway and AWS projects have not yet been modeled alongside the RWS operations and assumptions. Staff also continue to identify and explore additional opportunities including local, regional and upcountry projects. The SFPUC has committed to developing an Alternative Water Supply Plan by 2023, which will contain additional information about these projects, their anticipated yields, and next steps. As planning analyses continue between now and June 2023, SFPUC staff will regularly update water supply benefit estimates on a project-by-project basis and share them periodically through the Alternative Water Supply Program Quarterly Report.

		- Commission a peer review of San Francisco's and BAWSCA's population and demand projections, which would explain how past over-projections have been corrected, explain why the UWMP population forecasts are so much higher than the California Dept. of Finance projections, and explain why the UWMP demand projections are higher than the SFPUC's financial department's forecasts.	Basis for UWMP Demand Projections: As required by Water Code section 10631(a), SFPUC coordinates with the San Francisco Planning Department to obtain information about housing and population growth projections for the City. As described in Section 3.2.2 of the Plan, SFPUC develops its demand projections based on projections of household water use, not per capita water use. The Planning Department is currently updating the city's General Plan Housing Element (Housing Element 2022 Update). The housing element update is required to be adopted by the city and submitted to the state Department of Housing and Community Development by January 2023. One of the primary goals of the Housing Element 2022 Update is to improve housing affordability by increasing the rate of housing production compared with the past several decades. The housing projections are based on the Housing Element 2022 Update objective of producing an average of 5,000 housing units per year with adjustments for certain large development plans. The population projections presented in the plan correspond to the housing growth scenario described above from the Housing Element 2022 Update. Additional description about the basis for the demand projections was added to Section 4 for clarity. Regarding the projected population and demand growth for the Wholesale Customers, that information is provided to the SFPUC by BAWSCA in their Regional Water Demands and Conservation Projections Report. This is consistent with Water Code section 10631(h), which directs water suppliers that rely on wholesale agencies to provide the wholesale agency (in this case the SFPUC) with water use projections for that source of water.Differences between UWMP and Finance projections: SFPUC's 10-Year Financial Plan contains projections for water sales, whereas the UWMP contains projections for total water demand. The UWMP projections include water loss, which accounts for 6 mgd; this figure is not included in the Finance projections because it is not part of water sales. Comparing the retail demands from these two sources without water loss, there is a less than 10% difference between the UWMP and Financial Plan projections. This difference is appropriate given the different goals of the two sets of projections; for the Water Enterprise, demand projections are relied upon for future water supply needs. The goal of the Financial Plan is to ensure sufficient revenue for continued operation. Because all demand projections are an estimate, it is not possible to achieve 100% accurate projections. Different assumptions and approaches are warranted for different divisions based on planning priorities.
Peter Drekmeier	Tuolumne River Trust	The population projections included in the UWMP are much higher than the population growth trends in recent years and we recommend using the projections developed by the California Dept. of Finance, for both retail and wholesale service areas, instead of the Plan Bay Area numbers.	See response above to similar comment.
Peter Drekmeier	Tuolumne River Trust	Demand projections in the UWMP are highly inflated, which has been shown by the comparison of previous projections vs. actual demand (2018 RWS projected demand was 285 mgd, while actual demand in 2018 was 196 mgd). The main reason water demand has been decreasing is the rising water rates, and the water demands included in the 10-year Financial Plan are 8% lower than the UWMP water demand projections. SFPUC predictions forecast that water rates are going to increase by 65% by 2036 and that the combined water/wastewater rates will increase by 91%, whereas the UWMP includes an increase of 50% by 2045. Has the SFPUC's financial department reviewed Appendix E, and do they agree that the increase in water rates will be only 50% over the next 25 years? We recommend that the SFPUC create a group of stakeholders to meet with the Brattle Group to go over Appendix E before submission of the Plan.	SFPUC's Finance Division provided the information about projected rate increases that was used for the demand projections. See response above for similar comment about differences between UWMP and Finance projections
Peter Drekmeier	Tuolumne River Trust	The Design Drought appears arbitrary and the UWMP doesn't explain how the Design Drought scenario was developed. We encourage SFPUC staff to include an appendix that analyzes a 7.5-year design drought scenario.	The design drought is a tool used by the SFPUC for water supply planning. See response to above similar comment about the inclusion of an additional appendix.

Peter Drekmeier	Tuolumne River Trust	Section 6.1.3 about climate change impacts focuses on the negative potential impacts. This section should include a discussion about the potential benefits of climate change to water supply from earlier runoff.	Climate change is being covered in our Long Term Vulnerability Assessment. As stated in the UWMP, this study has not been completed yet.
Peter Drekmeier	Tuolumne River Trust	The development of alternative water supplies has been lagging. 30 years after ordinances 390/391-91 were adopted, SFPUC is using 0.1 mgd of recycled water (while the Hetch Hetchy System was built over 20 years). The SFPUC has identified 35 mgd of alternative water supplies and it would be worthy to determine if some of these projects could be factored into the UWMP's future water supply.	See response above to similar comment.
Peter Drekmeier	Tuolumne River Trust	The UWMP should include a table similar to Table 8-3, which excludes the interruptible customers, to see how the decision regarding San Jose and Santa Clara might impact San Francisco's interests.	The SFPUC is in the process of determining whether to make the Cities of San Jose and Santa Clara permanent customers. The UWMP is not the vehicle that the SFPUC will use to present the analysis of this decision-making process.
Doug Obegi & Jon Rosenfield	NRDC & San Francisco Baykeeper	The draft UWMP significantly overestimates water demand, which is directly correlated to an overestimation of the retail and wholesale population projections. The UWMP plans for a 39% population increase in the City from 2020 to 2045, which is 3 X higher than the California Dept. of Finance projections, and is not in accordance with the population growth trends of the last 10 years. The wholesale population projections also don't match the trends of Dept. of Finance population growth for the utilities' respective counties. The NRDC strongly encourages the Commission to review the UWMP to incorporate current estimates of population growth and the resulting lower estimates of total water demand	See response above to similar comment in how our demand projections are developed.
Doug Obegi & Jon Rosenfield	NRDC & San Francisco Baykeeper	The draft UWMP significantly overestimates demand (by approximately 20-25%) compared to the Commission's financial planning projections in the 10-Year Financial Plan adopted in February 2021. The Commission's 10-year Financial Plan forecasts declining retail and wholesale water sales over the coming decade, based on the observed historical trend.	Please note that this comment incorrectly characterizes the projected demand from the UWMP; the plan projects a retail demand of 72.4 mgd in 2030 (the demand shown in the comment letter is 80.6 mgd, which is the 2045 projected demand). The 10-Year Financial Plan projects total sales of 60.5 mgd in 2030. Half of the difference in these two projections is from the fact that the UWMP demands include 6 mgd of water loss, which is not included in the financial plan sales projections. Comparing the retail demands without water loss, there is a less than 10% difference between the UWMP and Financial Plan projections. See additional information in response above to similar comment.
Doug Obegi & Jon Rosenfield	NRDC & San Francisco Baykeeper	The draft UWMP fails to demonstrate that there is a surplus of water available for new development, and should review the assumptions to determine the available supply under the Bay Delta Plan scenario, including (1) the overestimated population growth and water demands in the retail and wholesale service areas, (2) the 8.5-year design drought, which is significantly longer than is required by State law for UWMP, (a shorter design drought could result in less frequent and severe shortages), (3) the assumed allocation of responsibility from meeting reduced diversions from the Tuolumne River borne by the Commission vs. the other water rights holders.	(1) See response above to similar comment; (2) See response above to similar comment; (3) Allocations of responsibility for meeting Tuolumne River instream flow requirements are assumed to be in accordance with the Fourth Agreement.
Doug Obegi & Jon Rosenfield	NRDC & San Francisco Baykeeper	Despite identifying significant water shortages for retail and wholesale customers, the draft UWMP includes minimal investments in local and regional water supply projects in retail service area and diversify supply sources (with 91% of supply still coming from the Tuolumne River in 2045), and does not include analysis of local water supplies in the wholesale service area. San Francisco should intensify its efforts to incorporate water recycling, stormwater capture and improved water use efficiency, comparably to other cities in Southern California.	Regarding investments in alternative water supplies, see response to similar comment above.
Doug Obegi & Jon Rosenfield	NRDC & San Francisco Baykeeper	There is a lack of information regarding wholesale water use and potential local supplies expansion opportunities, which raises questions about the projected RWS water needs for the wholesale customers.	The projected Wholesale Customer purchase requests shown in Section 4, Table 4-3 of the plan are specifically demands on the Regional Water System after accounting for local supplies developed by the Wholesale Customers. Additional information about these supplies can be found in the Wholesale Customer agencies' individual UWMPs.

Heinrich Albert	Sierra Club San Francisco Bay Chapter Water Committee	The draft UWMP significantly overestimates future water demand. The retail and wholesale population growth projections are significantly higher than the population growth trends provided by the California Dept. of Finance. In addition, the UWMP water demand projections are 20-25% higher than the Commission's 2030 water demand projections included in the 10-Year Financial Plan.	See response above to similar comment.
Heinrich Albert	Sierra Club San Francisco Bay Chapter Water Committee	The draft UWMP includes limited alternative water supply sources (wastewater recycling, groundwater, stormwater capture, etc.) and does not plan for supply vulnerability. San Francisco plans for minimal investments in water recycling and other local supply projects, unlike other Southern California cities.	See response above to similar comment.
Nicole Sandkulla	BAWSCA	The SFPUC should reflect the additional purchase requests (above their existing contract limit) of the City of San Jose (4.5 mgd) and the City of Santa Clara (2 mgd) in its regional water planning efforts and in this UWMP.	The UWMP is not the vehicle that the SFPUC will use to make decisions about water supply requests from its Wholesale Customers.
Nicole Sandkulla	BAWSCA	The estimated yield for each individual AWS project should be included in Sections 7.2, 8.4 and Table 8-1, as presented at the March 26 workshop. This would characterize each project's contribution to narrowing the system-wide shortage identified under drought conditions.	See response above to similar comment.
Nicole Sandkulla	BAWSCA	Discussion of the Tuolumne River Voluntary Agreement (TRVA) and associated modeling results should be included in the UWMP, as presented in the March 26 workshop.	The TRVA has not been adopted by the State Water Resources Control Board, and as such remains subject to change. The information presented at the March 26th workshop was intended for illustrative purposes, and is not appropriate for inclusion in the UWMP at this time.
Nicole Sandkulla	BAWSCA	The cutbacks to the wholesale customers in drought years under the BDP scenarios indicate that the SFPUC will not meet its established Level of Service Goals to limit rationing to no more than 20% system-wide during droughts if the BDP is implemented.	Comment noted.
Dick Morten		Neither the State of California nor San Francisco provide sufficient consideration to the environmental, natural resources and wildlife habitat. The UWMP must be the basis for having a sustainable freshwater ecosystem throughout the entire Hetch Hetchy water system from the watershed to the drinking faucet.	This is beyond the scope of the UWMP. The UWMP is structured to meet the requirements in the California Water Code. The SFPUC is engaged in several regulatory processes regarding the Tuolumne River and Bay-Delta environment, including the State Board's Bay-Delta Plan and the FERC relicensing of Don Pedro Dam. These processes have not yet reached conclusions.
Dick Morten		The global warming impacts on Hetch Hetchy discussed may not fully reflect the potential water scarcity forecasts. The SFPUC must take into account more dynamic global warming conditions in the UWMP. Further analysis of climate change and the related impacts on drought are needed to reduce the vulnerability of our scarce water resources.	Climate change is being covered in our Long Term Vulnerability Assessment.
Dick Morten		I support the recommendation to add a Section 12 to the UWMP about the Tuolumne River Environment to detail the SFPUC's commitment to enhance the Tuolumne River flows and protect fish and wildlife habitat.	Comment noted.
Dick Morten		Is there way for San Francisco's LWMP to influence the development of its wholesale customer's plans, including conservation, leakage, groundwater management, consumer price signals, recycled water, new construction water standards, etc.? Would SFPUC be able to influence the river intake from the Turlock and Modesto Irrigation Districts to effectively manage the scarce Tuolumne River resources?	As a wholesale water supplier, SFPUC provides its wholesale customers with information about anticipated supply reliability as required by the Water Code. Each wholesale customer is responsible for the preparation of their own UWMP.
Dick Morten		The UWMP should not confine itself to freshwater, groundwater and recycled water supply sources, and should include the abundant saltwater sources, which will be critical to the City's response in the event of earthquakes/fires.	UWMP is not an emergency water supply planning document, it is a long-term water supply planning document. The Water Shortage Contingency Plan references relevant emergency planning documents.
Dick Morten		SFPUC must not ignore the State Water Code 73505, which states that in the event of a water emergency, the SFPUC is obligated to deliver water from University Mound, Sunset and Merced Manor reservoirs to its wholesale peninsula customers. This situation could tax San Francisco's domestic water supply and firefighting capability.	UWMP is not an emergency water supply planning document, it is a long-term water supply planning document. The Water Shortage Contingency Plan references relevant emergency planning documents.

Dick Morten		The UWMP identifies Lake Merced as a water resource. It should be clarified that the lake is designated by the state as a non-potable water to be utilized for firefighting. Unfortunately, as far as I am aware there are no pumps, manifolds and pipes that would enable the fire department to have easy and quick access to this abundant water resource.	Section 3.1.4 identified Lake Merced as a non-potable water source: "In addition, there is an emergency supply of existing non-potable water immediately available within the City at Lake Merced."
Dick Morten		Consumer price signals for San Franciscans are likely to be more affected by rapidly increasing sewer rates rather than water rates. Will these increased rates bring about larger reductions in water consumption? To offset the growing consumer cost impacts there should be strong incentives for water conservation through provision of water conserving devices, stepping up water pipe leakage repair, etc.	Regarding the impacts of wastewater rates on demand, see response to similar comment above. Regarding our conservation program, refer to our 2020 Retail Water Conservation Plan for additional detail on our extensive conservation activities and planning.
Nancy Wuerfel		I request that language be added in Section 1 to acknowledge the AWSS as a city asset, transferred under the SFPUC's jurisdiction in 2010, and that notes the distinction between the AWSS as the non-potable firefighting supply source) and the EFWS as the potable water delivery system for firefighting.	UWMP is not an emergency water supply planning document, it is a long-term water supply planning document. Collectively in early 2019, the City Administrator's Office, Office of Resilience and Capital Planning, Mayor's Office, SFPUC, SFFD, and Public Works all collaboratively decided to utilize the term "Emergency Firefighting Water System" (EFWS) instead of "Auxiliary Water Supply System" (AWSS).
Nancy Wuerfel		I request that language be added in Section 3 that describes the historical development of the AWSS, and includes a description of the transferred AWSS assets.	UWMP is not an emergency water supply planning document, it is a long-term water supply planning document, and does not need to address the historical development of the Emergency Firefighting Water System.
Nancy Wuerfel		I request that Figure 3-2 be updated as follows:- update the title to note "map of in-city distribution system for potable water delivery"- remove Lombard reservoir from Figure 3-2 (and from Table 3-2) because the SFPUC transferred the reservoir's jurisdiction to the Recreation and Park Department in 2014- remove Harding Park recycled water facility because it is not part of the potable water distribution system- Create a new Figure 3-2.1 "Map of in-city distribution system for non-potable water delivery through the AWSS"	Figure 3-2 correctly illustrates the components of the SFPUC in-City distribution system. Lombard Reservoir remains under SFPUC jurisdiction (Francisco Reservoir was transferred to Rec and Park).
Nancy Wuerfel		I request that Section 6 and the WSCP section "Preparation for catastrophic supply interruption" include reference to the Budget and Legislative Draft Policy Analysis Report of February 2021 and the updated conceptual plan to expand the EFWS using Lake Merced as a primary source and Sunset Reservoir as a secondary source. In addition, I request additional language about cross-connection control to prevent raw water in Lake Merced from entering the potable water system pumped separately at the Lake Merced site.	UWMP is not an emergency water supply planning document, it is a long-term water supply planning document. Additionally, it is not a technical cross-connection control document. The SFPUC follows all cross-connection control regulations to ensure our customers receive high quality safe drinking water. In 2019, the San Francisco Board of Supervisors, via Resolution 484-19, urged SFPUC, SFFD, and the Office of Resilience and Capital Planning to develop a comprehensive Citywide EFWS Plan by December 31, 2021. The three agencies are diligently developing this Plan and will bring it to the Board of Supervisors by December 31, 2021.
Nancy Wuerfel		I request that the WSCP annual water supply and demand assessment include the AWSS.	The intent of the Annual Water Supply and Demand Assessment (WSDA) is to compare projected retail and wholesale demands with supplies (Regional Water System and local supplies). The AWSS is not a supply that is used to meet these demands, and thus is not pertinent for the Annual WSDA.
Nancy Wuerfel		I request that the Plan include Water Code Section 73503 and the use of the City's terminal reservoirs - Sunset, University Mound and Merced Manor, for emergency supply to the wholesale customers.	UWMP is not an emergency water supply planning document, it is a long-term water supply planning document. Water Code Section 73503 states the following: (a) The city, in consultation with the association and the offices of emergency services in Alameda County, Santa Clara County, and San Mateo County, shall prepare an emergency response plan describing how water service will be restored to the area served by the bay area regional water system after an interruption caused by earthquake or other natural or manmade catastrophe, and thereafter shall be implemented. (b) During any interruption in supply caused by earthquake, or other natural or manmade catastrophe, a regional wholesale water supplier shall distribute water to customers on an equitable basis, to the extent feasible given physical damage to the regional water system, without preference or discrimination based on a customer's geographic location within or outside the boundary of the regional wholesale water supplier.

Dave Warner		The SFPUC has consistently overestimated retail water demand in its 2010 and 2015 UWMP projections (2010 projection for 2020 - 71.7 mgd, 2015 projection for 2020 - 72.5 mgd, actual 2020 in-city demand, 65.3 mgd). It would be great to have Brattle show a reconciliation of the projections and actual demand, and how the overestimates are addressed in the new demand forecast.	The projections developed for this 2020 UWMP are significantly lower than those presented in the 2015 plan. The methodology was updated significantly, as described in Appendix E of the plan. One key indicator of the changes is that the projected per capita demands decreased significantly between the 2015 and 2020 projections; in 2015, per capita residential demand was projected to remain at about 44 gpcd through 2040; in the new projections, per capita residential demand is projected to decrease to 38 gpcd.
Dave Warner		The water demand is not adjusted for economic activity, which would lead to the overestimation of the demand (ex: during the drought, there was a substantial increase in economic activity, and a substantial decrease in economic activity resulted from the COVID pandemic in 2020).	The demand forecasts were developed under the assumption that future years are 'normal', i.e. not experiencing a drought or anomolous event such as the COVID-19 pandemic. Although such anomolous events are likely to occur in the future, we don't have a way to predict their occurrence. Because anomolous events can impact demands in both directions (i.e. increase or decrease depending on the nature of the event), excluding such events does not create a clear bias in the demand projections. In developing the model, the impacts of these events in the past were accounted for when determining the impacts of other variables such as rates. See Appendix E for additional discussion and quantification of the impact of drought and COVID-19 on demands.
Dave Warner		The demand projections are not adjusted to account for infill development, which would lead to the overestimation of the demand, since the increase in housing and employment would lead to a decrease in outdoor water use.	The residential and commercial demand forecasts are based on the number of projected households and employees in the City; if new residential units are replacing old ones, that would be accounted for in the total number of residential units. The largest outdoor water users in the retail service area, e.g. Golden Gate Park, golf courses, are not being replaced by infill development. Thus it is not clear that infill development would lead to a significant reduction in outdoor water use.
Dave Warner		The water demand analysis doesn't take into consideration the changing income levels of the city's population. Given the high housing prices, it could be expected that income levels would increase over time, which would affect water demands, by accelerating increased access to conservation measures.	The Brattle Group determined that the income parameter was not statistically significant when they also controlled for other housing characteristics. Therefore it was not used as an explanatory variable for the demand forecasts.
Dave Warner		It appears counterintuitive to assume that the newly built multi-family units would consume more water than the old ones, as we'd expect that newer units have more conservation measures in place.	This is indeed counterintuitive, and we will be further investigating this phenomenon. Although these newer buildings certainly have the latest water saving fixtures, in many cases we are seeing additional water fixtures in unit rather than shared such as clothes washers while also seeing more shared water-using amenities such as pools and cooling towers. The projections included in this study are based on the actual water use of recently constructed multi-family units.
Dave Warner		When adjusting demand projections to offset the impact of COVID, adjusted residential demand drops 0.5 mgd while adjusted commercial and industrial demand increases 3.1 mgd, which sounds counterintuitive. Given the in-city population of employees is less than the in-city residential population, it would be good to explain why the expected commercial and industrial demand would increase much less than residential demand decreases (closer or below the absolute value of the 0.5 mgd residential adjustment), particularly as per capita commercial and industrial demand is a fraction of per capita residential demand.	The impacts of COVID were opposite in the residential and commercial sectors; it increased residential demand while decreasing commercial demand. The magnitude of impact on the commercial demand was greater than the magnitude of impact on the residential sector, likely due to the fact that commercial buildings were occupied pre-COVID by a significant proportion of employees commuting from outside the City. The portion of employees who also live in the City stayed home and increased their residential consumption; but the large portion of employees who reside outside the City did not come to the office. However, for the demand projections in the UWMP, the projections were built off of a 2020 demand level that was normalized to remove the effects of COVID in both sectors.

Carlos Wadkins	San Francisco Coalition on Homelessness Human Rights Working Group	- The UWMP does not adequately capture the water needs of thousands of unhoused San Franciscans, and only accounts for housed residents with a household water connection, including the section about lower-income households, which only accounts for lower-income San Franciscans who reside in homes. - The 2020 Draft UWMP does not include public water access facilities (public drinking water fountains and public restrooms), which are a significant water source among San Francisco's unhoused community, but still do not provide sufficient access to public water. According to the 2021 "Water for All" Report by San Francisco's Coalition on Homelessness, the overwhelming majority of unhoused San Franciscans fall below the international minimum standards for water access.	Although the residential sector water use and projections only capture water use associated with households, water use of unhoused populations may be captured within other water use categories. For example, drinking fountains would be captured in municipal usage or irrigation usage (if these fountains are located in parks); water usage of homeless shelters or other supportive services would be captured in municipal or commercial water usage. The SFPUC, working with RPD, SFUSD, and SFPW, has supported the installation of 173 drink-tap stations. 70 drink tap stations have been installed in the public realm (right of way, parks, plazas, etc.), with the remaining 103 stations installed at SFUSD schools. The SFPUC is actively working on installing 3 additional stations in the public realm in the Tenderloin.
Greg Gaar		Recycling and water reuse will result in conserving potable water. Commenter suggests SFPUC make it a simple process to collect and store rainwater. Commenter suggests expanding removal of asphalt and concrete to allow rainwater to enter the ground. Commenter asks about San Francisco's efforts with water recycling.	See Section 7 of the Plan for additional descriptions of recycled water projects being pursued. See the Retail Water Conservation Plan for additional information on our conservation programs.
Ginny Stearns		Commenter supports the increased development and use of recycled water and the Onsite Water Reuse program. Commenter also supports replenishment of groundwater with recycled water, and expressed desire to maintain sufficient water for City green spaces. Commenter expressed concern about potential presents of chemicals in recycled water.	Comments noted.
Steve Lawrence		In analyzing the scenario where the Bay Delta Plan (Amendment) is implemented, are San Jose and Santa Clara made permanent customers?	No assumption is made about the status of San Jose and Santa Clara in our supply modeling in the text of the UWMP. Their demands are included in the wholesale customer demand projections that are analyzed, and the total demands for the planning horizon never exceed our wholesale customer contractual obligation of 184 mgd. We provided the wholesale allocation that resulted from our supply modeling to BAWSCA, who then determined the allocation for each of their member agencies.
Steve Lawrence		Is 6 mgd a reasonable estimate of water losses? Page 38/432. I doubt it. Firstly, you state that 7.18 mgd was lost in the latest year, '19-20, but if one divides the loss figure for the year by 365 one gets 7.45. Secondly, you simply state that 6 mgd is "real" loss. Is there an explanation? Losses have been increasing 2016 on; makes sense, infrastructure ages, and much street work and other city construction shakes pipes loose. Drier periods, then wetter, will probably stress pipes as climate changes in upcoming years.	The water loss value has been corrected in the final document. 6 mgd of real losses is a conservative estimate, and we have several programs in place to reduce both real and apparent water losses moving forward. You can read more about these efforts in Chapter 10 of the plan.
Steve Lawrence		Single family residents are assumed not to increase use (in fact decrease over 10%) despite, and without consideration that I can find, of: 1) will residents per SFR remain the same, or will the average rise as housing becomes more expensive, e.g. with adult children returning to parents' home and with aging parents living in? 2) will ADUs, a state policy, add to single unit lots another housing unit? (Accessory dwelling unit)	Our assumptions about single family housing units are provided by the Planning Department; we do not make our own projections about housing changes in the City. Our projections do not make assumptions about the number of residents per unit; rather, the projections are based on consumption at the household level and the response to rates, temperature, and precipitation, as well as conservation. We currently have no basis for projecting changes in household occupancy into the future.
Steve Lawrence		At about 38/432 the draft appears to say that temperature and precipitation changes caused by climate change will not significantly affect demand. This surprises. I wonder.	This assertion is based on the trends observed in the 10 years of historical water use data that showed that over that period, changes in temperature and precipitation did not have large impacts on demand, likely due to limited outdoor water use by residential customers in the city. It is true that climate change could lead to more extreme changes; however, given the uncertainty about future climate scenarios, this plan evaluated a limited number of future temperature and precipitation conditions. We are currently in the process of finalizing our Long Term Vulnerability Study that will further examine the implications of a range of future climate scenarios.

Steve Lawrence		Are the draft's assumptions right re wholesale customers' assurances and how much water SF gets during droughts if the state's plan is implemented? I don't pretend to follow, but I fear that the 2009 WSA assured wholesale customers that rationing for them would not exceed 20%. If WCs stood firm, SF would be severely parched. The draft does admit that it makes assumptions about what happens if supply shortage exceeds 20%.	SFPUC has adopted a Level of Service objective to limit system-wide rationing to no greater than 20%. Per the WSA, the Supply Assurance to the Wholesale Customers is subject to reduction by water shortage, drought, emergencies, or malfunctioning/rehabilitation of Regional Water System facilities. The process for allocating water shortages between the retail and wholesale customers is defined in the WSA, however as stated in the plan, there are additional procedures and negotiations that would be undertaken in the event of a system-wide shortage greater than 20%.
Steve Lawrence		4.1.1 of App.K says that over ten percent supply shortage --> rationing, but Table 3.2 says otherwise; which is right? pg366-7/432	Section 4.1.1 states that SFPUC will likely use calls for voluntary reductions if the target water use reduction is 10% or less, however the SFPUC retains the flexibility to implement voluntary or mandatory calls for water use reduction as needed during a water shortage. Table 3.2 shows that in a Stage 4 shortage, a water use reduction of 5 - 18% would be targeted, and thus depending on where we landed in that range, the calls may be voluntary or mandatory.
SFPUC 2020 UWMP Update – Wholesale Customer Comments Received After 05/05/2021 Deadline			
Darryl Barrow	General Manager, Westborough Water District	The draconian cuts that implementation of the UWMP would require would have a devastating impact on the customers of the Westborough Water District. The District has made aggressive efforts to conserve water; current water usage is 66 gallons per capita per day. In order to implement additional cuts, while still protecting the health and safety of its customers, the District would need to prohibit a range of important uses, including the use of potable water for construction and dust control, the use of water by landscape accounts, the use of water for landscape irrigation, and the issuance of new water connections. The water supply shortages presented in the UWMP are not sustainable for the basic health and safety needs of the District customers. We urge you to redouble your efforts to secure a voluntary agreement in the Bay-Delta proceeding and urge you to support an effort to hammer out an arrangement among the BAWSCA members to address what will occur in the event of a supply shortage that exceeds 20%. We urge the SFPUC to expedite water supply projects to meet its supply assurance obligations.	Comment noted. The SFPUC will be communicating with our Wholesale Customers collectively on this topic.
Justin Chapel	Public Works Superintendent, City of Redwood City	Redwood City is expressing concern regarding the water supply reliability resulting from implementation of the Bay-Delta Plan. For Redwood City, which purchases all of its drinking water from the SFPUC, the cutbacks are expected to be as high as 49% of available supply in multiple dry year scenarios. If such a reduction in demand is required the City will be forced to impose severe measures, including prohibition on irrigation with potable water, suspension of distribution system flushing, cutbacks for CII customers by 30%, a moratorium on new development, and a reduction of residential indoor water use to 27 gallons per capita per day, which raises concerns about basic health and safety needs and the economic vitality of our community. Redwood City requests that the SFPUC fully commit to the voluntary agreement process and fund the Alternative Water Supply Program at levels necessary to meet its Level of Service Goals and contractual obligations to the Wholesale Customers. Redwood City has been and continues to be committed to conservation and development of recycled water. Redwood City is also a partner in the Crystal Springs Purified Water Project, and requests that the SFPUC prioritize this project.	Comment noted. The SFPUC will be communicating with our Wholesale Customers collectively on this topic.

Thomas J. Piccolotti	President, Board of Directors, North Coast County Water District	North Coast County Water District (NCCWD) relies solely on water provided by the SFPUC to meet the potable water needs of its customers. NCCWD was shocked when it saw the huge cutbacks that would be imposed in drought years with implementation of the Bay-Delta Plan. The potential cutbacks far exceed SFPUC's level of service goal. NCCWD urges the SFPUC to expedite water supply projects to meet its supply assurance obligations and Individual Supply Guarantee. NCCWD 2020 per capita water use was 60 gpcd, with a residential water use of 48 gpcd. NCCWD will not be able to reduce its water consumption by 54% without significant risks to the health and safety of its customers. NCCWD expects SFPUC will take the steps necessary to ensure it meets its Level of Service goal.	Comment noted. The SFPUC will be communicating with our Wholesale Customers collectively on this topic.

PUBLIC UTILITIES COMMISSION

City and County of San Francisco

RESOLUTION NO. **21-0100**

WHEREAS, The Urban Water Management Planning Act of 1983, as amended through 2020 (the Act), requires that an urban water supplier serving 3,000 customers or 3,000 acre-feet per year must prepare an Urban Water Management Plan (Plan or UWMP) update every five years; and

WHEREAS, On June 14, 2016, by Resolution No. 16-0118, the San Francisco Public Utilities Commission (SFPUC) adopted the 2015 Urban Water Management Plan; and

WHEREAS, The SFPUC, in compliance with the Act, has prepared a 2020 update to its Plan, including the 2020 Water Shortage Contingency Plan; and

WHEREAS, The preparation of the Plan update has been coordinated with the City's wholesale water customers and other public agencies to the extent practicable, and staff has encouraged the active involvement of diverse social, cultural and economic elements of the population within the SFPUC's retail water service area during preparation of the Plan; and

WHEREAS, At this Commission's regular public meeting on April 13, 2021, a Draft Plan was presented to the Commission and a Public Hearing was held during the Commission meeting in order to receive public comment on the Draft Plan; and

WHEREAS, Minor revisions to the Draft Plan have been made based on public comments received at the Public Hearing and during the public comment period of April 5, 2021 through May 5, 2021; and

WHEREAS, The San Francisco Planning Department issued a statutory exemption determination on May 25, 2021 under California Environmental Quality Act Guidelines section 15282(v), under Planning Department Case Number 2021-005261ENV; and

WHEREAS, This action constitutes the Approval Action for the project for the purposes of CEQA, pursuant to Section 31.04(h) of the San Francisco Administrative Code; and

WHEREAS, A Final 2020 Urban Water Management Plan was presented to the Commission at its public meeting on June 8, 2021 for consideration and adoption in advance of the July 1, 2021 deadline for submittal to the State and copy of the Final Plan is on file with the Commission Secretary; now, therefore, be it

RESOLVED, That this Commission hereby adopts the 2020 Urban Water Management Plan for the City and County of San Francisco, including the 2020 Water Shortage Contingency Plan, and directs the General Manager to submit it to the California Department of Water Resources by July 1, 2021.

I hereby certify that the foregoing resolution was adopted by the Public Utilities Commission at its meeting of June 11, 2021.

Donna Hood

Secretary, Public Utilities Commission

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APPENDIX D

SB X7-7 Compliance Form

JUNE 2021

2020 URBAN WATER MANAGEMENT PLAN

for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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SB X7-7 Table 0: Units of Measure Used in 2020 UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.*
NOTES: The units of measure used in the body of the UWMP are millions of gallons per day (mgd).

Appendix D - SB X7-7 2020 Compliance Form

SB X7-7 Table 1 pertains to baselines and targets and is not used in the SB X7-7 2020 Compliance Form.

SB X7-7 Table 2: Method for 2020 Population Estimate	
Method Used to Determine 2020 Population (may check more than one)	
☑	**1. Department of Finance** (DOF) or **American Community Survey** (ACS)
☑	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☑	**4. Other** DWR recommends pre-review
NOTES:	

SB X7-7 Table 3: 2020 Service Area Population	
2020 Compliance Year Population	
2020	899,732
NOTES: Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is therefore excluded from SB X7-7 calculations.	

SB X7-7 Table 4: 2020 Gross Water Use							
Compliance Year 2020	**2020 Volume Into Distribution System** *This column will remain blank until SB X7-7 Table 4-A is completed.*	**2020 Deductions**					**2020 Gross Water Use**
		Exported Water *	**Change in Dist. System Storage*** (+/-)	**Indirect Recycled Water** *This column will remain blank until SB X7-7 Table 4-B is completed.*	**Water Delivered for Agricultural Use***	**Process Water** *This column will remain blank until SB X7-7 Table 4-D is completed.*	
	76,730			-		-	**76,730**

*** Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.

NOTES: Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is therefore excluded from SB X7-7 calculations.

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment
Complete one table for each source.

Name of Source	Regional Water System

This water source is *(check one)*:

☑	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	74,260	-	74,260

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*
[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:
Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is therefore excluded from SB X7-7 calculations.

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s) Meter Error Adjustment
Complete one table for each source.

Name of Source	Groundwater

This water source is *(check one)*:

☑	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	2,470		2,470

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*
[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES: Groundwater use has found to be constant throughout the years, which consists of 1.5 mgd (1,680 AF) of in-city irrigation use, another 0.4 mgd (450 AF) of in-city potable water production, and 0.3 mgd (340 AF) for Castlewood CSA.

Appendix D - SB X7-7 2020 Compliance Form

SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD)		
2020 Gross Water *Fm SB X7-7 Table 4*	**2020 Population** *Fm SB X7-7 Table 3*	**2020 GPCD**
76,730	899,732	**76**
NOTES:		

SB X7-7 Table 6 pertains to baselines and targets and is not used in the SB X7-7 2020 Compliance Form.

SB X7-7 Table 7 applies to baselines and targets and is not used in the SB X7-7 2020 Compliance Form.

SB X7-7 Table 8 was used for the 2015 Interim Target and is not used in the 2020 UWMP.

SB X7-7 Table 9: 2020 Compliance							
Actual 2020 GPCD[1]	Optional Adjustments to 2020 GPCD Enter "0" if Adjustment Not Used Extraordinary Events[1]	Weather Normalization[1]	Economic Adjustment[1]	TOTAL Adjustments[1]	Adjusted 2020 GPCD [1] *(Adjusted if applicable)*	2020 Confirmed Target GPCD [1, 2]	**Did Supplier Achieve Targeted Reduction for 2020?**
76	-	-	-	-	76	96	**YES**

[1] All values are reported in GPCD
*[2] **2020 Confirmed Target GPCD** is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.*

NOTES:

SFPUC RETAIL BASELINES AND TARGETS NARRATIVE

With the adoption of the Water Conservation Act of 2009, also known as SB X7-7, the State was required to set a goal of reducing urban water use by 20% by the year 2020. Each retail urban water supplier was required to determine its baseline water use, expressed in gallons per capita per day (GPCD) during its baseline period, as well as its target water use for the years 2015 and 2020 in order to help the State achieve the 20% reduction.

In its 2010 UWMP, the SFPUC first established the baseline per capita water use, as well as the interim (i.e. 2015) and 2020 water use targets. In the 2015 UWMP, the SFPUC performed a detailed analysis to update the baseline and target per capitas based on in-City retail service area population and water use. The 2015 UWMP analysis by (1) revising the population of the in-City retail service area to reflect the 2010 U.S. Census rather than the 2000 U.S. Census, and (2) including the population and water use of the suburban retail service area. The baseline and targets established in 2015 do not need to be updated. This section provides a summary of the 2015 analysis and shows the SFPUC's compliance with the 2020 target.

Note that water use presented in this section reflects gross water use (i.e., water use by all sectors, including water loss). A complete set of standardized SB X7-7 Verification Form tables prescribed by DWR is provided Appendix D. Additionally, Groveland CSD is not included in this section, as explained in Section 2.4.

1.1 PER CAPITA WATER USE BASELINE CALCULATIONS

As described in DWR's *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use For the Consistent Implementation of the Water Conservation Act of 2009*, the Water Conservation Act of 2009 requires that each urban retail water supplier include in its UWMP an estimate of base daily per capita water use, expressed in GPCD, for a continuous multi-year base period. The California Water Code (CWC) specifies two different base periods:

- A continuous 10-year period, used to calculate baseline per capita water use, which may be extended up to an additional 5 years to a maximum of a continuous 15-year period for an urban retail water supplier that meets at least 10 percent of its retail water demand through recycled water, per CWC Section 10608.12(b)(1) and (2).

- A continuous five-year period, used to determine whether the 2020 per capita water use target meets the legislation's minimum water use reduction requirement, per CWC Section 10608.12(b)(3).

Because the SFPUC's current and past recycled water use does not equal or exceed 10% of retail water demand, the 15-year period cannot be used to calculate baseline per capita water use. The SFPUC will utilize a 10-year baseline period. Water use data from 2001 to 2010 have been used for this analysis, which is consistent with the baseline period used in the previous analysis in the 2010 UWMP.

Base daily per capita water use has been calculated for the 10-year baseline period as follows:

- Step 1: Estimate Distribution System Area. The distribution system area refers to the in-City and suburban retail areas, as described in Section 3.2.

- Step 2: Estimate Service Area Population for Base Period. The retail population was estimated for the period of 2001 to 2010 based on various sources depending on data availability. For the in-City retail service area, population data were obtained from the California Department of Finance for the County of San Francisco. However, the same method could not be used for the suburban retail service area since the service area does not align with municipal boundaries. Therefore, the SFPUC consulted with DWR (i.e., pre-review) on an appropriate, alternate methodology based on U.S. Census data at the census block level and persons-per-household data. Use of persons-per-household data was deemed adequate since it is assumed that all residential accounts serve single family homes in the suburban retail service area,

and no multi-family residences are served. Therefore, the number of connections can be considered equivalent to number of households. For the Town of Sunol specifically, the SFPUC used the web-based DWR Population Tool since the corresponding service area was difficult to define at the census block level (output provided in Appendix H). The resulting retail population estimates are shown in Table 5-1.

- Step 3: Calculate Gross Water Use. Gross water use is summarized in
- Table 0-2. Gross water use is comprised of water from the SFPUC's own water supply sources delivered to all retail customers. Changes in storage were then factored in to develop gross water use. The SFPUC compiles daily flow data for the County-line, system input, and in-line meters, as well as daily reservoir water level data. The meters, water level sensors, and associated metering equipment are all inspected, tested, calibrated, and maintained according to the applicable meter calibration and maintenance frequency by an independent metering consultant. These include annual pitot tube tests, quarterly secondary meter equipment testing and calibration, cleaning, flushing, inspecting, and lubricating. The flow quantities are expected to be accurate and no meter error adjustment is necessary.

- Step 4: Calculate Annual Daily Per Capita Water Use. Annual daily per capita water use was calculated by dividing gross water use by population. Annual daily per capita water use is shown in Table 0-3.

- Step 5: Calculate Base Daily Per Capita Water Use. Base daily per capita water use is calculated as the average of per capita water use, or 107 GPCD as shown in Table 0-3.

Table 0-1. Retail Population for 10-Year and Five-Year Baselines
[SB X7-7 Verification Form Table 3: Service Area Population]

10-Year Baseline	Five-Year Baseline	Year	Service Area Population		
			In-City Retail[a]	Suburban Retail[c]	Total Retail
Year 1	—	2001	780,614	1,634	782,248
Year 2	—	2002	782,765	1,633	784,398
Year 3	—	2003	782,599	1,630	784,229
Year 4	—	2004	781,308	1,626	782,934
Year 5	—	2005	780,187	1,619	781,806
Year 6	Year 1	2006	781,295	1,611	782,906
Year 7	Year 2	2007	787,127	1,786	788,913
Year 8	Year 3	2008	795,002	1,773	796,775
Year 9	Year 4	2009	800,239	1,751	801,990
Year 10	Year 5	2010	805,235	1,747	806,982
2020 Compliance Year			897,806	1,926	899,732

a In-City population estimated as County of San Francisco population obtained from the California Department of Finance Report E-8: Historical Population and Housing Estimates for Cities, Counties, and the State, 2000-2010, released September 2012. Population data for 2001 through 2009 are for January 1 of the applicable year, whereas population data for 2010 is for April 1, 2010 per the revised 2010 decennial census count.

b In-City population estimated as County of San Francisco population obtained from the California Department of Finance Report E-5: Population and Housing Estimates for Cities, Counties, and the State, 2011-2020 with 2010 Census Benchmark, released May 2020. Population data corresponds to January 1, 2020.

c Suburban retail population based on estimates for the Town of Sunol, Redwood City, Daly City, Fremont, Millbrae, Castlewood CSA, and San Francisco County Jail #5. Groveland CSD is not included.

1) Population of retail customers in the Town of Sunol was estimated using the DWR Population Tool. Output from the tool is provided in Appendix H.
2) Populations of retail customers in Redwood City, Daly City, Fremont, Millbrae, and Castlewood were estimated using data from the 2000 and 2010 U.S. Census at the census block level.
3) Inmate population of the San Francisco County Jail #5 in San Bruno was provided by staff of the San Francisco Sheriff's Department.
4) Other suburban customers include individual research and commercial facilities, such as the Lawrence Livermore National Lab, San Francisco International Airport, National Aeronautics and Space Administration, etc. Because these are non-residential facilities, their population is assumed to be zero.

Table 0-2. Retail Gross Water Use for 10-Year and Five-Year Baselines

[SB X7-7 Verification Form Table 4: Annual Gross Water Use]

10-Year Baseline	Five-Year Baseline	Year	Volume Into Distribution System[a]	Deductions					Annual Gross Water Use [c]
				Exported Water	Change in Storage[b]	Indirect Recycled Water	Water Delivered for Agricultural Use	Process Water	
Year 1	—	2001	90.9	0	-0.01	0	0	0	91.0
Year 2	—	2002	91.2	0	0.00	0	0	0	91.2
Year 3	—	2003	88.0	0	0.15	0	0	0	87.9
Year 4	—	2004	85.6	0	0.02	0	0	0	85.6
Year 5	—	2005	85.6	0	-0.09	0	0	0	85.7
Year 6	Year 1	2006	83.9	0	0.00	0	0	0	84.0
Year 7	Year 2	2007	82.3	0	0.03	0	0	0	82.3
Year 8	Year 3	2008	80.6	0	0.00	0	0	0	80.6
Year 9	Year 4	2009	78.8	0	-0.01	0	0	0	78.8
Year 10	Year 5	2010	76.9	0	0.06	0	0	0	76.8
10-Year Baseline Average Gross Water Use									84.4
Five-Year Baseline Average Gross Water Use									80.5
2020 Compliance Year									68.5

a All sources are metered, and all meters are calibrated annually.

b Changes in distribution system storage were estimated based on storage records of all in-City storage. Most suburban retail systems do not have storage facilities or the changes in storage were found to be negligible.

c The annual gross water use does not include water supplied to Groveland CSD.

Table 0-3. Retail Gross Per Capita Water Use for 10-Year and Five-Year Baselines

[SB X7-7 Verification Form Table 5: Gallons Per Capita Per Day (GPCD)]

10-Year Baseline	Five-Year Baseline	Year	Service Area Population	Annual Gross Water Use (mgd)	Daily Per Capita Water Use (GPCD)
Year 1	—	2001	782,248	91.0	116
Year 2	—	2002	784,398	91.2	116
Year 3	—	2003	784,229	87.9	112
Year 4	—	2004	782,934	85.6	109
Year 5	—	2005	781,806	85.7	110
Year 6	Year 1	2006	782,906	84.0	107
Year 7	Year 2	2007	788,913	82.3	104
Year 8	Year 3	2008	796,775	80.6	101
Year 9	Year 4	2009	801,990	78.8	98
Year 10	Year 5	2010	806,982	76.8	95
10-Year Baseline Average GPCD					107
Five-Year Baseline Average GPCD					101
2020 Compliance Year					76

1.2 GROSS PER CAPITA WATER USE TARGETS CALCULATIONS

Consistent with its 2010 UWMP, the SFPUC used Method 3 of the four approved methods provided by the Water Conservation Act of 2009 for determining urban water use targets in 2015. The SFPUC's retail service area is contained entirely within the San Francisco Bay hydrologic region. The hydrologic region baseline, interim, and 2020 targets are 157, 144, and 131 GPCD, respectively. To calculate the urban water use targets using Method 3, 95% of the 2015 interim and 2020 targets are calculated, yielding 2015 interim and 2020 targets of 137 and 124 GPCD, respectively.

In the event that the five-year baseline exceeds the 100-GPCD threshold specified in CWC Section 10608.22, the 2015 and 2020 per capita water use targets shall be verified to determine whether they meet the minimum water use reduction requirements, which warrant that an urban retail water supplier's 2020 target shall be at least 95% of the five-year baseline per capita water use. The SFPUC's daily per capita water use for the five-year period from 2006 to 2010 is 101 GPCD. Because it is above the 100-GPCD threshold specified by the CWC, the 2020 target must be adjusted to reduce water use by a minimum of 5% of the five-year baseline, or 5 GPCD. As such, the SFPUC's highest allowable 2020 target is 96 GPCD (initial 2020 target of 101 GPCD minus the adjustment of 5 GPCD). Since the highest allowable 2020 target is less than the target calculated using Method 3, the SFPUC's 2020 target is adjusted to 96 GPCD. The resulting 2015 interim target was 102 GPCD (i.e., the midpoint between the 10-year baseline of 107 GPCD and the 2020 target of 96 GPCD) (see Table 0-4).

Table 0-4. Gross Per Capita Water Use Baselines and Targets Summary (GPCD)

[Standardized Table 5-1: Baselines and Targets Summary]

Baseline Period	Start Year	End Year	Average Baseline	Interim 2015 Target	Confirmed 2020 Target
10–Year Baseline	2001	2010	107	102	96
Five-Year Baseline	2006	2010	101	—	—

1.3 COMPLIANCE WITH 2020 DAILY PER CAPITA WATER USE TARGET

As shown in Table 0-3, with a 2020 per capita water use of 76 GPCD, the SFPUC is in compliance with its 2020 target of 96 GPCD. No adjustments were needed.

Taking into consideration the impact of population and employment growth, as well as passive and active conservation efforts, the SFPUC initially projected in 2015 that its 2020 daily per capita water use would be approximately 86 GPCD. With its continued water conservation program, the SFPUC has achieved a lower than initially predicted per capita water use with a 2020 per capita water use of 76 GPCD, in compliance with the final 2020 target of 96 GPCD.

1.4 ASSISTANCE TO WHOLESALE CUSTOMERS

As a wholesale supplier, the SFPUC is required to provide an assessment of present and proposed future measures, programs, and policies that will help the retail water suppliers in their wholesale service area to achieve their water use reduction targets. This is further discussed in Section 10.3.

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APPENDIX E

2020 Retail Demand Model and Projections Technical Memorandum

JUNE 2021
2020 URBAN WATER MANAGEMENT PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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Water Demand Forecast for the City of San Francisco

2020-2045

PREPARED BY

David Sunding
Oliver Browne

PREPARED FOR

The San Francisco Public Utilities Commission

MARCH 26, 2021

Brattle

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

NOTICE

- This report was prepared for the San Francisco Public Utilities Commission, in accordance with The Brattle Group's engagement terms, and is intended to be read and used as a whole and not in parts.
- The report reflects the analyses and opinions of the authors and does not necessarily reflect those of The Brattle Group's clients or other consultants.
- There are no third party beneficiaries with respect to this report, and The Brattle Group does not accept any liability to any third party in respect of the contents of this report or any actions taken or decisions made as a consequence of the information set forth herein.

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TABLE OF CONTENTS

Executive Summary....3

I. Methodology....7
A. Data....7
1. Data Sources and Construction....7
2. Remove Water Conservation Policy from Raw Data....8
B. Econometric Model....9
C. Forecast Data....10
1. Forecast Assumptions....10
2. Econometric Projections....12
3. Add Water Conservation Estimates and Other Demands back into Forecast....12

II. Single-Family Residential Forecast....13
A. Model Estimates....13
B. Demand Forecast....14

III. Multiple-Family Residential Demand Forecast....15
A. Model Estimates....15
B. Demand Forecast....16

IV. Commercial and Industrial Demand Forecast....17
A. Model Estimates....17
B. Demand Forecast....19

TABLE OF TABLES

Table 1: Summary of Forecasts by Sector....5
Table 2: Forecast Assumptions – Housing Unit and Employment Growth....12
Table 3: Forecast Assumptions - Covariates....12
Table 4: Model Estimates – Single-Family Residential Sector....14
Table 5: Demand Forecast - Single-Family Residential Sector....15
Table 6: Model Estimates - Multiple-Family Residential Sector....16
Table 7: Demand Forecast – Multiple-Family Residential Sector....17
Table 8: Model Estimates- Commercial and Industrial Sector....18
Table 9: Demand Forecast - Commercial and Industrial Sector....19

Executive Summary

The San Francisco Public Utilities Commission (SFPUC) commissioned the Brattle Group to forecast water demand within SFPUC's in-City retail service area, encompassing the City and County of San Francisco (CCSF). We forecast demand for the following three types of accounts within the in-City retail service area:

- Single-Family Residential,
- Multi-Family Residential, and
- Commercial and Industrial.

To forecast future water demands, we obtained data on monthly water consumption and billing for each account of the above types in the City and County of San Francisco. We merged this data with property characteristics held by the Office of the Assessor-Recorder, demographic characteristics from the American Community Survey at the census block-group level, and historical climate data from the PRISM dataset.

We forecast account-level water demand based on each household's or business's historical average water consumption and statistical relationships between each household's water consumption and demand drivers such as water rates, weather, and other factors such drought and the COVID-19 pandemic. For each account, we estimate the relationship between water use and these demand factors using a multiple regression analysis. In a regression analysis, changes in the dependent variable, namely account-level water use, are explained by the control variables such as rates, climate, and macro-economic factors. The statistical estimates are not based on differences in the average level of water use between accounts, which we adjust for using as a statistical technique called 'fixed-effects'. Rather our estimates are based on the different trends in how each account's water use changes in response to changes in rates, climate and macro-economic factors.

The results of our statistical model are a set of "demand elasticities" with respect to water rates, average monthly average temperature, and monthly precipitation. These elasticities describe the percentage change in water consumption predicted in response to a one-percentage change in each of these control variables. The models also produce the estimated change in water use for each type of account during the COVID-19 pandemic and periods of drought.

For each account, future demand from 2020 to 2045 is forecast based on the historical aggregate water use for each account, and expected future changes in rates and climate. The assumptions for future rates and climate were developed in consultation with SFPUC. The forecasts assume that by 2045 water

rates increase by 50% in real terms (i.e., after controlling for inflation), average temperatures in San Francisco increase 1.1°C, and average precipitation is unchanged. We forecast demands for normal years by removing the estimated impact of drought and the ongoing COVID-19 pandemic.

Total demand for the in-city retail service area is calculated by aggregating the monthly account-level forecasts by the number of units and businesses. In addition to the existing stock of residential and commercial accounts, San Francisco's Urban Water Management Plan assumes significant growth in both the number of multiple-family homes and employment within the City based on housing and employment forecasts provided by the San Francisco Planning Department. The forecast incorporates approximately 5,100 new multi-family residential units each year with a simulation that assumes that newly built buildings have the same number of units and per-unit level of consumption as similar existing buildings that have been built in San Francisco since 1990. This approach implicitly assumes that these new multifamily units adopt the current standards in water-efficient plumbing fixtures. The forecast incorporates employment growth of approximately 5,000 jobs per year, split across five different land-use types.[1] The forecast assumes that new commercial and industrial accounts have the same water use patterns as similarly sized existing firms with the same land-use category.

Table 1 summarizes our forecasts. By 2045, single-family residential consumption is forecast to fall to 13.54 million gallons per day; multi-family residential consumption is forecast to grow to 33.03 million gallons per day; and commercial and industrial consumption will remain approximately flat at 18.00 million gallons per day. These forecasts account for all single-family, multi-family, and commercial/industrial water use in the SFPUC retail service area, including fire accounts and combination accounts. However, these forecasts do not include water losses or other account types such as suburban retail accounts, irrigation accounts, or municipal accounts.

In 2015, The Brattle Group produced demand forecasts for SFPUC as part of the previous Urban Water Management Planning process. The model in this memo departs in several important ways from the model that we previously used to forecast water demand in San Francisco. First, the previous model was calibrated to 2010 levels of demand, which are out of date and significantly higher than current consumption. Second, San Francisco's forecasts for future housing and employment growth have changed substantially; the San Francisco Planning Department now expects zero growth in single-family units, but significant growth in multi-family units and in-city employment. Third, our statistical model relies on different data and a different estimation strategy. The new model is estimated from variation over-time in consumption within each individual account in the SFPUC retail service area, whereas the previous model was estimated based on a cross-section of aggregated city-level observations across the

[1] Employment forecasts and the five different types of land-use categories come from the Plan Bay Area produced by the Association of Bay Area Governments. The five different types of land-use are: Office/Professional; Health/Education/Recreation; Manufacturing/Wholesale; Retail/Restaurants; and Other.

Regional Water System service area (i.e., the BAWSCA agencies and the City and County of San Francisco). Fourth, our model now explicitly adjusts for savings from active conservation programs and non-potable / onsite reuse in SFPUC's water conservation model.[2] Fifth, our previous model assumed that water consumption depends on household income levels as a proxy for each account's housing size and type, which we did not have individual-level data for our previous analysis. The model in this memo instead directly adjusts for every existing account's average water and forecasts the water use of homes built in the future.

TABLE 1: SUMMARY OF FORECASTS BY SECTOR

		FY2019-20 (Actual)	FY2019-20 (Forecast)	FY2024-25	FY2029-30	FY2034-35	FY2039-40	FY2044-45
				(millions of gallons per day)				
Single Family Residential								
Raw Prediction		14.45	14.32	13.83	13.63	13.60	13.63	13.65
Conservation:	*Active*	0.00	0.00	-0.15	-0.18	-0.17	-0.13	-0.11
Total		14.45	14.32	13.68	13.45	13.43	13.49	13.54
Multifamily Residential (5100 new units / year)								
Raw Prediction		22.91	22.47	24.03	26.14	28.65	31.32	33.99
Conservation:	Active	0.00	0.00	-0.15	-0.20	-0.18	-0.11	-0.06
	Non-Potable / Onsite Reuse	-0.07	-0.07	-0.21	-0.35	-0.63	-0.91	-0.91
Other Accounts:	*Fire*	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total		22.85	22.41	23.68	25.60	27.85	30.31	33.03
Commercial and Industrial								
Raw Prediction		14.70	17.81	17.25	17.33	17.49	17.93	18.38
Conservation:	*Active*	0.00	0.00	-0.28	-0.30	-0.30	-0.28	-0.23
	Non-Potable / Onsite Reuse	-0.03	-0.03	-0.09	-0.15	-0.27	-0.39	-0.39
Other Accounts:	*Docks / Ships*	0.01	0.02	0.02	0.02	0.02	0.02	0.02
	Builders / Contractors	0.14	0.18	0.18	0.18	0.18	0.18	0.18
	Fire	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Total		14.86	18.02	17.12	17.11	17.16	17.51	18.00
Grand Total		52.15	54.75	54.47	56.16	58.44	61.31	64.57

Notes:

The FY2019-20 (Actual): This column is a forecast that reflects actual demands under the prevailing COVID-19 and weather conditions and perfectly matches with realized demand.

The FY2019-20 (Forecast): This column is a forecast that assumes no COVID-19 pandemic and average weather conditions.

Raw Prediction: This is the raw output of Brattle's statistical forecast. In each sector, this category includes both standard accounts and combination-fire accounts.

[2] Onsite water reuse savings result from buildings installing and operating onsite water reuse systems. These systems involve the collection, treatment, and reuse of alternate water sources such as blackwater, graywater, and foundation drainage for non-potable end uses such as toilet flushing and irrigation. The water supplies produced by these systems are not municipally-supplied by the SFPUC and thus they serve to reduce demands on SFPUC's system.

Conservation Adjustment: This is the output of the SFPUC Conservation model. This value accounts for estimated water savings from the SFPUC's active conservation program and on-site and non-potable water reuse program. Passive conservation savings from plumbing code are already assumed/reflected in the raw demand projections.

Residential Fire Accounts: These values were supplied by SFPUC

Commercial and Industrial – Other: This category includes Docks and Ships; Builders/Contractors; and Non-Residential Fire Accounts. These values were supplied by SFPUC.

Grand Total: This row does not include water losses, suburban accounts, irrigation accounts or municipal accounts.

I. Methodology

Our estimation process has several steps that we discuss in the respective subsections below. First subsection discusses the raw data that we collect and how we pre-adjust our raw data to remove the impact of SFPUC's active water conservation programs, which we account for separately after forecasting future demand. The second section discusses the econometric model that we estimate. The third sub-section discusses the assumptions and calculations that we use to produce both individual-level and aggregate demand estimates from the econometric model.

A. Data

1. Data Sources and Construction

Our estimates rely on account-level data from SFPUC's retail service area, matched with data on parcel characteristics, and local weather fluctuations. We matched SFPUC's monthly billing data to publicly available data on land-use and building characteristics based on addresses provided in San Francisco's 2017 Tax Assessor and 2016 Land Use data. We then used these parcels to add characteristics about each meter from the public Tax Assessor, and Land Use data, as well historical weather data from the University of Oregon State's PRISM dataset, US Census block-group characteristics from the 2018 American Community Survey, US Census tract characteristics from the 2010-2019 American Community Survey, and Employment and Land Use forecasts provided by the SFPUC.

San Francisco's public agencies do not keep a data key that links information between the parcel identifiers in the Tax Assessor's records and the account numbers used in SFPUC's records. Therefore, to merge assessor information into our dataset, we matched accounts based on their reported addresses. Due to inconsistencies in address reporting between the two datasets, we could not match all records; however, we managed to match over 95% of all accounts. Based on a comparison of summary statistics between all accounts and only matched summary statistics, these accounts appear to be a representative sample, and therefore, we are confident using these data as the basis for our forecast model.

We use climate data from the University of Oregon State's PRISM Climate Group.[3] This dataset gathers climate observations from a wide range of monitoring networks, applies sophisticated quality control measures, and develops spatial climate datasets to reveal short- and long-term climate patterns. We use a dataset of monthly average temperature and precipitation at a resolution of 800m x 800m. These

[3] https://prism.oregonstate.edu/

datasets' spatial resolution allow us to identify microclimates at a high spatial resolution within San Francisco and identify how these microclimates affect water use.

From the assessor's parcel data, we can match each account up with the land-use category of the property on which it lies. The ABAG Plan Bay Area forecasts the total employment between 2005 and 2045 within each TAZ (transportation assessment zone), a unit of geography about the size of a zip-code. Within each TAZ, Plan Bay Area forecasts employment in each of five sectors: 1) Retail / Restaurants; 2) Financial and Professional Services; 3) Health, Education and Recreational Services; 4) Manufacturing, Wholesale Trade and Transportation; and 5) Other Categories.

Consumption data is also matched to past rate data and forecasted future rate increases out to 2045, which were provided to us by the finance department at SFPUC. All of the rates in our data are adjusted for inflation to 2020 dollars using CPI data from the St. Louis Federal Reserve's Economic Data (FRED).

2. Remove Water Conservation Policy from Raw Data

In addition to these fundamental determinants, we also explicitly adjust the forecast demand based on expected future water conservation from active water conservation programs run by SFPUC and from non-potable and onsite water reuse programs. This approach of explicitly accounting for active conservation programs in demand forecasts has been advocated as best practice by local researchers and advocacy groups[4]. However, explicitly adjusting for water conservation introduces some challenges into the demand estimation process. Specifically, care needs to be taken not to double-count savings from conservation programs with consumers' responses to rates, drought and climate. To do this, we adjust our historical data, by adding back in the savings that SFPUC estimates have been generated as a result of their active conservation programs. Savings for water conservation are calculated at an aggregate level, but we split these savings down to the household level by calculating the share of conservation attributable to each household and adding these savings back onto each household's daily water use.[5]

4 Diringer, Sarah E., Heather Cooley, Matthew Heberger, Rapichan Phurisamban, Andrea Turner, John McKibbin, and Mary Ann Dickinson. 2018. Integrating Water Efficiency Standards and Codes into Long-Term Demand Forecasting. Water Research Foundation.

Abraham, Sonali, Sarah Diringer, and Heather Cooley. 2020. An Assessment of Urban Water Demand Forecasts in California. Oakland, Calif.: Pacific Institute.

5 Although we make explicit adjustments for active water conservation programs, demand for which is driven my SFPUC outreach, we do not make a similar adjustment for passive water saving. Passive water savings are primarily driven consumers' changing their water consumption behavior to in response to changes in rates, and so are implicitly accounted for in our demand elasticity estimates. Including an explicit adjustment for these savings would risk double-counting and underestimating future water use.

After adding these savings back in, we arrive at an estimate of "pre-conservation" demand, which describes what demand would have been but-for SFPUC's conservation programs. We estimate our statistical demand model and predict demand based on this "pre-conservation" data.

Future demand reduction as a result of onsite water reuse systems was also incorporated into the multi-family and commercial sector models. Estimates of future reductions were provided by SFPUC staff and were subtracted off the raw demand forecasts. In the last step of our analysis, we add back in thedr active conservation savings and savings from reuse and non-potable water programs to generate the final demand estimate.

B. Econometric Model

To predict how water demand in SFPUC's retail service area will change over time, it is necessary to estimate a relationship between water use and the demand factors used in this analysis (e.g., rates and climate). Generally, water use and water price are negatively correlated. In other words, as water becomes more expensive, users will reduce their demands to offset the higher costs. As temperature increases or precipitation decreases, water demand is expected to increase.

For each account, we estimate the relationship between water use and these demand factors using a regression analysis with account-level fixed effects. In a regression analysis, changes in the explanatory variable, customer water use, are explained by the dependent variables, such as rates, climate, and macro-economic factors. In a regression with account-level fixed effects, we also control for the average level of water consumption for every premise in the retail service area. All explanatory variables in our empirical model are estimated in natural logarithms, which allows us to interpret their corresponding regression coefficients as elasticities.

An elasticity is the relationship between a variable, such as price, and water demand, which is calculated and interpreted as the percent change in water demand for a given percent change in the variable, water price. For example, a price elasticity of -0.2 implies that users reduce water demand by 0.2% for each 1% increase in price. We estimate similar elasticities with respect to elements of weather and climate such as temperature and precipitation. These elasticities can be used to estimate the impact of anticipated future climate change.

To estimate demand for single-family and multi-family water use, we estimate the follow equation, for multi-family homes q_{it} is the average water use per unit.

$$\ln(q_{it}) = \ln(rate_t)\beta^{rate} + \ln(temp_{it})\beta^{temp} + \ln(ppt_{it})\beta^{ppt} + \gamma^{COVID} + \gamma^{drght} + \gamma_i + \varepsilon_{it}$$

Where, the dependent variable, $\ln(q_{it})$, is the natural logarithm of household i's pre-conservation water consumption in month t. Dependent Variables:

- **Monthly Rate $rate_t$:** The volumetric rate paid by households in each month.
- **Weather $temp_{it}$ and ppt_{it}:** We obtain panel of modelled 800m x 800m climate characteristics from PRISM[6]. We control for each months' average precipitation and mean temperature.
- **Drought and COVID-19 Emergencies γ^{drght} and γ^{COVID}:** We include fixed effects, dummy variables which take on the value 0 or 1, during the 2015 to 16 drought, and during the COVID-19 pandemic beginning March 2020. These coefficient estimates on these dummy variables can be interpreted as the average change in the natural logarithm of water use during periods of drought and COVID-19, relative to periods without these factors.
- **Individual Fixed Effects γ_i:** Using this high-resolution data, we can control for the average level of water use for each account in our data. Controlling for the average level of our water use within each household allows us to estimate how an individual account responds to changes in rates, rather than identifying our estimates based on a cross-sectional difference in water consumption.
- **Idiosyncratic error term ε_{it}**: This term is standard in statistical regression analysis and is used to rationalize unexplained variation in the model. The model coefficients β are chosen to minimize the idiosyncratic error. The variance of ε_{it} is a key factor that is used to calculate the 95% confidence interval that characterizes the uncertainty associated with the model's parameters estimates β. We adopt two-way cluster-robust method, clustered at the census block-group and year level to account for unexplained correlations in water use either within years or within neighborhoods.

To estimate demand for commercial and industrial accounts we use the following equation:

$$\ln(q_{ijt}) = \ln(rate_t)\beta_j^{rate} + \ln(temp_{it})\beta^{temp} + \ln(ppt_{it})\beta^{ppt} + \gamma_j^{COVID} + \gamma^{drght} + \gamma_i + \varepsilon_{it}$$

This specification is the same as for the residential model, except the key differences is that the parameter estimates for rates β_j^{rate} and for COVID-19 γ_j^{COVID} are allowed to vary by land-use with a different parameter being chosen in each different type of land-use in the commercial and industrial sector.

C. Forecast Data

1. Forecast Assumptions

Table 2 and Table 3 summarize the assumptions that we adopt in our forecast. Assumptions about growth in the number of single-family and multi-family units comes from the San Francisco Planning Department. Assumptions for the number of employees are from the Plan Bay Area out to the year 2045. Assumptions about future climate are based on the average of outcomes across multiple

[6] PRISM Climate Group, Oregon State University, http://prism.oregonstate.edu, accessed 20 October 2020.

profession elicitations and climate change models specific to the San Francisco Peninsula considered by SFPUC's Long Term Vulnerability Assessment.

For each existing account, we then forecast demand from 2020 to 2045 based on the historical aggregate water use for each account, and expected future changes in rates and climate. Our forecasts assume that by 2045 water rates increase by 50% in real terms; that average temperatures in San Francisco increase 1.1^{o}C, and that precipitation is unchanged.

In addition to our central climate forecast, we also tested the robustness of our results to two alternative climate-change scenarios. In footnotes, we have reported the unadjusted baseline demand per-unit, noting that these alternative scenarios did not substantially change the results.[7]

In addition to forecasting demand for existing accounts, we also need to account for growth from new accounts, including newly constructed multifamily units and employment growth in the non-residential sector. The forecast incorporates approximately 5,100 new multiple-family residential units each year with a simulation that assumes that newly built buildings have the same number of units and per-unit level of consumption as similar existing buildings that have been recently built since 1990. This approach implicitly assumes that these new multifamily units adopt the current standards in water-efficient plumbing fixtures. The forecast incorporates employment growth of approximately 5,100 jobs per year, split across five different land-use types[8]. The forecast assumes that new commercial and industrial accounts have the same water use patterns as similarly sized existing firms with the same land-use category.

[7] Specifically, we considered a "hot and dry" scenario, in which temperatures increase by 1.7 degrees Celsius and precipitation declines by 8.3% in 2045 relative to relative to 2020, and a "wet and slower warming" scenario where average temperatures increases by only 0.5 degrees Celsius and precipitation increases by 8.3% in 2045 relative to 2020. These scenarios reflect the expected range in climate trends, but do not reflect the expected range of year-to-year weather fluctuations.

[8] Employment forecasts and the five different types of land-use categories come from the Plan Bay Area produced by the Association of Bay Area Governments. The five different types of land-use are: Office/Professional; Health/Education/Recreation; Manufacturing/Wholesale; Retail/Restaurants; and Other.

TABLE 2: FORECAST ASSUMPTIONS – HOUSING UNIT AND EMPLOYMENT GROWTH

		FY2019-20 (Actual)	FY2019-20 (Forecast)	FY2024-25	FY2029-30	FY2034-35	FY2039-40	FY2044-45
No. Housing Units	Single-Family Residential	124,186	124,186	124,186	124,186	124,186	124,186	124,186
	Multi-Family Residential	275,127	275,127	300,932	326,737	352,542	378,347	404,152
	Total	399,313	399,313	425,118	450,923	476,728	502,533	528,338
No. Employees	Office/Professional	304,250	304,250	321,496	338,741	349,153	369,063	388,973
	Health/Education/Recreation	225,061	225,061	232,894	240,727	244,797	249,917	255,037
	Manufacturing/Wholesale	32,763	32,763	31,404	30,045	27,774	25,532	23,290
	Retail	50,541	50,541	52,208	53,875	54,979	56,479	57,979
	Other	160,952	160,952	164,819	168,686	169,471	170,885	172,299
	Total	773,567	773,567	802,821	832,074	846,174	871,876	897,578

TABLE 3: FORECAST ASSUMPTIONS - COVARIATES

	FY2019-20 (Actual)	FY2019-20 (Forecast)	FY2024-25	FY2029-30	FY2034-35	FY2039-40	FY2044-45
Average Real Marginal Rate (2020 Dollars / CCF)	9.2	9.2	12.1	13.6	14.0	14.0	14.0
Monthly Average Temperature (°C)	14.9	15.3	15.5	15.8	16.0	16.2	16.4
Monthly Average Precipitation (mm)	27.3	49.9	49.9	49.9	49.9	49.9	49.9
COVID-19	34%	0%	0%	0%	0%	0%	0%
Drought	0%	0%	0%	0%	0%	0%	0%

2. Econometric Projections

The econometric model that we use in the single-family and multi-family sectors is estimated on a per-unit basis, and our forecasts are also on a per-unit basis. Characteristics and fixed-effects for existing accounts are estimated from our data. For new multi-family residential and commercial and industrial accounts, we simulate firm fixed-effects. Then based on these individual fixed effects we estimate individual level demand using the following equation:

$$\hat{q}_{it} = e^{\ln(rate_t)\beta^{rate} + \ln(temp_{it})\hat{\beta}^{temp} + \ln(ppt_{it})\hat{\beta}^{ppt} + \hat{\gamma}^{COVID} + \hat{\gamma}^{drght} + \hat{\gamma}_i}$$

Once we have calculated individual-level demand for each account, we calculate total demand by aggregating each of the individual estimates in our data:

$$\hat{Q}_t^{Raw} = \sum_i \hat{q}_{it}$$

3. Add Water Conservation Estimates and Other Demands back into Forecast

The final step of the forecasting process is to subtract the estimated savings from active conservation programs and non-potable / onsite reuse programs based on SFPUC's water conservation model and the

additional demand from other sectors not covered in our model, specifically residential and non-residential fire accounts, docks and ship accounts, builder/contractors accounts back into our model to calculate total consumption in each sector. The forecasts for these accounts are outside of our model and were developed in consultation with SFPUC. Note that this memo does not address other sectors of water use, including losses, irrigation accounts, municipal accounts and suburban retail accounts.

$$\hat{Q}_t^{Final} = \hat{Q}_t^{Raw} - Q^{Conservation} + Q^{Other}$$

II. Single-Family Residential Forecast

A. Model Estimates

Table 4 summarizes the estimates of the demand model for the single-family residential sector. The model has good fit to the data due to account-level fixed effects that adjust for the average level of water use of every household. Specifically, the model has an R-squared of 0.72, implying that our estimate explains 72% of the total variation in demand.

Across all units in the sample, we estimate a price-elasticity of demand of -0.14. This elasticity implies that a 10% increase in rates will lead to a 1.4% reduction in demand. This estimate is statistically significant and has a confidence interval from -0.26 to -0.02. Note that SFPUC charges two tiers of variable rates and a fixed rate. The demand elasticity estimate is with respect to the two-tiers of rates variable rates but not the fixed rate. We estimate an elasticity of demand with respect to temperature of 0.13 and with respect to precipitation of -0.008. This estimate implies that a 10% increase in average temperature will lead to a 1.3% increase in demand, and that a 10% increase in precipitation will lead to a 0.08% decrease in demand. These estimates are also both statistically significant.

We estimate that the 2014-15 drought caused a 9% decline in demand for residential water use and that the COVID-19 pandemic caused a 12% increase in demand for residential water use.

TABLE 4: MODEL ESTIMATES – SINGLE-FAMILY RESIDENTIAL SECTOR

	Coefficient	95% Confidence Interval	Change in Consumption from 10% Predictor Change
log(Marginal Rates)	-0.14	[-0.26, -0.02]	-1.4%
log(Temperature)	0.13	[0.08, 0.18]	1.3%
log(Precipitation)	-0.008	[-0.01, -0.005]	-0.08%
			Change in Consumption from Predictor Event
COVID-19 (Starting 3/20)	0.09	[0.08, 0.10]	9.3%
Drought (Starting 4/14)	-0.13	[-0.21, -0.06]	-12.4%
Account Fixed-Effects	Yes		
R-squared	0.72		

B. Demand Forecast

Table 5: Demand Forecast - Single-Family Residential Sector summarizes our demand forecast for the single-family residential sector. Between today and FY2044-45, SFPUC does not forecast any growth in the existing stock of 124,186 single-family residential units in San Francisco. The forecast is calibrated to match total family single-family residential consumption in FY2019-20, which was 14.45 MGD or 116.4 gal/day for each unit. However, when we adjust prediction to remove the estimated impacts of COVID-19 and the relatively hot and dry weather in that year, we find that demand would have been slightly lower had 2019-20 been a `normal` year, with total consumption of 14.32 MGD or 115.3 gal/unit each day. Due to increasing rates and average temperatures, per-unit demand is forecast to decrease from 14.32 MGD or 115.3 gal/day per unit in FY2019-20 to 13.65 MGD or a daily 109.9 gal/unit in FY2044-45[9]. SFPUC's conservation model forecasts that active SFPUC conservation programs will lead to an estimated reduction in the total demand for water of 0.22 MGD or 0.9 gal/unit daily by 2045. After accounting for these conservation savings, our total demand is forecast to decrease to 13.54 MGD or 109.1 gal/unit daily in FY2044-45.

[9] We also forecast demand under two alternative climate scenarios: in the "hot and dry" scenario, we estimate unadjusted baseline demand per-unit of 110.3 gal/unit in 2045. In the "wet and slower warming" scenario, we estimate unadjusted baseline demand per-unit of 109.8 gal/unit in 2045.

TABLE 5: DEMAND FORECAST - SINGLE-FAMILY RESIDENTIAL SECTOR

	FY2019-20 (Actual)	FY2019-20 (Forecast)	FY2024-25	FY2029-30	FY2034-35	FY2039-40	FY2044-45
Number of Units	124,186	124,186	124,186	124,186	124,186	124,186	124,186
Residents per Unit	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Avg. Consumption per Capita (gal / day)							
Baseline Demand per Unit	50.6	50.1	48.4	47.7	47.6	47.7	47.8
Conservation - Active	-	-	-0.5	-0.6	-0.6	-0.5	-0.4
Demand per Capita	50.6	50.1	47.9	47.1	47.0	47.2	47.4
Avg. Consumption per Unit (gal / day)							
Baseline Demand per Unit	116.4	115.3	111.4	109.8	109.5	109.7	109.9
Conservation - Active	-	-	-1.2	-1.4	-1.4	-1.1	-0.9
Demand per Unit	116.4	115.3	110.1	108.3	108.2	108.7	109.1
Total Consumption (MGD)							
Baseline Demand	14.45	14.32	13.83	13.63	13.60	13.63	13.65
Conservation - Active	-	-	-0.15	-0.18	-0.17	-0.13	-0.11
Total Demand	14.45	14.32	13.68	13.45	13.43	13.49	13.54

III. Multiple-Family Residential Demand Forecast

A. Model Estimates

Table 6 summarizes the estimates of the demand model for the multiple-family residential sector. Note that forecasts are made on a per-unit rather than per-account basis, this distinction is important in the multiple-family rsidential sector, where many accounts serve multiple units. The model has good fit to the data due with an R-squared of 0.75, implying that our estimate explains 75% of the total variation in demand.

Across all units in the sample, we estimate a price-elasticity of demand of -0.2. This elasticity implies that a 10% increase in rates will lead to a 2.0% reduction in demand. This estimate is statistically significant and has a confidence interval from -0.30 to -0.10. Note that SFPUC charges two tiers of variable rates and a fixed rate. The demand elasticity estimate is with respect to the two-tiers of rates variable rates but not the fixed rate. We estimate an elasticity of demand with respect to temperature of 0.09 and with respect to precipitation of -0.002. This estimate implies that a 10% increase in average temperature will lead to a 0.9% increase in demand, and that a 10% increase in precipitation will lead to a 0.02% decrease in demand.

We find that drought caused a decline in water use of 7.4% and that the COVID-19 pandemic caused an increase in water use of 5.8%.

TABLE 6: MODEL ESTIMATES - MULTIPLE-FAMILY RESIDENTIAL SECTOR

	Coefficient	95% Confidence Interval	Change in Consumption from 10% Predictor Change
log(Marginal Price)	-0.20	[-0.30, -0.10]	-2.0%
log(Temperature)	0.09	[0.06, 0.12]	0.9%
log(Precipitation)	-0.002	[-0.004, -0.001]	0.0%
			Change in Consumption from Predictor Event
COVID-19 (Starting 3/20)	0.06	[0.05, 0.07]	5.8%
Drought (Starting 4/14)	-0.08	[-0.13, -0.02]	-7.4%
Account Fixed-Effects	Yes		
R-squared	0.75		

B. Demand Forecast

Table 7 summarizes the multi-family residential demand forecast. The San Francisco Planning Department forecasts significant growth in the stock of multi-family residential units in San Francisco at a rate of approximately 5,100 units per year from 275,000 units in FY2019-20 to 404,000 units in FY2044-45.

The forecast is calibrated to match total multi-family residential consumption in FY2019-20, which was 22.9 MGD or 83.3 gal/day for each unit.[10] However, when we adjust our estimate to consider a typical year, removing the impacts of COVID-19 and the relatively hot and dry weather in that year, we find that demand would have been slightly lower, a total of 22.5 MGD or a daily 81.7 gal/unit. Increasing rates will push consumption down, and increasing average temperatures which will drive consumption up. Consumption will also be affected by the composition of dwellings, with newly build units on average consuming more water than older ones. On net, per-unit demand is forecast to increase from 81.7 gal/day per unit in 2019-20 to 84.1 gal/unit primarily driven by higher per-unit consumption in new

[10] This total demand number includes combination residential and fire accounts.

buildings[11]. Due to the significant growth in the number of units, total consumption is forecast to increase from 22.5 MGD to 34.0 MGD. SFPUC's conservation model also forecasts that there will be a reduction in water use as a result of active SFPUC conservation programs, and the implementation of onsite reuse systems. These conservation programs are expected to account for a total of 1.0 MGD or 2.4 gal/unit daily by FY2044-45. After accounting for conservation savings, total demand is forecast to be 33.0 MGD or 81.7 gal/unit daily in FY2044-45.

TABLE 7: DEMAND FORECAST – MULTIPLE-FAMILY RESIDENTIAL SECTOR

	FY2019-20 (Actual)	FY2019-20 (Forecast)	FY2024-25	FY2029-30	FY2034-35	FY2039-40	FY2044-45
Number of Units	275,127	275,127	300,932	326,737	352,542	378,347	404,152
Residents per Unit	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Avg. Consumption per Capita (gal / day)							
Unadjusted Baseline Demand	36.2	35.5	34.7	34.8	35.3	36.0	36.6
Conservation: *Active*	-	-	-0.2	-0.3	-0.2	-0.1	-0.1
Non-Potable / Onsite Reuse	-0.1	-0.1	-0.3	-0.5	-0.8	-1.0	-1.0
Demand per Capita	36.1	35.4	34.2	34.0	34.3	34.8	35.5
Avg. Consumption per Unit (gal / day)							
Unadjusted Baseline Demand	83.3	81.7	79.8	80.0	81.3	82.8	84.1
Conservation: *Active*	-	-	-0.5	-0.6	-0.5	-0.3	-0.1
Non-Potable / Onsite Reuse	-0.3	-0.3	-0.7	-1.1	-1.8	-2.4	-2.3
Demand per Unit	83.0	81.4	78.7	78.3	79.0	80.1	81.7
Total Consumption (MGD)							
Unadjusted Baseline Demand	22.9	22.5	24.0	26.1	28.7	31.3	34.0
Conservation: *Active*	-	-	-0.1	-0.2	-0.2	-0.1	-0.1
Non-Potable / Onsite Reuse	-0.1	-0.1	-0.2	-0.4	-0.6	-0.9	-0.9
Total Demand	22.8	22.4	23.7	25.6	27.8	30.3	33.0

IV. Commercial and Industrial Demand Forecast

A. Model Estimates

Table 8 summarizes the estimates of the demand model for the commercial and industrial sector. Note that we estimate a model on a per-unit account, but we present our results on a per-employee basis, as this is the input data into our forecast model. Due to the substantial heterogeneity in the commercial and industrial sectors, we estimate a model that allows for different types of land-use to be differentially responsive to changes in rates and COVID-19. Specifically, we estimate different

[11] We also forecast demand under two alternative climate scenarios: in the "hot and dry" scenario, we estimate unadjusted baseline demand per-unit of 84.0 gal/unit in 2045. In the "wet and slower warming" scenario, we estimate unadjusted baseline demand per-unit of 84.3 gal/unit in 2045.

coefficients for different types of land-use. The model has good fit to the data due with an R-squared of 0.88 implying that our estimate explains 88% of the total variation in demand.

We estimate five price elasticities, which vary from -0.14 in the manufacturing/wholesale sector to -0.3 in the health/education/retail sector. These elasticities imply that a 10% increase in rates will lead to a reduction in demand of between 1.4 and 3.0 percent. We estimate that these demand elasticities are statistically significant in the Office / Professional, Health/Education/Recreation, and Other sectors, but not in the Retail and Manufacturing/Wholesale sectors[12]. We estimate an elasticity of demand with respect to temperature of 0.14 and with respect to precipitation of -0.002. This estimate implies that a 10% increase in average temperature will lead to a 1.4% increase in demand, and that a 10% increase in precipitation will lead to a 0.02% decrease in demand.

We estimate that the COVID-19 pandemic caused a substantial reduction in demand across all sectors of commercial and industrial accounts. This reduction in demand was smallest in the Manufacturing/Wholesale and Retail/Restaurant sectors at -39.6% and -41.9% respectively, and it was largest in the Office/Professional, Health/Education/Recreation, and Other sectors at -53.6%, -49.7% and -56.5% respectively. We do not find that drought caused a statistically significant change in commercial and industrial consumption.

TABLE 8: MODEL ESTIMATES- COMMERCIAL AND INDUSTRIAL SECTOR

	Coefficient	95% Confidence Interval	Change in Consumption from 10% Predictor Change
log(Marginal Price) : Office/Professional	-0.19	[-0.33, -0.05]	-1.9%
log(Marginal Price) : Health/Education/Recreation	-0.30	[-0.42, -0.17]	-3.0%
log(Marginal Price) : Manufacturing/Wholesale	-0.14	[-0.32, 0.04]	-1.4%
log(Marginal Price) : Retail	-0.19	[-0.50, 0.12]	-1.9%
log(Marginal Price) : Other	-0.22	[-0.35, -0.09]	-2.2%
log(Temperature)	0.14	[0.09, 0.18]	1.4%
log(Precipitation)	-0.002	[-0.003, -0.001]	0.0%
			Change in Consumption from Predictor Event
COVID-19 (Starting 3/20) : Office/Professional	-0.77	[-0.83, -0.71]	-53.6%
COVID-19 (Starting 3/20) : Health/Education/Recreation	-0.69	[-0.71, -0.66]	-49.7%
COVID-19 (Starting 3/20) : Manufacturing/Wholesale	-0.50	[-0.53, -0.48]	-39.6%
COVID-19 (Starting 3/20) : Retail	-0.54	[-0.61, -0.48]	-41.9%
COVID-19 (Starting 3/20) : Other	-0.83	[-0.86, -0.80]	-56.5%
Drought (Starting 4/14)	0.004	[-0.05, 0.05]	0.4%
Account Fixed-Effects	Yes		
R-squared	0.88		

[12] Our estimates are deemed be statistically significant if the estimated 95% confidence interval does not include zero. If the estimated 95% confidence interval does include zero, the estimates are considered to not be statistically significant. Note that to obtain the best fitting model, we include all variables in our forecasts regardless of whether or not they are statistically significant.

B. Demand Forecast

Table 9 summarizes the commercial and industrial demand forecast. The San Francisco Planning Department forecasts that the City will experience significant employment growth, of approximately 5,100 jobs per year, from 774,000 jobs in FY2019-20 to 898,000 jobs in FY2044-45.

The forecast is calibrated to match total multiple-family residential consumption in FY2019-20, which was 14.7 MGD or 19.0 gal/day for each employee. However, when we adjust our estimate to consider a typical year, removing the impacts of COVID-19 and the relatively hot and dry weather in that year, we find that demand would have been significantly higher, a total of 17.8 MGD or a daily 23.0 gal/employee. Per-employee demand is forecast to decrease from 23.0 gal/day per employee in 2019-20 to 20.5 gal/employee, driven primarily by increasing rates, and slightly offset by increasing temperatures[13]. However due to the significant growth in the number of employees, total consumption is forecast to increase from 17.8 MGD to 18.4 MGD. SFPUC's conservation model also forecasts that there will be a significant reduction in water use as a result of active SFPUC conservation programs and adoption of non-potable water and onsite reuse programs. These conservation programs are expected to reduce total water-use by 0.6 MGD or 0.7 gal/employee daily by FY2044-45. After accounting for conservation savings, total demand is forecast to be approximately flat, finishing at 17.8 MGD gal/employee daily in FY2044-45.

TABLE 9: DEMAND FORECAST - COMMERCIAL AND INDUSTRIAL SECTOR

	FY2019-20 (Actual)	FY2019-20 (Forecast)	FY2024-25	FY2029-30	FY2034-35	FY2039-40	FY2044-45
Number of Employees	773,567	773,567	802,821	832,074	846,174	871,876	897,578
Avg. Consumption per Employee (gal / day)							
Unadjusted Baseline Demand	19.0	23.0	21.5	20.8	20.7	20.6	20.5
Conservation: *Active*	0.0	0.0	-0.4	-0.4	-0.4	-0.3	-0.3
Non-Potable / Onsite Reuse	0.0	0.0	-0.1	-0.2	-0.3	-0.4	-0.4
Total Demand	19.0	23.0	21.0	20.3	20.0	19.8	19.8
Total Consumption (MGD)							
Unadjusted Baseline Demand	14.7	17.8	17.3	17.3	17.5	17.9	18.4
Conservation: *Active*	0.0	0.0	-0.3	-0.3	-0.3	-0.3	-0.2
Non-Potable / Onsite Reuse	0.0	0.0	-0.1	-0.2	-0.3	-0.4	-0.4
Total Demand	14.7	17.8	16.9	16.9	16.9	17.3	17.8

[13] We also forecast demand under two alternative climate scenarios: in the "hot and dry" scenario, we estimate unadjusted baseline demand per-unit of 20.6 gal/unit in 2045. In the "wet and slower warming" scenario, we estimate unadjusted baseline demand per-unit of 20.5 gal/unit in 2045.

APPENDIX F

In-City Retail Water Audit Worksheet (Draft)

JUNE 2021
2020 URBAN WATER MANAGEMENT PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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AWWA Free Water Audit Software v5.0

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This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format, and is not meant to take the place of a full-scale, comprehensive water audit format.

Auditors are strongly encouraged to refer to the most current edition of AWWA M36 Manual for Water Audits for detailed guidance on the water auditing process and targetting loss reduction levels

The spreadsheet contains several separate worksheets. Sheets can be accessed using the tabs towards the bottom of the screen, or by clicking the buttons below.

Please begin by providing the following information

Name of Contact Person:	Chris Hewes
Email Address:	chewes@sfwater.org
Telephone | Ext.:	4153213422
Name of City / Utility:	San Francisco Public Utilities Commission
City/Town/Municipality:	San Francisco
State / Province:	California (CA)
Country:	USA
Year:	2020 Financial Year
Start Date:	07/2019 Enter MM/YYYY numeric format
End Date:	06/2020 Enter MM/YYYY numeric format
Audit Preparation Date:	12/1/2020
Volume Reporting Units:	Million gallons (US)
PWSID / Other ID:	3810011

The following guidance will help you complete the Audit

All audit data are entered on the ***Reporting Worksheet***

- Value can be entered by user
- Value calculated based on input data
- These cells contain recommended default values

Use of Option (Radio) Buttons: Pcnt: 0.25% Value:

Select the default percentage by choosing the option button on the left

To enter a value, choose this button and enter a value in the cell to the right

The following worksheets are available by clicking the buttons below or selecting the tabs along the bottom of the page

Instructions
The current sheet. Enter contact information and basic audit details (year, units etc)

Reporting Worksheet
Enter the required data on this worksheet to calculate the water balance and data grading

Comments
Enter comments to explain how values were calculated or to document data sources

Performance Indicators
Review the performance indicators to evaluate the results of the audit

Water Balance
The values entered in the Reporting Worksheet are used to populate the Water Balance

Dashboard
A graphical summary of the water balance and Non-Revenue Water components

Grading Matrix
Presents the possible grading options for each input component of the audit

Service Connection Diagram
Diagrams depicting possible customer service connection line configurations

Definitions
Use this sheet to understand the terms used in the audit process

Loss Control Planning
Use this sheet to interpret the results of the audit validity score and performance indicators

Example Audits
Reporting Worksheet and Performance Indicators examples are shown for two validated audits

Acknowledgements
Acknowledgements for the AWWA Free Water Audit Software v5.0

If you have questions or comments regarding the software please contact us via email at: wlc@awwa.org

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association.
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? Click to access definition
+ Click to add a comment

Water Audit Report for: San Francisco Public Utilities Commission (3810011)
Reporting Year: 2020 7/2019 - 6/2020

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: MILLION GALLONS (US) PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

<---------- Enter grading in column 'E' and 'J' ---------->

Master Meter and Supply Error Adjustments

WATER SUPPLIED				Pcnt:	Value:	
Volume from own sources:	10	23,139.650	MG/Yr	8	-49.147	MG/Yr
Water imported:	n/a	0.000	MG/Yr			MG/Yr
Water exported:	n/a	0.000	MG/Yr			MG/Yr
WATER SUPPLIED:		**23,188.797**	MG/Yr			

Enter negative % or value for under-registration
Enter positive % or value for over-registration

AUTHORIZED CONSUMPTION				Pcnt:	Value:	
Billed metered:	9	20,229.578	MG/Yr			
Billed unmetered:	n/a	0	MG/Yr			
Unbilled metered:	10	260.321	MG/Yr			
Unbilled unmetered:	8	70.753	MG/Yr		70.753	MG/Yr
AUTHORIZED CONSUMPTION:		**20,560.652**	MG/Yr			

Click here: ? for help using option buttons below

Use buttons to select percentage of water supplied **OR** value

WATER LOSSES (Water Supplied - Authorized Consumption)				Pcnt:	Value:	
		2,628.145	MG/Yr			
Apparent Losses						
Unauthorized consumption:	6	28.986	MG/Yr		28.986	MG/Yr
Customer metering inaccuracies:	7	391.905	MG/Yr		391.905	MG/Yr
Systematic data handling errors:	9	12.806	MG/Yr		12.806	MG/Yr
Apparent Losses:		**433.698**	MG/Yr			

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses:		**2,194.447**	MG/Yr
WATER LOSSES:		**2,628.145**	MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER:		**2,959.219**	MG/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	1,275.2	miles
Number of active AND inactive service connections:	9	179,156	
Service connection density:		140	conn./mile main
Are customer meters typically located at the curbstop or property line?		Yes	
Average length of customer service line:			

(length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure:	7	76.1	psi

COST DATA

Total annual cost of operating water system:	10	$379,126,174	$/Year	
Customer retail unit cost (applied to Apparent Losses):	10	$21.13	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	5	$294.10	$/Million gallons	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 89 out of 100 ***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Variable production cost (applied to Real Losses)
2: Customer metering inaccuracies
3: Unauthorized consumption

AWWA Free Water Audit Software:
System Attributes and Performance Indicators

WAS v5.0
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Water Audit Report for: San Francisco Public Utilities Commission (3810011)
Reporting Year: 2020 | 7/2019 - 6/2020

*** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 89 out of 100 ***

System Attributes:

	Apparent Losses:	433.698	MG/Yr
+	Real Losses:	2,194.447	MG/Yr
=	Water Losses:	2,628.145	MG/Yr
?	Unavoidable Annual Real Losses (UARL):	938.07	MG/Yr
	Annual cost of Apparent Losses:	$12,250,527	
	Annual cost of Real Losses:	$645,387	Valued at Variable Production Cost

Return to Reporting Worksheet to change this assumpiton

Performance Indicators:

Financial:	Non-revenue water as percent by volume of Water Supplied:	12.8%	
	Non-revenue water as percent by cost of operating system:	3.4%	Real Losses valued at Variable Production Cost
Operational Efficiency:	Apparent Losses per service connection per day:	6.63	gallons/connection/day
	Real Losses per service connection per day:	33.56	gallons/connection/day
	Real Losses per length of main per day*:	N/A	
	Real Losses per service connection per day per psi pressure:	0.44	gallons/connection/day/psi
	From Above, Real Losses = Current Annual Real Losses (CARL):	2,194.45	million gallons/year
?	Infrastructure Leakage Index (ILI) [CARL/UARL]:	2.34	

* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline

AWWA Free Water Audit Software:
User Comments

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Use this worksheet to add comments or notes to explain how an input value was calculated, or to document the sources of the information used.

General Comment:	

Audit Item	Comment
Volume from own sources:	
Vol. from own sources: Master meter error adjustment:	
Water imported:	
Water imported: master meter error adjustment:	
Water exported:	
Water exported: master meter error adjustment:	
Billed metered:	
Billed unmetered:	
Unbilled metered:	

Audit Item	Comment
Unbilled unmetered:	
Unauthorized consumption:	
Customer metering inaccuracies:	
Systematic data handling errors:	
Length of mains:	
Number of active AND inactive service connections:	
Average length of customer service line:	
Average operating pressure:	
Total annual cost of operating water system:	
Customer retail unit cost (applied to Apparent Losses):	
Variable production cost (applied to Real Losses):	

AWWA Free Water Audit Software: Water Balance

WAS v5.0

American Water Works Association.

Water Audit Report for:	San Francisco Public Utilities Commission (3810011)
Reporting Year:	2020 — 7/2019 - 6/2020
Data Validity Score:	89

Water Exported
0.000

Billed Water Exported

Revenue Water
0.000

Own Sources
(Adjusted for known errors)
23,188.797

Water Imported
0.000

System Input
23,188.797

Water Supplied
23,188.797

Authorized Consumption
20,560.652

Billed Authorized Consumption
20,229.578

Billed Metered Consumption (water exported is removed)
20,229.578

Billed Unmetered Consumption
0.000

Revenue Water
20,229.578

Unbilled Authorized Consumption
331.074

Unbilled Metered Consumption
260.321

Unbilled Unmetered Consumption
70.753

Non-Revenue Water (NRW)
2,959.219

Water Losses
2,628.145

Apparent Losses
433.698

Unauthorized Consumption
28.986

Customer Metering Inaccuracies
391.905

Systematic Data Handling Errors
12.806

Real Losses
2,194.447

Leakage on Transmission and/or Distribution Mains
Not broken down

Leakage and Overflows at Utility's Storage Tanks
Not broken down

Leakage on Service Connections
Not broken down

AWWA Free Water Audit Software: Dashboard

WAS v5.0

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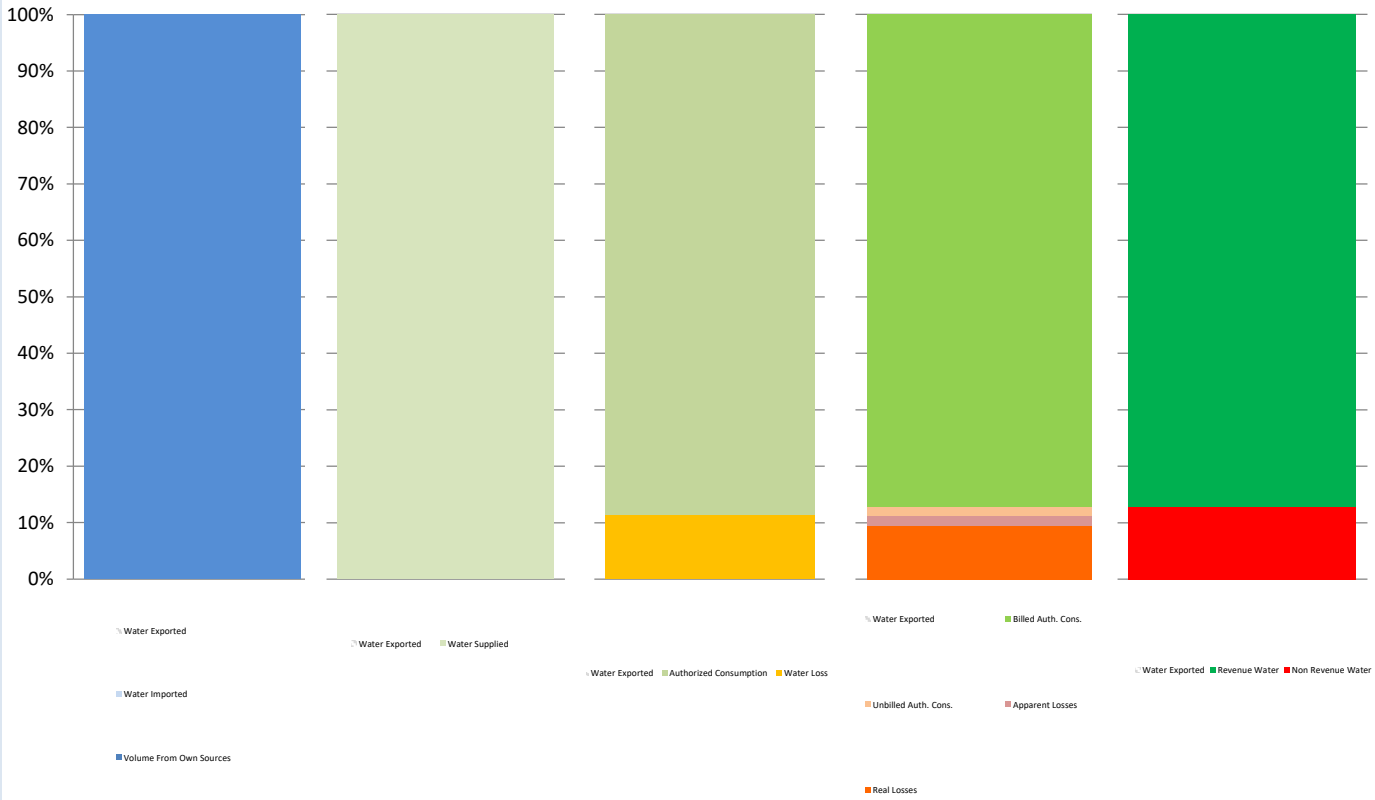
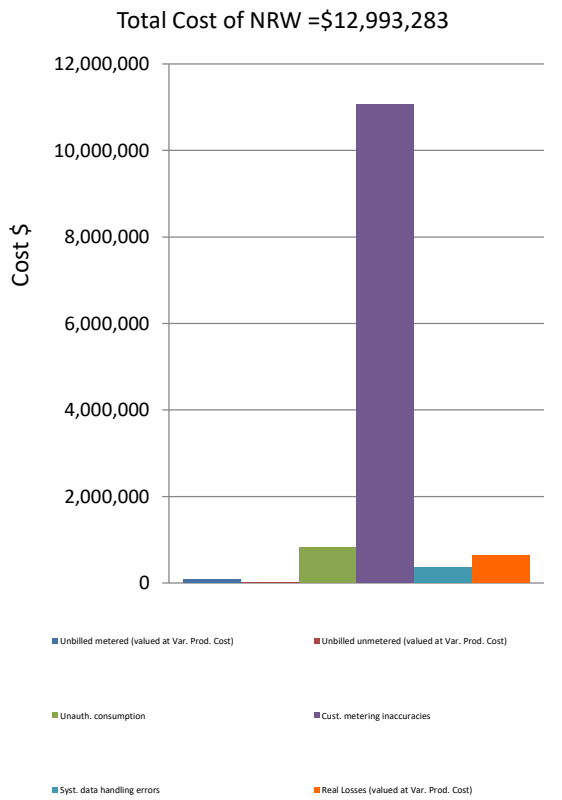
The graphic below is a visual representation of the Water Balance with bar heights propotional to the volume of the audit components

Water Audit Report for:	San Francisco Public Utilities Commission (3810011)	
Reporting Year:	2020	7/2019 - 6/2020
Data Validity Score:	89	

○ Show me the VOLUME of Non-Revenue Water
◉ Show me the COST of Non-Revenue Water





AWWA Free Water Audit Software: Grading Matrix

WAS 5.0

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The grading assigned to each audit component and the corresponding recommended improvements and actions are highlighted in yellow. Audit accuracy is likely to be improved by prioritizing those items shown in red

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
WATER SUPPLIED											
Volume from own sources:	Select this grading only if the water utility purchases/imports all of its water resources (i.e. has no sources of its own)	Less than 25% of water production sources are metered, remaining sources are estimated. No regular meter accuracy testing or electronic calibration conducted.	25% - 50% of treated water production sources are metered; other sources estimated. No regular meter accuracy testing or electronic calibration conducted.	Conditions between 2 and 4	50% - 75% of treated water production sources are metered, other sources estimated. Occasional meter accuracy testing or electronic calibration conducted.	Conditions between 4 and 6	At least 75% of treated water production sources are metered, or at least 90% of the source flow is derived from metered sources. Meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually, with less than 10% found outside of +/- 3% accuracy. Procedures are reviewed by a third party knowledgeable in the M36 methodology.
Improvements to attain higher data grading for "Volume from own Sources" component:		to qualify for 2: Organize and launch efforts to collect data for determining volume from own sources	to qualify for 4: Locate all water production sources on maps and in the field, launch meter accuracy testing for existing meters, begin to install meters on unmetered water production sources and replace any obsolete/defective meters.		to qualify for 6: Formalize annual meter accuracy testing for all source meters; specify the frequency of testing. Complete installation of meters on unmetered water production sources and complete replacement of all obsolete/defective meters.		to qualify for 8: Conduct annual meter accuracy testing and calibration of related instrumentation on all meter installations on a regular basis. Complete project to install new, or replace defective existing, meters so that entire production meter population is metered. Repair or replace meters outside of +/- 6% accuracy.		to qualify for 10: Maintain annual meter accuracy testing and calibration of related instrumentation for all meter installations. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to further improve meter accuracy.		to maintain 10: Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.
Volume from own sources master meter and supply error adjustment:	Select n/a only if the water utility fails to have meters on its sources of supply	Inventory information on meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined	No automatic datalogging of production volumes; daily readings are scribed on paper records without any accountability controls. Flows are not balanced across the water distribution system: tank/storage elevation changes are not employed in calculating the "Volume from own sources" component and archived flow data is adjusted only when grossly evident data error occurs.	Conditions between 2 and 4	Production meter data is logged automatically in electronic format and reviewed at least on a monthly basis with necessary corrections implemented. "Volume from own sources" tabulations include estimate of daily changes in tanks/storage facilities. Meter data is adjusted when gross data errors occur, or occasional meter testing deems this necessary.	Conditions between 4 and 6	Hourly production meter data logged automatically & reviewed on at least a weekly basis. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and/or error is confirmed by meter accuracy testing. Tank/storage facility elevation changes are automatically used in calculating a balanced "Volume from own sources" component, and data gaps in the archived data are corrected on at least a weekly basis.	Conditions between 6 and 8	Continuous production meter data is logged automatically & reviewed each business day. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and/or results of meter accuracy testing. Tank/storage facility elevation changes are automatically used in "Volume from own sources" tabulations and data gaps in the archived data are corrected on a daily basis.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically balances flows from all sources and storages; results are reviewed each business day. Tight accountability controls ensure that all data gaps that occur in the archived flow data are quickly detected and corrected. Regular calibrations between SCADA and sources meters ensures minimal data transfer error.
Improvements to attain higher data grading for "Master meter and supply error adjustment" component:		to qualify for 2: Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature.	to qualify for 4: Install automatic datalogging equipment on production meters. Complete installation of level instrumentation at all tanks/storage facilities and include tank level data in automatic calculation routine in a computerized system. Construct a computerized listing or spreadsheet to archive input volumes, tank/storage volume changes and import/export flows in order to determine the composite "Water Supplied" volume for the distribution system. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps.		to qualify for 6: Refine computerized data collection and archive to include hourly production meter data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Use daily net storage change to balance flows in calculating "Water Supplied" volume. Necessary corrections to data errors are implemented on a weekly basis.		to qualify for 8: Ensure that all flow data is collected and archived on at least an hourly basis. All data is reviewed and detected errors corrected each business day. Tank/storage levels variations are employed in calculating balanced "Water Supplied" component. Adjust production meter data for gross error and inaccuracy confirmed by testing.		to qualify for 10: Link all production and tank/storage facility elevation change data to a Supervisory Control & Data Acquisition (SCADA) System, or similar computerized monitoring/control system, and establish automatic flow balancing algorithm and regularly calibrate between SCADA and source meters. Data is reviewed and corrected each business day.		to maintain 10: Monitor meter innovations for development of more accurate and less expensive flowmeters. Continue to replace or repair meters as they perform outside of desired accuracy limits. Stay abreast of new and more accurate water level instruments to better record tank/storage levels and archive the variations in storage volume. Keep current with SCADA and data management systems to ensure that archived data is well-managed and error free.
Water Imported:	Select n/a if the water utility's supply is exclusively from its own water resources (no bulk purchased/ imported water)	Less than 25% of imported water sources are metered, remaining sources are estimated. No regular meter accuracy testing.	25% - 50% of imported water sources are metered; other sources estimated. No regular meter accuracy testing.	Conditions between 2 and 4	50% - 75% of imported water sources are metered, other sources estimated. Occasional meter accuracy testing conducted.	Conditions between 4 and 6	At least 75% of imported water sources are metered, meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually for all meter installations. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of imported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of imported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually for all meter installations, with less than 10% of accuracy tests found outside of +/- 3% accuracy.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Water Imported Volume" component: (*Note: usually the water supplier selling the water - "the Exporter" - to the utility being audited is responsible to maintain the metering installation measuring the imported volume. The utility should coordinate carefully with the Exporter to ensure that adequate meter upkeep takes place and an accurate measure of the Water Imported volume is quantified.*)		<u>to qualify for 2:</u> Review bulk water purchase agreements with partner suppliers; confirm requirements for use and maintenance of accurate metering. Identify needs for new or replacement meters with goal to meter all imported water sources.	<u>To qualify for 4</u>: Locate all imported water sources on maps and in the field, launch meter accuracy testing for existing meters, begin to install meters on unmetered imported water interconnections and replace obsolete/defective meters.		<u>to qualify for 6</u>: Formalize annual meter accuracy testing for all imported water meters, planning for both regular meter accuracy testing and calibration of the related instrumentation. Continue installation of meters on unmetered imported water interconnections and replacement of obsolete/defective meters.		<u>to qualify for 8</u>: Complete project to install new, or replace defective, meters on all imported water interconnections. Maintain annual meter accuracy testing for all imported water meters and conduct calibration of related instrumentation at least annually. Repair or replace meters outside of +/- 6% accuracy.		<u>to qualify for 10:</u> Conduct meter accuracy testing for all meters on a semi-annual basis, along with calibration of all related instrumentation. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to improve meter accuracy.		<u>to maintain 10</u>: Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Continue to conduct calibration of related instrumentation on a semi-annual basis. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.
Water imported master meter and supply error adjustment:	Select n/a if the Imported water supply is unmetered, with Imported water quantities estimated on the billing invoices sent by the Exporter to the purchasing Utility.	Inventory information on imported meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined Written agreement(s) with water Exporter(s) are missing or written in vague language concerning meter management and testing.	No automatic datalogging of imported supply volumes; daily readings are scribed on paper records without any accountability controls to confirm data accuracy and the absence of errors and data gaps in recorded volumes. Written agreement requires meter accuracy testing but is vague on the details of how and who conducts the testing.	Conditions between 2 and 4	Imported supply metered flow data is logged automatically in electronic format and reviewed at least on a monthly basis by the Exporter with necessary corrections implemented. Meter data is adjusted by the Exporter when gross data errors are detected. A coherent data trail exists for this process to protect both the selling and the purchasing Utility. Written agreement exists and clearly states requirements and roles for meter accuracy testing and data management.	Conditions between 4 and 6	Hourly Imported supply metered data is logged automatically & reviewed on at least a weekly basis by the Exporter. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and to correct for error confirmed by meter accuracy testing. Any data gaps in the archived data are detected and corrected during the weekly review. A coherent data trail exists for this process to protect both the selling and the purchasing Utility.	Conditions between 6 and 8	Continuous Imported supply metered flow data is logged automatically & reviewed each business day by the Exporter. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and/or results of meter accuracy testing. Any data errors/gaps are detected and corrected on a daily basis. A data trail exists for the process to protect both the selling and the purchasing Utility.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically records data which is reviewed each business day by the Exporter. Tight accountability controls ensure that all error/data gaps that occur in the archived flow data are quickly detected and corrected. A reliable data trail exists and contract provisions for meter testing and data management are reviewed by the selling and purchasing Utility at least once every five years.
Improvements to attain higher data grading for "Water imported master meter and supply error adjustment" component:		<u>to qualify for 2:</u> Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature. Review the written agreement between the selling and purchasing Utility.	<u>to qualify for 4</u>: Install automatic datalogging equipment on Imported supply meters. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps. Launch discussions with the Exporters to jointly review terms of the written agreements regarding meter accuracy testing and data management; revise the terms as necessary.		<u>to qualify for 6</u>: Refine computerized data collection and archive to include hourly Imported supply metered flow data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Make necessary corrections to errors/data errors on a weekly basis.		<u>to qualify for 8</u>: Ensure that all Imported supply metered flow data is collected and archived on at least an hourly basis. All data is reviewed and errors/data gaps are corrected each business day.		<u>to qualify for 10</u>: Conduct accountability checks to confirm that all Imported supply metered data is reviewed and corrected each business day by the Exporter. Results of all meter accuracy tests and data corrections should be available for sharing between the Exporter and the purchasing Utility. Establish a schedule for a regular review and updating of the contractual language in the written agreement between the selling and the purchasing Utility; at least every five years.		<u>to maintain 10</u>: Monitor meter innovations for development of more accurate and less expensive flowmeters; work with the Exporter to help identify meter replacement needs. Keep communication lines with Exporters open and maintain productive relations. Keep the written agreement current with clear and explicit language that meets the ongoing needs of all parties.
Water Exported:	Select n/a if the water utility sells no bulk water to neighboring water utilities (no exported water sales)	Less than 25% of exported water sources are metered, remaining sources are estimated. No regular meter accuracy testing.	25% - 50% of exported water sources are metered; other sources estimated. No regular meter accuracy testing.	Conditions between 2 and 4	50% - 75% of exported water sources are metered, other sources estimated. Occasional meter accuracy testing conducted.	Conditions between 4 and 6	At least 75% of exported water sources are metered, meter accuracy testing and/or electronic calibration conducted annually. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of exported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of exported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually for all meter installations, with less than 10% of accuracy tests found outside of +/- 3% accuracy.
Improvements to attain higher data grading for "Water Exported Volume" component: (*Note: usually, if the water utility being audited sells (Exports) water to a neighboring purchasing Utility, it is the responsibility of the utility exporting the water to maintain the metering installation measuring the Exported volume. The utility exporting the water should ensure that adequate meter upkeep takes place and an accurate measure of the Water Exported volume is quantified.*)		<u>to qualify for 2:</u> Review bulk water sales agreements with purchasing utilities; confirm requirements for use & upkeep of accurate metering. Identify needs to install new, or replace defective meters as needed.	<u>To qualify for 4</u>: Locate all exported water sources on maps and in field, launch meter accuracy testing for existing meters, begin to install meters on unmetered exported water interconnections and replace obsolete/defective meters		<u>to qualify for 6</u>: Formalize annual meter accuracy testing for all exported water meters. Continue installation of meters on unmetered exported water interconnections and replacement of obsolete/defective meters.		<u>to qualify for 8</u>: Complete project to install new, or replace defective, meters on all exported water interconnections. Maintain annual meter accuracy testing for all exported water meters. Repair or replace meters outside of +/- 6% accuracy.		<u>to qualify for 10:</u> Maintain annual meter accuracy testing for all meters. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to improve meter accuracy.		<u>to maintain 10</u>: Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Water exported master meter and supply error adjustment:	Select n/a only if the water utility fails to have meters on its exported supply interconnections.	Inventory information on exported meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined Written agreement(s) with the utility purchasing the water are missing or written in vague language concerning meter management and testing.	No automatic datalogging of exported supply volumes; daily readings are scribed on paper records without any accountability controls to confirm data accuracy and the absence of errors and data gaps in recorded volumes. Written agreement requires meter accuracy testing but is vague on the details of how and who conducts the testing.	Conditions between 2 and 4	Exported metered flow data is logged automatically in electronic format and reviewed at least on a monthly basis, with necessary corrections implemented. Meter data is adjusted by the utility selling (exporting) the water when gross data errors are detected. A coherent data trail exists for this process to protect both the utility exporting the water and the purchasing Utility. Written agreement exists and clearly states requirements and roles for meter accuracy testing and data management.	Conditions between 4 and 6	Hourly exported supply metered data is logged automatically & reviewed on at least a weekly basis by the utility selling the water. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and to correct for error found by meter accuracy testing. Any data gaps in the archived data are detected and corrected during the weekly review. A coherent data trail exists for this process to protect both the selling (exporting) utility and the purchasing Utility.	Conditions between 6 and 8	Continuous exported supply metered flow data is logged automatically & reviewed each business day by the utility selling (exporting) the water. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and any error confirmed by meter accuracy testing. Any data errors/gaps are detected and corrected on a daily basis. A data trail exists for the process to protect both the selling (exporting) Utility and the purchasing Utility.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically records data which is reviewed each business day by the utility selling (exporting) the water. Tight accountability controls ensure that all error/data gaps that occur in the archived flow data are quickly detected and corrected. A reliable data trail exists and contract provisions for meter testing and data management are reviewed by the selling Utility and purchasing Utility at least once every five years.
Improvements to attain higher data grading for "Water exported master meter and supply error adjustment" component:		to qualify for 2: Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature. Review the written agreement between the utility selling (exporting) the water and the purchasing Utility.	to qualify for 4: Install automatic datalogging equipment on exported supply meters. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps. Launch discussions with the purchasing utilities to jointly review terms of the written agreements regarding meter accuracy testing and data management; revise the terms as necessary.		to qualify for 6: Refine computerized data collection and archive to include hourly exported supply metered flow data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Make necessary corrections to errors/data errors on a weekly basis.		to qualify for 8: Ensure that all exported metered flow data is collected and archived on at least an hourly basis. All data is reviewed and errors/data gaps are corrected each business day.		to qualify for 10: Conduct accountability checks to confirm that all exported metered flow data is reviewed and corrected each business day by the utility selling the water. Results of all meter accuracy tests and data corrections should be available for sharing between the utility and the purchasing Utility. Establish a schedule for a regular review and updating of the contractual language in the written agreements with the purchasing utilities; at least every five years.		to maintain 10: Monitor meter innovations for development of more accurate and less expensive flowmeters; work with the purchasing utilities to help identify meter replacement needs. Keep communication lines with the purchasing utilities open and maintain productive relations. Keep the written agreement current with clear and explicit language that meets the ongoing needs of all parties.
AUTHORIZED CONSUMPTION											
Billed metered:	n/a (not applicable). Select n/a only if the entire customer population is not metered and is billed for water service on a flat or fixed rate basis. In such a case the volume entered must be zero.	Less than 50% of customers with volume-based billings from meter readings; flat or fixed rate billing exists for the majority of the customer population	At least 50% of customers with volume-based billing from meter reads; flat rate billing for others. Manual meter reading is conducted, with less than 50% meter read success rate, remainding accounts' consumption is estimated. Limited meter records, no regular meter testing or replacement. Billing data maintained on paper records, with no auditing.	Conditions between 2 and 4	At least 75% of customers with volume-based, billing from meter reads; flat or fixed rate billing for remaining accounts. Manual meter reading is conducted with at least 50% meter read success rate; consumption for accounts with failed reads is estimated. Purchase records verify age of customer meters; only very limited meter accuracy testing is conducted. Customer meters are replaced only upon complete failure. Computerized billing records exist, but only sporadic internal auditing conducted.	Conditions between 4 and 6	At least 90% of customers with volume-based billing from meter reads; consumption for remaining accounts is estimated. Manual customer meter reading gives at least 80% customer meter reading success rate; consumption for accounts with failed reads is estimated. Good customer meter records eixst, but only limited meter accuracy testing is conducted. Regular replacement is conducted for the oldest meters. Computerized billing records exist with annual auditing of summary statistics conducting by utility personnel.	Conditions between 6 and 8	At least 97% of customers exist with volume-based billing from meter reads. At least 90% customer meter reading success rate; or at least 80% read success rate with planning and budgeting for trials of Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) in one or more pilot areas. Good customer meter records. Regular meter accuracy testing guides replacement of statistically significant number of meters each year. Routine auditing of computerized billing records for global and detailed statistics occurs annually by utility personnel, and is verified by third party at least once every five years.	Conditions between 8 and 10	At least 99% of customers exist with volume-based billing from meter reads. At least 95% customer meter reading success rate; or minimum 80% meter reading success rate, with Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) trials underway. Statistically significant customer meter testing and replacement program in place on a continuous basis. Computerized billing with routine, detailed auditing, including field investigation of representative sample of accounts undertaken annually by utility personnel. Audit is conducted by third party auditors at least once every three years.
Improvements to attain higher data grading for "Billed Metered Consumption" component:	If n/a is selected because the customer meter population is unmetered, consider establishing a new policy to meter the customer population and employ water rates based upon metered volumes.	to qualify for 2: Conduct investigations or trials of customer meters to select appropriate meter models. Budget funding for meter installations. Investigate volume based water rate structures.	to qualify for 4: Purchase and install meters on unmetered accounts. Implement policies to improve meter reading success. Catalog meter information during meter read visits to identify age/model of existing meters. Test a minimal number of meters for accuracy. Install computerized billing system.		to qualify for 6: Purchase and install meters on unmetered accounts. Eliminate flat fee billing and establish appropriate water rate structure based upon measured consumption. Continue to achieve verifiable success in removing manual meter reading barriers. Expand meter accuracy testing. Launch regular meter replacement program. Launch a program of annual auditing of global billing statistics by utility personnel.		to qualify for 8: Purchase and install meters on unmetered accounts. If customer meter reading success rate is less than 97%, assess cost-effectiveness of Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) system for portion or entire system; or otherwise achieve ongoing improvements in manual meter reading success rate to 97% or higher. Refine meter accuracy testing program. Set meter replacement goals based upon accuracy test results. Implement annual auditing of detailed billing records by utility personnel and implement third party auditing at least once every five years.		to qualify for 10: Purchase and install meters on unmetered accounts. Launch Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) system trials if manual meter reading success rate of at least 99% is not achieved within a five-year program. Continue meter accuracy testing program. Conduct planning and budgeting for large scale meter replacement based upon meter life cycle analysis using cumulative flow target. Continue annual detailed billing data auditing by utility personnel and conduct third party auditing at least once every three years.		to maintain 10: Continue annual internal billing data auditing, and third party auditing at least every three years. Continue customer meter accuracy testing to ensure that accurate customer meter readings are obtained and entered as the basis for volume based billing. Stay abreast of improvements in Automatic Meter Reading (AMR) and Advanced Metering Infrastructure (AMI) and information management. Plan and budget for justified upgrades in metering, meter reading and billing data management to maintain very high accuracy in customer metering and billing.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Billed unmetered:	Select n/a if it is the policy of the water utility to meter all customer connections and it has been confirmed by detailed auditing that all customers do indeed have a water meter; i.e. no intentionally unmetered accounts exist	Water utility policy does not require customer metering; flat or fixed fee billing is employed. No data is collected on customer consumption. The only estimates of customer population consumption available are derived from data estimation methods using average fixture count multiplied by number of connections, or similar approach.	Water utility policy does not require customer metering; flat or fixed fee billing is employed. Some metered accounts exist in parts of the system (pilot areas or District Metered Areas) with consumption read periodically or recorded on portable dataloggers over one, three, or seven day periods. Data from these sample meters are used to infer consumption for the total customer population. Site specific estimation methods are used for unusual buildings/water uses.	Conditions between 2 and 4	Water utility policy does require metering and volume based billing in general. However, a liberal amount of exemptions and a lack of clearly written and communicated procedures result in up to 20% of billed accounts believed to be unmetered by exemption; or the water utility is in transition to becoming fully metered, and a large number of customers remain unmetered. A rough estimate of the annual consumption for all unmetered accounts is included in the annual water audit, with no inspection of individual unmetered accounts.	Conditions between 4 and 6	Water utility policy does require metering and volume based billing but established exemptions exist for a portion of accounts such as municipal buildings. As many as 15% of billed accounts are unmetered due to this exemption or meter installation difficulties. Only a group estimate of annual consumption for all unmetered accounts is included in the annual water audit, with no inspection of individual unmetered accounts.	Conditions between 6 and 8	Water utility policy does require metering and volume based billing for all customer accounts. However, less than 5% of billed accounts remain unmetered because meter installation is hindered by unusual circumstances. The goal is to minimize the number of unmetered accounts. Reliable estimates of consumption are obtained for these unmetered accounts via site specific estimation methods.	Conditions between 8 and 10	Water utility policy does require metering and volume based billing for all customer accounts. Less than 2% of billed accounts are unmetered and exist because meter installation is hindered by unusual circumstances. The goal exists to minimize the number of unmetered accounts to the extent that is economical. Reliable estimates of consumption are obtained at these accounts via site specific estimation methods.
Improvements to attain higher data grading for "Billed Unmetered Consumption" component:		to qualify for 2: Conduct research and evaluate cost/benefit of a new water utility policy to require metering of the customer population; thereby greatly reducing or eliminating unmetered accounts. Conduct pilot metering project by installing water meters in small sample of customer accounts and periodically reading the meters or datalogging the water consumption over one, three, or seven day periods.	to qualify for 4: Implement a new water utility policy requiring customer metering. Launch or expand pilot metering study to include several different meter types, which will provide data for economic assessment of full scale metering options. Assess sites with access difficulties to devise means to obtain water consumption volumes. Begin customer meter installation.		to qualify for 6: Refine policy and procedures to improve customer metering participation for all but solidly exempt accounts. Assign staff resources to review billing records to identify errant unmetered properties. Specify metering needs and funding requirements to install sufficient meters to significant reduce the number of unmetered accounts		to qualify for 8: Push to install customer meters on a full scale basis. Refine metering policy and procedures to ensure that all accounts, including municipal properties, are designated for meters. Plan special efforts to address "hard-to-access" accounts. Implement procedures to obtain a reliable consumption estimate for the remaining few unmetered accounts awaiting meter installation.		to qualify for 10: Continue customer meter installation throughout the service area, with a goal to minimize unmetered accounts. Sustain the effort to investigate accounts with access difficulties, and devise means to install water meters or otherwise measure water consumption.		to maintain 10: Continue to refine estimation methods for unmetered consumption and explore means to establish metering, for as many billed remaining unmetered accounts as is economically feasible.
Unbilled metered:	select n/a if all billing-exempt consumption is unmetered.	Billing practices exempt certain accounts, such as municipal buildings, but written policies do not exist; and a reliable count of unbilled metered accounts is unavailable. Meter upkeep and meter reading on these accounts is rare and not considered a priority. Due to poor recordkeeping and lack of auditing, water consumption for all such accounts is purely guesstimated.	Billing practices exempt certain accounts, such as municipal buildings, but only scattered, dated written directives exist to justify this practice. A reliable count of unbilled metered accounts is unavailable. Sporadic meter replacement and meter reading occurs on an as-needed basis. The total annual water consumption for all unbilled, metered accounts is estimated based upon approximating the number of accounts and assigning consumption from actively billed accounts of same meter size.	Conditions between 2 and 4	Dated written procedures permit billing exemption for specific accounts, such as municipal properties, but are unclear regarding certain other types of accounts. Meter reading is given low priority and is sporadic. Consumption is quantified from meter readings where available. The total number of unbilled, unmetered accounts must be estimated along with consumption volumes.	Conditions between 4 and 6	Written policies regarding billing exemptions exist but adherence in practice is questionable. Metering and meter reading for municipal buildings is reliable but sporadic for other unbilled metered accounts. Periodic auditing of such accounts is conducted. Water consumption is quantified directly from meter readings where available, but the majority of the consumption is estimated.	Conditions between 6 and 8	Written policy identifies the types of accounts granted a billing exemption. Customer meter management and meter reading are considered secondary priorities, but meter reading is conducted at least annually to obtain consumption volumes for the annual water audit. High level auditing of billing records ensures that a reliable census of such accounts exists.	Conditions between 8 and 10	Clearly written policy identifies the types of accounts given a billing exemption, with emphasis on keeping such accounts to a minimum. Customer meter management and meter reading for these accounts is given proper priority and is reliably conducted. Regular auditing confirms this. Total water consumption for these accounts is taken from reliable readings from accurate meters.
Improvements to attain higher data grading for "Unbilled Metered Consumption" component:		to qualify for 2: Reassess the water utility's policy allowing certain accounts to be granted a billing exemption. Draft an outline of a new written policy for billing exemptions, with clear justification as to why any accounts should be exempt from billing, and with the intention to keep the number of such accounts to a minimum.	to qualify for 4: Review historic written directives and policy documents allowing certain accounts to be billing-exempt. Draft an outline of a written policy for billing exemptions, identify criteria that grants an exemption, with a goal of keeping this number of accounts to a minimum. Consider increasing the priority of reading meters on unbilled accounts at least annually.		to qualify for 6: Draft a new written policy regarding billing exemptions based upon consensus criteria allowing this occurrence. Assign resources to audit meter records and billing records to obtain census of unbilled metered accounts. Gradually include a greater number of these metered accounts to the routes for regular meter reading.		to qualify for 8: Communicate billing exemption policy throughout the organization and implement procedures that ensure proper account management. Conduct inspections of accounts confirmed in unbilled metered status and verify that accurate meters exist and are scheduled for routine meter readings. Gradually increase the number of unbilled metered accounts that are included in regular meter reading routes.		to qualify for 10: Ensure that meter management (meter accuracy testing, meter replacement) and meter reading activities for unbilled accounts are accorded the same priority as billed accounts. Establish ongoing annual auditing process to ensure that water consumption is reliably collected and provided to the annual water audit process.		to maintain 10: Reassess the utility's philosophy in allowing any water uses to go "unbilled". It is possible to meter and bill all accounts, even if the fee charged for water consumption is discounted or waived. Metering and billing all accounts ensures that water consumption is tracked and water waste from plumbing leaks is detected and minimized.
Unbilled unmetered:		Extent of unbilled, unmetered consumption is unknown due to unclear policies and poor recordkeeping. Total consumption is quantified based upon a purely subjective estimate.	Clear extent of unbilled, unmetered consumption is unknown, but a number of events are randomly documented each year, confirming existence of such consumption, but without sufficient documentation to quantify an accurate estimate of the annual volume consumed.	Conditions between 2 and 4	Extent of unbilled, unmetered consumption is partially known, and procedures exist to document certain events such as miscellaneous fire hydrant uses. Formulae is used to quantify the consumption from such events (time running multiplied by typical flowrate, multiplied by number of events).	Default value of 1.25% of system input volume is employed	Coherent policies exist for some forms of unbilled, unmetered consumption but others await closer evaluation. Reasonable recordkeeping for the managed uses exists and allows for annual volumes to be quantified by inference, but unsupervised uses are guesstimated.	Conditions between 6 and 8	Clear policies and good recordkeeping exist for some uses (ex: water used in periodic testing of unmetered fire connections), but other uses (ex: miscellaneous uses of fire hydrants) have limited oversight. Total consumption is a mix of well quantified use such as from formulae (time running multiplied by typical flow, multiplied by number of events) or temporary meters, and relatively subjective estimates of less regulated use.	Conditions between 8 and 10	Clear policies exist to identify permitted use of water in unbilled, unmetered fashion, with the intention of minimizing this type of consumption. Good records document each occurrence and consumption is quantified via formulae (time running multiplied by typical flow, multiplied by number of events) or use of temporary meters.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Unbilled Unmetered Consumption" component:		to qualify for 5: Utilize the accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of this use. to qualify for 2: Establish a policy regarding what water uses should be allowed to remain as unbilled and unmetered. Consider tracking a small sample of one such use (ex: fire hydrant flushings).	to qualify for 5: Utilize accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of this use. to qualify for 4: Evaluate the documentation of events that have been observed. Meet with user groups (ex: for fire hydrants - fire departments, contractors to ascertain their need and/or volume requirements for water from fire hydrants).		to qualify for 5: Utilize accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of all such use. This is particularly appropriate for water utilities who are in the early stages of the water auditing process, and should focus on other components since the volume of unbilled, umetered consumption is usually a relatively small quatity component, and other larger-quantity components should take priority.	to qualify for 6 or greater: Finalize policy and begin to conduct field checks to better establish and quantify such usage. Proceed if top-down audit exists and/or a great volume of such use is suspected.	to qualify for 8: Assess water utility policy and procedures for various unmetered usages. For example, ensure that a policy exists and permits are issued for use of fire hydrants by persons outside of the utility. Create written procedures for use and documentation of fire hydrants by water utility personnel. Use same approach for other types of unbilled, unmetered water usage.		to qualify for 10: Refine written procedures to ensure that all uses of unbilled, unmetered water are overseen by a structured permitting process managed by water utility personnel. Reassess policy to determine if some of these uses have value in being converted to billed and/or metered status.		to maintain 10: Continue to refine policy and procedures with intention of reducing the number of allowable uses of water in unbilled and unmetered fashion. Any uses that can feasibly become billed and metered should be converted eventually.
APPARENT LOSSES											
Unauthorized consumption:		Extent of unauthorized consumption is unknown due to unclear policies and poor recordkeeping. Total unauthorized consumption is guesstimated.	Unauthorized consumption is a known occurrence, but its extent is a mystery. There are no requirements to document observed events, but periodic field reports capture some of these occurrences. Total unauthorized consumption is approximated from this limited data.	conditions between 2 and 4	Procedures exist to document some unauthorized consumption such as observed unauthorized fire hydrant openings. Use formulae to quantify this consumption (time running multiplied typical flowrate, multiplied by number of events).	Default value of 0.25% of volume of water supplied is employed	Coherent policies exist for some forms of unauthorized consumption (more than simply fire hydrant misuse) but others await closer evaluation. Reasonable surveillance and recordkeeping exist for occurrences that fall under the policy. Volumes quantified by inference from these records.	Conditions between 6 and 8	Clear policies and good auditable recordkeeping exist for certain events (ex: tampering with water meters, illegal bypasses of customer meters); but other occurrences have limited oversight. Total consumption is a combination of volumes from formulae (time x typical flow) and subjective estimates of unconfirmed consumption.	Conditions between 8 and 10	Clear policies exist to identify all known unauthorized uses of water. Staff and procedures exist to provide enforcement of policies and detect violations. Each occurrence is recorded and quantified via formulae (estimated time running multiplied by typical flow) or similar methods. All records and calculations should exist in a form that can be audited by a third party.
Improvements to attain higher data grading for "Unauthorized Consumption" component:		to qualify for 5: Use accepted default of 0.25% of volume of water supplied. to qualify for 2: Review utility policy regarding what water uses are considered unauthorized, and consider tracking a small sample of one such occurrence (ex: unauthorized fire hydrant openings)	to qualify for 5: Use accepted default of 0.25% of system input volume to qualify for 4: Review utility policy regarding what water uses are considered unauthorized, and consider tracking a small sample of one such occurrence (ex: unauthorized fire hydrant openings)		to qualify for 5: Utilize accepted default value of 0.25% of volume of water supplied as an expedient means to gain a reasonable quantification of all such use. This is particularly appropriate for water utilities who are in the early stages of the water auditing process.	to qualify for 6 or greater: Finalize policy updates to clearly identify the types of water consumption that are authorized from those usages that fall outside of this policy and are, therefore, unauthorized. Begin to conduct regular field checks. Proceed if the top-down audit already exists and/or a great volume of such use is suspected.	to quality for 8: Assess water utility policies to ensure that all known occurrences of unauthorized consumption are outlawed, and that appropriate penalties are prescribed. Create written procedures for detection and documentation of various occurrences of unauthorized consumption as they are uncovered.		to qualify for 10: Refine written procedures and assign staff to seek out likely occurrences of unauthorized consumption. Explore new locking devices, monitors and other technologies designed to detect and thwart unauthorized consumption.		to maintain 10: Continue to refine policy and procedures to eliminate any loopholes that allow or tacitly encourage unauthorized consumption. Continue to be vigilant in detection, documentation and enforcement efforts.
Customer metering inaccuracies:	select n/a only if the entire customer population is unmetered. In such a case the volume entered must be zero.	Customer meters exist, but with unorganized paper records on meters; no meter accuracy testing or meter replacement program for any size of retail meter. Metering workflow is driven chaotically with no proactive management. Loss volume due to aggregate meter inaccuracy is guesstimated.	Poor recordkeeping and meter oversight is recognized by water utility management who has allotted staff and funding resources to organize improved recordkeeping and start meter accuracy testing. Existing paper records gathered and organized to provide cursory disposition of meter population. Customer meters are tested for accuracy only upon customer request.	Conditions between 2 and 4	Reliable recordkeeping exists; meter information is improving as meters are replaced. Meter accuracy testing is conducted annually for a small number of meters (more than just customer requests, but less than 1% of inventory). A limited number of the oldest meters are replaced each year. Inaccuracy volume is largely an estimate, but refined based upon limited testing data.	Conditions between 4 and 6	A reliable electronic recordkeeping system for meters exists. The meter population includes a mix of new high performing meters and dated meters with suspect accuracy. Routine, but limited, meter accuracy testing and meter replacement occur. Inaccuracy volume is quantified using a mix of reliable and less certain data.	Conditions between 6 and 8	Ongoing meter replacement and accuracy testing result in highly accurate customer meter population. Testing is conducted on samples of meters of varying age and accumulated volume of throughput to determine optimum replacement time for various types of meters.	Ongoing meter replacement and accuracy testing result in highly accurate customer meter population. Statistically significant number of meters are tested in audit year. This testing is conducted on samples of meters of varying age and accumulated volume of throughput to determine optimum replacement time for these meters.	Good records of all active customer meters exist and include as a minimum: meter number, account number/location, type, size and manufacturer. Ongoing meter replacement occurs according to a targeted and justified basis. Regular meter accuracy testing gives a reliable measure of composite inaccuracy volume for the customer meter population. New metering technology is embraced to keep overall accuracy improving. Procedures are reviewed by a third party knowledgeable in the M36 methodology.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Customer meter inaccuracy volume" component:	If n/a is selected because the customer meter population is unmetered, consider establishing a new policy to meter the customer population and employ water rates based upon metered volumes.	to qualify for 2: Gather available meter purchase records. Conduct testing on a small number of meters believed to be the most inaccurate. Review staffing needs of the metering group and budget for necessary resources to better organize meter management.	to qualify for 4: Implement a reliable record keeping system for customer meter histories, preferably using electronic methods typically linked to, or part of, the Customer Billing System or Customer Information System. Expand meter accuracy testing to a larger group of meters.		to qualify for 6: Standardize the procedures for meter recordkeeping within an electronic information system. Accelerate meter accuracy testing and meter replacements guided by testing results.		to qualify for 8: Expand annual meter accuracy testing to evaluate a statistically significant number of meter makes/models. Expand meter replacement program to replace statistically significant number of poor performing meters each year.		to qualify for 9: Continue efforts to manage meter population with reliable recordkeeping. Test a statistically significant number of meters each year and analyze test results in an ongoing manner to serve as a basis for a target meter replacement strategy based upon accumulated volume throughput.	to qualify for 10: Continue efforts to manage meter population with reliable recordkeeping, meter testing and replacement. Evaluate new meter types and install one or more types in 5-10 customer accounts each year in order to pilot improving metering technology.	to maintain 10: Increase the number of meters tested and replaced as justified by meter accuracy test data. Continually monitor development of new metering technology and Advanced Metering Infrastructure (AMI) to grasp opportunities for greater accuracy in metering of water flow and management of customer consumption data.
Systematic Data Handling Errors:	Note: all water utilities incur some amount of this error. Even in water utilities with unmetered customer populations and fixed rate billing, errors occur in annual billing tabulations. Enter a positive value for the volume and select a grading.	Policies and procedures for activation of new customer water billing accounts are vague and lack accountability. Billing data is maintained on paper records which are not well organized. No auditing is conducted to confirm billing data handling efficiency. An unknown number of customers escape routine billing due to lack of billing process oversight.	Policy and procedures for activation of new customer accounts and oversight of billing records exist but need refinement. Billing data is maintained on paper records or insufficiently capable electronic database. Only periodic unstructured auditing work is conducted to confirm billing data handling efficiency. The volume of unbilled water due to billing lapses is a guess.	Conditions between 2 and 4	Policy and procedures for new account activation and oversight of billing operations exist but needs refinement. Computerized billing system exists, but is dated or lacks needed functionality. Periodic, limited internal audits conducted and confirm with approximate accuracy the consumption volumes lost to billing lapses.	Conditions between 4 and 6	Policy and procedures for new account activation and oversight of billing operations is adequate and reviewed periodically. Computerized billing system is in use with basic reporting available. Any effect of billing adjustments on measured consumption volumes is well understood. Internal checks of billing data error conducted annually. Reasonably accurate quantification of consumption volume lost to billing lapses is obtained.	Conditions between 6 and 8	New account activation and billing operations policy and procedures are reviewed at least biannually. Computerized billing system includes an array of reports to confirm billing data and system functionality. Checks are conducted routinely to flag and explain zero consumption accounts. Annual internal checks conducted with third party audit conducted at least once every five years. Accountability checks flag billing lapses. Consumption lost to billing lapses is well quantified and reducing year-by-year.	Conditions between 8 and 10	Sound written policy and procedures exist for new account activation and oversight of customer billing operations. Robust computerized billing system gives high functionality and reporting capabilities which are utilized, analyzed and the results reported each billing cycle. Assessment of policy and data handling errors are conducted internally and audited by third party at least once every three years, ensuring consumption lost to billing lapses is minimized and detected as it occurs.
Improvements to attain higher data grading for "Systematic Data Handling Error volume" component:		to qualify for 2: Draft written policy and procedures for activating new water billing accounts and oversight of billing operations. Investigate and budget for computerized customer billing system. Conduct initial audit of billing records by flow-charting the basic business processes of the customer account/billing function.	to qualify for 4: Finalize written policy and procedures for activation of new billing acocunts and overall billing operations management. Implement a computerized customer billing system. Conduct initial audit of billing records as part of this process.		to qualify for 6: Refine new account activation and billing operations procedures and ensure consistency with the utility policy regarding billing, and minimize opportunity for missed billings. Upgrade or replace customer billing system for needed functionality - ensure that billing adjustments don't corrupt the value of consumption volumes. Procedurize internal annual audit process.		to qualify for 8: Formalize regular review of new account activation process and general billing practices. Enhance reporting capability of computerized billing system. Formalize regular auditing process to reveal scope of data handling error. Plan for periodic third party audit to occur at least once every five years.		to qualify for 10: Close policy/procedure loopholes that allow some customer accounts to go unbilled, or data handling errors to exist. Ensure that billing system reports are utilized, analyzed and reported every billing cycle. Ensure that internal and third party audits are conducted at least once every three years.		to maintain 10: Stay abreast of customer information management developments and innovations. Monitor developments of Advanced Metering Infrastructure (AMI) and integrate technology to ensure that customer endpoint information is well-monitored and errors/lapses are at an economic minimum.
SYSTEM DATA											
Length of mains:		Poorly assembled and maintained paper as-built records of existing water main installations makes accurate determination of system pipe length impossible. Length of mains is guesstimated.	Paper records in poor or uncertain condition (no annual tracking of installations & abandonments). Poor procedures to ensure that new water mains installed by developers are accurately documented.	Conditions between 2 and 4	Sound written policy and procedures exist for documenting new water main installations, but gaps in management result in a uncertain degree of error in tabulation of mains length.	Conditions between 4 and 6	Sound written policy and procedures exist for permitting and commissioning new water mains. Highly accurate paper records with regular field validation; or electronic records and asset management system in good condition. Includes system backup.	Conditions between 6 and 8	Sound written policy and procedures exist for permitting and commissioning new water mains. Electronic recordkeeping such as a Geographical Information System (GIS) and asset management system are used to store and manage data.	Conditions between 8 and 10	Sound written policy exists for managing water mains extensions and replacements. Geographic Information System (GIS) data and asset management database agree and random field validation proves truth of databases. Records of annual field validation should be available for review.
Improvements to attain higher data grading for "Length of Water Mains" component:		to qualify for 2: Assign personnel to inventory current as-built records and compare with customer billing system records and highway plans in order to verify poorly documented pipelines. Assemble policy documents regarding permitting and documentation of water main installations by the utility and building developers; identify gaps in procedures that result in poor documentation of new water main installations.	to qualify for 4: Complete inventory of paper records of water main installations for several years prior to audit year. Review policy and procedures for commissioning and documenting new water main installation.		to qualify for 6: Finalize updates/improvements to written policy and procedures for permitting/commissioning new main installations. Confirm inventory of records for five years prior to audit year; correct any errors or omissions.		to qualify for 8: Launch random field checks of limited number of locations. Convert to electronic database such as a Geographic Information System (GIS) with backup as justified. Develop written policy and procedures.		to qualify for 10: Link Geographic Information System (GIS) and asset management databases, conduct field verification of data. Record field verification information at least annually.		to maintain 10: Continue with standardization and random field validation to improve the completeness and accuracy of the system.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Number of active AND inactive service connections:		Vague permitting (of new service connections) policy and poor paper recordkeeping of customer connections/billings result in suspect determination of the number of service connections, which may be 10-15% in error from actual count.	General permitting policy exists but paper records, procedural gaps, and weak oversight result in questionable total for number of connections, which may vary 5-10% of actual count.	Conditions between 2 and 4	Written account activation policy and procedures exist, but with some gaps in performance and oversight. Computerized information management system is being brought online to replace dated paper recordkeeping system. Reasonably accurate tracking of service connection installations & abandonments; but count can be up to 5% in error from actual total.	Conditions between 4 and 6	Written new account activation and overall billing policies and procedures are adequate and reviewed periodically. Computerized information management system is in use with annual installations & abandonments totaled. Very limited field verifications and audits. Error in count of number of service connections is believed to be no more than 3%.	Conditions between 6 and 8	Policies and procedures for new account activation and overall billing operations are written, well-structured and reviewed at least biannually. Well-managed computerized information management system exists and routine, periodic field checks and internal system audits are conducted. Counts of connections are no more than 2% in error.	Conditions between 8 and 10	Sound written policy and well managed and audited procedures ensure reliable management of service connection population. Computerized information management system, Customer Billing System, and Geographic Information System (GIS) information agree; field validation proves truth of databases. Count of connections recorded as being in error is less than 1% of the entire population.
Improvements to attain higher data grading for "Number of Active and Inactive Service Connections" component:	**Note: The number of Service Connections does <u>not</u> include fire hydrant leads/lines connecting the hydrant to the water main**	<u>to qualify for 2</u>: Draft new policy and procedures for new account activation and overall billing operations. Research and collect paper records of installations & abandonments for several years prior to audit year.	<u>to qualify for 4</u>: Refine policy and procedures for new account activation and overall billing operations. Research computerized recordkeeping system (Customer Information System or Customer Billing System) to improve documentation format for service connections.		<u>to qualify for 6</u>: Refine procedures to ensure consistency with new account activation and overall billing policy to establish new service connections or decommission existing connections. Improve process to include all totals for at least five years prior to audit year.		<u>to qualify for 8</u>: Formalize regular review of new account activation and overall billing operations policies and procedures. Launch random field checks of limited number of locations. Develop reports and auditing mechanisms for computerized information management system.		<u>to qualify for 10</u>: Close any procedural loopholes that allow installations to go undocumented. Link computerized information management system with Geographic Information System (GIS) and formalize field inspection and information system auditing processes. Documentation of new or decommissioned service connections encounters several levels of checks and balances.		<u>to maintain 10</u>: Continue with standardization and random field validation to improve knowledge of system.
Average length of customer service line:	Note: if customer water meters are located outside of the customer building next to the curb stop or boundary separating utility/customer responsibility, then the auditor should answer "Yes" to the question on the Reporting Worksheet asking about this. If the answer is Yes, the grading description listed under the Grading of 10(a) will be followed, with a value of zero automatically entered at a Grading of 10. See the Service Connection Diagram worksheet for a visual presentation of this distance.	Gradings 1-9 apply if customer properties are unmetered, if customer meters exist and are located inside the customer building premises, or if the water utility owns and is responsible for the entire service connection piping from the water main to the customer building. In any of these cases the average distance between the curb stop or boundary separating utility/customer responsibility for service connection piping, and the typical first point of use (ex: faucet) or the customer meter must be quantified. Gradings of 1-9 are used to grade the validity of the means to quantify this value. (See the "Service Connection Diagram" worksheet)									<u>Either of two conditions can be met for a grading of 10</u>: a) Customer water meters exist outside of customer buildings next to the curb stop or boundary separating utility/customer responsibility for service connection piping. If so, answer "Yes" to the question on the Reporting Working asking about this condition. A value of zero and a Grading of 10 are automatically entered in the Reporting Worksheet . b). Meters exist inside customer buildings, or properties are unmetered. In either case, answer "No" to the Reporting Worksheet question on meter location, and enter a distance determined by the auditor. For a Grading of 10 this value must be a very reliable number from a Geographic Information System (GIS) and confirmed by a statistically valid number of field checks.
		Vague policy exists to define the delineation of water utility ownership and customer ownership of the service connection piping. Curb stops are perceived as the breakpoint but these have not been well-maintained or documented. Most are buried or obscured. Their location varies widely from site-to-site, and estimating this distance is arbitrary due to the unknown location of many curb stops.	Policy requires that the curb stop serves as the delineation point between water utility ownership and customer ownership of the service connection piping. The piping from the water main to the curb stop is the property of the water utility; and the piping from the curb stop to the customer building is owned by the customer. Curb stop locations are not well documented and the average distance is based upon a limited number of locations measured in the field.	Conditions between 2 and 4	Good policy requires that the curb stop serves as the delineation point between water utility ownership and customer ownership of the service connection piping. Curb stops are generally installed as needed and are reasonably documented. Their location varies widely from site-to-site, and an estimate of this distance is hindered by the availability of paper records of limited accuracy.	Conditions between 4 and 6	Clear written policy exists to define utility/customer responsibility for service connection piping. Accurate, well-maintained paper or basic electronic recordkeeping system exists. Periodic field checks confirm piping lengths for a sample of customer properties.	Conditions between 6 and 8	Clearly worded policy standardizes the location of curb stops and meters, which are inspected upon installation. Accurate and well maintained electronic records exist with periodic field checks to confirm locations of service lines, curb stops and customer meter pits. An accurate number of customer properties from the customer billing system allows for reliable averaging of this length.	Conditions between 8 and 10	
Improvements to attain higher data grading for "Average Length of Customer Service Line" component:		<u>to qualify for 2</u>: Research and collect paper records of service line installations. Inspect several sites in the field using pipe locators to locate curb stops. Obtain the length of this small sample of connections in this manner.	<u>to qualify for 4</u>: Formalize and communicate policy delineating utility/customer responsibilities for service connection piping. Assess accuracy of paper records by field inspection of a small sample of service connections using pipe locators as needed. Research the potential migration to a computerized information management system to store service connection data.		<u>to qualify for 6</u>: Establish coherent procedures to ensure that policy for curb stop, meter installation and documentation is followed. Gain consensus within the water utility for the establishment of a computerized information management system.		<u>to qualify for 8</u>: Implement an electronic means of recordkeeping, typically via a customer information system, customer billing system, or Geographic Information System (GIS). Standardize the process to conduct field checks of a limited number of locations.		<u>to qualify for 10</u>: Link customer information management system and Geographic Information System (GIS), standardize process for field verification of data.		<u>to maintain 10</u>: Continue with standardization and random field validation to improve knowledge of service connection configurations and customer meter locations.
Average operating pressure:		Available records are poorly assembled and maintained paper records of supply pump characteristics and water distribution system operating conditions. Average pressure is guesstimated based upon this information and ground elevations from crude topographical maps. Widely varying distribution system pressures due to undulating terrain, high system head loss and weak/erratic pressure controls further compromise the validity of the average pressure calculation.	Limited telemetry monitoring of scattered pumping station and water storage tank sites provides some static pressure data, which is recorded in handwritten logbooks. Pressure data is gathered at individual sites only when low pressure complaints arise. Average pressure is determined by averaging relatively crude data, and is affected by significant variation in ground elevations, system head loss and gaps in pressure controls in the distribution system.	Conditions between 2 and 4	Effective pressure controls separate different pressure zones; moderate pressure variation across the system, occasional open boundary valves are discovered that breech pressure zones. Basic telemetry monitoring of the distribution system logs pressure data electronically. Pressure data gathered by gauges or dataloggers at fire hydrants or buildings when low pressure complaints arise, and during fire flow tests and system flushing. Reliable topographical data exists. Average pressure is calculated using this mix of data.	Conditions between 4 and 6	Reliable pressure controls separate distinct pressure zones; only very occasional open boundary valves are encountered that breech pressure zones. Well-covered telemetry monitoring of the distribution system (not just pumping at source treatment plants or wells) logs extensive pressure data electronically. Pressure gathered by gauges/dataloggers at fire hydrants and buildings when low pressure complaints arise, and during fire flow tests and system flushing. Average pressure is determined by using this mix of reliable data.	Conditions between 6 and 8	Well-managed, discrete pressure zones exist with generally predictable pressure fluctuations. A current full-scale SCADA System or similar realtime monitoring system exists to monitor the water distribution system and collect data, including real time pressure readings at representative sites across the system. The average system pressure is determined from reliable monitoring system data.	Conditions between 8 and 10	Well-managed pressure districts/zones, SCADA System and hydraulic model exist to give very precise pressure data across the water distribution system. Average system pressure is reliably calculated from extensive, reliable, and cross-checked data. Calculations are reported on an annual basis as a minimum.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Average Operating Pressure" component:		to qualify for 2: Employ pressure gauging and/or datalogging equipment to obtain pressure measurements from fire hydrants. Locate accurate topographical maps of service area in order to confirm ground elevations. Research pump data sheets to find pump pressure/flow characteristics	to qualify for 4: Formalize a procedure to use pressure gauging/datalogging equipment to gather pressure data during various system events such as low pressure complaints, or operational testing. Gather pump pressure and flow data at different flow regimes. Identify faulty pressure controls (pressure reducing valves, altitude valves, partially open boundary valves) and plan to properly configure pressure zones. Make all pressure data from these efforts available to generate system-wide average pressure.		to qualify for 6: Expand the use of pressure gauging/datalogging equipment to gather scattered pressure data at a representative set of sites, based upon pressure zones or areas. Utilize pump pressure and flow data to determine supply head entering each pressure zone or district. Correct any faulty pressure controls (pressure reducing valves, altitude valves, partially open boundary valves) to ensure properly configured pressure zones. Use expanded pressure dataset from these activities to generate system-wide average pressure.		to qualify for 8: Install a Supervisory Control and Data Acquisition (SCADA) System, or similar realtime monitoring system, to monitor system parameters and control operations. Set regular calibration schedule for instrumentation to insure data accuracy. Obtain accurate topographical data and utilize pressure data gathered from field surveys to provide extensive, reliable data for pressure averaging.		to qualify for 10: Annually, obtain a system-wide average pressure value from the hydraulic model of the distribution system that has been calibrated via field measurements in the water distribution system and confirmed in comparisons with SCADA System data.		to maintain 10: Continue to refine the hydraulic model of the distribution system and consider linking it with SCADA System for real-time pressure data calibration, and averaging.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
COST DATA											
Total annual cost of operating water system:		Incomplete paper records and lack of financial accounting documentation on many operating functions makes calculation of water system operating costs a pure guesstimate	Reasonably maintained, but incomplete, paper or electronic accounting provides data to estimate the major portion of water system operating costs.	Conditions between 2 and 4	Electronic, industry-standard cost accounting system in place. However, gaps in data are known to exist, periodic internal reviews are conducted but not a structured financial audit.	Conditions between 4 and 6	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited periodically by utility personnel, but not a Certified Public Accountant (CPA).	Conditions between 6 and 8	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited at least annually by utility personnel, and at least once every three years by third-party CPA.	Conditions between 8 and 10	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited annually by utility personnel and annually also by third-party CPA.
Improvements to attain higher data grading for "Total Annual Cost of Operating the Water System" component:		<u>to qualify for 2</u>: Gather available records, institute new financial accounting procedures to regularly collect and audit basic cost data of most important operations functions.	<u>to qualify for 4</u>: Implement an electronic cost accounting system, structured according to accounting standards for water utilities		<u>to qualify for 6</u>: Establish process for periodic internal audit of water system operating costs; identify cost data gaps and institute procedures for tracking these outstanding costs.		<u>to qualify for 8</u>: Standardize the process to conduct routine financial audit on an annual basis. Arrange for CPA audit of financial records at least once every three years.		<u>to qualify for 10</u>: Standardize the process to conduct a third-party financial audit by a CPA on an annual basis.		<u>to maintain 10</u>: Maintain program, stay abreast of expenses subject to erratic cost changes and long-term cost trend, and budget/track costs proactively
Customer retail unit cost (applied to Apparent Losses):	Customer population unmetered, and/or only a fixed fee is charged for consumption.	Antiquated, cumbersome water rate structure is used, with periodic historic amendments that were poorly documented and implemented; resulting in classes of customers being billed inconsistent charges. The actual composite billing rate likely differs significantly from the published water rate structure, but a lack of auditing leaves the degree of error indeterminate.	Dated, cumbersome water rate structure, not always employed consistently in actual billing operations. The actual composite billing rate is known to differ from the published water rate structure, and a reasonably accurate estimate of the degree of error is determined, allowing a composite billing rate to be quantified.	Conditions between 2 and 4	Straight-forward water rate structure in use, but not updated in several years. Billing operations reliably employ the rate structure. The composite billing rate is derived from a single customer class such as residential customer accounts, neglecting the effect of different rates from varying customer classes.	Conditions between 4 and 6	Clearly written, up-to-date water rate structure is in force and is applied reliably in billing operations. Composite customer rate is determined using a weighted average residential rate using volumes of water in each rate block.	Conditions between 6 and 8	Effective water rate structure is in force and is applied reliably in billing operations. Composite customer rate is determined using a weighted average composite consumption rate, which includes residential, commercial, industrial, institutional (CII), and any other distinct customer classes within the water rate structure.	Conditions between 8 and 10	Current, effective water rate structure is in force and applied reliably in billing operations. The rate structure and calculations of composite rate - which includes residential, commercial, industrial, institutional (CII), and other distinct customer classes - are reviewed by a third party knowledgeable in the M36 methodology at least once every five years.
Improvements to attain higher data grading for "Customer Retail Unit Cost" component:		<u>to qualify for 2</u>: Formalize the process to implement water rates, including a secure documentation procedure. Create a current, formal water rate document and gain approval from all stakeholders.	<u>to qualify for 4</u>: Review the water rate structure and update/formalize as needed. Assess billing operations to ensure that actual billing operations incorporate the established water rate structure.		<u>to qualify for 6</u>: Evaluate volume of water used in each usage block by residential users. Multiply volumes by full rate structure.	<u>Launch effort to fully meter the customer population and charge rates based upon water volumes</u>	<u>to qualify for 8</u>: Evaluate volume of water used in each usage block by all classifications of users. Multiply volumes by full rate structure.		<u>to qualify for 10</u>: Conduct a periodic third-party audit of water used in each usage block by all classifications of users. Multiply volumes by full rate structure.		<u>to maintain 10</u>: Keep water rate structure current in addressing the water utility's revenue needs. Update the calculation of the customer unit rate as new rate components, customer classes, or other components are modified.
Variable production cost (applied to Real Losses):	Note: if the water utility purchases/imports its entire water supply, then enter the unit purchase cost of the bulk water supply in the Reporting Worksheet with a grading of 10	Incomplete paper records and lack of documentation on primary operating functions (electric power and treatment costs most importantly) makes calculation of variable production costs a pure guesstimate	Reasonably maintained, but incomplete, paper or electronic accounting provides data to roughly estimate the basic operations costs (pumping power costs and treatment costs) and calculate a unit variable production cost.	Conditions between 2 and 4	Electronic, industry-standard cost accounting system in place. Electric power and treatment costs are reliably tracked and allow accurate weighted calculation of unit variable production costs based on these two inputs and water imported purchase costs (if applicable). All costs are audited internally on a periodic basis.	Conditions between 4 and 6	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Pertinent additional costs beyond power, treatment and water imported purchase costs (if applicable) such as liability, residuals management, wear and tear on equipment, impending expansion of supply, are included in the unit variable production cost, as applicable. The data is audited at least annually by utility personnel.	Conditions between 6 and 8	Reliable electronic, industry-standard cost accounting system in place, with all pertinent primary and secondary variable production and water imported purchase (if applicable) costs tracked. The data is audited at least annually by utility personnel, and at least once every three years by a third-party knowledgeable in the M36 methodology.	Conditions between 8 and 10	Either of two conditions can be met to obtain a grading of 10: 1) Third party CPA audit of all pertinent primary and secondary variable production and water imported purchase (if applicable) costs on an annual basis. or: 2) Water supply is entirely purchased as bulk water imported, and the unit purchase cost - including <u>all</u> applicable marginal supply costs - serves as the variable production cost. If <u>all</u> applicable marginal supply costs are not included in this figure, a grade of 10 should <u>not</u> be selected.
Improvements to attain higher data grading for "Variable Production Cost" component:		<u>to qualify for 2</u>: Gather available records, institute new procedures to regularly collect and audit basic cost data and most important operations functions.	<u>to qualify for 4</u>: Implement an electronic cost accounting system, structured according to accounting standards for water utilities		<u>to qualify for 6</u>: Formalize process for regular internal audits of production costs. Assess whether additional costs (liability, residuals management, equipment wear, impending infrastructure expansion) should be included to calculate a more representative variable production cost.		<u>to qualify for 8</u>: Formalize the accounting process to include direct cost components (power, treatment) as well as indirect cost components (liability, residuals management, etc.) Arrange to conduct audits by a knowledgable third-party at least once every three years.		<u>to qualify for 10</u>: Standardize the process to conduct a third-party financial audit by a CPA on an annual basis.		<u>to maintain 10</u>: Maintain program, stay abreast of expenses subject to erratic cost changes and budget/track costs proactively

AWWA Free Water Audit Software: Customer Service Line Diagrams

WAS v5.0

American Water Works Association.
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Average Length of Customer Service Line

The three figures shown on this worksheet display the assignment of the Average Length of Customer Service Line, Lp, for the three most common piping configurations.

Figure 1 shows the configuration of the water meter outside of the customer building next to the curb stop valve. In this configuration Lp = 0 since the distance between the curb stop and the customer metering point is essentially zero.

Figure 2 shows the configuration of the customer water meter located inside the customer building, where Lp is the distance from the curb stop to the water meter.

Figure 3 shows the configuration of an unmetered customer building , where Lp is the distance from the curb stop to the first point of customer water consumption, or, more simply, the building line.

In any water system the Lp will vary notably in a community of different structures, therefore the average Lp value is used and this should be approximated or calculated if a sample of service line measurements has been gathered.

Click for more information

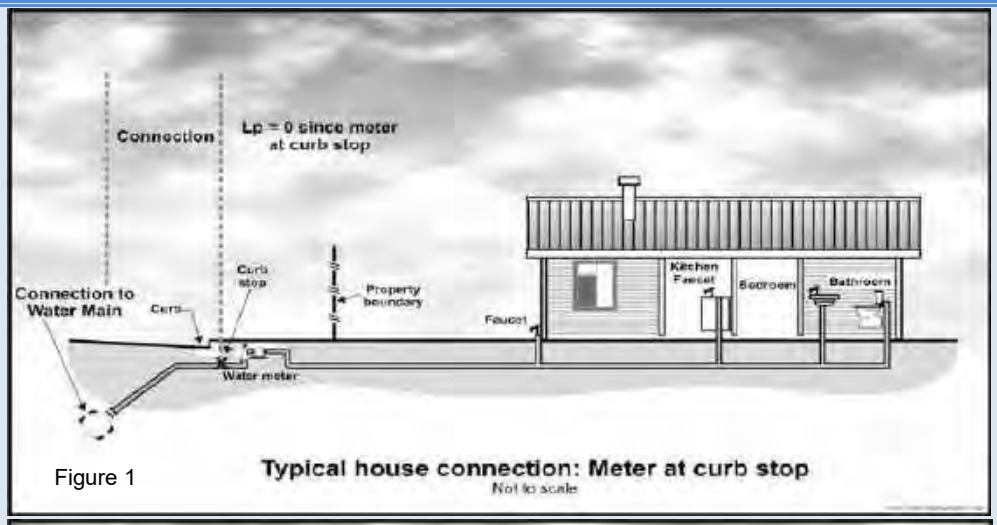

Figure 1 Typical house connection: Meter at curb stop
Not to scale

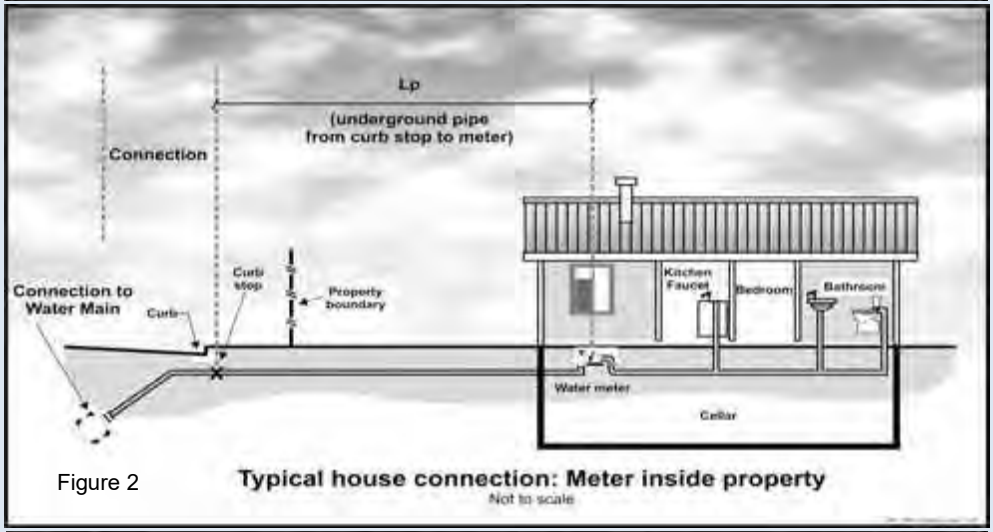

Figure 2 Typical house connection: Meter inside property
Not to scale

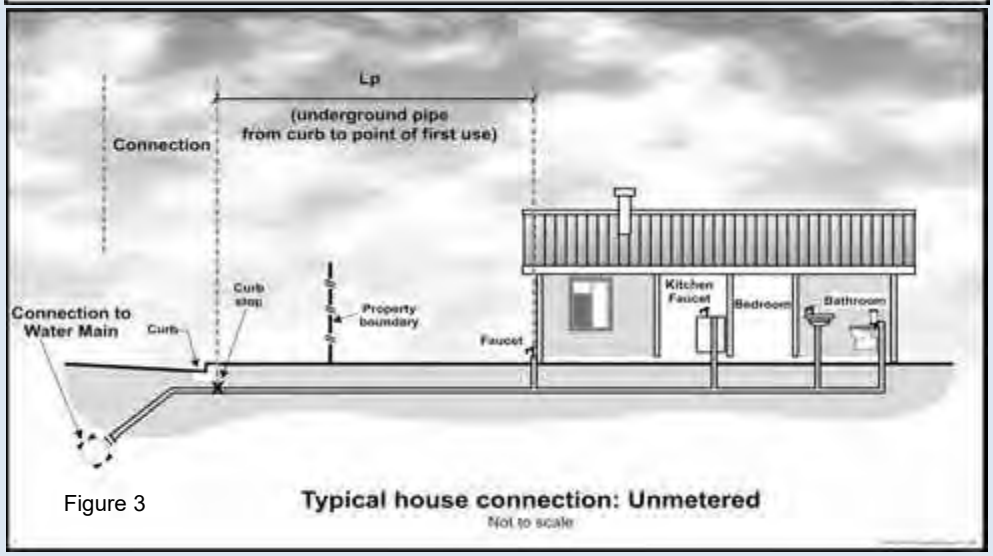

Figure 3 Typical house connection: Unmetered
Not to scale

AWWA Free Water Audit Software: Definitions

WAS v5.0

American Water Works Association.
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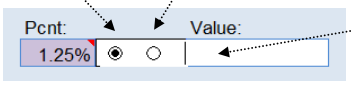
Item Name	Description
Apparent Losses Find	= unauthorized consumption + customer metering inaccuracies + systematic data handling errors Apparent Losses include all types of inaccuracies associated with customer metering (worn meters as well as improperly sized meters or wrong type of meter for the water usage profile) as well as systematic data handling errors (meter reading, billing, archiving and reporting), plus unauthorized consumption (theft or illegal use). NOTE: Over-estimation of Apparent Losses results in under-estimation of Real Losses. Under-estimation of Apparent Losses results in over-estimation of Real Losses.
AUTHORIZED CONSUMPTION Find	= billed water exported + billed metered + billed unmetered + unbilled metered + unbilled unmetered consumption The volume of metered and/or unmetered water taken by registered customers, the water utility's own uses, and uses of others who are implicitly or explicitly authorized to do so by the water utility; for residential, commercial, industrial and public-minded purposes. Typical retail customers' consumption is tabulated usually from established customer accounts as billed metered consumption, or - for unmetered customers - billed unmetered consumption. These types of consumption, along with billed water exported, provide revenue potential for the water utility. **Be certain to tabulate the water exported volume as a separate component and do not "double-count" it by including in the billed metered consumption component as well as the water exported component.** Unbilled authorized consumption occurs typically in non-account uses, including water for fire fighting and training, flushing of water mains and sewers, street cleaning, watering of municipal gardens, public fountains, or similar public-minded uses. Occasionally these uses may be metered and billed (or charged a flat fee), but usually they are unmetered and unbilled. In the latter case, the water auditor may use a default value to estimate this quantity, or implement procedures for the reliable quantification of these uses. This starts with documenting usage events as they occur and estimating the amount of water used in each event. (See Unbilled unmetered consumption)
View Service Connection Diagram **Average length of customer service line** Find	This is the average length of customer service line, Lp, that is owned and maintained by the customer; from the point of ownership transfer to the customer water meter, or building line (if unmetered). The quantity is one of the data inputs for the calculation of Unavoidable Annual Real Losses (UARL), which serves as the denominator of the performance indicator: Infrastructure Leakage Index (ILI). The value of Lp is multiplied by the number of customer service connections to obtain a total length of customer owned piping in the system. The purpose of this parameter is to account for the unmetered service line infrastructure that is the responsibility of the customer for arranging repairs of leaks that occur on their lines. In many cases leak repairs arranged by customers take longer to be executed than leak repairs arranged by the water utility on utility-maintained piping. Leaks run longer - and lose more water - on customer-owned service piping, than utility owned piping. If the customer water meter exists near the ownership transfer point (usually the curb stop located between the water main and the customer premises) this distance is zero because the meter and transfer point are the same. This is the often encountered configuration of customer water meters located in an underground meter box or "pit" outside of the customer's building. The Free Water Audit Software asks a "Yes/No" question about the meter at this location. If the auditor selects "Yes" then this distance is set to zero and the data grading score for this component is set to 10. If water meters are typically located inside the customer premise/building, or properties are unmetered, it is up to the water auditor to estimate a system-wide average Lp length based upon the various customer land parcel sizes and building locations in the service area. Lp will be a shorter length in areas of high density housing, and a longer length in areas of low density housing and varied commercial and industrial buildings. General parcel demographics should be employed to obtain a composite average Lp length for the entire system. Refer to the "Service Connection Diagram" worksheet for a depiction of the service line/metering configurations that typically exist in water utilities. This worksheet gives guidance on the determination of the Average Length, Lp, for each configuration.
Average operating pressure Find	This is the average pressure in the distribution system that is the subject of the water audit. Many water utilities have a calibrated hydraulic model of their water distribution system. For these utilities, the hydraulic model can be utilized to obtain a very accurate quantity of average pressure. In the absence of a hydraulic model, the average pressure may be approximated by obtaining readings of static water pressure from a representative sample of fire hydrants or other system access points evenly located across the system. A weighted average of the pressure can be assembled; but be sure to take into account the elevation of the fire hydrants, which typically exist several feet higher than the level of buried water pipelines. If the water utility is compiling the water audit for the first time, the average pressure can be approximated, but with a low data grading. In subsequent years of auditing, effort should be made to improve the accuracy of the average pressure quantity. This will then qualify the value for a higher data grading.
Billed Authorized Consumption	All consumption that is billed and authorized by the utility. This may include both metered and unmetered consumption. See "Authorized Consumption" for more information.
Billed metered consumption Find	All metered consumption which is billed to retail customers, including all groups of customers such as domestic, commercial, industrial or institutional. **It does NOT include water supplied to neighboring utilities (water exported) which is metered and billed. Be sure to subtract any consumption for exported water sales that may be included in these billing roles. Water supplied as exports to neighboring water utilities should be included only in the Water Exported component.** The metered consumption data can be taken directly from billing records for the water audit period. The accuracy of yearly metered consumption data can be refined by including an adjustment to account for customer meter reading lag time since not all customer meters are read on the same day of the meter reading period. However additional analysis is necessary to determine the lag time adjustment value, which may or may not be significant.
Billed unmetered consumption Find	All billed consumption which is calculated based on estimates or norms from water usage sites that have been determined by utility policy to be left unmetered. This is typically a very small component in systems that maintain a policy to meter their customer population. However, this quantity can be the key consumption component in utilities that have not adopted a universal metering policy. **This component should NOT include any water that is supplied to neighboring utilities (water exported) which is unmetered but billed. Water supplied as exports to neighboring water utilities should be included only in the Water Exported component.**

Item Name	Description
Customer metering inaccuracies Find	Apparent water losses caused by the collective under-registration of customer water meters. Many customer water meters gradually wear as large cumulative volumes of water are passed through them over time. This causes the meters to under-register the flow of water. This occurrence is common with smaller residential meters of sizes 5/8-inch and 3/4 inch after they have registered very large cumulative volumes of water, which generally occurs only after periods of years. For meters sized 1-inch and larger - typical of multi-unit residential, commercial and industrial accounts - meter under-registration can occur from wear or from the improper application of the meter; i.e. installing the wrong type of meter or the wrong size of meter, for the flow pattern (profile) of the consumer. For instance, many larger meters have reduced accuracy at low flows. If an oversized meter is installed, most of the time the routine flow will occur in the low flow range of the meter, and a significant portion of it may not be registered. It is important to properly select and install all meters, but particularly large customer meters, size 1-inch and larger. The auditor has two options for entering data for this component of the audit. The auditor can enter a percentage under-registration (typically an estimated value), this will apply the selected percentage to the two categories of metered consumption to determine the volume of water not recorded due to customer meter inaccuracy. Note that this percentage is a composite average inaccuracy for all customer meters in the entire meter population. The percentage will be multiplied by the sum of the volumes in the Billed Metered and Unbilled Metered components. Alternatively, if the auditor has substantial data from meter testing activities, he or she can calculate their own loss volumes, and this volume may be entered directly. Note that a value of zero will be accepted but an alert will appear asking if the customer population is unmetered. Since all metered systems have some degree of inaccuracy, a positive value should be entered. A value of zero in this component is valid only if the water utility does not meter its customer population.
Customer retail unit cost Find	The Customer Retail Unit Cost represents the charge that customers pay for water service. This unit cost is applied routinely to the components of Apparent Loss, since these losses represent water reaching customers but not (fully) paid for. Since most water utilities have a rate structure that includes a variety of different costs based upon class of customer, a weighted average of individual costs and number of customer accounts in each class can be calculated to determine a single composite cost that should be entered into this cell. Finally, the weighted average cost should also include additional charges for sewer, storm water or biosolids processing, but only if these charges are based upon the volume of potable water consumed. For water utilities in regions with limited water resources and a questionable ability to meet the drinking water demands in the future, the Customer Retail Unit Cost might also be applied to value the Real Losses; instead of applying the Variable Production Cost to Real Losses. In this way, it is assumed that every unit volume of leakage reduced by leakage management activities will be sold to a customer. Note: the Free Water Audit Software allows the user to select the units that are charged to customers (either $/1,000 gallons, $/hundred cubic feet, or $/1,000 litres) and automatically converts these units to the units that appear in the "WATER SUPPLIED" box. The monetary units are United States dollars, $.
Infrastructure Leakage Index (ILI) Find	The ratio of the Current Annual Real Losses (Real Losses) to the Unavoidable Annual Real Losses (UARL). The ILI is a highly effective performance indicator for comparing (benchmarking) the performance of utilities in operational management of real losses.
Length of mains Find	Length of all pipelines (except service connections) in the system starting from the point of system input metering (for example at the outlet of the treatment plant). It is also recommended to include in this measure the total length of fire hydrant lead pipe. Hydrant lead pipe is the pipe branching from the water main to the fire hydrant. Fire hydrant leads are typically of a sufficiently large size that is more representative of a pipeline than a service connection. The average length of hydrant leads across the entire system can be assumed if not known, and multiplied by the number of fire hydrants in the system, which can also be assumed if not known. This value can then be added to the total pipeline length. Total length of mains can therefore be calculated as: Length of Mains, miles = (total pipeline length, miles) + [{(average fire hydrant lead length, ft) x (number of fire hydrants)} / 5,280 ft/mile] or Length of Mains, kilometres = (total pipeline length, kilometres) + [{(average fire hydrant lead length, metres) x (number of fire hydrants)} / 1,000 metres/kilometre]
NON-REVENUE WATER Find	= Apparent Losses + Real Losses + Unbilled Metered Consumption + Unbilled Unmetered Consumption. This is water which does not provide revenue potential to the utility.
Number of active AND inactive service connections Find	Number of customer service connections, extending from the water main to supply water to a customer. Please note that this includes the actual number of distinct piping connections, including fire connections, whether active or inactive. This may differ substantially from the number of customers (or number of accounts). **Note: this number does not include the pipeline leads to fire hydrants - the total length of piping supplying fire hyrants should be included in the "Length of mains" parameter.**
Real Losses Find	Physical water losses from the pressurized system (water mains and customer service connections) and the utility's storage tanks, up to the point of customer consumption. In metered systems this is the customer meter, in unmetered situations this is the first point of consumption (stop tap/tap) within the property. The annual volume lost through all types of leaks, breaks and overflows depends on frequencies, flow rates, and average duration of individual leaks, breaks and overflows.
Revenue Water	Those components of System Input Volume that are billed and have the potential to produce revenue.
Service Connection Density Find	=number of customer service connections / length of mains

Item Name	Description
Systematic data handling errors Find	Apparent losses caused by accounting omissions, errant computer programming, gaps in policy, procedure, and permitting/activation of new accounts; and any type of data lapse that results in under-stated customer water consumption in summary billing reports. **Systematic Data Handling Errors result in a direct loss of revenue potential. Water utilities can find "lost" revenue by keying on this component.** Utilities typically measure water consumption registered by water meters at customer premises. The meter should be read routinely (ex: monthly) and the data transferred to the Customer Billing System, which generates and sends a bill to the customer. Data Transfer Errors result in the consumption value being less than the actual consumption, creating an apparent loss. Such error might occur from illegible and mis-recorded hand-written readings compiled by meter readers, inputting an incorrect meter register unit conversion factor in the automatic meter reading equipment, or a variety of similar errors. Apparent losses also occur from Data Analysis Errors in the archival and data reporting processes of the Customer Billing System. Inaccurate estimates used for accounts that fail to produce a meter reading are a common source of error. Billing adjustments may award customers a rightful monetary credit, but do so by creating a negative value of consumption, thus under-stating the actual consumption. Account activation lapses may allow new buildings to use water for months without meter readings and billing. Poor permitting and construction inspection practices can result in a new building lacking a billing account, a water meter and meter reading; i.e., the customer is unknown to the utility's billing system. Close auditing of the permitting, metering, meter reading, billing and reporting processes of the water consumption data trail can uncover data management gaps that create volumes of systematic data handling error. Utilities should routinely analyze customer billing records to detect data anomalies and quantify these losses. For example, a billing account that registers zero consumption for two or more billing cycles should be checked to explain why usage has seemingly halted. Given the revenue loss impacts of these losses, water utilities are well-justified in providing continuous oversight and timely correction of data transfer errors & data handling errors. If the water auditor has not yet gathered detailed data or assessment of systematic data handling error, it is recommended that the auditor apply the default value of 0.25% of the the Billed Authorized Consumption volume. However, if the auditor has investigated the billing system and its controls, and has well validated data that indicates the volume from systematic data handling error is substantially higher or lower than that generated by the default value, then the auditor should enter a quantity that was derived from the utility investigations and select an appropriate grading. Note: negative values are not allowed for this audit component. If the auditor enters zero for this component then a grading of 1 will be automatically assigned.
Total annual cost of operating the water system Find	These costs include those for operations, maintenance and any annually incurred costs for long-term upkeep of the drinking water supply and distribution system. It should include the costs of day-to-day upkeep and long-term financing such as repayment of capital bonds for infrastructure expansion or improvement. Typical costs include employee salaries and benefits, materials, equipment, insurance, fees, administrative costs and all other costs that exist to sustain the drinking water supply. Depending upon water utility accounting procedures or regulatory agency requirements, it may be appropriate to include depreciation in the total of this cost. This cost should not include any costs to operate wastewater, biosolids or other systems outside of drinking water.
Unauthorized consumption Find	Includes water illegally withdrawn from fire hydrants, illegal connections, bypasses to customer consumption meters, or tampering with metering or meter reading equipment; as well as any other ways to receive water while thwarting the water utility's ability to collect revenue for the water. Unauthorized consumption results in uncaptured revenue and creates an error that understates customer consumption. In most water utilities this volume is low and, if the water auditor has not yet gathered detailed data for these loss occurrences, it is recommended that the auditor apply a default value of 0.25% of the volume of water supplied. However, if the auditor has investigated unauthorized occurrences, and has well validated data that indicates the volume from unauthorized consumption is substantially higher or lower than that generated by the default value, then the auditor should enter a quantity that was derived from the utility investigations. Note that a value of zero will not be accepted since all water utilities have some volume of unauthorized consumption occurring in their system. Note: if the auditor selects the default value for unauthorized consumption, a data grading of 5 is automatically assigned, but not displayed on the Reporting Worksheet.
Unavoidable Annual Real Losses (UARL) Find	UARL (gallons)=(5.41Lm + 0.15Nc + 7.5Lc) xP, or UARL (litres)=(18.0Lm + 0.8Nc + 25.0Lc) xP where: Lm = length of mains (miles or kilometres) Nc = number of customer service connections Lp = the average distance of customer service connection piping (feet or metres) (see the Worksheet "Service Connection Diagram" for guidance on deterring the value of Lp) Lc = total length of customer service connection piping (miles or km) Lc = Nc X Lp (miles or kilometres) P = Pressure (psi or metres) The UARL is a theoretical reference value representing the technical low limit of leakage that could be achieved if all of today's best technology could be successfully applied. It is a key variable in the calculation of the Infrastructure Leakage Index (ILI). Striving to reduce system leakage to a level close to the UARL is usually not needed unless the water supply is unusually expensive, scarce or both. NOTE: The UARL calculation has not yet been proven as fully valid for very small, or low pressure water distribution systems. If, in gallons: (Lm x 32) + Nc < 3000 or P <35psi in litres: (Lm x 20) + Nc < 3000 or P < 25m then the calculated UARL value may not be valid. The software does not display a value of UARL or ILI if either of these conditions is true.

Item Name	Description
Unbilled Authorized Consumption	All consumption that is unbilled, but still authorized by the utility. This includes Unbilled Metered Consumption + Unbilled Unmetered Consumption. See "Authorized Consumption" for more information. For Unbilled Unmetered Consumption, the Free Water Audit Software provides the auditor the option to select a default value if they have not audited unmetered activities in detail. The default calculates a volume that is 1.25% of the Water Supplied volume. If the auditor has carefully audited the various unbilled, unmetered, authorized uses of water, and has established reliable estimates of this collective volume, then he or she may enter the volume directly for this component, and not use the default value.
Unbilled metered consumption Find	Metered consumption which is authorized by the water utility, but, for any reason, is deemed by utility policy to be unbilled. This might for example include metered water consumed by the utility itself in treatment or distribution operations, or metered water provided to civic institutions free of charge. **It does not include water supplied to neighboring utilities (water exported) which may be metered but not billed.**
Unbilled unmetered consumption Find	Any kind of Authorized Consumption which is neither billed or metered. This component typically includes water used in activities such as fire fighting, flushing of water mains and sewers, street cleaning, fire flow tests conducted by the water utility, etc. In most water utilities it is a small component which is very often substantially overestimated. **It does NOT include water supplied to neighboring utilities (water exported) which is unmetered and unbilled – an unlikely case.** This component has many sub-components of water use which are often tedious to identify and quantify. Because of this, and the fact that it is usually a small portion of the water supplied, it is recommended that the auditor apply the default value, which is 1.25% of the Water Supplied volume. Select the default percentage to enter this value. If the water utility has carefully audited the unbilled, unmetered activities occurring in the system, and has well validated data that gives a value substantially higher or lower than the default volume, then the auditor should enter their own volume. However the default approach is recommended for most water utilities. Note that a value of zero is not permitted, since all water utilities have some volume of water in this component occurring in their system.
Units and Conversions	The user may develop an audit based on one of three unit selections: 1) Million Gallons (US) 2) Megalitres (Thousand Cubic Metres) 3) Acre-feet Once this selection has been made in the instructions sheet, all calculations are made on the basis of the chosen units. Should the user wish to make additional conversions, a unit converter is provided below (use drop down menus to select units from the yellow unit boxes): Enter Units: 1 | Convert From… Million Gallons (US) = Converts to….. 3.06888329 Acre-feet (conversion factor = 3.06888328973723)
Use of Option Buttons	To use the default percent value choose this button To enter a value choose this button and enter the value in the cell to the right  **NOTE:** For Unbilled Unmetered Consumption, Unauthorized Consumption and Systematic Data Handling Errors, a recommended default value can be applied by selecting the Percent option. The default values are based on fixed percentages of Water Supplied or Billed Authorized Consumption and are recommended for use in this audit unless the auditor has well validated data for their system. Default values are shown by purple cells, as shown in the example above. If a default value is selected, the user does not need to grade the item; a grading value of 5 is automatically applied (howe ver, this grade will not be displayed).
Variable production cost (applied to Real Losses) Find	The cost to produce and supply the next unit of water (e.g., $/million gallons). This cost is determined by calculating the summed unit costs for ground and surface water treatment and all power used for pumping from the source to the customer. It may also include other miscellaneous unit costs that apply to the production of drinking water. It should also include the unit cost of bulk water purchased as an import if applicable. It is common to apply this unit cost to the volume of Real Losses. However, if water resources are strained and the ability to meet future drinking water demands is in question, then the water auditor can be justified in applying the Customer Retail Rate to the Real Loss volume, rather than applying the Variable Production Cost. The Free Water Audit Software applies the Variable Production costs to Real Losses by default. However, the auditor has the option on the Reporting Worksheet to select the Customer Retail Cost as the basis for the Real Loss cost evaluation if the auditor determines that this is warranted.
Volume from own sources Find	The volume of water withdrawn (abstracted) from water resources (rivers, lakes, streams, wells, etc) controlled by the water utility, and then treated for potable water distribution. Most water audits are compiled for utility retail water distribution systems, so this volume should reflect the amount of treated drinking water that entered the distribution system. Often the volume of water measured at the effluent of the treatment works is slightly less than the volume measured at the raw water source, since some of the water is used in the treatment process. Thus, it is useful if flows are metered at the effluent of the treatment works. If metering exists only at the raw water source, an adjustment for water used in the treatment process should be included to account for water consumed in treatment operations such as filter backwashing, basin flushing and cleaning, etc. If the audit is conducted for a wholesale water agency that sells untreated water, then this quantity reflects the measure of the raw water, typically metered at the source.

Item Name	Description
Volume from own sources: Master meter and supply error adjustment Find	An estimate or measure of the degree of inaccuracy that exists in the master (production) meters measuring the annual Volume from own Sources, and any error in the data trail that exists to collect, store and report the summary production data. This adjustment is a weighted average number that represents the collective error for all master meters for all days of the audit year and any errors identified in the data trail. Meter error can occur in different ways. A meter or meters may be inaccurate by under-registering flow (did not capture all the flow), or by over-registering flow (overstated the actual flow). Data error can occur due to data gaps caused by temporary outages of the meter or related instrumentation. All water utilities encounter some degree of inaccuracy in master meters and data errors in archival systems are common; thus a value of zero should not be entered. Enter a negative percentage or value for metered data under-registration; or, enter a positive percentage or value for metered data over-registration.
Water exported Find	The Water Exported volume is the bulk water conveyed and sold by the water utility to neighboring water systems that exists outside of their service area. Typically this water is metered at the custody transfer point of interconnection between the two water utilities. Usually the meter(s) are owned by the water utility that is selling the water: i.e. the exporter. If the water utility who is compiling the annual water audit sells bulk water in this manner, they are an exporter of water. Note: The Water Exported volume is sold to wholesale customers who are typically charged a wholesale rate that is different than retail rates charged to the retail customers existing within the service area. Many state regulatory agencies require that the Water Exported volume be reported to them as a quantity separate and distinct from the retail customer billed consumption. For these reasons - and others - the Water Exported volume is always quantified separately from Billed Authorized Consumption in the standard water audit. **Be certain not to "double-count" this quantity by including it in both the Water Exported box and the Billed Metered Consumption box of the water audit Reporting Worksheet. This volume should be included only in the Water Exported box.**
Water exported: Master meter and supply error adjustment Find	An estimate or measure of the volume in which the Water Exported volume is incorrect. This adjustment is a weighted average that represents the collective error for all of the metered and archived exported flow for all days of the audit year. Meter error can occur in different ways. A meter may be inaccurate by under-registering flow (did not capture all the flow), or by over-registering flow (overstated the actual flow). Error in the metered, archived data can also occur due to data gaps caused by temporary outages of the meter or related instrumentation. All water utilities encounter some degree of error in their metered data, particularly if meters are aged and infrequently tested. Occasional errors also occur in the archived data. Thus, a value of zero should not be entered. Enter a negative percentage or value for metered data under-registration; or enter a positive percentage or value for metered data over-registration. If regular meter accuracy testing is conducted on the meter(s) - which is usually conducted by the water utility selling the water - then the results of this testing can be used to help quantify the meter error adjustment. Corrections to data gaps or other errors found in the archived data should also be included as a portion of this meter error adjustment.
Water imported Find	The Water Imported volume is the bulk water purchased to become part of the Water Supplied volume. Typically this is water purchased from a neighboring water utility or regional water authority, and is metered at the custody transfer point of interconnection between the two water utilities. Usually the meter(s) are owned by the water supplier selling the water to the utility conducting the water audit. The water supplier selling the bulk water usually charges the receiving utility based upon a wholesale water rate.
Water imported: Master meter and supply error adjustment Find	An estimate or measure of the volume in which the Water Imported volume is incorrect. This adjustment is a weighted average that represents the collective error for all of the metered and archived imported flow for all days of the audit year. Meter error can occur in different ways. A meter may be inaccurate by under-registering flow (did not capture all the flow), or by over-registering flow (overstated the actual flow). Error in the metered, archived data can also occur due to data gaps caused by temporary outages of the meter or related instrumentation. All water utilities encounter some level of meter inaccuracy, particularly if meters are aged and infrequently tested. Occasional errors also occur in the archived metered data. Thus, a value of zero should not be entered. Enter a negative percentage or value for metered data under-registration; or, enter a positive percentage or value for metered data over-registration. If regular meter accuracy testing is conducted on the meter(s) - which is usually conducted by the water utility selling the water - then the results of this testing can be used to help quantify the meter error adjustment.
WATER LOSSES Find	= apparent losses + real losses Water Losses are the difference between Water Supplied and Authorized Consumption. Water losses can be considered as a total volume for the whole system, or for partial systems such as transmission systems, pressure zones or district metered areas (DMA); if one of these configurations are the basis of the water audit.

AWWA Free Water Audit Software:
Determining Water Loss Standing

WAS v5.0

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Water Audit Report for: San Francisco Public Utilities Commission (3810011)
Reporting Year: 2020 7/2019 - 6/2020
Data Validity Score: **89**

Water Loss Control Planning Guide

	Water Audit Data Validity Level / Score				
Functional Focus Area	**Level I** (0-25)	**Level II** (26-50)	**Level III** (51-70)	**Level IV** (71-90)	**Level V** (91-100)
Audit Data Collection	Launch auditing and loss control team; address production metering deficiencies	Analyze business process for customer metering and billing functions and water supply operations. Identify data gaps.	Establish/revise policies and procedures for data collection	Refine data collection practices and establish as routine business process	Annual water audit is a reliable gauge of year-to-year water efficiency standing
Short-term loss control	Research information on leak detection programs. Begin flowcharting analysis of customer billing system	Conduct loss assessment investigations on a sample portion of the system: customer meter testing, leak survey, unauthorized consumption, etc.	Establish ongoing mechanisms for customer meter accuracy testing, active leakage control and infrastructure monitoring	Refine, enhance or expand ongoing programs based upon economic justification	Stay abreast of improvements in metering, meter reading, billing, leakage management and infrastructure rehabilitation
Long-term loss control		Begin to assess long-term needs requiring large expenditure: customer meter replacement, water main replacement program, new customer billing system or Automatic Meter Reading (AMR) system.	Begin to assemble economic business case for long-term needs based upon improved data becoming available through the water audit process.	Conduct detailed planning, budgeting and launch of comprehensive improvements for metering, billing or infrastructure management	Continue incremental improvements in short-term and long-term loss control interventions
Target-setting			Establish long-term apparent and real loss reduction goals (+10 year horizon)	Establish mid-range (5 year horizon) apparent and real loss reduction goals	Evaluate and refine loss control goals on a yearly basis
Benchmarking			Preliminary Comparisons - can begin to rely upon the Infrastructure Leakage Index (ILI) for performance comparisons for real losses (see below table)	Performance Benchmarking - ILI is meaningful in comparing real loss standing	Identify Best Practices/ Best in class - the ILI is very reliable as a real loss performance indicator for best in class service

For validity scores of 50 or below, the shaded blocks should not be focus areas until better data validity is achieved.

Once data have been entered into the Reporting Worksheet, the performance indicators are automatically calculated. How does a water utility operator know how well his or her system is performing? The AWWA Water Loss Control Committee provided the following table to assist water utilities is gauging an approximate Infrastructure Leakage Index (ILI) that is appropriate for their water system and local conditions. The lower the amount of leakage and real losses that exist in the system, then the lower the ILI value will be.

Note: this table offers an approximate guideline for leakage reduction target-setting. The best means of setting such targets include performing an economic assessment of various loss control methods. However, this table is useful if such an assessment is not possible.

General Guidelines for Setting a Target ILI (without doing a full economic analysis of leakage control options)

Target ILI Range	Financial Considerations	Operational Considerations	Water Resources Considerations
1.0 - 3.0	Water resources are costly to develop or purchase; ability to increase revenues via water rates is greatly limited because of regulation or low ratepayer affordability.	Operating with system leakage above this level would require expansion of existing infrastructure and/or additional water resources to meet the demand.	Available resources are greatly limited and are very difficult and/or environmentally unsound to develop.
>3.0 -5.0	Water resources can be developed or purchased at reasonable expense; periodic water rate increases can be feasibly imposed and are tolerated by the customer population.	Existing water supply infrastructure capability is sufficient to meet long-term demand as long as reasonable leakage management controls are in place.	Water resources are believed to be sufficient to meet long-term needs, but demand management interventions (leakage management, water conservation) are included in the long-term planning.
>5.0 - 8.0	Cost to purchase or obtain/treat water is low, as are rates charged to customers.	Superior reliability, capacity and integrity of the water supply infrastructure make it relatively immune to supply shortages.	Water resources are plentiful, reliable, and easily extracted.
Greater than 8.0	Although operational and financial considerations may allow a long-term ILI greater than 8.0, such a level of leakage is not an effective utilization of water as a resource. Setting a target level greater than 8.0 - other than as an incremental goal to a smaller long-term target - is discouraged.		
Less than 1.0	If the calculated Infrastructure Leakage Index (ILI) value for your system is 1.0 or less, two possibilities exist. a) you are maintaining your leakage at low levels in a class with the top worldwide performers in leakage control. b) A portion of your data may be flawed, causing your losses to be greatly understated. This is likely if you calculate a low ILI value but do not employ extensive leakage control practices in your operations. In such cases it is beneficial to validate the data by performing field measurements to confirm the accuracy of production and customer meters, or to identify any other potential sources of error in the data.		

AWWA Free Water Audit Software:
Examples of Completed and Validated Audits

WAS v5.0
American Water Works Association.
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Example 1a: Million Gallons: | **Example 1b**: Million Gallons: Performance Indicators | **Example 2a**: Megalitres: Reporting Worksheet | **Example 2b**: Megalitres: Reporting Worksheet

Example Audit 1a:

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association.
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? Click to access definition
+ Click to add a comment

Water Audit Report for: City of Asheville (01-11-010)
Reporting Year: 2013 (7/2012 - 6/2013)

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: MILLION GALLONS (US) PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ----------> | Pcnt: | Value:

Volume from own sources:	7	7,352.880	MG/Yr	3			285.450	MG/Yr
Water imported:	n/a	0.000	MG/Yr					MG/Yr
Water exported:	n/a	0.000	MG/Yr					MG/Yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 7,067.430 MG/Yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:
Billed metered:	8	4,782.250	MG/Yr		
Billed unmetered:	n/a	0.000	MG/Yr		
Unbilled metered:	7	27.757	MG/Yr		
Unbilled unmetered:	8	157.790	MG/Yr		157.790 MG/Yr

Unbilled Unmetered volume entered is greater than the recommended default value

Use buttons to select percentage of water supplied OR value

AUTHORIZED CONSUMPTION: 4,967.797 MG/Yr

WATER LOSSES (Water Supplied - Authorized Consumption) 2,099.633 MG/Yr

Apparent Losses

				Pcnt:	Value:
Unauthorized consumption:		17.669	MG/Yr	0.25%	MG/Yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	7	111.220	MG/Yr	2.26%	MG/Yr
Systematic data handling errors:	5	11.956	MG/Yr	0.25%	MG/Yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 140.844 MG/Yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 1,958.789 MG/Yr

WATER LOSSES: 2,099.633 MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: 2,285.180 MG/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	4	1,236.5	miles
Number of active AND inactive service connections:	7	55,256	
Service connection density:		45	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: 4 — 145.3 psi

COST DATA

Total annual cost of operating water system:	10	$33,630,676	$/Year	
Customer retail unit cost (applied to Apparent Losses):	10	$3.22	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	6	$335.94	$/Million gallons	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 72 out of 100 ***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Variable production cost (applied to Real Losses)
3: Unauthorized consumption

Example Audit 1b:

AWWA Free Water Audit Software:
System Attributes and Performance Indicators

WAS v5.0
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Water Audit Report for: City of Asheville (01-11-010)
Reporting Year: 2013 | 7/2012 - 6/2013

*** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 72 out of 100 ***

System Attributes:

	Apparent Losses:	140.844	MG/Yr
+	Real Losses:	1,958.789	MG/Yr
=	Water Losses:	2,099.633	MG/Yr
?	Unavoidable Annual Real Losses (UARL):	794.34	MG/Yr
	Annual cost of Apparent Losses:	$606,265	
	Annual cost of Real Losses:	$658,036	Valued at Variable Production Cost

Return to Reporting Worksheet to change this assumpiton

Performance Indicators:

Financial:	Non-revenue water as percent by volume of Water Supplied:	32.3%	
	Non-revenue water as percent by cost of operating system:	3.9%	Real Losses valued at Variable Production Cost
Operational Efficiency:	Apparent Losses per service connection per day:	6.98	gallons/connection/day
	Real Losses per service connection per day:	97.12	gallons/connection/day
	Real Losses per length of main per day*:	N/A	
	Real Losses per service connection per day per psi pressure:	0.67	gallons/connection/day/psi
	From Above, Real Losses = Current Annual Real Losses (CARL):	1,958.79	million gallons/year
?	Infrastructure Leakage Index (ILI) [CARL/UARL]:	2.47	

* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline

Example Audit 2a:

AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0
American Water Works Association.
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? Click to access definition
+ Click to add a comment

Water Audit Report for: The City of Calgary
Reporting Year: 2013 | 1/2013 - 12/2013

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: MEGALITRES (THOUSAND CUBIC METRES) PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

<----------- Enter grading in column 'E' and 'J' ----------> Master Meter Error Adjustments

WATER SUPPLIED

				Pcnt:	Value:	
Volume from own sources:	7	174,324.000	ML/Yr	1.00%		ML/Yr
Water imported:	n/a	0.000	ML/Yr			ML/Yr
Water exported:	7	8,190.131	ML/Yr	1.00%		ML/Yr
WATER SUPPLIED:		**164,488.979**	ML/Yr			

Enter negative % or value for under-registration
Enter positive % or value for over-registration

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:	
Billed metered:	6	125,111.268	ML/Yr			
Billed unmetered:	8	3,503.386	ML/Yr			
Unbilled metered:	7	166.157	ML/Yr			
Unbilled unmetered:	6	1,444.000	ML/Yr		1,444.000	ML/Yr
AUTHORIZED CONSUMPTION:		**130,224.811**	ML/Yr			

Use buttons to select percentage of water supplied **OR** value

WATER LOSSES (Water Supplied - Authorized Consumption)

34,264.168 ML/Yr

Apparent Losses

				Pcnt:	Value:	
Unauthorized consumption:		411.222	ML/Yr	0.25%		ML/Yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	6	1,265.429	ML/Yr	1.00%		ML/Yr
Systematic data handling errors:		312.778	ML/Yr	0.25%		ML/Yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: **1,989.429** ML/Yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: **32,274.739** ML/Yr

WATER LOSSES: **34,264.168** ML/Yr

NON-REVENUE WATER

NON-REVENUE WATER: **35,874.325** ML/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	8	4,945.0	kilometers
Number of active AND inactive service connections:	8	312,075	
Service connection density:		63	conn./km main
Are customer meters typically located at the curbstop or property line?		No	
Average length of customer service line:	8	12.0	metres (length of service line, beyond the property boundary, that is the responsibility of the utility)
Average operating pressure:	8	50.8	metres (head)

COST DATA

Total annual cost of operating water system:	9	$169,973,759	$/Year	
Customer retail unit cost (applied to Apparent Losses):	9	$2.35	$/1000 litres	
Variable production cost (applied to Real Losses):	9	$73.54	$/Megalitre	☑ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 72 out of 100 ***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Billed metered
3: Customer metering inaccuracies

Example Audit 2b:

AWWA Free Water Audit Software:
System Attributes and Performance Indicators

WAS v5.0

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Water Audit Report for: The City of Calgary
Reporting Year: 2013 1/2013 - 12/2013

*** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 72 out of 100 ***

System Attributes:

	Apparent Losses:	1,989.429	ML/Yr
+	Real Losses:	32,274.739	ML/Yr
=	Water Losses:	34,264.168	ML/Yr
?	Unavoidable Annual Real Losses (UARL):	8,015.57	ML/Yr
	Annual cost of Apparent Losses:	$4,675,159	
	Annual cost of Real Losses:	$75,845,637	Valued at Customer Retail Unit Cost

Return to Reporting Worksheet to change this assumpiton

Performance Indicators:

Financial:	Non-revenue water as percent by volume of Water Supplied:	21.8%	
	Non-revenue water as percent by cost of operating system:	49.6%	Real Losses valued at Customer Retail Unit Cost
Operational Efficiency:	Apparent Losses per service connection per day:	17.47	litres/connection/day
	Real Losses per service connection per day:	283.34	litres/connection/day
	Real Losses per length of main per day*:	N/A	
	Real Losses per service connection per day per meter (head) pressure:	5.58	litres/connection/day/m
	From Above, Real Losses = Current Annual Real Losses (CARL):	32,274.74	ML/year
?	Infrastructure Leakage Index (ILI) [CARL/UARL]:	4.03	

* This performance indicator applies for systems with a low service connection density of less than 20 service connections/kilometre of pipeline

www.awwa.org

AWWA Free Water Audit Software: Acknowledgements

WAS v5.0

American Water Works Association.
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AWWA Water Audit Software Version 5.0 Developed by the Water Loss Control Committee of the American Water Works Association August, 2014

This software is intended to serve as a basic tool to compile a preliminary, or "top-down", water audit. It is recommended that users also refer to the current edition of the AWWA M36 Publication, Water Audits and Loss Control Programs, for detailed guidance on compiling a comprehensive, or "bottom-up", water audit using the same water audit methodology.

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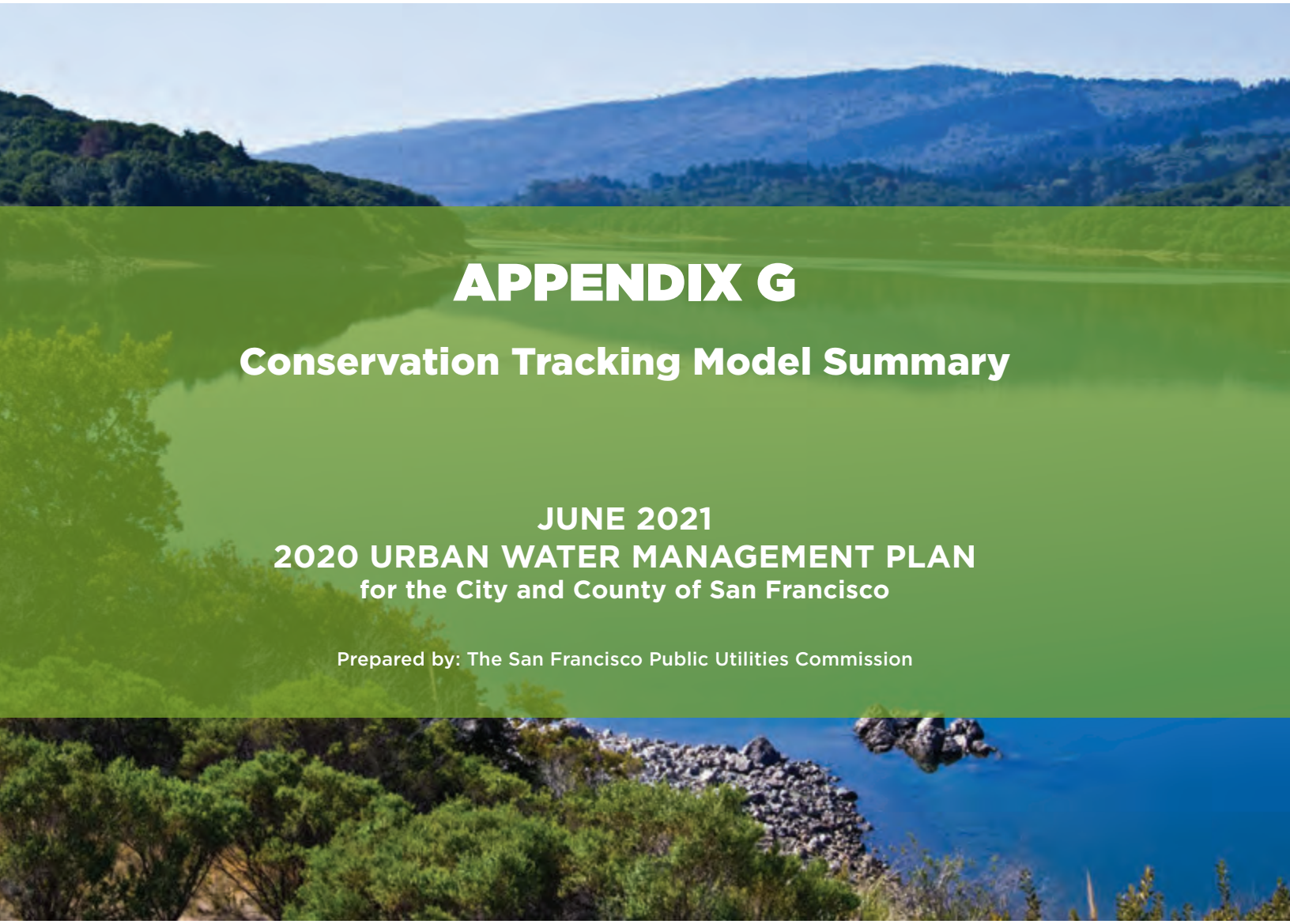
- AWWA Water Audits and Loss Control Programs, M36 Publication, 3rd Edition, 2009

- Service Connection Diagrams courtesy of Ronnie McKenzie, WRP Pty Ltd.

VERSION HISTORY:

Version:	Release Date:	Number of Worksheets:	Key Features and Developments
v1	2005/ 2006	5	The AWWA Water Audit Software was piloted in 2005 (v1.0 beta). The early versions (1.x) of the software restricted data entry to units of Million Gallons per year. For each entry into the audit, users identified whether the input was measured or estimated.
v2	2006	5	The most significant enhancement in v2 of the software was to allow the user to choose the volumetric units to be used in the audit, Million Gallons or Thousand Cubic Metres (megalitres) per year. Two financial performance indicators were added to provide feedback to the user on the cost of Real and Apparent losses.
v3	2007	7	In v3, the option to report volumetric units in acre-feet was added. Another new feature in v3 was the inclusion of default values for two water audit components (unbilled unmetered and unauthorized consumption). v3 also included two examples of completed audits in units of million gallons and Megalitres. Several checks were added into v3 to provide instant feedback to the user on common data entry problems, in order to help the user complete an accurate water audit.
v4 - v4.2	2010	10	v4 (and versions 4.x) of the software included a new approach to data grading. The simple "estimated" or "measured" approach was replaced with a more granular scale (typically 1-10) that reflected descriptions of utility practices and served to describe the confidence and accuracy of the input data. Each input value had a corresponding scale fully described in the Grading Matrix tab. The Grading Matrix also showed the actions required to move to a higher grading score. Grading descriptions were available on the Reporting Worksheet via a pop-up box next to each water audit input. A water audit data validity score is generated (max = 100) and priority areas for attention (to improve audit accuracy) are identified, once a user completes the requied data grading. A service connection diagram was also added to help users understand the impact of customer service line configurations on water losses and how this information should be entered into the water audit software. An acknoweldgements section was also added. Minor bug fixes resulted in the release of versions 4.1 and 4.2. A French language version was also made available for v4.2.
v5	2014	12	In v5, changes were made to the way Water Supplied information is entered into software, with each major component having a corresponding Master Meter Error Adjustment entry (and data grading requirement). This required changes to the data validity score calculation; v5 of the software uses a weighting system that is, in part, proportional to the volume of input components. The Grading Matrix was updated to reflect the new audit inputs and also to include clarifications and additions to the scale descriptions. The appearance of the software was updated in v5 to make the software more user-friendly and several new features were added to provide more feedback to the user. Notably, a dashboard tab has been added to provide more visual feedback on the water audit results and associated costs of Non-Revenue Water. A comments sheet was added to allow the user to track notes, comments and to cite sources used.



APPENDIX G

Conservation Tracking Model Summary

JUNE 2021
2020 URBAN WATER MANAGEMENT PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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SFPUC Conservation Tracking Model

Water and Energy Savings Specifications for Conservation Program Measures

David Mitchell, M.Cubed

Last Updated: 03-08-2021

SFPUC Conservation Tracking Model
Water and Energy Savings Specifications for Conservation Program Measures

Overview

The SFPUC Conservation Tracking Model is a tool developed to track conservation program activity, water savings, and costs and benefits for SFPUC's retail service area conservation programs. The model is a customized version of the Alliance for Water Efficiency's (AWE) Water Conservation Tracking Tool, an Excel-based water conservation tracking model with more than four hundred registered water utility users throughout North America. In 2014, the SFPUC customized the AWE Conservation Tracking Tool for its retail service area and began using it to forecast water savings from conservation measures.

The purpose of this Water and Energy Savings Specifications for Conservation Program Measures Technical Memorandum is to document the assumptions and methodologies used to estimate water savings for every measure in the SFPUC's Conservation Tracking Model and key updates made over time. This document reflects all measures with modeled water savings included in the Conservation Tracking Model, including measures the SFPUC implements now or plans to in the next five years, implemented in the past, and ones SFPUC has evaluated and not implemented and may or may not do so in the future. It does not reflect conservation measures the SFPUC provides or provided in the past that don't have established or sufficient water-savings methodologies.

History of SFPUC Conservation Forecast Modelling

The SFPUC developed its first model in 2004 to forecast both in-City retail water demands and water savings from conservation measures. The SFPUC used estimated conservation water savings generated by this model to develop its 2004 and 2011 conservation plans. The SFPUC migrated from using this combined demand/forecast model in 2014, and started using a separate econometric demand model developed by Brattle Group to estimate retail demands and to the SFPUC Conservation Tracking Model to estimate water savings from conservation measures. In 2020, the SFPUC updated its econometric demand model for its retail service area for use in preparing its 2020 Urban Water Management Plan and for providing updated demand estimates for its 2020 Retail Conservation Plan.

Model Structure

The Conservation Tracking Model is an Excel-based model with an extensive Visual Basic backend. Using the model requires completing Model Setup, Program Specification, and Annual Activity data input tasks. Each data input task is contained on a separate worksheet in the model.

Model Setup consists of providing the model with the baseline forecasts of population, housing units, and water demand, as well as other basic system information the model uses to calculate the costs and benefits of conservation programs. The baseline water demand forecast comes from the Brattle Group econometric demand models. The baseline population forecast is from the Association of Bay Area Governments (ABAG).

Program Specification consists of parameterizing the conservation programs in the model. The model can hold up to 75 separate programs. The model can be extended to hold more than 75 programs if needed. Program parameters are grouped into five categories: water saving parameters, utility cost parameters, participant cost parameters, participant non water benefits parameters, and plumbing code parameters. The latter are used to specify interaction effects with plumbing codes to avoid double counting water savings jointly produced by plumbing codes and conservation programs. In terms of forecasting conservation program water savings, the most important parameters are the water savings parameters and the plumbing code interaction parameters.

Annual Activity is simply the number of units of activity that have been done (in the case of historical years) or are expected to be done (in the case of future years). The user enters historical and projected annual activity for each conservation program that was specified during the Program Specification step. For toilets, urinals, and clothes washers, the model includes fixture inventory modules to keep track of how many fixtures have been converted to efficient fixtures due to plumbing codes and conservation programs to ensure the user does not specify levels of fixture replacement that are physically infeasible.

Once the three data input tasks have been completed the model results can be reviewed. Model results are summarized into three categories: (1) program water savings, (2) retail water demand, and (3) costs and benefits.

- Program water savings are the projected annual water savings from each specified conservation program through 2045. Results can be grouped by program category and customer class or shown individually.

- Retail demand results summarize the baseline annual demand forecast with plumbing code and conservation program adjustments through 2045. It is grouped by customer class and shown separately for the in-city and suburban parts of SFPUC's retail service area. Results can be shown in MGD or acre-feet. Gross per capita and residential per capita water use are also reported. In addition, projected per capita water use is compared to per capita water use targets under SBx7-7 and the MOU.

- Costs and benefits of conservation are reported for the utility and program participant perspectives. Unit costs, net present value, and benefit-cost ratios can be reported for the totality of all programs, for individual program categories (e.g. toilet replacement programs), or for individual programs. In addition to financial benefits and costs, the model calculates expected reductions in associated energy use and greenhouse gas emissions.

Model inputs can be saved as scenarios. This allows the model to simultaneously hold more than one set of data inputs. For example, a user could specify scenarios for alternative baseline population and demand forecasts or for alternative levels of conservation program investment. There is no practical limit to the number of scenarios the model can hold.

Summary of Key Updates since 2015

2015 Updates
The conservation program savings presented in SFPUC's 2011 Conservation Plan were developed with the SFPUC's original Retail Demand Model not the Conservation Tracking Model. While the Conservation Tracking Model can be calibrated to replicate the 2011 estimates, the final estimates developed for the 2015 Conservation Plan, which were developed with the Conservation Tracking Model, were generally lower after 2020 than what was presented in the 2011 Plan for three main reasons:

- The SFPUC undertook a review of the water saving estimates and assumptions and made several adjustments, including to savings estimates for clothes washers and toilets, both of which were lowered to account for new efficiency standards affecting the long-term savings potential of these programs.

- The 2015 Plan updated the end dates for toilet and clothes washer incentives due to high fixture saturation levels.
- The 2015 Plan focused mainly on the next five years, reflecting that beyond that horizon, there is much less certainty regarding what conservation programs SFPUC will find most beneficial and cost-effective to implement.

2020 Updates
In 2020, the SFPUC made the following changes to the model:

- Revised future participation levels for several measures to better reflect current trends.
- Added several new conservation measures.
- Adjusted the water savings assumptions of several existing measures.
- Updated the water savings module for clothes washer efficiency standards to align it with the approach used in Version 4 of the Alliance for Water Efficiency's Water Conservation Tracking Tool.
- Incorporated the City of San Francisco Planning Department's current population and housing estimates and projections.
- Removed the calculation of plumbing code water savings for new development (post 2020) because they are already embedded in SFPUC's updated retail demand projections.

These updates were based on analysis of historical program participation, updated fixture saturation rates, and new empirical and other water-savings studies and data available since 2015. This document reflects the assumptions and specifications used in the SFPUC's Conservation Tracking Model for purposes of estimating water savings for the SFPUC's 2020 Retail Conservation plan.

Updated Population and Housing Projections

Both population and housing estimates have changed since the 2015 version of the conservation model due to new assumptions about growth in the City of San Francisco. The City has a goal of increased housing development on the order of 5,000 new units per year. However, as described elsewhere in this TM, SFPUC expects new construction to be built at code and generate no additional passive savings. All future passive savings will come from existing stock. As such, population and housing estimates for 2020 were updated, as described below, and then held constant for the remainder of the planning horizon.

Population Projection Update

The City of San Francisco Planning Department provided an updated 2020 population of 941,269. Residential population in 2020 was estimated from total population by subtracting 3%, which represents population housed in group quarters. This value is based on historical estimates from 2011-2020 from Department of Finance E-5 Housing and Population Estimates (dated May 2020), as well as P-4 Household Projections for California Counties for 2020-2030 (dated June 2020).

The conservation model's original and updated population projections are shown in Table 1. As shown in this table, the population stops growing after 2020 to reflect no additional passive savings to be generated from future growth.

Table 1: Population Projection Update

Year	Total Population			Residential Population		
	2015 Model	2020 Model	% Difference	2015 Model	2020 Model	% Difference
2005	780,187	780,187	0.0%	756,678	756,678	0.0%
2010	805,235	805,235	0.0%	780,971	780,971	0.0%
2015	857,508	857,508	0.0%	831,995	831,995	0.0%
2020	890,400	941,269	5.7%	863,800	913,031	5.7%
2025	934,800	941,269	0.7%	906,800	913,031	0.7%
2030	981,800	941,269	-4.1%	952,500	913,031	-4.1%
2035	1,032,500	941,269	-8.8%	1,000,800	913,031	-8.8%
2040	1,085,700	941,269	-13.3%	1,051,100	913,031	-13.1%
2045	1,085,700	941,269	-13.3%	1,051,100	913,031	-13.1%
2050	1,085,700	941,269	-13.3%	1,051,100	913,031	-13.1%

Source: 2020 total population from San Francisco Planning Department, adjusted to residential population based on 3% group quarters (DOF E-5 and P-4)

Household Projection Update

The City of San Francisco Planning Department provided an estimate of total housing units as of 2020 to the SFPUC in October 2020. This value is assumed to be a projection of total constructed housing units as opposed to occupied housing units.

Occupied single-family housing units in 2020 were set equal to the number of single-family residential accounts in the SFPUC's billing system as of August 2020. This includes the number of accounts with the service agreement type residential single family (RES-SWTR), regardless of dwelling unit count, and the service agreement type of residential combination service (COMBO-R) with 1 dwelling unit. Occupied single-family housing units for 2025 and beyond were kept the same as 2020.

Total 2020 housing units from the Planning Department were adjusted to estimate occupied housing units using a vacancy rate of 8.26%, which is an average of the last five estimates provided by the ACS 5-year estimates for the City of San Francisco from 2015-2019 (ranging 7.7% to 8.9%). Total occupied multi-family housing units in 2020 were estimated by subtracting the number of occupied single-family housing units in 2020 from the total 2020 occupied housing units.

2015 housing units for both single- and multi-family were interpolated between values used previously for 2010 and the updated inputs for 2020.

The conservation model's original and updated projections for total, single-, and multi-family housing units are shown in Table 2. As shown in this table, the 2020 housing units stop growing after 2020 to reflect no additional passive savings to be generated from future growth.

Table 2: Housing Projection Update

Year	Total Occupied Housing Units			Occupied Single-Family Housing Units			Occupied Multi-Family Housing Units		
	2015 Model	2020 Model	% Difference	2015 Model	2020 Model	% Difference	2015 Model	2020 Model	% Difference
2005	335,054	335,054	0.0%	109,500	109,500	0.0%	225,554	225,554	0.0%
2010	345,811	345,811	0.0%	110,759	110,759	0.0%	235,052	235,052	0.0%
2015	366,540	356,070	-2.9%	113,687	111,231	-2.2%	252,853	244,840	-3.2%
2020	377,684	366,330	-3.0%	115,073	111,702	-2.9%	262,611	254,628	-3.0%
2025	393,630	366,330	-6.9%	116,475	111,702	-4.1%	277,155	254,628	-8.1%
2030	410,227	366,330	-10.7%	117,894	111,702	-5.3%	292,333	254,628	-12.9%
2035	426,235	366,330	-14.1%	119,331	111,702	-6.4%	306,904	254,628	-17.0%
2040	442,905	366,330	-17.3%	120,785	111,702	-7.5%	322,120	254,628	-21.0%
2045	442,905	366,330	-17.3%	120,785	111,702	-7.5%	322,120	254,628	-21.0%
2050	442,905	366,330	-17.3%	120,785	111,702	-7.5%	322,120	254,628	-21.0%

Source: 2020 total housing units provided by San Francisco Planning Department and adjusted to account for occupancy using average vacancy rate from ACS 5-year estimates from 2015-2019. Count of single-family units equal to 2020 count of SFPUC single-family water accounts served with remainder allocated to multi-family units.

Calculation of Plumbing Code Water Savings

The Conservation Tracking Model calculates the water savings associated with plumbing codes and appliance efficiency standards using models of fixture inventory coupled with usage assumptions. These savings are commonly referred to as passive water savings because they occur regardless of actions taken by the utility. The Tracking Model includes passive savings models for residential toilets, showerheads, and clothes washers, and non-residential toilets, urinals, hotel showerheads, and coin-op clothes washers.

It is important to emphasize that the passive savings estimates do not actually impact the model's estimates of final water demand. This is because the Brattle Group's baseline demand forecasts used in the Tracking Model are net of passive water savings. However, the Brattle forecast does not generate an explicit forecast of passive water savings because the adjustment for passive savings is enacted through the model's trend term. Because SFPUC desired explicit estimates of passive water savings, modules for estimating these savings were included in the Conservation Tracking Model. These estimates are added to the Brattle Group's baseline forecast before it is used in the model so that they can be represented explicitly. It is the Brattle Group's baseline forecast adjusted for passive savings that is entered on the Model Setup worksheet. The adjusted baseline forecast is:[1]

Adjusted Baseline Forecast = Brattle Baseline Forecast + Passive Water Savings

The final demand forecast generated by the Conservation Tracking Model is then:

[1] The passive water savings adjustment also includes water savings expected to be realized after 2015 from the historical implementation of SFPUC conservation programs prior to the start of the Brattle Group's baseline forecast. This is done to prevent the model from double counting these water savings.

Final Demand Forecast = Adjusted Baseline Forecast – Passive Water Savings – Program Water Savings

This is also equal to:

Final Demand Forecast = Brattle Baseline Forecast – Program Water Savings

This means the only determinants of the final demand forecast are the Brattle Baseline Forecast and the forecast of programmatic water savings from future implementation of SFPUC conservation programs. While the passive savings forecast is useful because it provides an estimate of how much demand reduction can be ascribed to plumbing codes and appliance standards, it does not actually affect the final estimate of future demand.

Following are descriptions of how passive savings are calculated for each fixture/appliance category. The SFPUC Plumbing Fixture Population and Efficiency Saturation Estimates Technical Memorandum issued on January 13, 2014 and included in Appendix A of the 2015 Retail Conservation Plan and the updated saturation estimates memo dated August 19, 2019, and included in appendices of the 2020 Retail Conservation Plan provide more details on fixture population and saturation estimates.

Residential Toilets

The population of residential toilets is based on SFPUC's forecasts of single and multi-family housing units. These forecasts are multiplied by the average number of toilets per dwelling unit, which are estimated from recent American Housing Survey data. The model uses an average of 2.22 and 1.26 toilets per dwelling unit for single and multi-family housing, respectively. Toilets installed in new housing constructed between 1991 and 2013 are assumed to be ULFT (1.6 gpf). Toilets installed in new housing constructed after 2013 are assumed to be HET (1.28 gpf). Toilets in existing housing constructed before 1991 are assumed to have an average flush volume of 3.5 gpf. Toilets in existing housing are assumed to be replaced at an annual rate of 3.1% per year. This is the average rate of residential toilet replacement reported in studies done by EBMUD and SCVWD. Existing toilets replaced between 1991 and 2013 are assumed to be replaced by ULFTs. Existing toilets replaced after 2013 are assumed to be replaced by HETs. Using this information, the model calculates the average flush volume for the inventory of new and existing toilets for each year between 1990 and 2064. Water savings per flush is calculated relative to the average flush volume in 1990. Average savings per flush is equal to the average flush volume in 1990 less the average flush volume in each year after 1990. Average savings per flush is multiplied by the estimated number of flushes per year to estimate annual water savings. The estimated number of flushes per year is equal to the residential population multiplied by the average daily per capita flush rate multiplied by 365. The residential population is derived from SFPUC's service area population forecasts. The average daily per capita flush rate of 4.8 is taken from the San Francisco Residential End Uses of Water Study.

Non-Residential Toilets

The population of non-residential toilets for the period 1990-2012 is taken from the Fixture Saturation Task Memo. The population of non-residential toilets for the period 2013-2064 is a linear extrapolation based on the forecast of service area population. The same assumptions used for residential toilets regarding flush volume of new toilets and replacement rate of existing toilets are used for non-residential toilets. The average flush volume of the toilet inventory and the water savings per flush relative to 1990 are calculated the same way as for residential toilets. Average savings per flush is multiplied by the estimated number of flushes per year to estimate annual water savings. Vickers (2001)

estimates annual flushes by multiplying daily flushes by a 260-day work year. Male workers are assumed to flush toilets (as opposed to urinals) an average of one time per day while female workers are assumed to flush toilets an average of three times per day. Male workers are assumed to comprise 54% of the labor force, per City of San Francisco (2009). Total employment is taken from SFPUC's employment forecast.

Non-Residential Urinals

Based on an analysis of DBI data, the ratio of urinals to toilets is estimated to be 0.15. This ratio is applied to the estimated stock of non-residential toilets to estimate the stock of urinals. Urinals installed before 1992 are assumed to have an average flush volume of 2 gpf. Urinals installed between 1992 and 2013 are assumed to have an average flush volume of 1 gpd. Urinals installed in 2014 are assumed to have a flush volume of 0.5 gpf. Urinals installed after 2014 are assumed to have a flush volume of 0.125 gpf. Urinals are assumed to have the same replacement rate as toilets. The average flush volume of the urinal inventory and the water savings per flush relative to 1990 are calculated the same way as for residential and commercial toilets. Average savings per flush is multiplied by the estimated number of flushes per year to estimate annual water savings. To calculate total flushes per year, male workers are assumed to have a daily flush rate of 2, per Vickers (2001). Male workers are assumed to comprise 54% of the labor force, per City of San Francisco (2009). Total employment is taken from SFPUC's employment forecast.

Residential Showerheads

The population of residential showerheads is based on SFPUC's forecasts of single and multi-family housing units. These forecasts are multiplied by the average number of showerheads per dwelling unit, which are estimated from recent American Housing Survey data. The model uses an average of 1.34 and 1.21 showerheads per dwelling unit for single and multi-family housing, respectively. Showerheads installed in new housing constructed before 2005 are assumed to have an average flow rate of 2.3 gpm. Showerheads installed in new housing constructed between 2005 and 2017 are assumed to have an average flow rate of 2.0 gpm. Showerheads installed after 2017 are assumed to have an average flow rate of 1.8 gpm. Showerheads in existing housing are assumed to be replaced at an annual rate of 12% per year, per the Alliance for Water Efficiency. Using this information, the model calculates the average showerhead flow rate for the inventory of new and existing showerheads for each year between 2005 and 2064. Average savings per minute is equal to the average flow rate in 2005 less the average flow rate in each year after 2005. Annual water savings is calculated as the product of the average flow rate and the annual number of minutes for showering. The annual number of minutes for showering is equal to the average number of shower events per household per day multiplied by the average shower duration in minutes multiplied by the number of households multiplied by 365. An average of 2 shower events per day and an average duration of 9 minutes per shower event are taken from the San Francisco Residential End Uses of Water Study.[2] The number of residential housing units is taken from SFPUC's housing forecast.

Hotel Showerheads

The population of hotel showerheads is based on an estimate of the total number of hotel rooms in San Francisco. The model assumes one showerhead per room. Showerheads installed before 2005 are

[2] The estimate of average number of shower events per day from the San Francisco Residential End Uses of Water Study is used directly in the single-family residential calculation. For the multi-family calculation, it is scaled by the ratio of multi-family to single-family persons per household to take into account the lower density in multi-family housing.

assumed to have an average flow rate of 2.5 gpm. Showerheads installed between 2005 and 2017 are assumed to have an average flow rate of 2.2 gpm. Showerheads installed after 2017 are assumed to have an average flow rate of 1.8 gpm. Showerheads are assumed to be replaced at an annual rate of 12% per year, per the Alliance for Water Efficiency. Using this information, the model calculates the average showerhead flow rate for the inventory of new and existing showerheads for each year between 2005 and 2064. Average savings per minute is equal to the average flow rate in 2005 less the average flow rate in each year after 2005. Annual water savings is calculated as the product of the average flow rate and the annual number of minutes for showering. The annual number of minutes for showering is equal to the average number of shower events per occupied room per day multiplied by the average shower duration in minutes multiplied by the number of occupied rooms multiplied by 365. An average of 1.34 shower events per day per occupied room and an average duration of 10 minutes per shower event are taken from the AWWARF Commercial End Uses of Water Study. The average hotel occupancy rate is based on a review of various estimates published on the internet of hotel occupancy in San Francisco.

Residential Clothes Washers

The stock of residential clothes washers is based on SFPUC's housing forecast and the average number of washers per dwelling unit. The average number of washers per dwelling unit is 0.937 for single-family and 0.41 for multi-family. The multi-family estimate includes both in-unit and common room washers. Existing washers are replaced at an annual rate of 9%, which is equivalent to assuming washers have an average useful life of 11 years, which is consistent with industry estimates. When a washer is replaced, it is replaced with either a conventional or high-efficiency (Energy Star) washer according to a forecast of market shares informed by market analyses done to support the setting of federal efficiency standards for washers. Water factors for new conventional and high-efficiency washers change over time in the model. Water factors for conventional washers are based on federal energy standards while water factors for high-efficiency washers are based on EPA Energy Star specifications. The average water factor for the stock of residential washers adjusts over the course of the forecast based upon the rate at which existing washers are replaced and new washers are added to the inventory. The model's accuracy in predicting water use by clothes washers is checked against water use benchmarks for 1997, 2007, and 2012 taken from residential end use studies. Washer utilization in single-family households is drawn from the San Francisco End Use of Water Study. Washer utilization in multi-family households scales down the single-family estimate to account for smaller average household size. Water savings are calculated relative to 2005 and are equal to the difference in water use assuming average washer efficiency in 2005 versus average washer efficiency in the forecast year.

Coin-op Clothes Washers

Estimates of passive water savings for coin-op clothes washers use the same methodology used for residential clothes washers. The natural replacement rate for coin-op washers is the average of estimates developed by the Alliance for Water Efficiency (11.1%) and the Department of Energy (13.3%). The stock of coin-op clothes washers is based on an internet search of coin-op washer facilities in San Francisco. The average number of washers per coin-op facility is taken from the Fixture Saturation Task Memo. The average number of loads per day is taken from a PG&E study of coin-op washer water and energy consumption. The water factors for new and replaced washers are based on existing federal efficiency regulations for commercial clothes washers.

Calculation of Programmatic Water Savings

The Conservation Tracking Model calculates the water savings associated with a program as the product of the estimated water savings per unit of activity and the amount of activity completed. These savings are commonly referred to as active water savings because they result from the utility's direct investment in conservation programs intended to reduce demand. In other words, the savings result from the utility's active pursuit of demand reduction.

In the Tracking Model, the user specifies a starting unit water savings for each program. The behavior and duration of the unit savings overtime can then be adjusted with the useful life, annual decay, and plumbing code interaction parameters. When the annual decay and plumbing code interaction parameters are both set to 0, annual savings is equal to the product of the initial unit savings and the amount of activity. Annual savings accrue until the measure's useful life is reached, after which annual savings are assumed to be zero. Thus given initial unit savings S_0, measure useful life u, and activity of A_s in year s, water savings in any year t ≥ s are:

$$S_t = A_s S_0 \; if \; t - s + 1 \leq u, 0 \; otherwise$$

When the annual decay parameter takes a value d in the range (0, 1], annual water savings in any year t ≥ s are:

$$S_t = A_s S_0 (1-d)^{t-s} \; if \; t - s + 1 \leq u, 0 \; otherwise$$

When the plumbing code interaction parameter takes a value p in the range (0, 1] and the plumbing code is in effect for any year t ≥ v, annual water savings in any year t ≥ s are:

$$S_t = \begin{cases} A_s S_0 \; if \; u \geq t - s + 1 \; and \; t < v \\ A_s (1-p)^{t-s} S_0 \; if \; t - s + 1 \leq u \; and \; t \geq v \\ 0 \; if \; t - s + 1 > u \end{cases}$$

When the plumbing code interaction parameter takes a value p in the range (0, 1], the plumbing code is in effect for any year t ≥ v, and the annual decay parameter takes a value d in the range (0, 1], annual water savings in any year t ≥ s are:

$$S_t = \begin{cases} A_s S_0 (1-d)^{t-s} \; if \; t - s + 1 \leq u \; and \; t < v \\ A_s (1-p)^{t-s} S_0 (1-d)^{t-s} \; if \; t - s + 1 \leq u \; and \; t \geq v \\ 0 \; if \; \; t - s + 1 > u \end{cases}$$

The specification of these parameters are based on current state and federal plumbing codes and appliance standards and findings from empirical evaluations of conservation program performance, as compiled by the California Urban Water Conservation Council (CUWCC) and Alliance for Water Efficiency (AWE). The specific data sources and assumptions used to create the water savings and plumbing code specifications for each program are provided in the remainder of this document.

The model's toilet fixture inventory modules for single- and multi-family toilets also estimate water savings from the City's toilet retrofit-on-resale ordinance that started in 2009. These estimates rest on two simplifying assumptions: (1) 3.5+ gpf toilets are uniformly distributed across the housing stock and

(2) each housing unit is equally likely to be put on the market for sale each year. Given these two assumptions, ROR toilet replacements in any year t ≥ 2009 are calculated as:

(Stock of 3.5+ gpf toilets at beginning of year – SFPUC toilet replacements) x housing resale rate

The model assumes ROR toilets are replaced with ULFTs prior to 2014 and HETs thereafter.

Program Water Savings Specifications

The remainder of this document presents the water savings specifications for each conservation measure included in the Conservation Tracking Model. Program specifications are grouped first by customer class and second by programs type.

Confidence in Estimates

The program water savings specifications utilize the best available information on water savings. Only measures with a sufficient level of confidence in the approach to estimating water-savings are included in the Tracking Model. The SFPUC implements a number of measures that are not included in the model that are likely to generate some water savings but for which there are insufficient empirical studies or standard engineering estimates to generate estimates with a reasonable level of confidence. For the measures included in the model there is a range of reliability of savings estimates. While all measures in the tool meet a base level of confidence, for established and widely deployed measures – e.g. toilet replacements -- there is strong empirical evidence on water savings from multiple empirical program evaluations. In other cases, less data is available or the program is so new that empirical performance data is limited or nonexistent. In these cases, the water savings estimates may be based on results of a single evaluation done elsewhere or they may be built up from utilization and flow rate assumptions – commonly referred to as engineering estimates.

A confidence score of 1, 2 and 3 is assigned to each program specification to indicate the level of confidence in the water savings specification. The confidence scores are subjective in the sense that they rely on professional judgement as to the quality and applicability of the data underlying the water savings specification.

Confidence Score	**Criteria**
1	Savings are based on well-designed empirical evaluations of program performance. The program is widely deployed by other water suppliers and water savings have been evaluated in multiple locations and contexts. Savings estimates are directly applicable or can reasonably be re-scaled to be applicable to SFPUC's service area.
2	Savings are based on simple empirics of program performance (e.g. a simple difference in means or difference-in-differences analysis). The program may not be widely deployed by other water suppliers and may not have been evaluated in multiple locations and contexts.
3	Empirical estimates of program performance are not available or are limited in their applicability to SFPUC's service area. Savings are based on engineering estimates relying on general

	assumptions about water use with and without the program intervention

Measure Summary Tables

The following tables summarize the measures in the model at the time of this update (August 2020). The tables provides:

- A brief description of each measure
- The unit savings estimate for the measure
- The basis for the estimate
- The expected annual water savings at the planned level of activity
- The confidence score for the water savings estimate

Link to Detailed Specifications

The measure IDs in the summary tables are hyperlinked to the measure's detailed specification. Ctr-clicking the specification ID will take the reader to the measure's detailed specification. Ctr-clicking the ID the detailed specification will take the reader back to the summary table.

Basis for Savings Estimates

The basis for the savings estimate is either:

Empirical Program Evaluations – the savings estimate is based on results from one or more empirical evaluations of water savings for similar programs. The empirical estimate may be adjusted to account for differences between the location(s) where the empirical evaluation was completed and SFPUC's service area. Such adjustments are explained in the measure's detailed specification.

Engineering Estimate – the savings estimate is based on assumptions about fixture/device utilization and the water-using properties of the existing and new fixture/device. Engineering estimates are generally less reliable than estimates based on empirical program evaluations.

Annual Savings Estimates

The annual savings estimates show the expected water savings from one year of planned annual activity. These savings would be expected to persist over the useful life of the measure. Savings for most measures are assumed to be stationary, meaning the model does not assume the savings will change significantly over its useful life. However, this assumption is not adopted for every measure. For example, the model assumes savings from surveys are not constant, but rather decrease with time. The estimates in the summary tables do not reflect these adjustments. Therefore, the estimates should be viewed as upper-bounds for measures whose savings are expected to decrease over time.

Single-Family Measures

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
S1	Mandatory CAP Audit	Free site evaluation required for single-family residents to participate in the SFPUC's Community Assistance Program (CAP) for discounted water and sewer rates. Identify inefficient plumbing fixtures and leaks and suggest improvements.	17.5 gpd	0	NA	Empirical Program Evaluations	Savings assumed to decay by 20% per year	2
S2	WaterWise Evaluation	Free indoor and outdoor site consultation: review consumption history, check plumbing fixtures and irrigation system components for leaks, determine fixture flow rates, recommend improvements, identify fixtures eligible for replacement through rebate programs, and provide standard repair parts for faulty toilets and free water-saving devices and materials. Customized report of findings sent to customer after visit.	17.5 gpd	500	9.8	Empirical Program Evaluations	Savings assumed to decay by 20% per year	2
S3a	Leak Alerts	SFPUC uses its AMI data to flag accounts that trigger continuous usage thresholds and alerts customers if a leak is suspected. SFPUC provides alerted customers with information on	0.7 gpd	109,000	85.5	Empirical Program Evaluations	Unit savings is per active Single-Family account	1

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
		how to check for and repair common leaks						
S3b	Custom Water Use Report	Report with customers' water use information, comparison of water to similar properties, and customized information on ways to save.	8.4 gpd	0	NA	Empirical Program Evaluations	Multiple empirical evaluations have found home water reports reduce water use by 5-6%. The model assumes 5.5%.	1
S4	1.5 GPM Showerhead Distribution	Up to two free showerheads (as part of measure S2 or in-person pickup from SFPUC) per household.	6.8 gpd	500	3.6	Empirical Program Evaluations	Based on empirical evaluation of bathroom retrofit programs completed in 2018. Assumes 54% installation rate	2
S5	1.5 GPM Showerhead Direct Install	Provides free installation of 1.5 gpm showerheads to single family residents. WaterWise Evaluation (S2) is a pre-requisite to this measure.	12.6 gpd	100	1.4	Empirical Program Evaluations	Based on empirical evaluation of bathroom retrofit programs completed in 2018	1

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
S6	HET Rebate	Cash rebates of up to $125 to replace old toilets (3.5 gpf or more) with approved HETs (1.28 gpf or less).	20.9 gpd	0	NA	Empirical Program Evaluations	Based on empirical evaluation of bathroom retrofit programs completed in 2018. Direct install savings reduced by 25% to account for rebates used to replace ULF toilets and program free-riders	2
S7	CAP Direct Install thru SFPUC Funding	Free installation of HETs (1.28 gpf) for single-family residents who are also CAP participants. Only 3.5 gpf toilets replaced except a small number of old, poorly performing 1.6s. **Pre-requisite:** Mandatory CAP Audits (Measure S1).	27.8 gpd	0	NA	Empirical Program Evaluations	Based on empirical evaluation of bathroom retrofit programs completed in 2018	1
S8	HET Direct Install (Non-CAP)	Same as measure S7 but is open to single-family residents who are not a CAP participant. Program did not start until 2016	27.8 gpd	206	6.4	Empirical Program Evaluations	Based on empirical evaluation of bathroom retrofit	1

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
							programs completed in 2018	
S9	HET Voucher	A voucher issued to eligible residents to replace their older toilets with HETs.	20.9 gpd	0	NA	Empirical Program Evaluations	Based on empirical evaluation of bathroom retrofit programs completed in 2018. Direct install savings reduced by 25% to account for rebates used to replace ULF toilets and program free-riders	2
S11	CEE Tier 3 Washer Rebate (WF 4.0)	Up to $100 rebate from SFPUC and $50 rebate from PG&E for a combined $150 rebate for a washer with 4 WF or lower.	10.2 gpd	0	NA	Engineering Estimate	Engineering estimate based on limited data on clothes washer market shares	3
S12	Energy Star Most Efficient Washer	Up to $100 rebate from SFPUC and $50 rebate from PG&E for a combined $150 rebate for a washer with 3.5 WF or lower.	11.6 gpd	80	1.0	Engineering Estimate	Engineering estimate based on limited data on clothes	3

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
	Rebate (WF 3.5)						washer market shares	
S16a	Rain Barrel Rebate	Subsidy program that discounts the purchase cost of rain barrel and provides training.	0.8 gpd	30	0.03	Engineering Estimate	60 gal capacity. Estimated with AWE Rain Barrel Harvest & Application Model	3
S16b	Rain Cistern Rebate	Subsidy program that discounts the purchase cost of cisterns and provides training.	2.4 gpd	15	0.04	Engineering Estimate	205 gal capacity. Estimated with AWE Rain Barrel Harvest & Application Model	3
S18	Weather-Based Irrigation Controller Rebate	Financial rebate towards purchase and installation of a weather-based irrigation controller that uses site specific data and adjusts the irrigation time depending on the local weather.	3.7 gpd	50	0.2	Empirical Program Evaluations	Estimate is based on review of empirical evaluations of WBIC savings in Southern and Northern CA	2
S20	Device Distribution	Various water-efficient fixtures: bathroom aerators (0.5/1.0/1.5 gpm), kitchen/bathroom laminar (1.5 gpm), kitchen aerators (1.5/2.2 gpm), utility aerators (1.5/2.0/2.2), pre-rinse spray nozzles, garden spray hose nozzles, toilet flappers, toilet fill valves, and soil moisture meters.	3.3 gpd	1600	5.9	Engineering Estimate	Based on review of end use studies and engineering estimates of savings potential of	3

Water and Energy Savings Specifications for Conservation Program Measures

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
							aerators and other devices	

Multi-Family Measures

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
M1	WaterWise Direct Installation Evaluation	Free, required site evaluation for multi-family residents to participate in the SFPUC's HET/Urinal Direct Install Program). Identify inefficient plumbing fixtures and leaks and suggest improvements.	10.6 gpd	206	2.4	Empirical Program Evaluations	Equal to indoor savings for S1 and S2. Savings assumed to decay by 20% per year	2
M2	WaterWise Evaluation	Free site consultation: review consumption history, check toilets for leaks, determine fixture flow rates, recommend improvements, identify fixtures eligible for replacement through rebate programs, provide standard repair parts for faulty toilets and free water-saving devices and materials.	10.6 gpd	500	5.9	Empirical Program Evaluations	Equal to indoor savings for S1 and S2. Savings assumed to decay by 20% per year	2
M3	Leak Alert	SFPUC uses its AMI data to flag 2-5 dwelling unit multi-family accounts that trigger continuous usage thresholds and alerts customers if a leak is suspected. SFPUC provides alerted customers with information on how to check for and repair common leaks	2 gpd	27,000	60.5	Empirical Program Evaluations	Unit savings applies to all Multi-Family customers with 2-5 dwelling units	1
M4	Showerhead Distribution	Buildings with 10 or less units are limited to one showerhead per unit. These buildings can pick up showerheads at the customer service counter. Also includes	6.8 gpd	700	5.3	Empirical Program Evaluations	Based on empirical evaluation of bathroom	2

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
		buildings that receive showerheads that are not installed during a Water Wise Evaluation. Buildings with over 10 units must schedule a WaterWise Evaluation (measure M2) in order to receive the free devices					retrofit programs completed in 2018. Assumes 54% installation rate	
M5	Showerhead Direct Install	Free installation of showerheads. **Pre-requisite:** WaterWise Direct Install Evaluations (Measure M1)	12.6 gpd	200	2.8	Empirical Program Evaluations	Based on empirical evaluation of bathroom retrofit programs completed in 2018	1
M6	HET Rebate	Cash rebates of up to $125 per tank-style HET or up to $300 per flushometer valve HET to replace a high-flow toilet (3.5 gpf or more).	30 gpd	0	NA	Empirical Program Evaluations	Based on empirical evaluation of bathroom retrofit programs completed in 2018. Direct install savings reduced by 25% to account for rebates used to replace ULF toilets and	2

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
							program free-riders	
M7	HET Direct Install	Free installation of tank-style (T) or flushometer valve (F) HETs. **Pre-requisite:** WaterWise Direct Install Evaluation (Measure M1)	38.6 gpd	300	13.0	Empirical Program Evaluations	Based on empirical evaluation of bathroom retrofit programs completed in 2018	1
M8	HET Voucher	A voucher issued to eligible residents to replace their older toilets with HETs	30 gpd	0	NA	Empirical Program Evaluations	Based on empirical evaluation of bathroom retrofit programs completed in 2018. Direct install savings reduced by 25% to account for rebates used to replace ULF toilets and program free-riders	2
M9	HET Install thru On-Bill Financing	Partner with third-party vendors to find customers with remaining savings opportunity, sell them the	38.6 gpd	0	NA	Empirical Program Evaluations	Based on empirical evaluation of	1

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
		program, and conduct the installation. The customer pays for the program through savings received through their water bill.					bathroom retrofit programs completed in 2018	
M10	CEE Tier 3 Washer Rebate (WF 4.0)	Rebate for coin-op, common area clothes washer with WF of 4 or lower. (multi-family in-unit residential style washers are covered under SF measure)	126 gpd	80	11.3	Engineering Estimate	Engineering estimate based on limited data on clothes washer market shares	3
M20	Device Distribution	Various water-efficient fixtures: bathroom aerators (0.5/1.0/1.5 gpm), kitchen/bathroom laminar (1.5 gpm), kitchen aerators (1.5/2.2 gpm), utility aerators (1.5/2.0/2.2), pre-rinse spray nozzles, garden spray hose nozzles, toilet flappers, toilet fill valves, and soil moisture meters.	3.3 gpd	2750	10.2	Engineering Estimate	Based on review of end use studies and engineering estimates of savings potential of aerators and other devices	3

Non-Residential Measures

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
N1	WaterWise Evaluations for Commercial Buildings	Free site consultation: review consumption history, check toilets for leaks, determine fixture flow rates, recommend improvements, identify fixtures eligible for replacement through incentive programs, provide standard repair parts for faulty toilets and free water-saving devices and materials. Customized report of findings sent after visit.	215 gpd	50	12.0	Empirical Program Evaluations	Based on empirical evaluations of CII surveys done in Southern California in the 1990s	3
N2	Commercial Direct Install Audits	Free site consultation similar to measure N1. Required for commercial buildings that applied for direct install programs.	215 gpd	0	NA	Empirical Program Evaluations	Based on empirical evaluations of CII surveys done in Southern California in the 1990s	3
N3	Surveys – Hospitals, Hotels, Schools	Free site consultation for hospitals, hotels, and schools	837 gpd	16	15.0	Empirical Program Evaluations	Based on empirical evaluations of CII surveys done in Southern California in the 1990s	3
N4	Surveys – Large Landscape by Contractors	Free landscape survey provided to eligible customers (0.5 acres or more of irrigated landscapes) under the Landscape Technical Assistance Program. Survey	161 gpd	30	5.4	Engineering Estimate	Unit savings per acre surveyed. Assumes 10% reduction in average landscape	3

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
		will evaluate the water delivery system to check for inefficiencies that lead to water losses, Surveyors will also determine the site's water budget by cataloguing plant type and will create site-specific recommendations and a cost estimate for improving irrigation efficiency.					site water use of 1.8 AF/Acre	
N5	Surveys – CII Facilities by Contractors	Free site consultation for other types of non-residential customers provided by third-party consultant or other funding sources.	5120 gpd	3	17.2	Engineering Estimate	SFPUC staff estimate of water savings from consultant audits	2
N7	1.5 GPM Showerhead Giveaway	Provides free, high-efficiency 1.5 gpm showerheads for San Francisco businesses.	5.6 gpd	300	1.9	Engineering Estimate	Based on review of hotel end use studies and engineering estimates of hotel showerhead savings potential. Assumes 54% installation rate	3
N8	1.5 GPM Showerhead Direct Install	Free installation of high-efficiency 1.5 gpm showerheads for San Francisco businesses. **Pre-requisite:** Direct Install Audit (Measure N2)	10.4 gpd	100	1.2	Engineering Estimate	Based on review of hotel end use studies and engineering estimates of hotel showerhead savings potential.	3
N9	Device Distribution	Various water-efficient fixtures: bathroom aerators (0.5/1.0/1.5 gpm),	3.3 gpd	700	2.6	Engineering Estimate	Based on review of end use studies and	3

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
		kitchen/bathroom laminar (1.5 gpm), kitchen aerators (1.5/2.2 gpm), utility aerators (1.5/2.0/2.2), pre-rinse spray nozzles, garden spray hose nozzles, toilet flappers, toilet fill valves, and soil moisture meters.					engineering estimates of savings potential of aerators and other devices	
N10	HET Rebate	Cash rebates of up to $125 per tank style toilet and up to $300 per flushometer valve toilet for replacing high-flow toilets (3.5 gpf or more) with approved HET models (1.28 gpf or less).	28.4 gpd	0	NA	Empirical Program Evaluations	Based on CUWCC CII Toilet Savings Study. Estimate scales-up ULFT savings to account for improved efficiency of HET	2
N11	HET Rebate – Schools, Hotels, Muni	Cash rebates of up to $125 per tank style toilet and up to $300 per flushometer valve toilet for replacing high-flow toilets (3.5 gpf or more) with approved HET models (1.28 gpf or less).	20.6 gpd	0	NA	Empirical Program Evaluations	Based on CUWCC CII Toilet Savings Study. Estimate scales-up ULFT savings to account for improved efficiency of HET	2
N12	HET Direct Install	Free installation of High-Efficiency Toilets for businesses in SF **Pre-requisite:** Direct Install Audit (Measure N2)	29 gpd	0	NA	Empirical Program Evaluations	Based on CUWCC CII Toilet Savings Study. Estimate scales-up ULFT savings to account for improved efficiency of HET	2

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
N13	HET Direct Install – Schools, Hotels	Free installation of HETs for schools or hotels in SF. **Pre-requisite:** Direct Install Audit (Measure N2)	19.6 gpd	0	NA	Empirical Program Evaluations	Based on CUWCC CII Toilet Savings Study. Estimate scales-up ULFT savings to account for improved efficiency of HET	2
N14	HET Voucher	A voucher for HET purchase.	28.4 gpd	0	NA	Empirical Program Evaluations	Based on CUWCC CII Toilet Savings Study. Estimate scales-up ULFT savings to account for improved efficiency of HET	2
N15	HET Voucher – Schools, Hotels	Same as N14 but directed at schools and hotels	17.8 gpd	0	NA	Empirical Program Evaluations	Based on CUWCC CII Toilet Savings Study. Estimate scales-up ULFT savings to account for improved efficiency of HET	2
N16	HET Install thru On-Bill Financing	Partner with third-party vendors to find customers with savings opportunity, sell them the program, and conduct the installation. The customer pays for the program through savings received through their water bill.	29 gpd	0	NA	Empirical Program Evaluations	Based on CUWCC CII Toilet Savings Study. Estimate scales-up ULFT savings to account for improved efficiency of HET	2

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
N17	HEU Rebate	Cash rebates of up to $300 per urinal for eligible commercial businesses when high flow urinals (1.5 gpf or more) are replaced with High-Efficiency Urinal (HEU) models that are 0.125 gpf or less.	16.2 gpd	0	NA	Empirical Program Evaluations	Based on CUWCC Urinal Savings Potential PBMP Study	3
N18	HEU Direct Install	A program for replacing 1.5 gallons per flush (gpf) high efficiency urinals with pint flush urinals.	16.2 gpd	0	NA	Engineering Estimate	Based on CUWCC Urinal Savings Potential PBMP Study	3
N20	Energy Star Washer Rebate (WF 4.5)	Measure has been discontinued. Cash rebates for commercial high-efficiency clothes washers with a water factor of 4.5 or below.	39 gpd	0	NA	Engineering Estimate	Engineering estimate based on limited data on clothes washer market shares and coin-op washer utilization rates	3
N21	Energy Star Washer Rebate (WF 4)	Cash rebates of up to $200 for commercial high-efficiency clothes washers with a water factor of 4.0 or below. For any business where 10 or more washers are being installed, a pre-purchase inspection must be scheduled.	45 gpd	40	2.0	Engineering Estimate	Engineering estimate based on limited data on clothes washer market shares and coin-op washer utilization rates	3
N22	Landscape Grants	Under Landscape Grant Program, landscapes with over 0.5 acre of irrigated areas are eligible to receive funding to implement retrofits and install	446 gpd/acre	11.2 acres (2 projects per year)	5.6	Empirical Program Evaluations	Based on SFPUC staff estimates of water savings for 11 large	2

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
		fixtures to facilitate water conservation.					landscape grant projects	
N24	Equipment Retrofit Rebate	Incentives to businesses to upgrade indoor equipment. Projects must achieve an annual water savings of 200 ccf or more to qualify. SFPUC will provide qualifying projects incentives of $0.50 per ccf over a 10-year lifespan up to 50% of the equipment costs. Program includes customized incentives as well as standard incentives for equipment with predictable water savings, such as water efficient ice machines, and connectionless food steamers.	2 gpd per dollar of grant funding	1 project (200 ccf/yr)	0.5		Minimum required savings per $1 of grant funding – e.g. if $100K awarded, expected savings would be 200,000 gpd	1
N25	Custom Equipment Retrofit Rebate	Similar to Measure N24, but allows applicants to create customized project tailored toward their specific business needs and water use patterns.	2 gpd per dollar of grant funding	1 project (200 ccf/yr)	0.5		Minimum required savings per $1 of grant funding – e.g. if $100K awarded, expected savings would be 200,000 gpd	1
N27	Kitchen Low Flow Spray Valves	Rebate or giveaway of high-efficiency kitchen spray valves used primarily by dishwashing stations	30 gpd	10	0.3	Empirical Program Evaluations	Based on multiple empirical evaluations of savings from kitchen spray-valve retrofits. Estimate assumes 50%	1

Water and Energy Savings Specifications for Conservation Program Measures

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
							installation/retention rate	

Measures Applicable to All Customers

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings	Notes on Savings Estimate	Water Savings Estimate Confidence Score
A3	Irrigation Customer Large Landscape Budget	The SFPUC calculates how water use for irrigated landscape sites that received an irrigation or landscape grant or were required to comply with San Francisco's Water Efficient Irrigation Ordinance (WEIO) compares to the maximum allowable water use (MAWA) recommended for the plant types per state calculations. Staff are exploring how to potentially expand the program to all sites served by dedicated irrigation meters	357 gpd	TBD	Engineering Estimate	Unit savings per acre surveyed. Assumes 10% reduction in average pre-grant water use of 4 AF/Acre for 9 large landscapes enrolled in SFPUC landscape grant program	3
S16a	Rain Barrel Rebate	Subsidy program that discounts the purchase cost of rain barrel and provides training.	0.8 gpd	See Single-Family Table	Engineering Estimate	Originally specified as a single-family measure, multi-family and non-residential customers also can participate in the program. Currently single-family customer account for about 80% of program participants with the	3

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings	Notes on Savings Estimate	Water Savings Estimate Confidence Score
						other 20% split more or less evenly between multi-family and non-residential customers	
S16b	Rain Cistern Rebate	Subsidy program that discounts the purchase cost of cisterns and provides training.	2.4 gpd	See Single-Family Table	Engineering Estimate	See previous note	3

ID	Name	Class	Category
A3	Irrigation Customer Landscape Budgets	Non Residential	Audits & Reports

Water Savings: Many water suppliers have adopted water budgets for their large landscapes, which provides an effective way for both managing and evaluating large landscape programs. Landscape budgets are a form of customer education/information designed to help customers irrigate landscape efficiently. The effectiveness of this intervention can vary significantly depending on existing water use practices, types of landscapes subject to budgets, types of customers receiving budgets, cost of water, etc. There have been several empirical evaluations of landscape budget performance. Cal WEP provides a good summary of these studies.

The impact of landscape education on compliance with water budgets was evaluated in Orange County, California in a 2004 study. The education component was targeted at landscape contractors and property managers at home-owner associations (HOAs). The results were based on the experience of 47 HOAs that had participated in the program up to that point. The impact evaluation concluded that early participants in the program reduced their water demand by 9%, later participants by 20% (the difference between early and later participants was not explained).

Several studies are available that examine the impact of budget-based rates on large landscape water use. An early study, published in 1997 showed that tiered rates tied to landscape water budgets can reduce irrigation demand by about 20-25%.

Cal WEP compiled data from 12 Bay Area retailers on actual water use versus budget for a sample of large landscapes. On average, actual use exceeded budgeted use by 33%. Cal WEP also compared budget exceedence by type of customer. It found budget exceedence was greatest for HOAs and commercial properties (excluding gold courses) and lowest for parks and schools. The average exceedence for HOAs and commercial was 23% and 34%, respectively; for parks and schools it was 10% and 5%, respectively.

This measure assumes budgets would reduce large landscape water use by 10%, on average. This is at the lower-end of the savings range from empirical studies and significantly less than the average budget exceedence for the sample of 12 Bay Area water agencies. A conservative savings assumption is deemed appropriate because:

- Parks and schools, which tend to have lower budge exceedence, comprise most of the large landscape area in SFPUC's retail service area.
- SFPUC's high retail water rates already discourage wasteful irrigation and landscape water use.
- SFPUC's cool summer climate results in lower irrigation application rates relative to other parts of California with dryer, hotter summer climates.

The average pre-grant irrigation application rate at large landscape sites participating in SFPUC's large landscape grant program is 4 AF/acre (see N22).

Savings = 4 AF/acre x 0.1 = 0.4 AF/acre (130,340 gpy/acre)

Plumbing Code Savings: NA

Plumbing Code NRR: NA

Annual Decay Rate: NA

Useful Life: 1 year

Peak Period Savings Percent: 100%

Unit Sewer Savings: 0

Unit Electricity Savings: NA

Unit Gas Savings: NA

Confidence Score: 3

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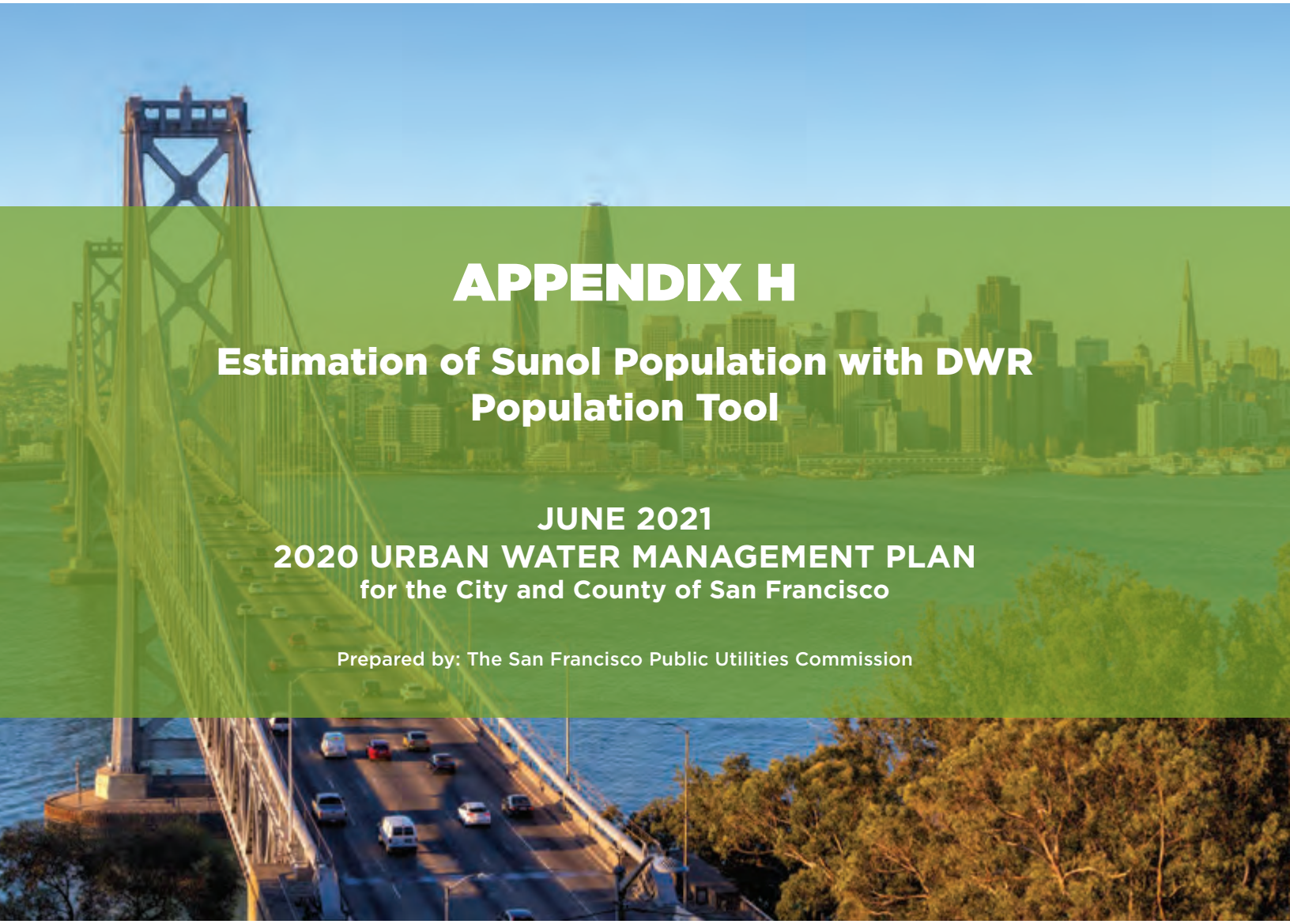

APPENDIX H

Estimation of Sunol Population with DWR Population Tool

JUNE 2021
2020 URBAN WATER MANAGEMENT PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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SFPUC 2020 UWMP Update

Population Estimate for the Town of Sunol

Appendix H

The DWR Population Tool was used in the development of the 2015 UWMP in order to estimate the population of the Town of Sunol, one of SFPUC's suburban retail customer. However, the results from the Population Tool in 2015 showed that the linear interpolation process of the tool was underestimating the population of the area. The Population Tool (see Population Tool results below) showed that estimated a 1.08 persons-per-connection in 2015, which is not representative of the area, based on the historical persons-per-connection of 4.75 in 2000 and of 2.30 in 2010. Based on SFPUC's understanding of the local population density, SFPUC consulted with DWR and it was determined that the 2010 persons-per-connection value could be applied to estimate the 2015 population.

For the 2020 UWMP, SFPUC sought guidance from DWR staff and since the local population density in the Town of Sunol has not changed significantly since 2015, DWR informed SFPUC that the use of the 2010 persons-per-connection value, previously used in the 2015 UWMP, was appropriate the 2020 UWMP. The 2010 persons-per-connection value is therefore applied to the updated 2020 number of connections to estimate the population for the Town of Sunol, for the calculation of the 2020 per capita water use target.
The 2020 population estimate is therefore 141 * 2.30 = 324.

This appendix includes the email correspondence with DWR about the 2020 UWMP and the results of the Population Tool analysis obtained during the preparation of the 2015 UWMP.

Gmail

Lara Egbeola-Martial <lara@srtconsultants.com>

Population Tool Estimates

Huff, Gwen@DWR <Gwen.Huff@water.ca.gov> Mon, Dec 14, 2020 at 12:21 PM
To: "lara@srtconsultants.com" <lara@srtconsultants.com>
Cc: "Ekstrom, Julia@DWR" <Julia.Ekstrom@water.ca.gov>

Lara -

Yes, you may modify the persons per connecĀon for the current year based on local knowledge of the popula. on.

In the UWMP, please describe the modifica. ons made and a jus fica on for the change.

Feel free to contact me if you have addiĀonal ques ons.

Sincerely,

Gwen

Gwen Huff
Re red Annuitant - Senior Environmental Scien st (Specialist)
gwen.huff@water.ca.gov
(916) 873-5923

From: Lara Egbeola-MarĀal <lara@srtconsultants.com>
Sent: Friday, December 11, 2020 2:33 PM
To: DWR Water Use Efficiency <wue@water.ca.gov>
Cc: Triolo, Sarah <STriolo@sfwater.org>; Lisa Pezzino <lisa@srtconsultants.com>
Subject: UWMP Update Ques on - Popula on Tool Es mates

Hi WUE Team,

My team and I at SRT Consultants are currently supporĀng the San Francisco Public UĀliĀes Commission (SFPUC) with the update of their 2020 UWMP.
I a ended the training session about the Popula on Tool on Tuesday this week and wanted to ask a case-specific ques on regarding the use of the tool.
The Popula on Tool facilitates the es ma on of the popula on for SFPUC's suburban retail customers that are located in the Town of Sunol. However, for the 2015 UWMP, the results from the Popula on Tool showed that the linear interpola on process of the tool was underes ma ng the popula on of the area (see document a ached - with a historical persons-per-connecĀon of 4.75 in 2000 and of 2.30 in 2010, the results showed an es mate of 1.08 persons-per-connecĀon for 2015, which is not representa ve of the area).
In 2015, SFPUC consulted with DWR staff, and it was determined that the 2010 persons-per-connecĀon value could be applied to es mate the 2015 popula on, considering the fact that the local popula on density had not changed much since 2010.

We are encountering a similar situa on for the 2020 UWMP. It is my understanding that with the same input data, the popula on es mates results from the tool for year 2020 are likely to underes mate the popula on again.
Since SFPUC expects that the local popula on density in the Town of Sunol has not changed significantly since 2015, we are considering using the same persons-per-connecĀon used in the 2015 Plan (based on the 2010 es mate) and apply it to the updated 2020 number of connecĀons to determine the popula on. We were hoping to get your feedback on this approach to es mate the popula on of a specific subset of SFPUC's retail customers for Chapter 5.

Thank you for your guidance,

Best,

--

Lara Egbeola-Martial, P.E.
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WUEdata - San Francisco City And County

Sign Out

Please print this page to a PDF and include as part of your UWMP submittal.

Confirmation Information

Generated By	Water Supplier Name	Confirmation #	Generated On
Winola Cheong	San Francisco City And County	8639310538	1/19/2016 9:11:45 PM

Boundary Information

Census Year	Boundary Filename	Internal Boundary ID
1990	Sunol_11Jan2016.kml	457
2000	Sunol_11Jan2016.kml	457
2010	Sunol_11Jan2016.kml	457

Baseline Period Ranges

10 to 15-year baseline period

2008 total water deliveries[1]:	425311	Hundred Cubic Feet (CCF)
2008 total volume of delivered recycled water[1]:	0	Hundred Cubic Feet (CCF)
2008 recycled water as a percent of total deliveries:	0.00%	
Number of years in baseline period[2]:	10	
Year beginning baseline period range:	2001	
Year ending baseline period range[3]:	2010	

5-year baseline period

Year beginning baseline period range:	2006
Year ending baseline period range[4]:	2010

[1] The selected units of measure must apply to both the 2008 total water deliveries and the 2008 total volume of delivered recycled water. If the water supplier records use different units of measure for these volumes, the user must make a conversion so that both volumes are in the same units of measure.

[2] If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period.

[3] The ending year must be between December 31, 2004 and December 31, 2010.

[4] The ending year must be between December 31, 2007 and December 31, 2010.

Persons per Connection

Year	Census Block Level Total Population	Number of Connections *	Persons per Connection
1990	198	69	2.87
1991	-	-	3.06
1992	-	-	3.25
1993	-	-	3.43
1994	-	-	3.62
1995	-	-	3.81
1996	-	-	4.00
1997	-	-	4.19
1998	-	-	4.37
1999	-	-	4.56
2000	328	69	4.75
2001	-	-	4.50
2002	-	-	4.26
2003	-	-	4.01
2004	-	-	3.77
2005	-	-	3.52
2006	-	-	3.28
2007	-	-	3.04
2008	-	-	2.79
2009	-	-	2.54
2010	237	103	2.30
2015	-	-	1.08

** Number of Connections may be either All Residential Connections (Single Family and Multi-Family combined) or All Service Connections. This will depend on the data available from the water supplier's records, but must remain consistent throughout the table.*

Population Using Persons-Per-Connection

Year		Number of Connections *	Persons per Connection	Total Population
10 to 15 Year Baseline Population Calculations				
Year 1	2001	63	4.50	**284**
Year 2	2002	67	4.26	**285**
Year 3	2003	71	4.01	**285**
Year 4	2004	75	3.77	**283**
Year 5	2005	79	3.52	**278**
Year 6	2006	83	3.28	**272**
Year 7	2007	89	3.04	**270**
Year 8	2008	93	2.79	**259**
Year 9	2009	94	2.54	**239**
Year 10	2010	103	2.30	**237**
5 Year Baseline Population Calculations				
Year 1	2006	83	3.28	**272**
Year 2	2007	89	3.04	**270**
Year 3	2008	93	2.79	**259**
Year 4	2009	94	2.54	**239**
Year 5	2010	103	2.30	**237**
2015 Compliance Year Population Calculations				
2015		112	1.08	**121**

** Number of Connections may be either All Residential Connections (Single Family and Multi-Family combined) or All Service Connections. This will depend on the data available from the water supplier's records, but must remain consistent throughout the table.*

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APPENDIX I

Energy Intensity Analysis

JUNE 2021
2020 URBAN WATER MANAGEMENT PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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Urban Water Supplier: *San Francisco Public Utilities Commission*

Water Delivery Product (If delivering more than one type of product use Table O-1C)

Other

Table O-1B: Recommended Energy Reporting - Total Utility Approach				
Enter Start Date for Reporting Period	7/1/2019	**Urban Water Supplier Operational Control**		
End Date	6/30/2020			
☐ Is upstream embedded in the values reported?		**Sum of All Water Management Processes**	**Non-Consequential Hydropower**	
Water Volume Units Used	*MG*	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process (volume unit)		*74132*		*74132*
Energy Consumed (kWh)		*-1242727474*		*-1242727474*
Energy Intensity (kWh/vol. converted to MG)		*-16763.7*	*#DIV/0!*	*-16763.7*

Quantity of Self-Generated Renewable Energy

kWh

Data Quality *(Estimate, Metered Data, Combination of Estimates and Metered Data)*

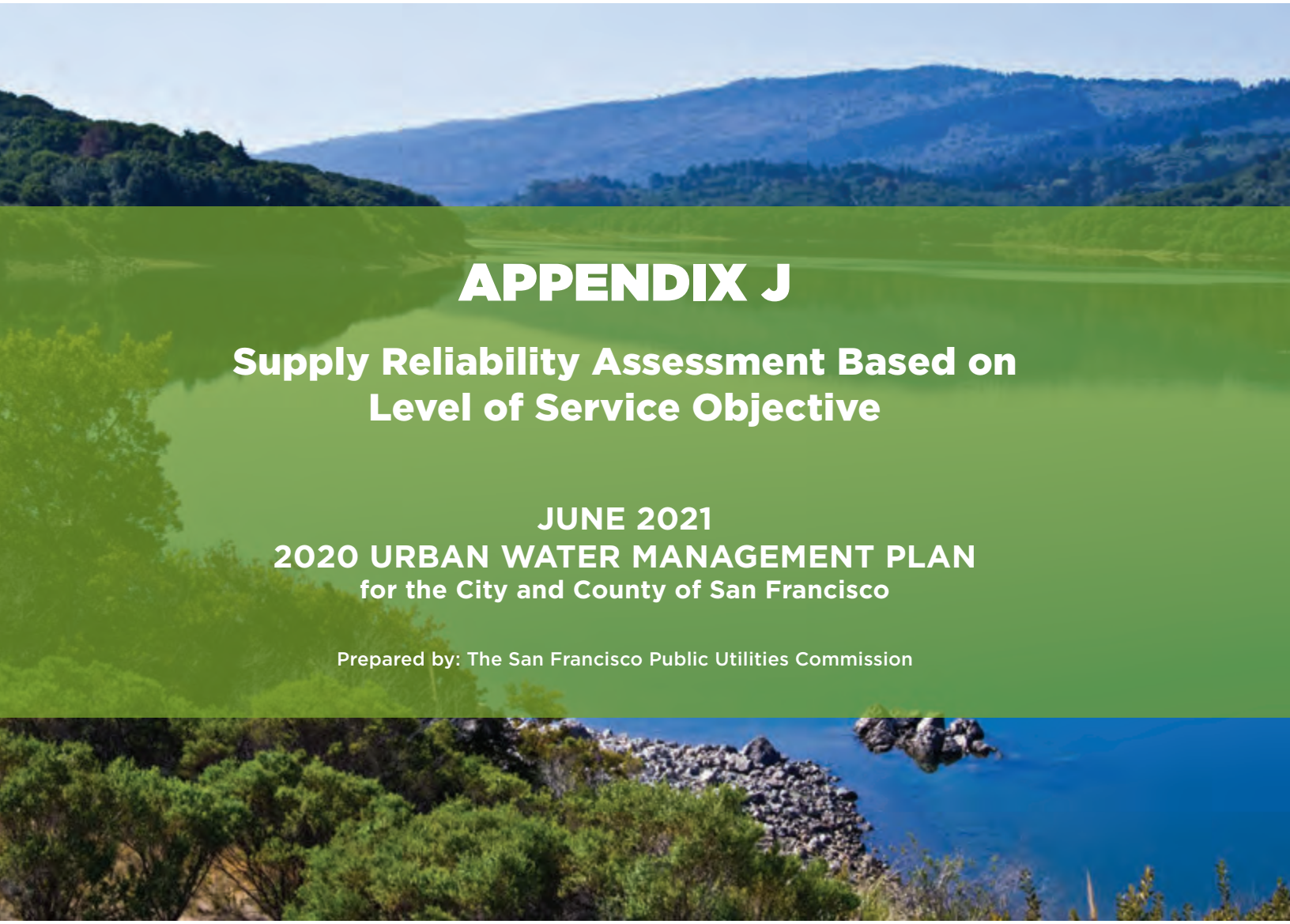
Metered Data

Data Quality Narrative:

The data reported covers FY2019-2020 (July 2019 to June 2020). The water production metering data includes the water supplied by the Regional Water System (RWS) to both retail and wholesale customers. The electricity usage data is based on billing records from meter data. The consequential hydroelectricity production data is based on metered data at the respective hydroelectric power houses. The energy intensity calculation focuses on water supplied by the RWS, since it is the main source of water supplied by SPFUC. In addition, the electricity consumed by other entities to produce recycled water is not included.
While the total volume of water delivered includes both retail and wholesale usage, SFPUC does not have access to electricity meter records for the electricity usage of its wholesale customers to distribute water within their own service areas, and is therefore not included in this analysis.
The data reported covers FY2019-2020 (July 2019 to June 2020). The water production metering data includes the water supplied by the Regional Water System (RWS) to both retail and wholesale customers. The electricity usage data is based on billing records from meter data. The consequential hydroelectricity production data is based on metered data at the respective hydroelectric power houses. The energy intensity calculation focuses on water supplied by the RWS, since it is the main source of water supplied by SPFUC. In addition, the electricity consumed by other entities to produce recycled water is not included.
While the total volume of water delivered includes both retail and wholesale usage, SFPUC does not have access to electricity meter records for the electricity usage of its wholesale customers to distribute water within their own service areas, and is therefore not included in this analysis.

Narrative:

As required, the amount of energy estimated includes the energy used to extract, convey, store, treat and distribute water, and also includes the consequential hydropower produced as a result of the water delivery. The Regional Water System (RWS) is almost entirely gravity-driven from its Sierra Reservoir to the Bay Area; no electricity is used for pumping at wholesale customer turnouts. Electricity usage taken into account in this analysis primarily represents pumping to off-stream storage in the Bay Area, in-city pumping for water distribution, and usage at the SFPUC's two water treatment plants (Sunol and Harry Tracy WTPs). The electricity usage also includes administrative and support facilities. The Hetch Hetchy Regional Power System is composed of three (3) hydroelectric powerhouses, which account of a total hydroelectric generating capacity of 385 MW: Moccasin Powerhouse, Kirkwood Powerhouse and Holm Powerhouse.



APPENDIX J

Supply Reliability Assessment Based on Level of Service Objective

JUNE 2021

2020 URBAN WATER MANAGEMENT PLAN

for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

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The SFPUC has a Level of Service objective to provide an annual average of 265 mgd in normal years, as well as a contractual obligation to provide 184 mgd to the Wholesale Customers in accordance with the Supply Assurance. In addition to the supply modeling presented in the main body of this UWMP, supply modeling was conducted to assess the SFPUC's ability to meet its Level of Service objective and contractual obligations.

As discussed in Section 7.1 of the UWMP, deliveries from the Regional Water System (RWS) to both retail and wholesale customers are limited to an average annual of 265 mgd for the watersheds. Current and projected supply available from the RWS is presented in Table J-1.

Table J-1. Regional Water System Supply Availability in Normal Years (mgd)

RWS Supply Allocation	Actual	Projected				
	2020	2025	2030	2035	2040	2045
Retail Customers[a, b]	81	81	81	81	81	81
Wholesale Customers[c, d]	184	184	184	184	184	184
Total RWS Supplies	265	265	265	265	265	265

a Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if these alternative supplies are not available, up to 81 mgd of RWS supply could be used in normal years.

b Groveland CSD is reported as a wholesale customer for the purposes of this 2020 UWMP, but it is considered a retail customer of the SFPUC solely for purposes of allocating RWS supplies between retail customers and Wholesale Customers. Its demands would be met by the retail supply allocation of 81 mgd.

c Projected Wholesale Customer deliveries are limited to 184 mgd. 184 mgd includes the demands of the Cities of San Jose and Santa Clara, which are supplied on a temporary and interruptible basis, with their total supply not exceeding 9 mgd assuming supply is available (decision to be made by end of 2028).

d Cordilleras MWC is not a party to the WSA, and it is not included in the wholesale supply allocation of 184 mgd. The demands of Cordilleras MWC are minor (projected to be less than 0.01 mgd) and are anticipated to be met with RWS supplies through 2045.

Supply modeling to assess whether SFPUC can meet its Level of Service objective of providing an annual average of 265 mgd in normal years, with no greater than 20% rationing in extended droughts, was conducted using the same methodology described in Section 8.2. The level of demand assumed for the HHLSM model was 265 mgd. For RWS supplies, supply modeling both with and without the implementation of the Bay-Delta Plan Amendment is included here. The two modeled scenarios show significantly different supply reliability projections for the RWS:

- With Full Implementation of the Bay-Delta Plan Amendment: Under the Bay-Delta Plan Amendment conditions, it is anticipated that the RWS supplies will experience a reduction of up to 55% through the multiple dry-year sequence. The implementation of the Alternative Water Supply Program and associated potential projects will help reduce the anticipated supply shortfalls.
- Without Implementation of the Bay-Delta Plan Amendment: In this scenario, the SFPUC system can expect to experience RWS supply reductions of at least 10% to 20% in a sequence of multiple dry years. Implementation of WSIP dry-year supply projects (see Section 7.1.2) will improve the SFPUC's water supply reliability, particularly in the earlier years of the design drought. However, in extended drought periods, the SFPUC will continue to experience multiple years of 10% to 20% reductions in RWS supply.

The supply modeling results are compared to retail demand projections and Wholesale Customer contractual obligations in Table J-3 through J-6 below.

Table J-2. Water Supply Availability During Normal and Dry Years – With and Without Bay-Delta Plan Amendment

Water Supply	Normal Year[a]	Single Dry Year	Multiple Dry Years				
			Year 1	Year 2	Year 3	Year 4	Year 5
Projected Years 2025 through 2045 (post-WSIP completion) – **With** Bay-Delta Plan Amendment							
RWS[b]	100%	50%	50%	45%	45%	45%	45%
Local Groundwater[c]	100%	100%	100%	100%	100%	100%	100%
Local Recycled Water[c]	100%	100%	100%	100%	100%	100%	100%
Projected Years 2025 through 2045 (post-WSIP completion) – **Without** Bay-Delta Plan Amendment							
RWS[b]	100%	90%	90%	90%	90%	80%	80%
Local Groundwater[c]	100%	100%	100%	100%	100%	100%	100%
Local Recycled Water[c]	100%	100%	100%	100%	100%	100%	100%

Normal, single dry, and multiple dry year conditions are on a water year basis. Dry year availability is presented in terms of percentage of normal year availability.

a For RWS, normal year is defined relative to Table J-1 above, in which 265 mgd of RWS supply is available.

b RWS supplies are available to meet both retail and wholesale demands.

c Local supplies are available only to meet retail demands.

Table J-3. Retail Supply and Demand Comparison for Projected Normal and Dry Year Scenarios, With Bay-Delta Plan Amendment

Year	Retail Supply and Demand	Normal Year	Single Dry Year[a]	Multiple Dry Years				
				Year 1[a]	Year 2[b]	Year 3[b]	Year 4[b]	Year 5[b]
2025	Total Retail Demand	70.7	70.7	70.7	70.7	70.7	70.7	70.7
	Baseline Retail Demand[c]	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*
	WSA 5% Demand Reduction Requirement[d]	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	84.5	53.2	53.2	48.2	48.2	48.2	48.2
	Retail Groundwater[e]	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*
	Retail Recycled Water[f]	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*
	RWS Supply Available to Retail[g]	*81.0*	*49.7*	*49.7*	*44.7*	*44.7*	*44.7*	*44.7*
	Difference (Supply Surplus or Shortfall)	13.8	-17.5	-17.5	-22.5	-22.5	-22.5	-22.5
	Difference as Percentage of Demand	19.5%	-24.8%	-24.8%	-31.8%	-31.8%	-31.8%	-31.8%
2030	Total Retail Demand	72.4	72.4	72.4	72.4	72.4	72.4	72.4
	Baseline Retail Demand[c]	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*
	WSA 5% Demand Reduction Requirement[d]	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	87.9	56.6	56.6	51.6	51.6	51.6	51.6
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Available to Retail[g]	*81.0*	*49.7*	*49.7*	*44.7*	*44.7*	*44.7*	*44.7*
	Difference (Supply Surplus or Shortfall)	15.5	-15.8	-15.8	-20.8	-20.8	-20.8	-20.8
	Difference as Percentage of Demand	21.4%	-21.8%	-21.8%	-28.7%	-28.7%	-28.7%	-28.7%
2035	Total Retail Demand	74	74	74	74	74	74	74

	Baseline Retail Demand[c]	*74.4*	*74.4*	*74.4*	*74.4*	*74.4*	*74.4*	*74.4*
	WSA 5% Demand Reduction Requirement[d]	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	87.9	56.6	56.6	51.6	51.6	51.6	51.6
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Available to Retail[g]	*81.0*	*49.7*	*49.7*	*44.7*	*44.7*	*44.7*	*44.7*
	Difference (Supply Surplus or Shortfall)	13.5	-17.8	-17.8	-22.8	-22.8	-22.8	-22.8
	Difference as Percentage of Demand	18.1%	-23.9%	-23.9%	-30.6%	-30.6%	-30.6%	-30.6%
2040	Total Retail Demand	77.3	77.3	77.3	77.3	77.3	77.3	77.3
	Baseline Retail Demand[c]	*77.3*	*77.3*	*77.3*	*77.3*	*77.3*	*77.3*	*77.3*
	WSA 5% Demand Reduction Requirement[d]	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	87.9	56.6	56.6	51.6	51.6	51.6	51.6
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Available to Retail[g]	*81.0*	*49.7*	*49.7*	*44.7*	*44.7*	*44.7*	*44.7*
	Difference (Supply Surplus or Shortfall)	10.6	-20.7	-20.7	-25.7	-25.7	-25.7	-25.7
	Difference as Percentage of Demand	13.7%	-26.8%	-26.8%	-33.2%	-33.2%	-33.2%	-33.2%
2045	Total Retail Demand	80.6	80.6	80.6	80.6	80.6	80.6	80.6
	Baseline Retail Demand[c]	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*
	WSA 5% Demand Reduction Requirement[d]	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	87.9	56.6	56.6	51.6	51.6	51.6	51.6
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Available to Retail[g]	*81.0*	*49.7*	*49.7*	*44.7*	*44.7*	*44.7*	*44.7*
	Difference (Supply Surplus or Shortfall)	7.3	-24.0	-24.0	-29.0	-29.0	-29.0	-29.0
	Difference as Percentage of Demand	9.1%	-29.8%	-29.8%	-36.0%	-36.0%	-36.0%	-36.0%

Normal, single dry, and multiple dry year conditions are on a water year basis.

a During a single dry year and multiple dry year 1, a system-wide shortage of 50% is in effect. For this analysis, a 50% shortage is considered equivalent to the maximum Stage 4, 16-20% system-wide shortage. Under the WSAP, the retail supply allocation at this stage of shortage is 36.0% of available RWS supply, or 49.7 mgd.

b During multiple dry years 2 to 5, a system-wide shortage of 55% is in effect. For this analysis, a 55% shortage is considered equivalent to the maximum Stage 4, 16-20% system-wide shortage. Under the WSAP, the retail supply allocation at this stage of shortage is 37.5% of available RWS supply, or 44.7 mgd.

c Total retail demands correspond to those in Table 4-1, and reflect active conservation, onsite water reuse savings as well as water loss. Demands for Groveland CSD is included in the table above. However, in the corresponding standardized tables in Appendix B, Groveland CSD is accounted for as a wholesale customer instead of a retail customer, as explained in Section 2.4.

d As amended in 2018, the WSAP Tier One Allocation Plan requires retail customers to conserve a minimum of 5% during droughts. If retail demands on the Regional Water System are lower than the retail allocation in a dry year, retail demands on the RWS will be reduced by 5%. An N/A on this row means that either this 5% rationing requirement doesn't apply, or retail customers are already rationing greater than 5%.

e Groundwater supplies are assumed to be equivalent to projected demands for the San Francisco Groundwater Supply Project (4.0 mgd by 2030) and Castlewood CSA (0.4 mgd). Groundwater availability would not be affected by dry year conditions.

f Recycled water supplies are assumed to be equivalent to projected demands related to the Westside Recycled Water Project (1.6 mgd by 2021 and 1.8 mgd by 2030), Harding Park and Fleming Golf Courses (0.23 mgd), and Sharp Park Golf Course (up to 0.1 mgd) and Treasure Island (0.2 mgd by 2025 and 0.4 mgd by 2030). Recycled water availability would not be affected by dry year conditions.

g Procedures for RWS allocations and the WSAP are described in Section 8.3. Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, in normal years, if groundwater and recycled water supplies are not available, up to 81 mgd of RWS supply could be used.

Table J-4. Retail Supply and Demand Comparison for Projected Normal and Dry Year Scenarios, Without Bay-Delta Plan Amendment

Year	Retail Supply and Demand	Normal Year	Single Dry Year[a]	Multiple Dry Years				
				Year 1[a]	Year 2[b]	Year 3[b]	Year 4[b]	Year 5[b]
2025	Total Retail Demand	70.7	67.2	67.2	67.2	67.2	67.2	67.2
	Baseline Retail Demand[c]	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*
	WSA 5% Demand Reduction Requirement[d]	*N/A*	*-3.5*	*-3.5*	*-3.5*	*-3.5*	*-3.5*	*-3.5*
	Total Retail Supply	84.5	84.5	84.5	84.5	84.5	83.0	83.0
	Retail Groundwater[e]	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*
	Retail Recycled Water[f]	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*
	RWS Supply Available to Retail[g]	*81.0*	*81.0*	*81.0*	*81.0*	*81.0*	*79.5*	*79.5*
	Difference (Supply Surplus or Shortfall)	13.8	17.3	17.3	17.3	17.3	15.8	15.8
	Difference as Percentage of Demand	19.5%	25.8%	25.8%	25.8%	25.8%	23.6%	23.6%
2030	Total Retail Demand	72.4	68.8	68.8	68.8	68.8	68.8	68.8
	Baseline Retail Demand[c]	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*
	WSA 5% Demand Reduction Requirement[d]	*0*	*-3.6*	*-3.6*	*-3.6*	*-3.6*	*-3.6*	*-3.6*
	Total Retail Supply	87.9	87.9	87.9	87.9	87.9	86.4	86.4
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Available to Retail[g]	*81.0*	*81.0*	*81.0*	*81.0*	*81.0*	*79.5*	*79.5*
	Difference (Supply Surplus or Shortfall)	15.5	19.1	19.1	19.1	19.1	17.6	17.6
	Difference as Percentage of Demand	21.4%	27.8%	27.8%	27.8%	27.8%	25.6%	25.6%
2035	Total Retail Demand	74	71	71	71	71	71	71
	Baseline Retail Demand[c]	*74.4*	*74.4*	*74.4*	*74.4*	*74.4*	*74.4*	*74.4*
	WSA 5% Demand Reduction Requirement[d]	*0*	*-3.7*	*-3.7*	*-3.7*	*-3.7*	*-3.7*	*-3.7*
	Total Retail Supply	87.9	87.9	87.9	87.9	87.9	86.4	86.4
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Available to Retail[g]	*81.0*	*81.0*	*81.0*	*81.0*	*81.0*	*79.5*	*79.5*
	Difference (Supply Surplus or Shortfall)	13.5	17.2	17.2	17.2	17.2	15.7	15.7
	Difference as Percentage of Demand	18.1%	24.4%	24.4%	24.4%	24.4%	22.2%	22.2%
2040	Total Retail Demand	77.3	73.4	73.4	73.4	73.4	73.4	73.4
	Baseline Retail Demand[c]	*77.3*	*77.3*	*77.3*	*77.3*	*77.3*	*77.3*	*77.3*
	WSA 5% Demand Reduction Requirement[d]	*0*	*-3.9*	*-3.9*	*-3.9*	*-3.9*	*-3.9*	*-3.9*
	Total Retail Supply	87.9	87.9	87.9	87.9	87.9	86.4	86.4
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Available to Retail[g]	*81.0*	*81.0*	*81.0*	*81.0*	*81.0*	*79.5*	*79.5*
	Difference (Supply Surplus or Shortfall)	10.6	14.5	14.5	14.5	14.5	13.0	13.0
	Difference as Percentage of Demand	13.7%	19.7%	19.7%	19.7%	19.7%	17.7%	17.7%

2045	Total Retail Demand	80.6	76.6	76.6	76.6	76.6	76.6	76.6
	Baseline Retail Demand[c]	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*
	WSA 5% Demand Reduction Requirement[d]	*0*	*-4.0*	*-4.0*	*-4.0*	*-4.0*	*-4.0*	*-4.0*
	Total Retail Supply	87.9	87.9	87.9	87.9	87.9	86.4	86.4
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Available to Retail[g]	*81.0*	*81.0*	*81.0*	*81.0*	*81.0*	*79.5*	*79.5*
	Difference (Supply Surplus or Shortfall)	7.3	11.3	11.3	11.3	11.3	9.8	9.8
	Difference as Percentage of Demand	9.1%	14.8%	14.8%	14.8%	14.8%	12.8%	12.8%

Normal, single dry, and multiple dry year conditions are on a water year basis.

a During a single dry year and multiple dry years 1 to 3, a system-wide shortage of 10% is in effect. Under the WSAP, the retail supply allocation at this stage of shortage is 36.0% of available RWS supply, or 85.9 mgd. However, due to the Phased WSIP Variant, only 81 mgd of RWS supply can be delivered.

b During multiple dry years 4 and 5, a system-wide shortage of 20% is in effect. Under the WSAP, the retail supply allocation at this stage of shortage is 37.5% of available RWS supply, or 79.5 mgd. RWS supply is capped at this amount.

c Total retail demands correspond to those in Table 4-1, and reflect active conservation, onsite water reuse savings as well as water loss. Demands from Groveland CSD are included in the table above. However, in the corresponding standardized tables in Appendix B, Groveland CSD is accounted for as a wholesale customer instead of a retail customer, as explained in Section 2.4.

d As amended in 2018, the WSAP Tier One Allocation Plan requires retail customers to conserve a minimum of 5% during droughts. If retail demands on the Regional Water System are lower than the retail allocation in a dry year, retail demands on the RWS will be reduced by 5%. An N/A on this row means that either this 5% rationing requirement doesn't apply, or retail customers are already rationing greater than 5%.

e Groundwater supplies are assumed to be equivalent to projected demands for the San Francisco Groundwater Supply Project (4.0 mgd by 2030) and Castlewood CSA (0.4 mgd). Groundwater availability would not be affected by dry year conditions.

f Recycled water supplies are assumed to be equivalent to projected demands related to the Westside Recycled Water Project (1.6 mgd by 2021 and 1.8 mgd by 2030), Harding Park and Fleming Golf Courses (0.23 mgd), and Sharp Park Golf Course (up to 0.1 mgd) and Treasure Island (0.2 mgd by 2025 and 0.4 mgd by 2030). Recycled water availability would not be affected by dry year conditions.

g Procedures for RWS allocations and the WSAP are described in Section 8.3. Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if groundwater and recycled water supplies are not available, up to 81 mgd of RWS supply could be used.

Table J-5. Wholesale Supply and Demand Comparison for Projected Normal and Dry Year Scenarios with Bay-Delta Plan Amendment (mgd)

Year	Wholesale Supply and Demand	Normal Year	Single Dry Year[a]	Multiple Dry Years[a]				
				Year 1	Year 2	Year 3	Year 4	Year 5
2025	Total Wholesale Demand[b]	184.0	184.0	184.0	184.0	184.0	184.0	184.0
	Total Wholesale RWS Supply[c]	184.0	82.8	82.8	74.5	74.5	74.5	74.5
	Difference (Surplus or Shortfall)	-0.0	-101.2	-101.2	-109.5	-109.5	-109.5	-109.5
	Difference as % of Demand	0.0%	-55.0%	-55.0%	-59.5%	-59.5%	-59.5%	-59.5%
2030	Total Wholesale Demand[b]	184.0	184.0	184.0	184.0	184.0	184.0	184.0
	Total Wholesale RWS Supply[c]	184.0	82.8	82.8	74.5	74.5	74.5	74.5
	Difference (Surplus or Shortfall)	-0.0	-101.2	-101.2	-109.5	-109.5	-109.5	-109.5
	Difference as % of Demand	0.0%	-55.0%	-55.0%	-59.5%	-59.5%	-59.5%	-59.5%
2035	Total Wholesale Demand[b]	184.0	184.0	184.0	184.0	184.0	184.0	184.0
	Total Wholesale RWS Supply[c]	184.0	82.8	82.8	74.5	74.5	74.5	74.5
	Difference (Surplus or Shortfall)	-0.0	-101.2	-101.2	-109.5	-109.5	-109.5	-109.5
	Difference as % of Demand	0.0%	-55.0%	-55.0%	-59.5%	-59.5%	-59.5%	-59.5%
2040	Total Wholesale Demand[b]	184.0	184.0	184.0	184.0	184.0	184.0	184.0
	Total Wholesale RWS Supply[c]	184.0	82.8	82.8	74.5	74.5	74.5	74.5
	Difference (Surplus or Shortfall)	-0.0	-101.2	-101.2	-109.5	-109.5	-109.5	-109.5
	Difference as % of Demand	0.0%	-55.0%	-55.0%	-59.5%	-59.5%	-59.5%	-59.5%
2045	Total Wholesale Demand[b]	184.0	184.0	184.0	184.0	184.0	184.0	184.0
	Total Wholesale RWS Supply[c]	184.0	82.8	82.8	74.5	74.5	74.5	74.5
	Difference (Surplus or Shortfall)	-0.0	-101.2	-101.2	-109.5	-109.5	-109.5	-109.5
	Difference as % of Demand	0.0%	-55.0%	-55.0%	-59.5%	-59.5%	-59.5%	-59.5%

Normal, single dry, and multiple dry year conditions are on a water year basis.

Groveland CSD is not accounted for as a wholesale customer for the purpose of this table.

a The WSA does not define a percentage split above a 20% shortage level. The same split as a 20% shortage level is assumed, and the Wholesale Customers are therefore allocated 62.5%.

b Total wholesale demands correspond to those in Table 4-3 of the UWMP. It is assumed that projected Wholesale Customer demands are limited to the Supply Assurance of 184 mgd. The 184 mgd assumes that San Jose and Santa Clara remain temporary, interruptible customers.

c Procedures for RWS allocations and the WSAP are described in Section 8.3.

Table J-6. Wholesale Supply and Demand Comparison for Projected Normal and Dry Year Scenarios Without Bay Delta Plan (mgd)

Year	Wholesale Supply and Demand	Normal Year	Single Dry Year[a]	Multiple Dry Years				
				Year 1[a]	Year 2[a]	Year 3[a]	Year 4[b]	Year 5[b]
2025	Total Wholesale Demand[c]	184.0	184.0	184.0	184.0	184.0	184.0	184.0
	Total Wholesale RWS Supply[d]	184.0	157.5	157.5	157.5	157.5	132.5	132.5
	Difference (Surplus or Shortfall)	-0.0	-26.5	-26.5	-26.5	-26.5	-51.5	-51.5
	Difference as % of Demand	0.0%	-14.4%	-14.4%	-14.4%	-14.4%	-28.0%	-28.0%
2030	Total Wholesale Demand[c]	184.0	184.0	184.0	184.0	184.0	184.0	184.0
	Total Wholesale RWS Supply[d]	184.0	157.5	157.5	157.5	157.5	132.5	132.5
	Difference (Surplus or Shortfall)	-0.0	-26.5	-26.5	-26.5	-26.5	-51.5	-51.5
	Difference as % of Demand	0.0%	-14.4%	-14.4%	-14.4%	-14.4%	-28.0%	-28.0%
2035	Total Wholesale Demand[c]	184.0	184.0	184.0	184.0	184.0	184.0	184.0
	Total Wholesale RWS Supply[d]	184.0	157.5	157.5	157.5	157.5	132.5	132.5
	Difference (Surplus or Shortfall)	-0.0	-26.5	-26.5	-26.5	-26.5	-51.5	-51.5
	Difference as % of Demand	0.0%	-14.4%	-14.4%	-14.4%	-14.4%	-28.0%	-28.0%
2040	Total Wholesale Demand[c]	184.0	184.0	184.0	184.0	184.0	184.0	184.0
	Total Wholesale RWS Supply[d]	184.0	157.5	157.5	157.5	157.5	132.5	132.5
	Difference (Surplus or Shortfall)	-0.0	-26.5	-26.5	-26.5	-26.5	-51.5	-51.5
	Difference as % of Demand	0.0%	-14.4%	-14.4%	-14.4%	-14.4%	-28.0%	-28.0%
2045	Total Wholesale Demand[c]	184.0	184.0	184.0	184.0	184.0	184.0	184.0
	Total Wholesale RWS Supply[d]	184.0	157.5	157.5	157.5	157.5	132.5	132.5
	Difference (Surplus or Shortfall)	-0.0	-26.5	-26.5	-26.5	-26.5	-51.5	-51.5
	Difference as % of Demand	0.0%	-14.4%	-14.4%	-14.4%	-14.4%	-28.0%	-28.0%

Normal, single dry, and multiple dry year conditions are on a water year basis.

Groveland CSD is not accounted for as a wholesale customer for the purpose of this table.

a Single dry year and multiple dry years 1 to 3 reflect a system-wide shortage of 10%. Under the WSAP, the wholesale supply allocation at this stage of shortage is 64.0% of available RWS supply, or 152.6 mgd. Retail allocation is 36%, or 85.9 mgd; retail allocations above 81 mgd are re-allocated to Wholesale Customers, per the 2018 WSA. 4.9 mgd is added to the wholesale allocation, bringing it to 157.5 mgd.

b Multiple dry years 4 and 5 reflect a system-wide shortage of 20%. Under the WSAP, wholesale supply allocation at this stage of shortage is 62.5% of available RWS supply, or 132.5 mgd.

c Total wholesale demands correspond to those in Table 4-3 of the UWMP. It is assumed that projected Wholesale Customer demands are limited to the Supply Assurance of 184 mgd. The 184 mgd assumes that San Jose and Santa Clara remain temporary, interruptible customers.

d Procedures for RWS allocations and the WSAP are described in Section 8.3.

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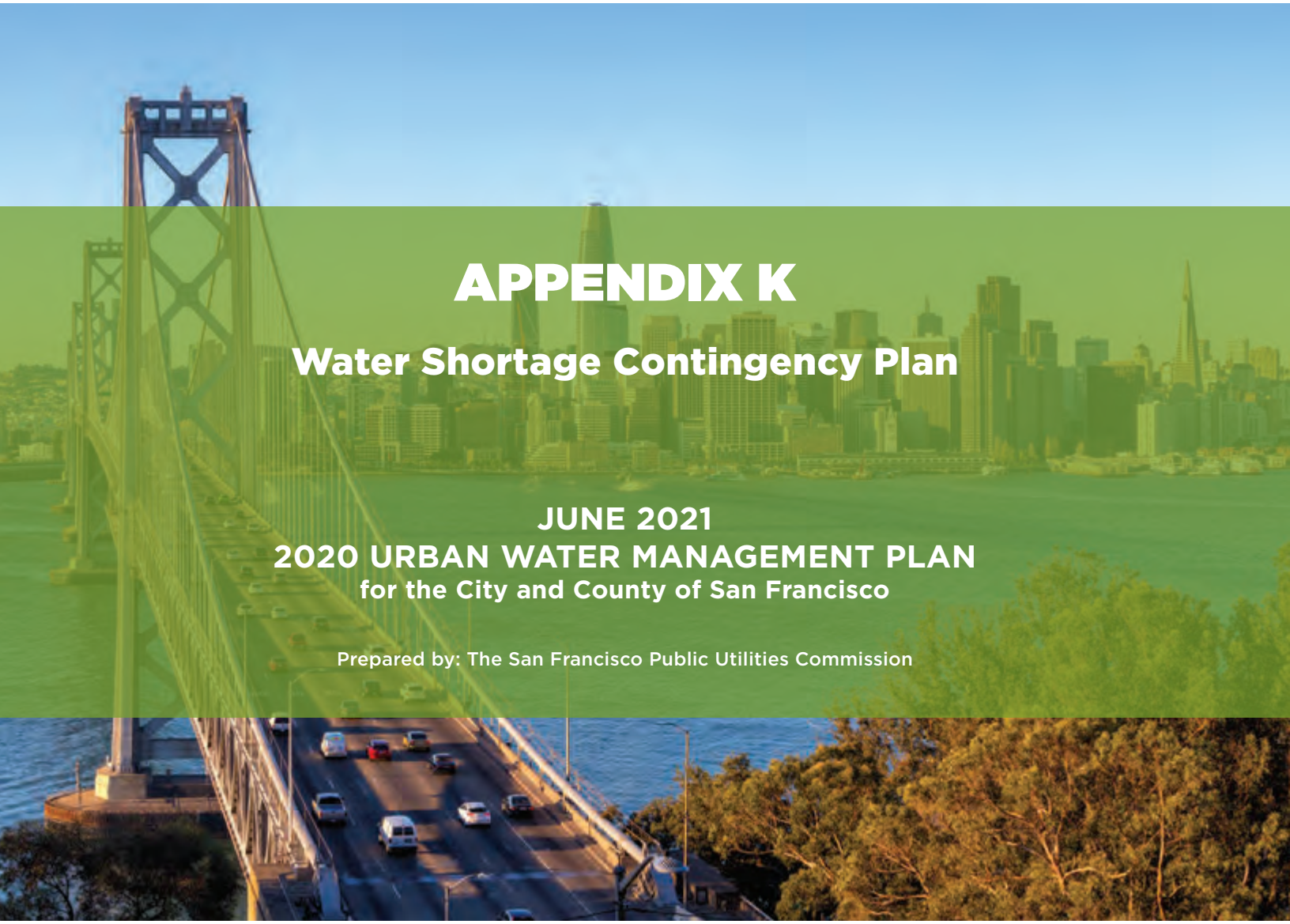

APPENDIX K

Water Shortage Contingency Plan

JUNE 2021
2020 URBAN WATER MANAGEMENT PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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2020 WATER SHORTAGE CONTINGENCY PLAN

for the City and County of San Francisco

June 2021

Prepared by:

The San Francisco Public Utilities Commission

San Francisco Water Power Sewer

Services of the San Francisco Public Utilities Commission

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TABLE OF CONTENTS

Section 1 Introduction 1
1.1 Experience with Water Shortages pre-2010 1
1.2 Experience with the 2012-2016 Drought 2
Section 2 Annual Water Supply and Demand Assessment Procedures 3
2.1 Demand Assessment [Water Code Section 10632(a)(2)(B)(i)] 3
2.2 Supply Assessment [Water Code SectionS 10632(a)(2)(B)(ii) and 10632(a)(2)(B)(V)] 3
2.3 Infrastructure Considerations [Water Code Section 10632(a)(2)(B)(iii)] 5
2.4 System Modeling [Water Code Section 10632(a)(2)(B)(iv)] 6
2.5 Decision-Making Process [Water Code Section 10632(a)(2)(A)] 6
Section 3 Water Shortage Levels 8
3.1 Water Shortage Allocation Plan (WSAP) and Associated Water Shortage Levels 8
3.2 Retail Water Shortage Levels 9
Section 4 Retail Water Shortage Response Actions 11
4.1 Retail Water Shortage Allocation Plan (RWSAP) 11
4.1.1 Voluntary vs. Mandatory Demand Reduction 11
4.1.2 Types of Allocation Methods for Mandatory Demand Reduction 11
4.1.3 Per Capita Residential Water Use Floor 12
4.1.4 Water Shortage Allocation Process 12
4.1.5 Appeal Process 13
4.2 Water Waste Prohibitions 13
4.3 Demand Reduction Actions 14
4.4 Operational Changes 15
4.5 Supply Augmentation Actions 16
4.6 Summary of Retail Shortage Response Actions 16
Section 5 Communication Protocols 18
5.1 Communications about Voluntary Reductions 18
5.2 Communications About Mandatory Demand Reduction 18
5.3 Communications Related to Wholesale Customers 19
Section 6 Enforcement and Penalties 19
6.1 Enforcement of Water Use Allocations 19
6.2 Enforcement of Water Waste Prohibitions 20
Section 7 Legal Authorities 21
Section 8 Financial Consequences of WSCP 21
Section 9 Monitoring and Reporting 22
Section 10 Preparation for Catastrophic Supply Interruption 22
10.1 Emergency Preparedness Plans 22
10.2 Emergency Drinking Water Planning 23
10.3 Power Outage Preparedness and Response 24
10.4 Seismic Risk Assessment and Mitigation Plan 24
Section 11 WSCP Refinement Procedures 26
Section 12 Plan Adoption, Submittal, and Availability 26

APPENDICES

Appendix A Water Shortage Allocation Plan (Attachment H of Water Supply Agreement Between the City and County of San Francisco and with Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County)

Appendix B Summary of San Francisco's Response to 1987-92 Drought Experience

Appendix C Summary of San Francisco's Response to 2012-2016 Drought Experience

Appendix D San Francisco Public Utilities Commission Resolution Adopting 2020 Water Shortage Contingency Plan

LIST OF FIGURES

Figure 2-1: Water Supply and Demand Assessment Process 7

LIST OF TABLES

Table 2-1. Regional Water System Supply Availability in Normal Years (mgd) 5

Table 2-2. Regional Water System Supply Utilized in Normal Years (mgd) 5

Table 3-1. Retail and Wholesale RWS Allocations during System-wide Shortage 9

Table 3-2. Retail Water Shortage Levels of Action 10

Table 4-1. Water Use Restrictions and Prohibitions 14

Table 4-2. Shortage Response Actions (Demand Reduction Actions) 17

ACRONYMS AND ABBREVIATIONS

AF	acre-feet (volume of water, equivalent to 325,851 gallons)
ASO	airborne snow observatory
AWIA	2018 America's Water Infrastructure Act
BAWSCA	Bay Area Water Supply and Conservation Agency
CCF	hundred cubic feet (volume of water, equivalent to 748 gallons)
City	City and County of San Francisco
CWC	California Water Code
DEOP	Division Emergency Operations Plan
DMM	Demand Management Measure
DWR	California Department of Water Resources
EBMUD	East Bay Municipal Utility District
EDRP	Emergency Disinfection and Recovery Plan
EOP	Emergency Operations Plan
ERAP	Emergency Response Action Plan
ERP	Emergency Response Plan
ERRP	Emergency Response and Recovery Plan
GPCD	gallons per capita per day
Groveland CSD	Groveland Community Services District
HTWTP	Harry Tracy Water Treatment Plant
ISL	Interim Supply Limitation
LOS	levels of service
MG	million gallons
mgd	million gallons per day (flow or usage rate of water)
RWS	San Francisco Regional Water System,
RWSAP	Retail Water Shortage Allocation Plan
SCVWD	Santa Clara Valley Water District
SFPUC	San Francisco Public Utilities Commission
State	State of California
SVWTP	Sunol Valley Water Treatment Plant
SWRCB	State Water Resources Control Board
UWMP	Urban Water Management Plan
WPCP	water pollution control plant
WSA	Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County
WSAP	Water Shortage Allocation Plan
WSCP	Water Shortage Contingency Plan
WSDA	Water Supply and Demand Assessment
WSIP	Water System Improvement Program

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SECTION 1 INTRODUCTION

The San Francisco Public Utilities Commission (SFPUC) is pleased to present this Water Shortage Contingency Plan (WSCP or Plan) for the City and County of San Francisco (City).

The City owns and operates the San Francisco Regional Water System (RWS), a public asset that plays a key role in delivering high-quality drinking water to more than 2.7 million residents and businesses in the San Francisco Bay Area. The system collects water from the Tuolumne River in the Sierra Nevada and from protected local watersheds in the East Bay and Peninsula.

The SFPUC operates the RWS to deliver water to 27 wholesale customers in Alameda, Santa Clara, and San Mateo Counties, as well as the Groveland Community Services District (Groveland CSD) in Tuolumne County. The Bay Area Water Supply and Conservation Agency (BAWSCA) represents the interests of 26 of the wholesale customers in Alameda, Santa Clara, and San Mateo Counties (collectively, Wholesale Customers) and coordinates their water conservation programming. The SFPUC also provides retail water service to customers in San Francisco (generally referred to as in-City retail customers) and a small number of customers outside of San Francisco that are located along the RWS transmission system (generally referred to as suburban retail customers). Additionally, some retail customers are supplied with local groundwater and recycled water supplies. The SFPUC also has a robust retail conservation program, as well as an Onsite Water Reuse program to reduce water demands and use water more efficiently.

This WSCP presents the latest information about the SFPUC's annual water supply and demand assessment (WSDA) procedures and describes the SFPUC's water shortage contingency planning. This WSCP coincides with additional planning efforts conducted by the SFPUC, including its urban water management planning.

This introduction section provides background on the SFPUC's response to past water shortage experiences pre-2010 (Section 1.1, described in more detail in Appendix B) as well as the most recent 2012-2016 drought (Section 1.2, described in more detail in Appendix C).

1.1 EXPERIENCE WITH WATER SHORTAGES PRE-2010

Every water system has vulnerabilities in terms of its ability to provide a safe and reliable supply of water. Water shortages can occur in a number of ways. Very localized shortages can occur due to distribution system problems, and system shortages can occur due to major facility failures. Apart from system facility contingencies, potential drought periods may limit the amount of water that is available over a series of years. Drought contingency planning is not necessarily caused by physical facility limitations. Within the past 30 years, San Francisco has experienced both localized shortages due to earthquakes and system-wide shortages due to drought.

The SFPUC's past experiences with water shortages during drought and following major earthquakes have shaped its current water shortage preparedness plans and response policies:

- In 1987-92 San Francisco experienced a serious drought. During 6-year drought the SFPUC adopted various levels of action in response to the main Hetch Hetchy source of water available to the SFPUC being taxed to the point of running out of water.

- Following the October 17, 1989 Loma Prieta earthquake, the SFPUC worked with the Mayor's Office of Emergency Response to reconnect water service to retail customers impacted by the earthquake. Most of the homes that lost water service were reconnected within 72 hours.

- In April 2007, below normal precipitation and snow pack caused the SFPUC to initiate a 10% voluntary reduction in water use in the service area. The call for a voluntary reduction continued through 2009.

The 1987-92 drought illustrated the deficit between the SFPUC's supplies and its customers' demands. Other than the 1976-77 drought, drought sequences in the past did not seriously affect the ability of the SFPUC to maintain full deliveries to its customers. As the SFPUC progressed into the 1987-92 drought and reservoir storage continued to decline, it became evident that full deliveries could not be sustained without the risk of running out of water before the drought ended. This circumstance became a reality in early 1991 when the Hetch Hetchy Reservoir became so depleted (less than 25,000 AF of storage in a reservoir with over 360,000 AF of capacity) that minimum instream flow releases and anticipated demands required the SFPUC to initiate programs to achieve a 45% reduction in system-wide water deliveries to balance water supplies with deliveries. Fortunately, unexpected runoff in March 1991 provided relief from the severity of that instance of water shortage; however, the drought was far from over.

Appendix B provides a more detailed summary of San Francisco's 1987-92 drought experience and the actions taken at the time.

1.2 EXPERIENCE WITH THE 2012-2016 DROUGHT

From 2012-2016, California experienced a severe drought which included the driest four consecutive water years based on statewide precipitation (2012-2015) and the lowest April 1 statewide snowpack water equivalent (5 percent in 2015). The unprecedented dry weather conditions prompted then-Governor Jerry Brown to declare a drought State of Emergency in January 2014, which remained in effect for most of California until 2017. The SFPUC took the following actions in response to the drought:

- **Voluntary call for water use reduction:** Spurred by the declaration of a State of Emergency in January 2014, the SFPUC requested that all customers of the RWS voluntarily reduce water use by at least 10 percent. Soon after, the San Francisco Mayor's Office issued a formal executive directive requiring all City departments to develop individual water conservation plans and take immediate steps to achieve a mandatory 10 percent reduction in water consumption. Ultimately, no water shortage emergency was declared, and no subsequent mandatory system-wide demand reductions and shortage allocations were imposed because customers exceeded the 10 percent voluntary system-wide reduction in conjunction with the Statewide mandatory reductions assigned by the State Water Resources Control Board (SWRCB) (see below). The SFPUC lifted the call for a voluntary 10 percent reduction in April 2017.
- **Statewide mandatory reductions:** In July 2014, new emergency conservation regulations issued by the SWRCB prompted the SFPUC to implement outdoor water waste restrictions and require a mandatory 10 percent reduction in outdoor water use. Additional emergency conservation regulations issued by the SWRCB in the spring of 2015 established more Statewide water use restrictions, a mandatory Statewide water reduction of 25 percent compared to 2013 water use, and conservation standards for individual urban water suppliers to meet the Statewide 25 percent reduction. These emergency conservation regulations were the first of their kind, indicative of the State's desire for swift and substantial action to cope with the drought. The State's these regulations assigned the SFPUC retail service area a conservation standard of 8 percent in recognition of its low residential per capita water use. In the SFPUC wholesale service area, conservation standards assigned to the Wholesale Customers ranged from 8 percent to 36 percent. The conservation standards took effect in June 2015 and remained in effect through April 2017.
- **Mandatory reduction of outdoor water use:** In addition to the State mandates, the SFPUC imposed a mandatory 10% reduction on outdoor irrigation along with water use allocations and excess use charges for all retail irrigation customers starting in August 2014. Following the additional SWRCB regulations in the spring of 2015, the SFPUC increased the mandatory reduction on retail outdoor irrigation from 10 percent to 25 percent starting in July 2015. The SFPUC lifted the mandatory reduction on outdoor irrigation in July 2016.

Appendix C provides a more detailed overview of San Francisco's response to the 2012-2016 drought.

SECTION 2 ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

Each year the SFPUC evaluates the amount of total water storage expected to occur throughout the RWS and compares it to expected demands. This annual Water Supply and Demand Assessment (WSDA) is described in the subsections below, which are organized by the sequential steps the SFPUC takes to conduct the assessment each year and reference the relevant California Water Code requirements for a WSDA.[1]

The SFPUC's annual WSDA is a robust planning system that considers a range of input factors unique to the SFPUC's water supplies and system configuration while also providing the flexibility to consider new factors. Traditional surface water supplies from the SFPUC's up country, East Bay, and Peninsula reservoirs are the backbone of the water supply, but the SFPUC extends and protects those supplies in many additional ways by: (1) partnering with the community to help save water through robust conservation programs; (2) minimizing the need for additional water to serve new developments through an onsite water reuse program; (3) recycling wastewater resources to deliver water for large non-potable uses; (4) utilizing local groundwater supplies to supplement surface water supplies; (5) investigating new, alternative water supply options such as purified water and desalination; and (6) investing in innovations that allow for creative solutions to meet diverse needs. These efforts help the SFPUC conserve water and diversify supplies to reduce likelihood of a water shortage condition.

2.1 DEMAND ASSESSMENT [WATER CODE SECTION 10632(A)(2)(B)(I)]

To calculate unconstrained customer demand for the purpose of an annual WSDA, the SFPUC collects information on both the retail and wholesale system demands. Retail customer demand is estimated based on the best available information to date, and typically includes the previous year's demands as well as consideration of current demand use patterns or other conditions impacting demands, such as weather and growth. Each year, in February, the SFPUC receives from BAWSCA a report of estimated Wholesale Customer demand for the upcoming year. Estimates of projected demands are provided to BAWSCA by each Wholesale Customer. Relatively small demands from the two additional wholesale customers not part of the WSA are estimated based on the best available information to date, and typically includes the previous year's demands as well as consideration of current demand use patterns or other conditions impacting demands, such as weather and growth.

2.2 SUPPLY ASSESSMENT [WATER CODE SECTIONS 10632(A)(2)(B)(II) AND 10632(A)(2)(B)(V)]

The RWS collects water from the Tuolumne River watershed in the Sierra Nevada and from local reservoirs in the Alameda and Peninsula watersheds. The RWS draws an average of 85 percent of its supply from the Tuolumne River watershed. This water feeds into an aqueduct system delivering water 167 miles by gravity to Bay Area reservoirs and customers. The remaining RWS supply is drawn from local surface waters in the Alameda and Peninsula watersheds. The split between these resources varies from year to year depending on the water year hydrology and operational circumstances.

To project and evaluate water supply conditions, the SFPUC uses measurements of precipitation and snowpack in the watersheds above Hetch Hetchy, Cherry, and Eleanor Reservoirs. Snowpack conditions are evaluated regularly by the Cooperative Snow Survey (conducted by the SFPUC in partnership with state and federal agencies) beginning in late January of each year. The SFPUC also estimates snowpack conditions using information from airborne snow observatory (ASO) and other sources. The SFPUC maintains a hydrologic model of the watersheds that uses this information to

[1] California Water Code section 10632(a)(1) requires "*the analysis of water supply reliability conducted pursuant to Section 10635.*" Additional information about the SFPUC's water supply reliability analysis can be found in Chapter 7 of the SFPUC's 2020 UWMP.

project expected runoff for the coming year. This process also includes a statistical analysis of additional expected precipitation. In addition to projected runoff, the determination of projected available water supply also takes into account stored water throughout the RWS, water acquired by the SFPUC from non-SFPUC sources, inactive storage, reservoir losses, and allowances for carryover storage.

Additionally, the SFPUC accounts for groundwater provided by the San Francisco Groundwater Supply Project for the in-City retail system and recycled water provided for irrigation at Harding Park, Fleming and Sharp Park Golf Courses.

The RWS relies on precipitation and snowmelt captured and stored in its reservoirs. During droughts, water supply deliveries can exceed inflows, such that water stored in previous years is relied upon to meet demands. Because of the importance of carry-over storage, the SFPUC constantly monitors and evaluates water supply conditions in the RWS. Look-ahead forecasts are updated as a year's hydrology and operations change. Generally, in early winter of any year, SFPUC staff can begin providing a forecast of water supply conditions for the upcoming year based on known and anticipated winter and spring precipitation and snowpack. The predictive power of this forecast improves greatly through the spring. The annual precipitation, snowmelt, and carry-over storage together constitute the SFPUC's reservoir storage condition. Using data for each of these factors, the SFPUC can determine whether the reservoir system will be capable of serving full deliveries to its customers. Section 2.3 describes the system modeling SFPUC conducts.

Table 2-1 shows the availability of RWS supplies for retail customers and Wholesale Customers in normal years. Table 2-2 shows the current and projected RWS supply needs to meet retail and wholesale demands based on information and projections presented in the SFPUC's 2020 UWMP.

The SFPUC sells water to 26 of its 28 wholesale customers under the terms of the 25-year contract known as the Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County (WSA) and associated individual water sales contracts with each Wholesale Customer. The WSA carries forward the SFPUC's "Supply Assurance" of 184 million gallons per day (mgd) to the Wholesale Customers. The SFPUC has agreed to deliver water to the Wholesale Customers up to the amount of the Supply Assurance, and this agreement is perpetual and survives the expiration of the WSA. The Supply Assurance is, however, subject to reduction due to water shortage, drought, scheduled RWS maintenance activities, and emergencies. As part of the Phased Water System Improvement Plan (WSIP) in 2008, the SFPUC established a temporary 265 mgd annual average limitation on water deliveries from RWS watersheds, the "Interim Supply Limitation" (ISL). The SFPUC has allocated the ISL between the retail customers and Wholesale Customers as follows:

- Wholesale supply allocation: 184 mgd
- Retail supply allocation: 81 mgd[2]

[2] Groveland CSD is considered a retail customer of the SFPUC. Thus, RWS supplies to Groveland CSD are accounted for in the retail supply allocation of 81 mgd.

Table 2-1. Regional Water System Supply Availability in Normal Years (mgd)

RWS Supply Allocation	Actual	Projected				
	2020	2025	2030	2035	2040	2045
Retail Customers[a, b]	81	81	81	81	81	81
Wholesale Customers[c, d]	184	184	184	184	184	184
Total RWS Supplies	265	265	265	265	265	265

a Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if these alternative supplies are not available, up to 81 mgd of RWS supply could be used in normal years.

b Groveland CSD is reported as a wholesale customer for the purposes of this 2020 UWMP, but it is considered a retail customer of the SFPUC solely for purposes of allocating RWS supplies between retail and Wholesale Customers. Its demands would be met by the retail supply allocation of 81 mgd.

c Projected Wholesale Customer deliveries are limited to 184 mgd, including the demands of the Cities of San Jose and Santa Clara, which are supplied on a temporary and interruptible basis, with their total supply not exceeding 9 mgd assuming supply is available (decision to be made by end of 2028).

d Cordilleras MWC is not a party to the WSA, and it is not included in the wholesale supply allocation of 184 mgd. The demands of Cordilleras MWC are minor (projected to be less than 0.01 mgd) and are anticipated to be met with RWS supplies through 2045.

Table 2-2. Regional Water System Supply Utilized in Normal Years (mgd)

RWS Supply Allocation	Actual	Projected				
	2020	2025	2030	2035	2040	2045
Retail Customers[a, b]	66.5	67.2	67.5	68.6	70.5	73.7
Wholesale Customers[c, d]	132.1	146.0	147.9	151.9	156.3	162.8
Total RWS Supplies	198.6	213.2	215.4	220.5	226.8	236.5

a Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if these alternative supplies are not available, up to 81 mgd of RWS supply could be used in normal years.

b Groveland CSD is reported as a wholesale customer for the purposes of this 2020 UWMP, but it is considered a retail customer of the SFPUC solely for purposes of allocating RWS supplies between retail and Wholesale Customers. Its demands would be met by the retail supply allocation of 81 mgd.

c Projected Wholesale Customer deliveries are limited to 184 mgd, including the demands of the Cities of San Jose and Santa Clara, which are supplied on a temporary and interruptible basis, with their total supply not exceeding 9 mgd assuming supply is available (decision to be made by end of 2028).

d Cordilleras MWC is not a party to the WSA, and it is not included in the wholesale supply allocation of 184 mgd. The demands of Cordilleras MWC are minor (projected to be less than 0.01 mgd) and are anticipated to be met with RWS supplies through 2045.

2.3 INFRASTRUCTURE CONSIDERATIONS [WATER CODE SECTION 10632(A)(2)(B)(III)]

On an ongoing basis, the SFPUC's Hetch Hetchy Water and Power, Water Supply and Treatment Division, and Hydrology and Water Systems group conduct analyses of the RWS that incorporate planned facility outages and multiple levels of projected system demands to evaluate and plan for potential water delivery constraints. These groups meet quarterly to share plans and coordinate how facility outages, changes in service area demand, wet or dry weather, and other variables shape the operating plans each year. Facility outages due to maintenance or upgrades are coordinated in an adaptive manner to respond to changes as they occur. For new water supplies or new capital projects related to supply distribution, impacts on the system are evaluated extensively prior to initiation of any changes. Results from these modeling efforts are considered in the annual WSDA.

2.4 SYSTEM MODELING [WATER CODE SECTION 10632(A)(2)(B)(IV)]

To proactively plan for conditions that would result in a shortage of water supplies, the SFPUC models conditions using a hypothetical drought that is more severe than what the RWS has historically experienced. This drought sequence is referred to as the "design drought" and serves as the basis for planning and modeling of future scenarios. The design drought consists of an 8.5-year sequence of dry conditions.

In applying its water supply planning methodology, the SFPUC performs an initial model simulation of the system for the design drought sequence and then reviews the ability of the system to deliver water to the service area through the entire design drought sequence. If the projected water supply runs out before the end of the design drought sequence in the initial model run, system-wide water use reduction is added and the scenario is re-run. This process continues iteratively until a model simulation of the system is achieved in which the water supply in storage at the end of the design drought sequence is brought to the system "dead pool," where no additional storage is available for delivery (currently simulated as 96,775 acre-feet). Drawing system storage down to the dead pool without going below it indicates that water supply delivery, including the adjusted amount of water use, is maintained through the design drought sequence.

Estimated reduced water use levels and corresponding storage threshold values can then be used to simulate the operation of the system through the historical record of hydrology, or to evaluate system water supply conditions during an ongoing drought. While the design drought sequence does not occur in the historical hydrology, the reduced water use and storage threshold values that are adjusted to allow a system configuration to maintain water delivery through the design drought sequence can be used to evaluate system performance in the historical record, or as a comparison for real-time system conditions. Through use of this planning method, the SFPUC can simulate a response to declining water supply in storage that is appropriate for the system conditions being evaluated.

The SFPUC plans its water deliveries using indicators for water use reduction that are developed through analysis with the design drought sequence. As a result, the SFPUC system operations are designed to provide sufficient carry-over water in SFPUC reservoirs to continue delivering water, although at reduced levels, during multiple-year droughts.

2.5 DECISION-MAKING PROCESS [WATER CODE SECTION 10632(A)(2)(A)]

Regardless of the expectation of shortage conditions, as part of the normal course of business, the SFPUC provides a water supply condition update to its executive team every two weeks throughout the year. The SFPUC also provides water supply estimates to its Wholesale Customers on a monthly basis beginning February 1. A Wholesale Customer Annual Meeting is held in the latter portion of February at which the SFPUC makes a presentation on current water supply conditions and forecasts. The last snow survey of the season typically occurs within the first week of April, followed by a runoff forecast to determine total system storage expected as of July 1. By the middle of April, the SFPUC sends a formal letter to the Wholesale Customers summarizing the water supply availability for the coming year.

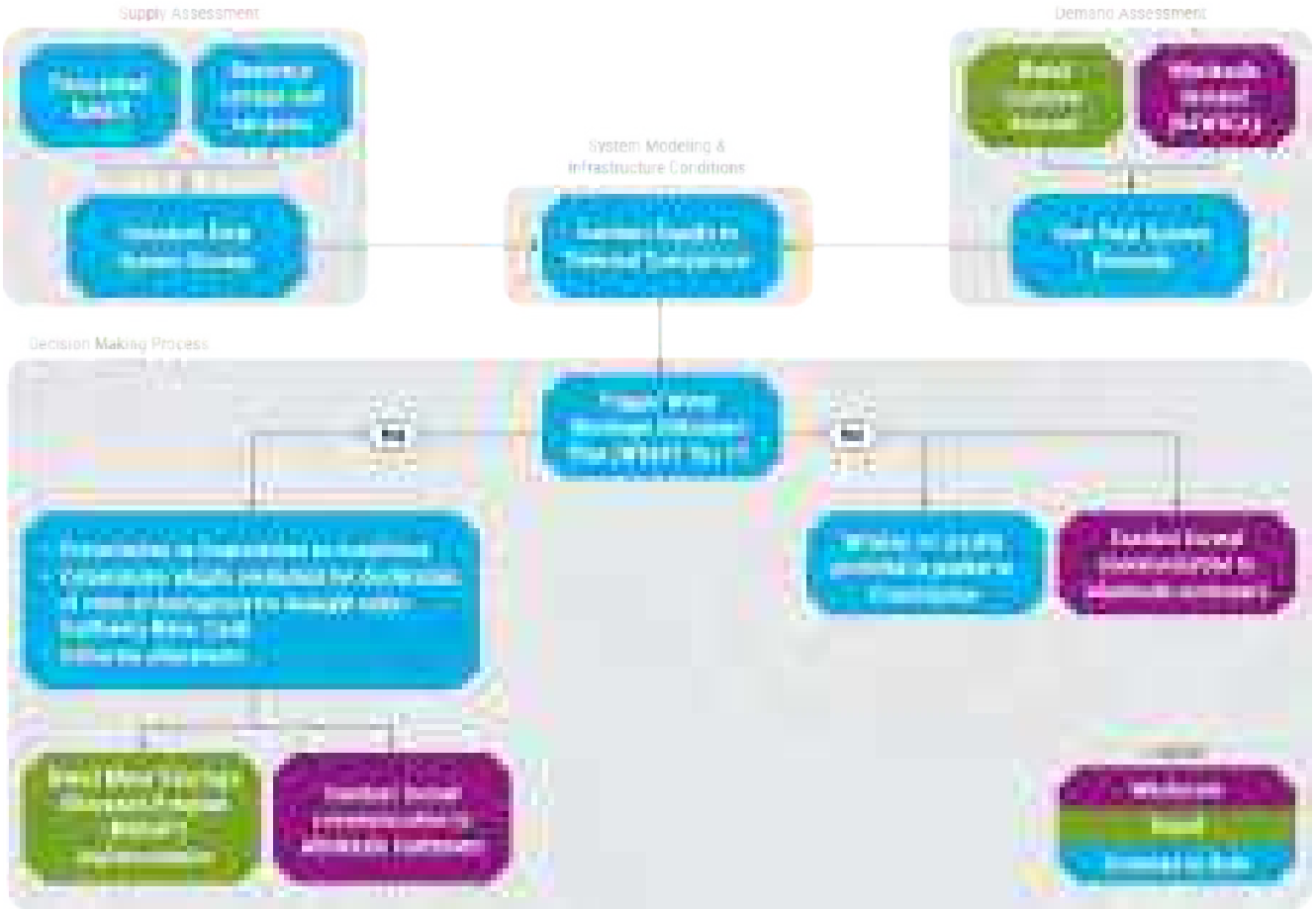
If the RWS appears incapable of meeting system-wide demand due to drought, the SFPUC is expected to declare a water shortage by March 31 of that drought year. The General Manager, or designee, is responsible for declaring such a shortage. A presentation would be made to the Commission as part of the General Manager's report, showing conditions of precipitation to date, snowpack, and storage levels with more information as necessary depending on the particulars of the supply forecast. Depending on the level of shortage, the Commission may adopt a resolution declaring a water shortage emergency under the California Water Code, or lesser actions such as a call for voluntary conservation efforts.

Prior to the initiation of any water delivery reductions to its retail customers, whether it be initial implementation of delivery reductions or implementing a different water shortage level, the SFPUC will outline a drought response plan to address the following: the water supply situation; proposed water use reduction objectives; alternatives to water use reductions;

methods to calculate water use allocations and adjustments; compliance methodology and enforcement measures; and budget considerations. Details on the expected allocation program are described further in Section 4.1. This drought response plan will be presented at a regularly scheduled SFPUC Commission meeting and advertised in accordance with the requirements of Section 6066 of the California Government Code.

The overall WSDA process is described visually in the flowchart presented in Figure 2-1.

Figure 2-1: Water Supply and Demand Assessment Process



SECTION 3 WATER SHORTAGE LEVELS

The SFPUC has two plans that determine how to allocate RWS supplies in the event of a water shortage condition: (1) the Water Shortage Allocation Plan (WSAP) defines how RWS supplies will be split between the SFPUC's retail customers and the Wholesale Customers collectively (see Section 3.1), and (2) the Retail Water Shortage Allocation Plan (RWSAP) defines how a retail water shortage will be allocated amongst the retail customers (see Section 3.2). The WSAP is also used for allocating the total wholesale supply allocation amongst the respective Wholesale Customers (see Appendix A). These two plans, and their associated water shortage levels, are described further below and in Section 4.1.

3.1 WATER SHORTAGE ALLOCATION PLAN (WSAP) AND ASSOCIATED WATER SHORTAGE LEVELS

The WSAP (see Appendix A) is an attachment to the Water Supply Agreement between the City and the Wholesale Customers described above. The WSAP describes the method for allocating water between the SFPUC's retail customers and the Wholesale Customers collectively during shortages caused by drought. The WSAP applies only when the SFPUC determines that a system-wide water shortage due to drought exists.

The WSAP includes specific allocations of the available water supply between the SFPUC's retail customers and the Wholesale Customers collectively for varying system-wide shortages of up to 20 percent, as shown in Table 3-1. In the event that the retail customer percentage share of the available water supply in Table 3-1 results in retail customers having a positive allocation (i.e., a supply of additional water rather than a required percentage reduction in water use), then the retail customer percentage share of the available water supply would be reduced to eliminate any positive allocation to retail customers, with a corresponding increase in the percentage share of the available water supply allocated to the Wholesale Customers. For any level of required reduction in system-wide water use during shortages, the SFPUC shall require retail customers to conserve a minimum of 5 percent, with any resulting reallocated supply credited to storage for inclusion in calculation of projected available RWS water supply in a subsequent year.

Note that the WSAP does not define allocations between the SFPUC's retail customers and the Wholesale Customers above shortage levels of 20 percent. For the purposes of this WSCP, the SFPUC assumes that the allocations for the 16-20 percent shortage level would apply to all higher shortage levels. In practice, the WSAP defines a process for the SFPUC and the Wholesale Customers to determine whether the application of this allocation to shortage levels greater than 20 percent is appropriate or whether a change is required (for further information about this process, see Appendix A).

The SFPUC's shortage response actions as they relate to the Wholesale Customers are defined in the WSAP (see Appendix A) and are included in this WSCP by reference.

Table 3-1. Retail and Wholesale RWS Allocations during System-wide Shortage

Shortage Level	Required Level of System-wide Reduction in Water Use	SFPUC Retail Share of Available RWS Supply[a]	Collective Wholesale Customers' Share of Available RWS Supply
1	5% or less	35.5%	64.5%
1	6 – 10%	36.0%	64.0%
2	11 – 15%	37.0%	63.0%
2	16 – 20%	37.5%	62.5%
3[b]	Up to 30%	37.5%	62.5%
4[b]	Up to 40%	37.5%	62.5%
5[b]	Up to 50%	37.5%	62.5%
6[b]	>50%	37.5%	62.5%

a While Groveland CSD is reported in the 2020 UWMP as a wholesale customer, it is considered a retail customer of the SFPUC solely for purposes of allocating RWS supplies between retail customers and Wholesale Customers. Thus, RWS supplies to Groveland CSD are accounted for in the retail supply allocation.

b Note that the WSAP does not define allocations between the SFPUC's retail customers and the Wholesale Customers above RWS shortage levels of 20%. The WSAP defines a process for the SFPUC and the Wholesale Customers to determine whether the application of the 16-20% allocation to shortage levels greater than 20% is appropriate or whether a change is required.

3.2 RETAIL WATER SHORTAGE LEVELS

The Retail Water Shortage Allocation Plan (RWSAP) (see Section 4.1 below), which pertains to retail customers only, outlines how any retail water shortages, after the application of the WSAP described above, will be allocated among the retail customers. Table 3-2 identifies the water shortage levels on a system-wide basis, and the corresponding retail water shortage condition that would need to be addressed at each shortage level under the RWSAP.

For the purposes of this analysis, system-wide shortages are expressed with respect to a normal year supply, i.e. 265 mgd, as shown above in Table 2-1. System-wide shortages are applied to this baseline supply of 265 mgd; subsequently, the WSAP allocation process described in Section 3.1 is applied to the actual RWS supply that is available to determine the shares of that supply that are available to the retail customers and the Wholesale Customers, respectively. The resulting share of RWS supply available for use by the retail customers, along with the retail groundwater and recycled water supplies that are projected to be available, are compared with the retail customers' demands to determine the level of retail shortage that would result.

The retail water shortage condition under the RWSAP may be different from the system-wide water shortage level. For example, in a 10 percent system-wide shortage of the Regional Water System, SFPUC would receive an allocation of 81 mgd.[3] Given that retail demands are projected to reach only 80.6 in 2045, there would not be an expected retail shortage

[3] 265 mgd of supply is first reduced by 10%, which results in an available supply of 238.5 mgd. Based on Table 3-1, the SFPUC retail share of available RWS supply is 36.0% under a 10% system-wide shortage: 238.5 mgd * 36.0% = 85.9 mgd. This results in retail customers having a positive allocation (i.e., a supply of additional

under that condition within the planning horizon of 2045. Under the terms of the Water Supply Agreement, as amended and restated in 2018, SFPUC has agreed to require 5 percent conservation in the event of any declared water shortage; thus in this scenario SFPUC would implement a voluntary reduction in water use of 5 percent.

At higher shortage levels, the retail allocation from the RWS results in a retail water shortage that varies depending on the retail demand levels. The ranges specified in Table 3-2 represent the expected water shortage conditions over the planning horizon from 2020 to 2045, over which time retail demands are increasing.

Table 3-2. Retail Water Shortage Levels of Action

[Standardized UWMP Table 8-1: Water Shortage Contingency Plan Levels]

Shortage Level	Required Level of System-wide Reduction in Water Use	Shortage Response Action
1	Up to 10%	Voluntary retail water use reduction of 5%
2	Up to 20%	Voluntary retail water use reduction of 5%
3	Up to 30%	Voluntary retail water use reduction of 5%
4	Up to 40%	Voluntary or mandatory retail water use reduction of 5% to 18%
5	Up to 50%	Mandatory retail water use reduction of 18% to 32%
6	>50%	Mandatory retail water use reduction of >32%

water rather than a required percentage reduction in water use), thus the retail customer percentage share of the available water supply is reduced to the normal retail supply allocation of 81 mgd to eliminate any positive allocation to retail customers.

SECTION 4 RETAIL WATER SHORTAGE RESPONSE ACTIONS

Once a water shortage has been identified, the SFPUC will implement its Retail Water Shortage Allocation Plan (RWSAP) to allocate available water supplies among the SFPUC's retail customers (see Section 4.1). The SFPUC also maintains several permanent restrictions on retail customer water use as well as potential prohibitions related to water use that may be enforced during a drought (see Section 4.2) and implements several other programs and activities that assist customers with reducing demands (see Section 4.3). The SFPUC may also, depending on the extent of water shortage, implement operational changes (see Section 4.4) or pursue the development of emergency water supplies (see Section 4.5).

4.1 RETAIL WATER SHORTAGE ALLOCATION PLAN (RWSAP)

The RWSAP was initially adopted in 2001 to formalize a program of action to be taken in the retail service area to reduce water use during a drought. This WSCP updates and replaces the standalone RWSAP. The new, updated RWSAP described herein outlines the actions the SFPUC may take in response to a declaration of a water shortage. The actions taken depend on the applicable retail water shortage level, as described in Table 3-2. The declared retail water shortage level determines the total level of retail customer demand reduction that the SFPUC may require; demand reduction begins as a voluntary measure and advances to a mandatory measure in higher retail water shortage levels.

4.1.1 Voluntary vs. Mandatory Demand Reduction

During a declared water shortage emergency, the SFPUC may implement either voluntary or mandatory demand reductions, depending on the retail water shortage condition. Based on experience in previous droughts, the SFPUC will likely use voluntary calls for demand reduction if the target retail water use reduction is 10% or less. If the target retail water use reduction is greater than 10%, the SFPUC will likely implement mandatory demand reduction as described further in the sections below.

4.1.2 Types of Allocation Methods for Mandatory Demand Reduction

In the event of a mandatory demand reduction program, the SFPUC must adopt a system for allocating water amongst its retail customers. During a water shortage emergency, multiple allocation methods may be needed for different customer types. During the 1987-1992 drought, four allocation methods were considered: (1) the per capita allocation method, (2) the inside/outside or seasonal allocation method, (3) the uniform allocation method, and (4) the percentage allocation method. The following provides a description of each method and the potential advantages or disadvantages of applying each method.

Per capita allocation method. The per capita allocation method, which is only applicable for residential customer types, assigns each residential occupant a fixed daily amount of water. To implement this method, an accurate count of the number of occupants per metered account is required. Currently, customers can self-report this information, and the SFPUC has collected self-reported occupancy data for the majority of residential accounts. The method does not take into account differences in dwelling type, existing landscaping needs, or special individual circumstances. Implementing a per capita allocation is not possible with commercial and industrial customers; those customers would require a different method for determining allocations.

Inside/Outside allocation method. The inside/outside method, also referred to as the seasonal method, applies a percent reduction to both indoor and outdoor use. To determine an individual customer's allocation, a base year of water use is selected and reductions are applied to both inside and outside use. Water use during the winter season is identified as reflecting typical "inside use". The average water use by a customer during the winter months

(November, December, January, February) of the base year is used as the baseline for determining inside use for all 12 months. Water use in excess of the baseline during other months of the year is considered "outside use". The monthly inside/outside allocation is a sum of the inside use and the outside use reduced by their respective percentages. This method is used to distribute water equitably and in previous decades was proven effective in achieving system-wide consumption goals. However, San Francisco's residential water use patterns have changed significantly in the last decade, showing very little seasonal use and limited savings to be achieved by focusing on outdoor use only. Additionally, because this method reduces water allocations for all customers regardless of their current use, there is concern that the individual water users who are already consuming very low amounts of water will be affected disproportionately compared to individual water users consuming larger amounts of water.

Uniform allocation method. The uniform allocation method applies a fixed daily amount per dwelling unit for all residential customers. This method does not distribute water equitably to all customers, especially since it does not take into consideration the number of individuals living in each dwelling unit. As with the per capita allocation method, this method could not be applied to commercial and industrial customers.

Percentage allocation method. The percentage allocation method requires water allocation to be based on a straight percent reduction of past use. As an example, to achieve a specified reduction goal, all customers would be allotted a specific percentage of the amount of water that they used in each billing period in the base year. The method requires a much greater reduction in inside use and could cause hardship on both residential and commercial customers.

During the 1987-92 drought, the inside/outside method was implemented because it was found to be the most fair and reasonable method amongst the alternatives. At that time, for those customers that appealed their allocations, a per capita allocation was applied to the account. Since then, SFPUC's residential water consumption patterns have changed significantly, reflecting less seasonality and less outdoor use overall. The SFPUC has also improved its collection of occupancy data per metered account, allowing use of the per capita method as the preferred allocation method for residential accounts. The preferred allocation method for non-residential accounts (i.e. irrigation-only, commercial, industrial, and municipal) is the percentage allocation method.

4.1.3 Per Capita Residential Water Use Floor

SFPUC retail customers already have one of the lowest residential per-capita water use rates in California, with an average water use rate of 42 gallons per capita per day (GPCD) in Fiscal Year 2019-2020. In the event that mandatory demand reduction is instituted during a water shortage emergency, the SFPUC will adopt a minimum per-capita residential allocation, or water use "floor" to ensure a sufficient amount of water is available to its customers for basic health and safety needs. The appropriate floor will be determined by the General Manager or designee at the time a water shortage emergency is declared and will be specified in the drought response plan, as further described in Section 5.

4.1.4 Water Shortage Allocation Process

If a water shortage emergency is declared that results in the need for mandatory demand reduction, the SFPUC will allocate shortages to different customer types in an effort to minimize the economic impacts of mandatory demand reductions. An example of how shortages may be allocated by customer type is as follows:

1. The SFPUC will apply reductions for *irrigation-only* accounts; different levels of reduction may be required depending on whether the irrigation-only account is a residential, commercial, or municipal account type. Note that customers using recycled water for irrigation will not be required to ration their use of recycled water.

2. If there is still a shortage remaining, the SFPUC will apply reductions to *single-family and multi-family residential* accounts, up to 30% or down to the per capita water use floor, whichever occurs first
3. If there is still a shortage remaining, the SFPUC will apply reductions to *commercial and industrial* accounts, up to 30%
4. If there is still a shortage remaining, the SFPUC will apply reductions to *municipal and other* accounts, up to 30%.
5. If there is still a shortage remaining, the SFPUC will return to *irrigation-only* accounts and make further reductions, proceeding in same order with additional reductions from each sector.

The SFPUC will inform its retail customers of a water shortage by March 31 of every year in which there is a shortage. If mandatory demand reductions are being implemented, the SFPUC will determine water allocations for each retail customer account using the allocation method that is determined to be the most appropriate at the time based on the nature of the water shortage and water use trends. If an allocation method is chosen that requires establishment of baseline water use levels, allocations will be based on water use for the last year prior to the drought declaration. The SFPUC will provide water use allocations to all retail customers by May 1 of the drought year. The water use allocations will become effective July 1. Allocations for residential customers will not go below the per capita water use floor that will be established by the General Manager or designee at the time of declared water shortage emergency.

4.1.5 Appeal Process

On or before May 1, retail customers will be notified of their reduced water allocations. Each retail customer will have the opportunity to appeal the allocation based on increased occupancy, medical exemptions, increased business, or other miscellaneous reasons. The SFPUC will provide retail customers with instructions on how to file appeals at the time the customers are notified of the water use allocations. Customers may be required to submit supplementary information in support of their appeal. The SFPUC will also inform customers of the methodology to be used in modifying allocations if they are granted.

4.2 WATER WASTE PROHIBITIONS

Table 4-1 summarizes potential temporary prohibitions related to water use that the SFPUC may enforce during a drought, as well as permanent restrictions on retail customer water use established in the SFPUC Rules and Regulations Governing Water Service to Customers.[4] Appendix B describes various measures employed during the 1987-92 drought to achieve a 25 percent system-wide reduction in retail demands (as applied to the pre-drought demand). These measures included absolute limitations on water use based on residential customer classification and a proportion of historical use within the non-residential sectors. Appendix C describes various measures employed during the 2012-2016 drought to achieve a primarily voluntary 10 percent system-wide reduction in retail demands.

Note that the SFPUC's implementation of each of the temporary prohibitions is not directly linked to a particular water shortage level under this WSCP. The only water shortage response action that will be implemented specifically in response to a particular shortage level is demand reduction (either voluntary or mandatory).

[4] The SFPUC Rules and Regulations Governing Water Service to Customers may be accessed at: https://www.sfpuc.org/sites/default/files/accounts-and-services/RulesRegs-waterservice_11FEB2020.pdf

Table 4-1. Water Use Restrictions and Prohibitions

Permanent[a]
Water waste, including but not limited to, any flooding or runoff into the street, sidewalk or gutter
Using hoses for any purpose without a positive shut-off valve
Serving water at a restaurant, café, or food counter without waiting for a request by a customer or customers
Potable water is not to be used to clean, fill or maintain levels in decorative fountains.
Use of potable water for consolidation of backfill, dust control or other nonessential construction purposes if groundwater or recycled water is available and approved by the San Francisco Department of Public Health[b]
Use of single-pass cooling systems, fountains, and commercial car washes
Use of potable water to wash sidewalks, driveways, plazas and other outdoor hardscapes for reasons other than health, safety, or to meet City of San Francisco standards for sidewalk cleanliness and in a manner that causes runoff to storm drains and sewer catch basins
Watering outdoor landscapes with potable water during and within 48 hours after a rain event
Not providing guests the option to refuse daily laundering of towels and linens at hotels and motels, and not prominently displaying notice of this option in each guestroom
Irrigation with potable water of ornamental turf on public street medians
Temporary (i.e., imposed during water shortage)
Limit the use of additional water for new or retrofitted landscaping or expansion of existing facilities under all conditions not otherwise subject to San Francisco's Water Efficient Irrigation Ordinance. [c]
Verified water waste as determined by the Water Department would serve as prima facie evidence that the allocation assigned to the water account is excessive; therefore, the allocation was subject to review and possible reduction, including termination of service[c]
Use of supplies other than groundwater and/or recycled water for irrigation of golf courses, median strips, and similar turf areas[c]
Use of potable water on golf courses outside irrigation of putting greens[c]
Use of potable water for street sweepers/washers[c]
The washing of all automobiles, motorcycles, RVS, trucks, transit vehicles, trailers, boats, trains, and airplanes outside of a commercial washing facility; unless required to clean windows on all vehicles and such commercial or safety vehicles for health and safety reasons[c]
The filling of new swimming pools, spas, hot tubs, or the draining and refilling of existing pools, etc.[c]
a Established in SFPUC Rules and Regulations Governing Water Service to Customers, Section E, Rule 12.
b Consistent with the Soil Compaction and Dust Control Ordinance, Ordinance 175-91 (San Francisco Public Works Code, Article 21, Sections 1100-1107).
c Prescribed in the 1987-92 and 2012-16 drought; may be enforced during a future drought.

4.3 DEMAND REDUCTION ACTIONS

The following methods are employed or offered by the SFPUC to help reduce consumption in the retail service area. All of these methods, except for one, are implemented on a continuous basis or as needed, regardless of whether there is a water shortage. Many of these methods are also demand management measures (DMMs) that are currently implemented and described in more detail in the SFPUC's 2020 Urban Water Management Plan (UWMP). Some of these methods may have

an increase in application, participation, or frequency as a result of a shortage (e.g., public outreach, rebates, Water Wise Evaluations), but the increase is not necessarily triggered by a specific level of shortage.

- **Expand Public Information Campaign:** Through its conservation program, the SFPUC develops media campaigns and extensive informational materials, and performs widespread outreach activities to (1) inform the public of a drought, (2) relay information about water use reductions and prohibitions, and (3) promote conservation and use of the SFPUC's conservation services. The SFPUC regularly notifies top residential and commercial water users of their consumption and the SFPUC's conservation services to help reduce demands.

- **Improve Customer Billing and Water Use Information:** In conjunction with the deployment of its Automated Water Meter Program, the SFPUC launched a new bill management system and web portal called My Account in May 2014. This system allows customers to view their daily and hourly water use data provided by the automated water meter reading system. The SFPUC also started to implement fractional billing in January 2017 so customers, instead of being billed on a 1 unit (i.e., 1 CCF) basis, are billed for each 0.01 unit (i.e., 1 cubic foot) consumed which provides customers with more detailed feedback on their water use on their monthly bills. The transition of the billing system from bi-monthly to monthly billing for all customers was completed in July 2013.

    - During the 2012-2016 drought, the SFPUC called for 10 percent voluntary reductions and added information and a graph to My Account so residential customers could visually connect with their water use and identify potential reductions.

- **Offer Water Use Surveys:** The SFPUC provides free Water-Wise Evaluations for homes and businesses through its conservation program. These Water-Wise Evaluations consist of an onsite or phone-based review of indoor fixtures and appliances as well as an onsite review of irrigation systems. Each assessment includes a summary report outlining recommendations to improve efficiency as well as estimated water savings. Interest and participation in this service tends to increase during times of drought.

- **Provide Rebates or Giveaways of Plumbing Fixtures and Devices:** Through its conservation program, the SFPUC provides free conservation fixtures and devices to San Francisco residents. Incentive programs may be accelerated during a water shortage. Free devices include showerheads, faucet aerators, toilet leak detection tablets and standard repair parts, flow-measuring bags, soil moisture meters, pre-rinse spray valves, plumbing repair handbooks, and other items.

- **Provide Rebates for Landscape Irrigation Efficiency or Turf Replacement:** The SFPUC's Large Landscape Grant Program offers grants for large landscape irrigation efficiency improvements. Incentive programs may be accelerated during a water shortage.

- **Increase Water Waste Patrols:** SFPUC field inspectors watch for, report, and respond to potential water waste they may encounter as part of their regular travel throughout the City, and the SFPUC also encourages the general public to report potential water waste through the City's 311 service request system, as described in Section 4.2

4.4 OPERATIONAL CHANGES

The following methods are employed or offered by the SFPUC to help reduce water use in the retail service area. These methods, though not formally enacted in the event of a shortage, are employed at the discretion of the SFPUC's operations.

- **Decrease Line Flushing:** Pipeline and other system flushing may be decreased at the discretion of the SFPUC's operations management. Due to the recent drought, the SFPUC temporarily reduced programmatic flushing of dead

ends within the in-City distribution system pipelines from a scheduled program to an as-needed basis to respond to water quality issues. Regular system maintenance flushing in the Town of Sunol was also temporarily reduced during the drought to an as-needed basis.

- **Reduce System Water Loss:** The SFPUC conducts pressure management, collects main break data, and administers a Linear Asset Management Program to help control distribution system losses. In addition, to address water loss at the customer level, the SFPUC launched a Leak Alert Program in April 2015 to notify single family residential customers about potential plumbing leaks that may be occurring at their homes. The SFPUC expanded this program to include small multi-family homes (2-5 dwelling units) in September 2018, as well as dedicated irrigation customers in March 2019, and commercial customers in April 2020. The Leak Program will be expanded to all remaining customer sectors in 2021. This program also meets State mandates requiring water suppliers to notify customers when they are aware of leaks that are within the customer's control.

4.5 SUPPLY AUGMENTATION ACTIONS

The SFPUC will use voluntary or mandatory demand reduction during a declared water shortage emergency. Depending on the severity and duration of the water shortage emergency, the SFPUC may also seek to develop emergency water supplies. This could include actions such as initiating water transfers.

4.6 SUMMARY OF RETAIL SHORTAGE RESPONSE ACTIONS

The SFPUC expects to meet water shortages primarily with voluntary and mandatory demand reduction, and will utilize the RWSAP described above in Section 4.1 to allocate water shortages amongst its retail customers. The SFPUC will also enforce restrictions and prohibitions of certain water uses (as described in Section 4.2) and provide additional programs to facilitate demand reduction (as described in Section 4.3) in order to support meeting its demand reduction targets. The SFPUC may also implement operational changes to reduce water use (as described in Section 4.4). At this time, no supply augmentation shortage response actions have been identified as a specific response to a shortage, but they would be considered (as described in Section 4.5). As described at the beginning of Section 2, the SFPUC already incorporates supply augmentation with dry-year supplies as a part of normal operations and water management planning to reduce the likelihood of a water shortage condition.

Table 4-2 shows the demand reduction actions and volumes of reduction associated with each shortage level described earlier in Table 3-2. For the purposes of this analysis, system-wide shortages are applied to the baseline available supply of 265 mgd; subsequently, the WSAP allocation process described above is applied to the actual RWS supply that is available to determine the shares of that supply that are available to the SFPUC's retail customers and the Wholesale Customers, respectively. The resulting share of RWS supply available for use by the retail customers, along with the retail groundwater and recycled water supplies that are projected to be available, are compared with the retail customer demands to determine the level of retail shortage that would result.

The demand reduction volumes necessary at a given shortage level will change based on the retail demands at the time of a declared water shortage emergency. The volumes associated with shortage response actions shown in Table 4-2 are intended for illustrative purposes, and are based on the projected 2025 levels of retail demand as presented in the SFPUC's 2020 UWMP. As retail demands increase, the associated necessary demand reductions will increase accordingly.

For Shortage Levels 1-3, the SFPUC expects to have enough supply to meet projected unconstrained retail demands. However, as described in Section 3.1 above, the SFPUC has a contractual obligation to require retail customers to conserve a minimum of 5 percent for any level of required reduction in system-wide water use during shortages. A 5

percent reduction in retail demand can be achieved with a voluntary call for reductions in water use. Retail customers collectively conserved more than they were asked to conserve during a 10 percent voluntary system-wide reduction in 2014-2017 during the previous drought. If a retail demand reduction of greater than 10 percent is needed, mandatory demand reduction will be implemented; in the scenario shown in Table 4-2, that would occur starting at shortage level 4.. Communication actions taken during voluntary and mandatory demand reduction are described in Section 5.1.

At the higher levels of shortage (i.e. those that would require mandatory demand reduction) the SFPUC would identify the appropriate allocation methods for different customer types as described in the RWSAP. Table 4-2 shows that the SFPUC could meet the highest level shortage of 21.2 mgd (i.e. shortage level 6) by requiring reductions of 50 percent to irrigation-only accounts, 30 percent reductions in other non-residential accounts, and using a per capita allocation of 25 GPCD for single-family and multi-family residential accounts.

Table 4-2. Shortage Response Actions (Demand Reduction Actions)

[Standardized UWMP Table 8-2: Demand Reduction Actions]

Shortage Level (percent system-wide supply reduction)	Retail Demand Reduction Actions	Associated Volume (mgd)[a]	Penalty, Charge, or Other Enforcement?
1 (up to 10%)	Voluntary Reduction[b]	3.3	N
2 (up to 20%)	Voluntary Reduction[b]		N
3 (up to 30%)	Voluntary Reduction[b]		N
4 (up to 40%)	Mandatory Reduction	6.3	Y
5 (up to 50%)	Mandatory Reduction	16.2	Y
6 (>50%)[c]	Mandatory Reduction	21.2	Y

a. Associated volume of reduction is based on 2025 projected unconstrained SFPUC Retail customer demands on the Regional Water System of 65.9 mgd. Volumes shown for each level represent the total shortage that must be met with the associated response action at that shortage level.

b. For Shortage Levels 1-3, the SFPUC expects to have enough supply to meet projected unconstrained retail demands. However, SFPUC has a contractual obligation that for any level of required reduction in system-wide water use during shortages, the SFPUC shall require Retail Customers to conserve a minimum of 5 percent. A 5 percent reduction in retail demand can be achieved with a voluntary call for reductions in water use.

c. The Level 6 shortage (assumed to be 55% system-wide supply reduction) has an associated 21.2 mgd shortage gap in 2025. The demand reductions (methodology described further in Section 4.1) are assumed to ultimately be met with a demand reduction approach consisting of a 25 gpcd floor for residential accounts, a 50% demand reduction in irrigation accounts, and 30% demand reduction in other non-residential accounts.

SECTION 5 COMMUNICATION PROTOCOLS

Communication with the SFPUC's customers and the public is essential during drought, and particularly so when mandatory actions or restrictions are in effect. Demand reduction schedules and requirements must be communicated early and often to all customers. The SFPUC will employ multiple methods and means to inform and educate customers and the public.

Prior to the initiation of any water delivery reductions to its retail customers, whether it be initial implementation of delivery reduction or increasing the severity of water shortage response measures, the SFPUC will outline a drought response plan to address the following: the water supply situation; proposed water use reduction objectives; alternatives to water use reductions; methods to calculate water use allocations and adjustments; minimum per capita allocation (i.e. residential water use floor); compliance methodology and enforcement measures; and budget considerations.

This drought response plan will be presented at a regularly scheduled SFPUC Commission meeting for public input. The meeting will be advertised in accordance with the requirements of Section 6066 of the California Government Code, and the public will be invited to comment on the SFPUC's plan to address reduced supply.

5.1 COMMUNICATIONS ABOUT VOLUNTARY REDUCTIONS

Outreach that may be taken during a call for voluntary reductions include, but are not limited to:

- Milestone press releases and briefings to media
- Social media posts
- Dedicated and regularly updated drought section on sfpuc.org web site
- Articles in the SFPUC's digital and print Currents newsletter to customers
- Bill inserts
- Outdoor billboard, transit station, bus, television, radio and newspaper ads
- Email blasts to stakeholder organizations and groups
- Community presentations
- Direct mail, email, automated call, and mobile text notices
- My Account portal updates to communicate water reduction goals

5.2 COMMUNICATIONS ABOUT MANDATORY DEMAND REDUCTION

Outreach listed in Section 5.1 would likely also occur during mandatory demand reduction. Additional notifications to account holders that the SFPUC will disseminate include:

- Notification letter to all customers prior to activation of mandatory demand reduction that indicates mandatory water demand reduction will be implemented, customers are subject to excess use charges, and that a drought surcharge will be levied.

- Notification letter to all customers affected by mandatory reductions that provides their monthly allocations for the fiscal year, including information about the appeals process, availability of daily and hourly consumption data on My Account, and other resources for conservation assistance.

- Notification letter to customers with adjustments to their reduced flow factors, including information about appeals process and resources for conservation assistance.

- End-of-mandatory reductions letters that inform all customers that water the water shortage emergency has been lifted and the SFPUC is ending mandatory demand reduction.

- Noticing for public hearings conducted at SFPUC Commission meetings that inform the Commissioners and public about the declaration of a water shortage emergency and any subsequent modifications to the water shortage stage.

Account holders receive mailed notifications either through the billing service utilized by Customer Service or the City's Reproduction and Mail Services (ReproMail).

5.3 COMMUNICATIONS RELATED TO WHOLESALE CUSTOMERS

Regardless of the expectation of shortage conditions, as part of normal course of business, the SFPUC provides water supply estimates to its Wholesale Customers on a monthly basis beginning February 1. A Wholesale Customer Annual Meeting is held in the latter part of February, at which the SFPUC makes a presentation on current water supply conditions and forecasts. The last snow survey of the season typically occurs within the first week of April, followed by a runoff forecast to determine total system storage expected as of July 1. By the middle of April, the SFPUC sends a formal letter to the Wholesale Customers summarizing the water supply availability for the coming year and, if applicable, the declaration of need for a voluntary or mandatory response. A flowchart depicting the annual Water Supply and Demand Assessment process, including communication processes, is shown in Figure 2-1.

SECTION 6 ENFORCEMENT AND PENALTIES

6.1 ENFORCEMENT OF WATER USE ALLOCATIONS

The SFPUC's primary methods of enforcing the water shortage response action of mandatory demand reduction include excess use charges, installation of flow restrictors on customers' service lines, and/or shut-off of water. In addition, a new state law passed in 2016 (SB 814, adding Chapter 3.3 to Division 1 of the Water Code) requires public disclosure of customers who are fined for exceeding water use allocations.

During the 1987-92 drought, the SFPUC applied drought excess use charges were applied as outlined below. The fines only applied to the amount of water used over their allotment.

- If a customer consumed up to 10% over its allotment, it was charged 2 times the normal rate;
- If a customer consumed 10.01% to 20% over its allotment, it was charged 8 times the normal rate; and
- If a customer consumed 20.01% or over its allotment, it was charged 10 times the normal rate.

During the 2012-2016 drought, the SFPUC called for a 10 percent voluntary reduction in water use by all customers system-wide. However, mandatory reductions and excess use charges were also applied to a small subset of customers:

- Established a mandatory reduction in water use by dedicated irrigation customers of 25%, subject to excess use charges of 1 times the normal rate.

- Established a mandatory reduction in water use by Interruptible Water Service accounts of 30%, subject to excess use charges of 3 times the normal rate.

Under this WSCP, in the event of mandatory demand reduction, the SFPUC will impose excess use charges at a level deemed appropriate at the time of a declared water shortage emergency. The General Manager, or designee, will inform retail customers of the specific multiplier rates that will be applied for determining excess use charges (as described in Section 5 about Communications). The SFPUC will also offer retail customers an audit at the first run-over of their water use allocation to determine if there are any leaks. In some cases, excess use charges may be reversed if leaks are found and repaired immediately.

In the event that a customer exceeds its water use allocation, the SFPUC may, after issuing one written warning, install a flow restrictor on the customer's service line. The SFPUC may charge the customer a fee for the installation and removal of the flow restrictor, as it did in the 1987-92 drought. The General Manager, or designee, will determine the relevant charge at the time of the drought. If a customer continues to consume water in excess of its allotment, the SFPUC has the authority to discontinue the customer's water service and require that the customer bear the cost for the re-connection of water service.

The Landlord Pass-through Ordinance[5] allows landlords to pass up to 50 percent of excess use charges on to their tenants under certain conditions.

6.2 ENFORCEMENT OF WATER WASTE PROHIBITIONS

The SFPUC has found customer outreach, communication, and responding to water waste reports submitted through the City's 311 service request system to be effective methods for enforcing water use prohibitions and restrictions. The SFPUC reviews reports of potential water waste and violation of prohibitions submitted through the 311 system. If a report contains sufficient information and reflects a restricted water use, the SFPUC issues a written notice to the water account holder, property owner, and occupant. If reports of waste continue, the SFPUC will call or visit the site to try to verify that there is waste. If water waste is verified and continues, the SFPUC will issue additional warning letters to the account holder. Account holders that receive multiple warnings of verified water waste may be subject to additional action. The SFPUC also takes the same actions for incidents of water waste observed by SFPUC conservation field inspectors, and the SFPUC may increase the number of and inspectors patrolling for water waste during drought periods.

The water use restrictions and prohibitions may be enforced using the following means:

- Per the SFPUC Rules and Regulations Governing Water Service to Customers and the SFPUC's water rate schedule, violation of any water use restriction may result in the installation of a flow-restricting device in the service line of the customer, and continued violation could result in termination of service. The customer bears the cost of any enforcement action.

- Per the SFPUC Rules and Regulations Governing Water Service to Customers, violation of water waste prevention for landscaped areas[6] is subject to a written warning, followed by possible termination of service and penalties per Chapter 100 of the San Francisco Administrative Code if the violation is not corrected.

- As part of the SWRCB emergency conservation regulations, the California Water Code was amended to identify violations of water use prohibitions as infractions, and therefore punishable by a fine of up to $500 for each day in which the violation occurs.

[5] San Francisco Administrative Code Section 37.3
[6] SFPUC Rules and Regulations Governing Water Service to Customers, Section F, Rule 16.

SECTION 7 LEGAL AUTHORITIES

The SFPUC shall declare a water shortage emergency in accordance with California Water Code Chapter 3, Section 350 of Division 1 (general provision regarding water shortage emergencies).

The SFPUC shall coordinate with any city of county within which it provides water supply services for the possible proclamation of a local emergency (California Government Code, California Emergency Services Act Article 2, Section 8558). As described in Section 2.5, the SFPUC is in regular communication with its wholesale customers about water supply conditions.

Additional relevant statutory authorities, local ordinances, and resolutions that provide the legal authorities for implementing the WSCP are listed below:

- Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County (described in more detail in Section 3).
- SFPUC Rules and Regulations Governing Water Service to Customers, established by Resolution No. 19.786 passed December 15, 1959.
- Water Efficient Irrigation Ordinance (City and County of San Francisco Ordinance No. 24-16, approved March 4, 2016).
- Chapter 3.3 of Division 1 of the California Water Code (Excessive Residential Water Use During Drought) requires public disclosure of customers who are fined for exceeding water use allocations.

SECTION 8 FINANCIAL CONSEQUENCES OF WSCP

The SFPUC includes a variable component to water rates for most retail customer classes. As a result, as sales decrease, revenues are lost on a per unit basis. Because the marginal cost of water production is relatively small, as production is reduced, the cost of service remains the same. Some new costs may be incurred to implement the water shortage action of mandatory demand reduction, such as the effort required to coordinate implementation of customer-specific allocations in the SFPUC's billing system and the cost of notifying customers (see Section 5.2). For both retail and wholesale customers, a reduction in water purchases – whether voluntary or mandated – would require the SFPUC to raise rates, cut costs, or use existing fund balance reserves to cover its expenses. The financial planning and rate-setting process is complex and iterative. While major impacts of a water shortage on rates are described below, the full process, especially for large water shortages, would incorporate significant stakeholder discussion about tradeoffs and financial impacts.

The SFPUC's current retail water rates have a provision for a "drought surcharge" that automatically increases adopted rates in the event of a declared water shortage. The drought surcharge is calculated so that, accounting for the expected reduction in retail water usage, total revenues are equal to what they would have been without the reduction. The drought surcharge protects the SFPUC's financial stability during water shortages, and provides customers an incentive to meet conservation targets.

For Wholesale Customers, the rate-setting process is governed by the terms of the WSA, which provides that, in the event of a water shortage emergency, the Commission may adjust wholesale rates in an expedited way concurrently with the imposition of drought surcharges on retail customers. Beyond drought rate setting and emergency rate setting, rates are set annually in coordination with the SFPUC annual budget process and are based on the forecasted wholesale share of RWS expenditures and total purchases. If Wholesale Customer usage is expected to decrease – either voluntarily, or due

to shortages – this would be incorporated into the wholesale rate forecast, and rates may increase to make up for the revenue loss caused by reductions in water use.

SECTION 9 MONITORING AND REPORTING

Enforcement of the mandatory demand reduction program is described in more detail above in Section **Error! Reference source not found.**. Actual water savings are tracked through monthly consumption reports that are generated from the customer billing system. These consumption reports are highly accurate as all retail and wholesale customers are metered. Based on a comparison between monthly consumption data, the SFPUC can determine reductions in water use for both retail and wholesale customers. These data will also be used in evaluating the effectiveness of the WSCP (see Section 11). Additional data may be collected on a case-by-case basis. The SFPUC conducts ongoing monitoring of its watersheds, reservoirs, and other components of the RWS for reporting on the status of the water supply for purpose of determining applicability of the water shortage level.

SECTION 10 PREPARATION FOR CATASTROPHIC SUPPLY INTERRUPTION

The SFPUC maintains various planning documents which collectively address its emergency preparedness and planned response in the event of a catastrophic interruption of water supplies due to power outages, earthquakes, or other disasters. These plans are described in sections 10.1 (Emergency Preparedness Plans), 10.2 (Emergency Drinking Water Planning), and 10.3 (Power Outage Preparedness and Response) below. Section 10.4 addresses the seismic risk assessment and mitigation plan required by California Water Code Section 10632.5.(a). Should a catastrophic interruption occur, the SFPUC will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency (California Government Code, California Emergency Services Act Article 2, Section 8558).

10.1 EMERGENCY PREPAREDNESS PLANS

Following the 1989 Loma Prieta Earthquake, the SFPUC created a departmental Emergency Operations Plan (EOP). The SFPUC EOP was originally released in 1992 and has been updated as necessary ever since. Most recently, the SFPUC developed a Water System Emergency Response Plan (Water ERP) to comply with the America's Water Infrastructure Act (AWIA) passed in 2018. The Water ERP acts as a unifying document, integrating and referencing common components of SFPUC plans and programs that have been developed to date. The Water ERP is intended to address water transmission and distribution systems and identify the Enterprises, Divisions, and Bureaus with direct roles and responsibilities. The Water ERP integrates directly into, and functions as an annex to, the SFPUC Emergency Operations Plan (EOP). The SFPUC EOP addresses a broad range of potential emergency situations that may affect the SFPUC and supplements the City's Emergency Response Plan, which was prepared by the Department of Emergency Management and most recently updated in 2017. Specifically, the purpose of the SFPUC EOP is to describe its emergency management organization, roles and responsibilities, and emergency policies and procedures.

In addition, SFPUC divisions and bureaus each have their own Division Emergency Operations Plans (DEOP) (in alignment with the SFPUC EOP), which detail that entity's specific emergency management organization, roles and responsibilities, and emergency policies and procedures. The SFPUC tests its DEOPs on a regular basis by conducting emergency exercises. Through these exercises, the SFPUC learns how well the plans and procedures will or will not work in response to an emergency. DEOP improvements are based on the results of these exercises and real-world event response and evaluation. The SFPUC also has an emergency response training plan that is based on federal, State, and local standards and exercise and incident improvement plans. SFPUC employees have emergency training requirements that are based on their emergency response roles.

The SFPUC EOP functions as a front end for the SFPUC's DEOPs, covering emergency response at the Department level; while each DEOP covers Division-specific information on the Division's emergency organization and response procedures specific to Division responsibilities, assets, technical scope, and operations. The types of events affecting SFPUC that may require emergency plans include but are not limited to:

- Major earthquake
- Loss of power
- Loss of water supply
- Major fire
- Hazardous material release that threatens water supply or environment
- Major pipeline breaks
- Dam break
- Significant outage of SFPUC services
- Man-made or intentional acts of terrorism resulting in damage to the system or interruption in service

In addition to the documents described above, the SFPUC also maintains various plans and procedures that deal with the possibility of alternate supply schemes and options. These include:

- Emergency Disinfection and Recovery Plan (EDRP)
- Emergency Response Action Plan (ERAP)
- Emergency Drinking Water Equipment and Alternatives Report
- Disinfection of SFPUC Water Trailers Procedure
- City Distribution Division Hydrant Manifold Standard Operating Procedure
- Pilot plant trailer (Mobile Pilot Plan O&M Plan)

10.2 EMERGENCY DRINKING WATER PLANNING

In February 2005, the SFPUC published the City Emergency Drinking Water Alternatives report. The purpose of this report was to outline a plan for supplying emergency drinking water in the City after damage and/or contamination of the SFPUC raw and/or treated water systems resulting from a major disaster. Since the publication of this report, the SFPUC has implemented a number of projects to increase its capability to support the provision of emergency drinking water during an emergency. These projects include:

- Completion of many Water System Improvement Program (WSIP) projects and other capital upgrades to improve security, detection, and communication (see Section 10.4);
- Public Information and materials for home and business;
- Construction of a disinfection and fill station at the existing San Francisco Zoo well, and obtaining a permit to utilize this well as a standby emergency drinking water source;

- Constructed six wells as part of the San Francisco Groundwater Supply Project, two of which also serve as emergency drinking water supplies, including a distribution system to fill emergency water tankers;

- Purchase and engineering of emergency-related equipment, including water tanker trucks and water distribution manifolds, to help with distribution post-disaster; and

- Coordination of planning with other City departments, neighboring jurisdictions, and other public and private partners to maximize resources and supplies for emergency response.

The SFPUC has also prepared the RWS Water Quality Notifications and Communications Plan. This plan, which was first prepared in 1996 and was most recently updated in 2017, provides contact information, procedures, and guidelines to be implemented by several SFPUC divisions, wholesale customers, and BAWSCA in the event of water quality impacts. The plan treats water quality issues as potential or actual supply problems, which fall under the emergency response structure of the SFPUC ERP.

10.3 POWER OUTAGE PREPAREDNESS AND RESPONSE

The SFPUC's water transmission system is primarily gravity fed from Hetch Hetchy Reservoir to the City. Within the in-City distribution system, key pump stations have generators on site and all others have connections in place that would allow portable generators to be used.

Although water conveyance throughout the RWS would not be greatly impacted by power outages because it is gravity fed, the SFPUC has prepared for potential regional power outages as follows:

- The Tesla Treatment Facility, the Sunol Valley Water Treatment Plant (SVWTP), and the San Antonio Pump Station have back-up power on site in the form of generators or diesel-powered pumps. Additionally, both the SVWTP and San Antonio Pump Station would not be impacted by a failure of the regional power grid because these facilities are powered by hydropower generated by the Hetch Hetchy Water and Power System.

- Both the Harry Tracy Water Treatment Plant (HTWTP) and the Baden Pump Station (part of the Peninsula System) have back-up generators in place.

- Administrative facilities that will act as emergency operation centers also have back-up power.

- The SFPUC has an emergency water supply connection with the Santa Clara Valley Water District (SCVWD), the SCVWD intertie, which also has back-up generators in place.

- Additionally, as described in the next section, the WSIP includes projects that expand the SFPUC's ability to remain in operation during power outages and other emergency situations.

10.4 SEISMIC RISK ASSESSMENT AND MITIGATION PLAN

As part of the Facilities Reliability Program and the Water System Improvement Program (WSIP), the SFPUC performed an extensive multi-year evaluation of seismic risks to its water system that resulted in major capital improvements to increase seismic reliability. The goals of WSIP include enhancing the ability of the SFPUC water system to meet identified service goals for water quality, seismic reliability, delivery reliability, and water supply. One of the original goals of WSIP was to limit rationing to no more than 20 percent on a system-wide basis; the WSIP was developed to reduce the likelihood of shortages, thereby reducing the likelihood of needing to implement the WSCP.

The WSIP projects include several projects located in San Francisco to improve the seismic reliability of the in-City distribution system, including more wells that can be used as emergency drinking water sources. The WSIP also incorporates many projects related to the RWS to address both seismic reliability and overall system reliability. As of August 2018, the WSIP is over 96 percent complete. Local San Francisco projects are 100 percent complete as of June 2020. The current forecasted date to complete the overall WSIP is December 2021.

WSIP seismic levels of service (LOS) informed development of capital projects and guided program implementation. The LOS established post-earthquake delivery and recovery objectives under the following seismic scenarios:

- Magnitude 7.9 event on the San Andreas fault
- Magnitude 7.3 event on the Hayward fault
- Magnitude 6.9 event on the Calaveras fault

An assessment of seismic risk and resilience is contained in the body of analysis performed to support the WSIP. The risks associated with the seismic scenarios considered are reflected in the delivery objectives established in the LOS, specifically:

- Delivery of winter month demand 24 hours after a major earthquake, and
- Delivery of average day demand 30 days after a major earthquake

In addition to the improvements that have or will come from the WSIP, the City has already constructed system interties for use during catastrophic emergencies, short-term facility maintenance and upgrade activities, and times of water shortages. These are listed below:

- A 35 mgd intertie with the EBMUD allowing EBMUD to serve the City of Hayward's demand and/or supply the SFPUC directly (and vice versa);
- A 40-mgd system intertie between the SFPUC and SCVWD; and,
- One permanent and one temporary intertie to the South Bay Aqueduct, which would enable the SFPUC to receive State Water Project water.

The WSIP also includes projects related to standby power facilities at various locations. These projects provide for standby electrical power at six critical facilities to keep them in operation during power outages and other emergency situations. Permanent engine generators are located at four locations (San Pedro Valve Lot, Millbrae Facility, Alameda West, and HTWTP), while hookups for portable engine generators are at two locations (San Antonio Reservoir and Calaveras Reservoir).The City of San Francisco also has a Hazard Mitigation Plan which was last updated in June 2014 and includes sections describing earthquakes hazards and mitigation for assets within the City's boundary, including state-regulated reservoirs (Sutro, Sunset North and South, and University Mound North and South).

SECTION 11 WSCP REFINEMENT PROCEDURES

The SFPUC considers the WSCP a dynamic tool that will be subject to regular refinement as needed to ensure shortage response actions are effective and produce the desired results. If planned shortage response actions are implemented in the future, the SFPUC will conduct an evaluation of their effectiveness using the monitoring and reporting described in Section 9 and incorporate edits as needed to the WSCP.

SECTION 12 PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY

The SFPUC prepared this 2020 WSCP and presented it to the SFPUC Commission for adoption on June 8, 2021. A copy of the SFPUC resolution adopting this 2020 WSCP is provided in Appendix D.

Within 30 days of SFPUC Commission approval, the adopted 2020 WSCP will be submitted electronically to the DWR via its Water Use Efficiency data online submittal tool (WUEdata). Electronic copies will also be provided on compact disc to the California State Library and via e-mail (within 60 days of WSCP submittal to DWR) to cities and counties within which the SFPUC provides water supplies. In addition, the SFPUC will make this adopted 2020 WSCP available for public review within 30 days of SFPUC Commission approval during normal business hours by placing a copy at the San Francisco Main Public Library and main offices of the SFPUC, as well as by posting an electronic copy on the SFPUC web site at www.sfpuc.org.

Should amendments to the WSCP be required in future years, it is expected that the same adoption, submittal, and availability processes described above would be followed for the updated WSCP.

2020 WATER SHORTAGE CONTINGENCY PLAN

for the City and County of San Francisco

APPENDICES

June 2021

Prepared by:

The San Francisco
Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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APPENDIX A

Water Shortage Allocation Plan

(Attachment H of Water Supply Agreement Between the City and County of San Francisco and with Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County)

JUNE 2021
WATER SHORTAGE CONTINGENCY PLAN

for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

ATTACHMENT H

WATER SHORTAGE ALLOCATION PLAN

This Interim Water Shortage Allocation Plan ("Plan") describes the method for allocating water between the San Francisco Public Utilities Commission ("SFPUC") and the Wholesale Customers collectively during shortages caused by drought. The Plan implements a method for allocating water among the individual Wholesale Customers which has been adopted by the Wholesale Customers. The Plan includes provisions for transfers, banking, and excess use charges. The Plan applies only when the SFPUC determines that a system-wide water shortage due to drought exists, and all references to "shortages" and "water shortages" are to be so understood. This Plan was adopted pursuant to Section 7.03(a) of the 1984 Settlement Agreement and Master Water Sales Contract and has been updated to correspond to the terminology used in the June 2009 Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County and Santa Clara County ("Agreement").

SECTION 1. SHORTAGE CONDITIONS

1.1. Projected Available SFPUC Water Supply. The SFPUC shall make an annual determination as to whether or not a shortage condition exists. The determination of projected available water supply shall consider, among other things, stored water, projected runoff, water acquired by the SFPUC from non-SFPUC sources, inactive storage, reservoir losses, allowance for carryover storage, and water bank balances, if any, described in Section 3.

1.2 Projected SFPUC Purchases. The SFPUC will utilize purchase data, including volumes of water purchased by the Wholesale Customers and by Retail Customers (as those terms are used in the Agreement) in the year immediately prior to the drought, along with other available relevant information, as a basis for determining projected system-wide water purchases from the SFPUC for the upcoming year.

1.3. Shortage Conditions. The SFPUC will compare the available water supply (Section 1.1) with projected system-wide water purchases (Section 1.2). A shortage condition exists if the SFPUC determines that the projected available water supply is less than projected system-wide water purchases in the upcoming Supply Year (defined as the period from July 1 through June 30). When a shortage condition exists, SFPUC will determine whether voluntary or mandatory actions will be required to reduce purchases of SFPUC water to required levels.

1.3.1 Voluntary Response. If the SFPUC determines that voluntary actions will be sufficient to accomplish the necessary reduction in water use throughout its service area, the SFPUC and the Wholesale Customers will make good faith efforts to reduce their water purchases to stay within their annual shortage allocations and associated monthly water use budgets. The SFPUC will not impose excess use charges during periods of voluntary rationing, but may suspend the prospective accumulation of water bank credits, or impose a ceiling on further accumulation of bank credits, consistent with Section 3.2.1 of this Plan.

1.3.2 Mandatory Response. If the SFPUC determines that mandatory actions will be required to accomplish the necessary reduction in water use in the SFPUC service area, the SFPUC may implement excess use charges as set forth in Section 4 of this Plan.

1.4. Period of Shortage. A shortage period commences when the SFPUC determines that a water shortage exists, as set forth in a declaration of water shortage emergency issued by the SFPUC pursuant to California Water Code Sections 350 et seq. Termination of the water shortage emergency will be declared by resolution of the SFPUC.

SECTION 2. SHORTAGE ALLOCATIONS

2.1. Annual Allocations between the SFPUC and the Wholesale Customers. The annual water supply available during shortages will be allocated between the SFPUC and the collective Wholesale Customers as follows:

Level of System Wide Reduction in Water Use Required	Share of Available Water	
	SFPUC Share	Wholesale Customers Share
5% or less	35.5%	64.5%
6% through 10%	36.0%	64.0%
11% through 15%	37.0%	63.0%
16% through 20%	37.5%	62.5%

The water allocated to the SFPUC shall correspond to the total allocation for all Retail Customers. In the event that the SFPUC share of the available water supply in the above table results in Retail Customers having a positive allocation (i.e., a supply of additional water rather than a required percentage reduction in water use), the SFPUC's percentage share of the available water supply in the table shall be reduced to eliminate any positive allocation to Retail Customers, with a corresponding increase in the percentage share of the available water supply allocated to the Wholesale Customers. For any level of required reduction in system-wide water use during shortages, the SFPUC shall require Retail Customers to conserve a minimum of 5%, with any resulting reallocated supply credited to storage for inclusion in calculation of projected available water SFPUC water supply in a subsequent year (Section 1.1).

The parties agree to reevaluate the percentages of the available water supply allocated to Retail and Wholesale Customers by May 1, 2028.

2.2 Annual Allocations among the Wholesale Customers. The annual water supply allocated to the Wholesale Customers collectively during system wide shortages of 20 percent or less will be apportioned among them based on a methodology adopted by all of the Wholesale Customers, as described in Section 3.11(C) of the Agreement. In any year for which the methodology must be applied, the Bay Area Water Supply and Conservation Agency ("BAWSCA") will calculate each Wholesale Customer's individual percentage share of the amount of water allocated to the Wholesale Customers collectively pursuant to Section 2.1. Following the declaration or reconfirmation of a water shortage emergency by the SFPUC, BAWSCA will deliver to the SFPUC General Manager a list, signed by the President of BAWSCA's Board of Directors and

its General Manager, showing each Wholesale Customer together with its percentage share and stating that the list has been prepared in accordance with the methodology adopted by the Wholesale Customers. The SFPUC shall allocate water to each Wholesale Customer, as specified in the list. The shortage allocations so established may be transferred as provided in Section 2.5 of this Plan. If BAWSCA or all Wholesale Customers do not provide the SFPUC with individual allocations, the SFPUC may make a final allocation decision after first meeting and discussing allocations with BAWSCA and the Wholesale Customers.

The methodology adopted by the Wholesale Customers utilizes the rolling average of each individual Wholesale Customer's purchases from the SFPUC during the three immediately preceding Supply Years. The SFPUC agrees to provide BAWSCA by November 1 of each year a list showing the amount of water purchased by each Wholesale Customer during the immediately preceding Supply Year. The list will be prepared using Customer Service Bureau report MGT440 (or comparable official record in use at the time), adjusted as required for any reporting errors or omissions, and will be transmitted by the SFPUC General Manager or his designee.

2.3. Limited Applicability of Plan to System Wide Shortages Greater Than Twenty Percent. The allocations of water between the SFPUC and the Wholesale Customers collectively, provided for in Section 2.1, apply only to shortages of 20 percent or less. The SFPUC and Wholesale Customers recognize the possibility of a drought occurring which could create system-wide shortages greater than 20 percent despite actions taken by the SFPUC aimed at reducing the probability and severity of water shortages in the SFPUC service area. If the SFPUC determines that a system wide water shortage greater than 20 percent exists, the SFPUC and the Wholesale Customers agree to meet within 10 days and discuss whether a change is required to the allocation set forth in Section 2.1 in order to mitigate undue hardships that might otherwise be experienced by individual Wholesale Customers or Retail Customers. Following these discussions, the Tier 1 water allocations set forth in Section 2.1 of this Plan, or a modified version thereof, may be adopted by mutual written consent of the SFPUC and the Wholesale Customers. If the SFPUC and Wholesale Customers meet and cannot agree on an appropriate Tier 1 allocation within 30 days of the SFPUC's determination of water shortage greater than 20 percent, then (1) the provisions of Section 3.11(C) of the Agreement will apply, unless (2) all of the Wholesale Customers direct in writing that a Tier 2 allocation methodology agreed to by them be used to apportion the water to be made available to the Wholesale Customers collectively, in lieu of the provisions of Section 3.11(C).

The provisions of this Plan relating to transfers (in Section 2.5), banking (in Section 3), and excess use charges (in Section 4) shall continue to apply during system-wide shortages greater than 20 percent.

2.4. Monthly Water Budgets. Within 10 days after adopting a declaration of water shortage emergency, the SFPUC will determine the amount of Tier 1 water allocated to the Wholesale Customers collectively pursuant to Section 2.1. The SFPUC General Manager, using the Tier 2 allocation percentages shown on the list delivered by BAWSCA pursuant to Section 2.2, will calculate each Wholesale Customer's individual annual allocation. The SFPUC General Manager, or his designee, will then provide each Wholesale Customer with a proposed schedule of monthly water budgets based on the pattern of monthly water purchases during the Supply Year immediately preceding the declaration of shortage (the "Default Schedule"). Each

Wholesale Customer may, within two weeks of receiving its Default Schedule, provide the SFPUC with an alternative monthly water budget that reschedules its annual Tier 2 shortage allocation over the course of the succeeding Supply Year. If a Wholesale Customer does not deliver an alternative monthly water budget to the SFPUC within two weeks of its receipt of the Default Schedule, then its monthly budget for the ensuing Supply Year shall be the Default Schedule proposed by the SFPUC.

Monthly Wholesale Customer water budgets will be derived from annual Tier 2 allocations for purposes of accounting for excess use. Monthly Wholesale Customer water budgets shall be adjusted during the year to account for transfers of shortage allocation under Section 2.5 and transfers of banked water under Section 3.4.

2.5. Transfers of Shortage Allocations. Voluntary transfers of shortage allocations between the SFPUC and any Wholesale Customers, and between any Wholesale Customers, will be permitted using the same procedure as that for transfers of banked water set forth in Section 3.4. The SFPUC and BAWSCA shall be notified of each transfer. Transfers of shortage allocations shall be deemed to be an emergency transfer and shall become effective on the third business day after notice of the transfer has been delivered to the SFPUC. Transfers of shortage allocations shall be in compliance with Section 3.05 of the Agreement. The transferring parties will meet with the SFPUC, if requested, to discuss any effect the transfer may have on its operations.

SECTION 3. SHORTAGE WATER BANKING

3.1. Water Bank Accounts. The SFPUC shall create a water bank account for itself and each Wholesale Customer during shortages in conjunction with its resale customer billing process. Bank accounts will account for amounts of water that are either saved or used in excess of the shortage allocation for each agency; the accounts are not used for tracking billings and payments. When a shortage period is in effect (as defined in Section 1.4), the following provisions for bank credits, debits, and transfers shall be in force. A statement of bank balance for each Wholesale Customer will be included with the SFPUC's monthly water bills.

3.2. Bank Account Credits. Each month, monthly purchases will be compared to the monthly budget for that month. Any unused shortage allocation by an agency will be credited to that agency's water bank account. Credits will accumulate during the entire shortage period, subject to potential restrictions imposed pursuant to Section 3.2.1. Credits remaining at the end of the shortage period will be zeroed out; no financial or other credit shall be granted for banked water.

3.2.1. Maximum Balances. The SFPUC may suspend the prospective accumulation of credits in all accounts. Alternatively, the SFPUC may impose a ceiling on further accumulation of credits in water bank balances based on a uniform ratio of the bank balance to the annual water allocation. In making a decision to suspend the prospective accumulation of water bank credits, the SFPUC shall consider the available water supply as set forth in Section 1.1 of this Plan and other reasonable, relevant factors.

3.3. Account Debits. Each month, monthly purchases will be compared to the budget for that month. Purchases in excess of monthly budgets will be debited against an agency's water bank account. Bank debits remaining at the end of the fiscal year will be subject to excess use charges (see Section 4).

3.4. Transfers of Banked Water. In addition to the transfers of shortage allocations provided for in Section 2.5, voluntary transfers of banked water will also be permitted between the SFPUC and any Wholesale Customer, and among the Wholesale Customers. The volume of transferred water will be credited to the transferee's water bank account and debited against the transferor's water bank account. The transferring parties must notify the SFPUC and BAWSCA of each transfer in writing (so that adjustments can be made to bank accounts), and will meet with the SFPUC, if requested, to discuss any affect the transfer may have on SFPUC operations. Transfers of banked water shall be deemed to be an emergency transfer and shall become effective on the third business day after notice of the transfer has been delivered to the SFPUC. If the SFPUC incurs extraordinary costs in implementing transfers, it will give written notice to the transferring parties within ten (10) business days after receipt of notice of the transfer. Extraordinary costs means additional costs directly attributable to accommodating transfers and which are not incurred in non-drought years nor simply as a result of the shortage condition itself. Extraordinary costs shall be calculated in accordance with the procedures in the Agreement and shall be subject to the disclosure and auditing requirements in the Agreement. In the case of transfers between Wholesale Customers, such extraordinary costs shall be considered to be expenses chargeable solely to individual Wholesale Customers and shall be borne equally by the parties to the transfer. In the case of transfers between the SFPUC and a Wholesale Customer, the SFPUC's share of any extraordinary transfer costs shall not be added to the Wholesale Revenue Requirement.

3.4.1. Transfer Limitations. The agency transferring banked water will be allowed to transfer no more than the accumulated balance in its bank. Transfers of estimated prospective banked credits and the "overdrafting" of accounts shall not be permitted. The price of transfer water originally derived from the SFPUC system is to be determined by the transferring parties and is not specified herein. Transfers of banked water shall be in compliance with Section 3.05 of the Agreement.

SECTION 4. WHOLESALE EXCESS USE CHARGES

4.1. Amount of Excess Use Charges. Monthly excess use charges shall be determined by the SFPUC at the time of the declared water shortage consistent with the calendar in Section 6 and in accordance with Section 6.03 of the Agreement. The excess use charges will be in the form of multipliers applied to the rate in effect at the time the excess use occurs. The same excess use charge multipliers shall apply to the Wholesale Customers and all Retail Customers. The excess use charge multipliers apply only to the charges for water delivered at the rate in effect at the time the excess use occurred.

4.2 Monitoring Suburban Water Use. During periods of voluntary rationing, water usage greater than a customer's allocation (as determined in Section 2) will be indicated on each SFPUC monthly water bill. During periods of mandatory rationing, monthly and cumulative water usage greater than a Wholesale Customer's shortage allocation and the associated excess use charges will be indicated on each SFPUC monthly water bill.

4.3. Suburban Excess Use Charge Payments. An annual reconciliation will be made of monthly excess use charges according to the calendar in Section 6. Annual excess use charges will be calculated by comparing total annual purchases for each Wholesale Customer with its

annual shortage allocation (as adjusted for transfers of shortage allocations and banked water, if any). Excess use charge payments by those Wholesale Customers with net excess use will be paid according to the calendar in Section 6. The SFPUC may dedicate excess use charges paid by Wholesale Customers toward the purchase of water from the State Drought Water Bank or other willing sellers in order to provide additional water to the Wholesale Customers. Excess use charges paid by the Wholesale Customers constitute Wholesale Customer revenue and shall be included within the SFPUC's annual Wholesale Revenue Requirement calculation.

SECTION 5. GENERAL PROVISIONS GOVERNING WATER SHORTAGE ALLOCATION PLAN

5.1. Construction of Terms. This Plan is for the sole benefit of the parties and shall not be construed as granting rights to any person other than the parties or imposing obligations on a party to any person other than another party.

5.2. Governing Law. This Plan is made under and shall be governed by the laws of the State of California.

5.3. Effect on Agreement. This Plan describes the method for allocating water between the SFPUC and the collective Wholesale Customers during system-wide water shortages of 20 percent or less. This Plan also provides for the SFPUC to allocate water among the Wholesale Customers in accordance with directions provided by the Wholesale Customers through BAWSCA under Section 2.2, and to implement a program by which such allocations may be voluntarily transferred among the Wholesale Customers. The provisions of this Plan are intended to implement Section 3.11(C) of the Agreement and do not affect, change or modify any other section, term or condition of the Agreement.

5.4. Inapplicability of Plan to Allocation of SFPUC System Water During Non-Shortage Periods. The SFPUC's agreement in this Plan to a respective share of SFPUC system water during years of shortage shall not be construed to provide a basis for the allocation of water between the SFPUC and the Wholesale Customers when no water shortage emergency exists.

5.5. Termination. This Plan shall expire at the end of the Term of the Agreement.. The SFPUC and the Wholesale Customers can mutually agree to revise or terminate this Plan prior to that date due to changes in the water delivery capability of the SFPUC system, the acquisition of new water supplies, and other factors affecting the availability of water from the SFPUC system during times of shortage.

SECTION 6. ALLOCATION CALENDAR

6.1. Annual Schedule. The annual schedule for the shortage allocation process is shown below. This schedule may be changed by the SFPUC to facilitate implementation.

6.1.1

	In All Years	Target Dates
1.	SFPUC delivers list of annual purchases by each Wholesale Customer during the immediately preceding Supply Year	November 1
2.	SFPUC meets with the Wholesale Customers and presents water supply forecast for the following Supply Year	February
3.	SFPUC issues initial estimate of available water supply	February 1
4.	SFPUC announces potential first year of drought (if applicable)	February 1
5.	SFPUC and Wholesale Customers meet upon request to exchange information concerning water availability and projected system-wide purchases	February 1-May 31
6.	SFPUC issues revised estimate of available water supply, and confirms continued potential shortage conditions, if applicable	March 1
7.	SFPUC issues final estimate of available water supply	April 15th or sooner if adequate snow course measurement data is available to form a robust estimate on available water supply for the coming year.
8.	SFPUC determines amount of water available to Wholesale Customers collectively	April 15th or sooner if adequate snow course measurement data is available to form a robust estimate on available water supply for the coming year.
	In Drought Years	**Target Dates**
9.	SFPUC formally declares the existence of water shortage emergency (or end of water shortage emergency, if applicable) under Water Code Sections 350 et. seq.	April 15-30
10.	SFPUC declares the need for a voluntary or mandatory response	April 15-30
11.	BAWSCA submits calculation to SFPUC of individual Wholesale Customers' percentage shares of water allocated to Wholesale Customers collectively	April 15- 30
12.	SFPUC determines individual shortage allocations, based on BAWSCA's submittal of individual agency percentage shares to SFPUC, and monthly water budgets (Default Schedule)	April 25—May 10
13.	Wholesale Customers submit alternative monthly water budgets (optional)	May 8-May 24
14.	Final drought shortage allocations are issued for the Supply Year beginning July 1 through June 30	June 1
15.	Monthly water budgets become effective	July 1
16.	Excess use charges indicated on monthly Suburban bills	August 1 (of the beginning year) through June 30 (of the succeeding year)
17.	Excess use charges paid by Wholesale Customers for prior year	August of the succeeding year

APPENDIX B

Summary of San Francisco's Response to 1987-92 Drought Experience

JUNE 2021
WATER SHORTAGE CONTINGENCY PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

Summary of San Francisco's Response to 1987-92 Drought Experience

Background:

The 1987-92 six year drought provides an example of how the near-term drought management process works in times when the operational capabilities of Hetch Hetchy and other water supplies available to the SFPUC are taxed to a point that forces drastic actions to avoid running out of water. By the sixth year of that drought period, many of the programs and actions identified in San Francisco's current Retail Water Shortage Allocation Plan (adopted in December 2001) had been implemented. The following describes some of the major actions that occurred.

Demand Reductions:

The extended drought forced San Francisco to adopt a mandatory rationing program, enforced by stiff excess use charges and the threat of shut-off for continued violations of water use prohibitions. Mandatory rationing was in effect May of 1988 through May of 1989, re-instituted in May of 1990, and continued until March of 1993. A Water Shortage Emergency Resolution was passed by the SFPUC on April 28, 1988 declaring these rationing periods (Resolution No. 88-0155). A copy of this resolution can be found at the end of this appendix.

The SFPUC's water rationing program was one of the toughest in the state and the most stringent imposed by any major urban water supply agency. Although the specifics of the program varied over time, the basic outline of the mandatory rationing program was to achieve a 25 percent reduction to 1987 (pre-drought) consumption (system-wide), with water allocations set on an account-by-account basis.

To provide a strong incentive for customers to use no more water than their allotment, the SFPUC adopted a rate structure that incorporated excess use charges. Any customer that used less water than its allotment was charged the normal rate per unit of water consumption, while any customer who used more than its allotment was charged a multiple of the normal rate for every unit of consumption above its allotment. As of January 1, 1992 (the last year of the rationing program), the rate structure shown in the table below applied to SFPUC customers.

Excess Use Charges	
If Water Consumption Is (Over Allotment)	Excess Use Charge Will Be (Times Normal Rate)
Up to 10%	2
10.01 - 20%	8
20.01% or over	10

In the event that water was used in excess of the customer's specified allotment, the SFPUC could, after one written warning, install a flow restrictor on the customer's service line. The charge to install and remove the restricting device is shown in the table below. If a customer continued to consume water in excess of its allotment, the SFPUC had the authority to discontinue the customer's water service and require the customer to bear the cost for the re-connection of water service.

Fee For Installing Flow Restricting Devices	
Meter Size	Installation/Removal Cost
to 1”	$95
1” to 2”	$149
3” and larger	Actual cost

In addition to pricing disincentives for excess water use, numerous water use restrictions were adopted and enforced. San Francisco retail customers were required to comply with the following water use prohibitions and restrictions:

- Water waste, including but not limited to, any flooding or runoff into the street or gutters, was prohibited.
- Hoses could not be used to clean sidewalks, driveways, patios, plazas, homes, businesses, parking lots, roofs, awnings or other hard surfaces areas.
- Hoses used for any purpose had to have positive shutoff valves.
- Restaurants served water to customers only upon request.
- Potable water was not to be used to clean, fill or maintain levels in decorative fountains.
- Use of additional water was not allowed for new landscaping or expansion of existing facilities unless low water use landscaping designs and irrigation systems were employed.
- Water service connections for new construction were granted only if water saving fixtures or devices were incorporated into the plumbing system.
- Use of potable water for consolidation of backfill, dust control or other non-essential construction purposes was prohibited.
- Irrigation of lawns, play fields, parks, golf courses, cemeteries, and landscaping of any type with potable water would be reduced by at least the amount specified for outside use in the adopted rationing plan.
- Verified water waste as determined by the Water Department would serve as prima facie evidence that the allocation assigned to the water account is excessive; therefore, the allocation was subject to review and possible reduction, including termination of service.
- Water used for all cooling purposes was to be recycled.
- The use of groundwater and/or reclaimed water for irrigation of golf courses, median strips, and similar turf areas was strongly encouraged.
- The use of groundwater and/or reclaimed water for street sweepers/washers was strongly encouraged.

In addition to water use prohibitions and directives specifically responsive to the drought, the SFPUC coincidentally was implementing long-term conservation programs, which also lowered water demands during the drought period (refer to the Demand Management discussion). Following the drought, several of the measures described above were adopted by San Francisco into permanent, on-going programs.

Water Management:

In addition to effecting reductions to water demands, the SFPUC also employed water management activities to control the severity of water shortages to its customers.

During the drought and for the first time in history, the SFPUC utilized a Delta supply within its system. The SFPUC imported water from the Delta through use of State Water Project South Bay Aqueduct facilities. The sources of water transferred included transfers via the California Emergency Water Bank, Placer County and the Modesto Irrigation District. The waters were diverted from the South Bay Aqueduct into the SFPUC's San Antonio Reservoir and then treated and integrated into SFPUC's water distribution system.

The amount of water actually delivered to the SFPUC was constrained due to numerous factors including the lack of willing sellers, allocation procedures, lack of priority in use of the State transmission facilities, storage constraints in San Antonio Reservoir, and water treatment constraints within the SFPUC's system. The total water that was imported into the SFPUC's system amounted to a maximum of approximately 31,000 acre-feet in one year, and in total for the drought period amounted to 59,000 acre-feet.

The importation of additional water into the SFPUC's system allowed the continuation of a 25 percent system-wide rationing program as compared to a potentially higher level of rationing had the transfers not occurred.

System Response and Effects:

The system-wide goal of reducing water use by 25 percent was achieved. However, the reduction was not accomplished without cost or hardship.

To achieve its annual 25 percent system-wide rationing goal, the SFPUC targeted a reduction of indoor consumption by 10 percent and outdoor consumption by 60 percent.

Due to the nature of the allocation formula for water allotments and the level of system-wide reduction goals, instances occurred where individual users or wholesale water customers were burdened with up to twice the system-wide average in delivery reductions.

Some of the costs incurred by individuals, property owners and renters include:

- The cost of installing low-flow toilets, retrofit kits for toilets and showerheads, and special low-water use landscaping and irrigation systems
- The financial losses resulting from loss of lawns, plants and trees due to the 60 percent reduction in water available for irrigation
- The cost of excess use charges ($12,300,000 in excess use charges was billed to retail accounts in fiscal year 1991-92 alone)

The ability of SFPUC's retail customers to achieve a 25 percent reduction in the future is highly unlikely due to the "hardening" of water demands that occurred during and subsequent to the drought. The rationing programs implemented by San Francisco during the 1987-92 drought were measured by comparison to calendar year 1987 water deliveries, i.e., pre-drought conditions.

During the 1987-92 drought San Francisco's retail and wholesale water customers implemented numerous conservation measures that have led to permanent per capita water usage savings. San Francisco's current

water demand is likely hardened as compared to the 1987 level of water demand. This situation leads to a conclusion that comparable rationing goals (e.g., up to 25 percent reduction) would be more difficult to achieve since the drought, and would require measures in excess of those implemented during the 1987-92 drought to achieve a comparable percentage of delivery reduction.

As the level of rationing increases, the economic and societal impacts become more severe. The SFPUC has first hand experience in attempting to employ rationing to levels, which are intolerable to citizens and businesses.

In 1991, water storage had deteriorated and the SFPUC was forced to immediately adopt a 45 percent system-wide rationing plan. It was proposed the reduction would be achieved through a 33 percent reduction to inside water use and a 90 percent reduction to outside water use.

San Francisco's plan for meeting its rationing goal included the following minimum and maximum criteria:

- *Maximum Allocation for Single and Multi-family Residences.* No single-family residence shall receive an allocation of more than 300 gallons per day: no multi-family residence shall receive an allocation of more than 150 gallons per day times the number of living units in the building.

- *Minimum Allocation for All Residential Accounts.* A minimum of 50 gallons per day per documented resident will be allowed. However, a minimum allocation will not be approved to increase an allocation above current usage absent a documented change in circumstances.

- *Irrigation Services.* Accounts classified for irrigation only will be reduced by 90 percent.

- *Commercial/Industrial Allocations.* Commercial and industrial allocations will be reduced by 32 percent. Hospitals and other health care facilities may be subject to lesser restrictions subject to verification that all conservation measures are in place; such approval shall require an on-site conservation inspection.

- *Allocations for New Accounts.* Initial allocations will be established at 50 gallons per day. These allocations will be re-evaluated after customers have installed retrofit kits provided by the San Francisco Water Department. After verification of installation, allocations will be calculated on the basis of the number of documented residents within a household, or, in the case of commercial or industrial customers, on the basis of business data supplied to the Department.

Additional water use restrictions and prohibitions were enforced:

- The washing of all automobiles, motorcycles, RVS, trucks, transit vehicles, trailers, boats, trains and airplanes was prohibited outside of a commercial washing facility.

- Exceptions to the above use restriction were windows on all vehicles and such commercial or safety vehicles requiring cleaning for health and safety reasons.

- Water used for all cooling purposes or for commercial car washes had to be recycled.

- The use of potable water on golf courses was limited to the irrigation of putting greens. The use of groundwater and reclaimed water was permitted when approved by the Department of Health.

- The filling of new swimming pools, spas, hot tubs or the draining and refilling of existing pools, etc., was prohibited; topping off was allowed to the extent that the designated allocation was not exceeded.

- The irrigation of median strips with potable water was prohibited. The use of groundwater and reclaimed water was permitted when approved by the Department of Health.

- The use of potable water for street sweepers/washers was prohibited. The use of groundwater and reclaimed water was permitted when approved by the Department of Health.

Public and commercial response to 45 percent rationing was overwhelmingly negative. During the first weeks after notification of the program, SFPUC received over 2,000 appeal letters per day. In the month before rationing was returned to 25 percent, 19,000 appeals, 12,000 telephone calls, and 1,500 walk-in complaints occurred.

Both the allocation levels and new prohibitions required to meet this level of rationing would have had a devastating effect on commercial enterprises. Some water uses would have simply been prohibited. Simply put, rationing had been taken to a level that was considered intolerable to citizens and had become economically disastrous.

CITY AND COUNTY OF SAN FRANCISCO

RESOLUTION No. 88-0155

WHEREAS, The San Francisco Water Department obtains water from the reservoirs operated by the Hetch Hetchy Water and Power and from local Bay Area reservoirs; and

WHEREAS, Due to critically low supplies of water within the reservoirs and anticipated low levels of inflow into the reservoirs, such that unless consumption is decreased there may be insufficient water supplies for human consumption, sanitation and fire protection; and

WHEREAS, Decreases in water consumption may be accomplished by reducing allocations to the Water Department's wholesale customers and by imposing water use restrictions on the Water Department's retail customers, as set forth in the Water Rationing Rules and Regulations, issued on April 21, 1988 and attached hereto as Water Rationing Rules and Regulations; and

WHEREAS, This Commission recognizes the need to declare a Water Shortage Emergency (Water Code Sec. 350, et. seq.) due to critically low water supplies now available, and the need for a reduction in water use by the San Francisco Water Department's Suburban Wholesale Customers; and

WHEREAS, This Commission recognizes the need to adopt a Water Conservation Program (Water Code Sec. 375, et. seq.) due to the critically low water supplies now available, and the need for a reduction in water use by the San Francisco Water Department's retail customers; and

WHEREAS, The City of San Jose is, by Resolution 85-0256, a temporary and interruptible wholesale customer of the Water Department, and the Settlement Agreement and Master Water Sales Contract between the City and County of San Francisco and certain Suburban Purchasers in San Mateo County, Santa Clara County and Alameda County (Settlement Agreement) requires action by the Commission to interrupt service to the City of San Jose (Section 8.17); and

WHEREAS, The City of Santa Clara is, by Resolution 85-0257, a temporary and interruptible wholesale customer of the Water Department, and the Settlement Agreement requires action by the Commission to interrupt service to the City of Santa Clara (Section 8.17); and

WHEREAS, Additional funding in the amount of $648,780 for FY 1988/89 has been identified by the Water Department for implementation of a mandatory water rationing program; and

WHEREAS, on April 21, 1988, the Water Department submitted to this Commission a Water Conservation Program; and

WHEREAS, The Conservation Program shall cease to exist in whole or in part at such time as the Commission finds that the supply of water available to the Water Department's service area has been replenished or augmented so that there are sufficient supplies to meet the needs of the Water Department's customers without the continued implementation of these measures; and

00192

I hereby certify that the foregoing resolution was adopted by the Public Utilities Commission at its meeting of APRIL 22 1988

Dorothea A. Baldridge
Secretary, Public Utilities Commission

PUBLIC UTILITIES COMMISSION
CITY AND COUNTY OF SAN FRANCISCO

RESOLUTION No. 88-0155

WHEREAS, The recommended Water Conservation Program has received wide-spread public distribution; and

WHEREAS, Members of the public have been given an opportunity to, and have expressed their views on the recommended Water Conservation Program in a public hearing; now, therefore be it

RESOLVED, That this Commission declares a Water Shortage Emergency; and

BE IT FURTHER RESOLVED, That this Commission adopts a Water Conservation Program; and

BE IT FURTHER RESOLVED, That this Commission approves the Water Conservation Program dated April 21, 1988 as amended April 28, 1988, and directs that it be placed in force on May 1, 1988; and

BE IT FURTHER RESOLVED, That it is not the Commission's intention to interrupt water service to the cities of San Jose and/or Santa Clara; however, pursuant to its obligation under the Settlement Agreement and Master Water Sales Contract this Commission authorizes the General Manager of the Water Department to interrupt water service to the cities of San Jose and/or Santa Clara if necessary to achieve the required water saving, however, prior to actual interruption of service to either the City of San Jose or Santa Clara, the General Manager of the Water Department shall report to the Commission the need for interruption and receive affirmation from the Commission prior to institution of the interruption; and the Commission further directs the General Manager of the Water Department to mitigate the effect of the interruptions to the extent possible and consistent with the needs of San Francisco's permanent customers; and

BE IT FURTHER RESOLVED, That this Commission hereby authorizes the additional budget needs to be added to the Water Department's Conservation Programmatic Budget, thus amending the Water Department's budget request for FY 1988/89; and

BE IT FURTHER RESOLVED, That this Commission hereby designates Tuesday, May 24, 1988 as the date for a public hearing by the Public Utilities Commission for considering proposals for rate increases and additional charges for water service and water supplied by the San Francisco Water Department to retail customers; and

BE IT FURTHER RESOLVED, That this Commission hereby designates Tuesday, May 24, 1988 as the date for a public hearing by the Public Utilities Commission for considering proposals for rate structure adjustments for water service and water supplied by the San Francisco Water Department to wholesale customers; and

BE IT FURTHER RESOLVED, That the revenue requirements and an analysis of the rate increases, rate structure adjustments and additional charges be made available for public inspection and review beginning Monday, May 16, 1988 in Room 287, City Hall, San Francisco.

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I hereby certify that the foregoing resolution was adopted by the Public Utilities Commission at its meeting of APRIL 28 1988

Dorothy A. Baldridge
Secretary, Public Utilities Commission

APPENDIX C

Summary of San Francisco's Response to 2012-2016 Drought Experience

JUNE 2021
WATER SHORTAGE CONTINGENCY PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

Summary of San Francisco's Response to 2012-2016 Drought Experience

Appendix to the 2020 Water Shortage Contingency Plan

Introduction

The purpose of this Drought Summary (Summary) is to provide an overview of the SFPUC's activities in response to the Statewide drought, beginning with State of Emergency declared by Governor Brown in January 2014. This drought is unprecedented, not only for being the driest period in California history, but also for the drastic measures taken by the State to mandate reductions in urban water use. This Summary primarily focuses on the SFPUC's retail service area (e.g., retail sales, excess use charges, customer outreach), but documentation related to the wholesale service area is included to a lesser extent.

This Summary is organized chronologically, with one section for each calendar year (CY): CY 2014, CY 2015, CY 2016, and CY 2017. The Summary covers activities through the end of Fiscal Year (FY) 2016-17 (i.e., through June 2017.

Each section provides an overview of the main drought-related activities that occurred during the year, and includes a timeline of regulatory actions made at the State and local levels and a summary of retail water use by sector compared to the CY 2013 baseline.

Summary of Activities in Calendar Year 2014

The three-year period from October 2011 to September 2014 was the driest in California's hydrologic record and, as a result, reservoir storage, snowpack, and reservoir inflows were significantly lower than normal throughout the State. The unprecedented dry weather conditions prompted Governor Jerry Brown to declare a drought emergency for the State of California in January 2014 (Proclamation 1-17-2014). This action spurred the SFPUC to request that all customers of the Regional Water System (RWS) voluntarily reduce water use by at least 10% (Press Release 3-14), corresponding to Stage 1 of the Retail Water Shortage Allocation Plan.

Soon after, the San Francisco Mayor's Office issued a formal executive directive requiring that all City departments develop individual water conservation plans and take immediate steps to achieve a mandatory 10% reduction in their water consumption (Executive Directive 14-01). Moreover, in July 2014, new emergency regulations issued by the SWRCB (Resolution 2014-0038) prompted the SFPUC to implement outdoor water waste restrictions and require a mandatory 10% reduction in outdoor water use (Resolutions 14-0121 and 14-0140).

At this time, starting in October 2014, mandatory reductions in water use and corresponding excess use charges applied only to dedicated irrigation customers for a few reasons. First, requiring reductions only in irrigation was in line with the State's regulations targeting outdoor water use. The call for a voluntary reduction of 10% still applied to all customers system-wide. Second, the outdoor sector had the most potential for water savings. Third, the SFPUC's Customer Care and Billing System (CC&B) was undergoing an upgrade in summer 2014, so it was not possible to implement any new rationing programs in CC&B until fall 2014. To implement the Mandatory Irrigation Allocation Program, and workaround system was created outside of CC&B. Because the pool of dedicated irrigation customers was relatively small (approximately 1,600 accounts), it was manageable with the workaround system. It would not have been feasible or cost-effective to create a workaround system for any large sectors (e.g., residential).

Per the SFPUC's existing Interruptible Water Service rate (Rate Schedules W-3B and W-34), a subset of dedicated irrigation customers, known as interruptible customers, pay reduced rates, but are subject more stringent reductions during water shortages. Since 2007, this rate was made available only to irrigation customers for public uses within the City and County of San Francisco (i.e., municipal City departments). However, on May 13, 2014, the SFPUC adopted Resolution 14-0070, which expanded Interruptible Water Service to all retail irrigation uses inside and outside the City and County of San Francisco. Coupled with the water use restrictions due to the drought, this resolution prompted SFPUC staff to make changes to and clarify the implementation of the Interruptible Water Service rate effective July 1, 2014. In June 2014, all eligible irrigation account holders, including both municipal and private customers, were notified of the opportunity to opt-in to the Interruptible Water Service program. Most City departments opted to remain in the program, and several private customers also opted to participate in the program. Implementation of the Interruptible Water Service rate was revised again in February 2015 with the adoption of formal rules and regulations for administering Interruptible Water Service; this is described in the chapter for CY 2015.

In June 2014, the SFPUC launched a multilingual "Water Conservation is Smart and Sexy" Citywide public education campaign. The advertisements were designed to capture public attention and present everyday water conservation tips and information about the drought. A combination of television, newspaper, billboard, bus, commuter transit station, and social media advertisements encouraged individuals to adjust their water use practices and pursue water-efficient plumbing fixture upgrades. The campaign also advised individuals to visit SFPUC water conservation web content and learn about the suite of services that are offered. As a result of the campaign, SFPUC water conservation web traffic increased by more than fourfold when comparing June-October of 2013 to June-October of 2014.

The SFPUC also implemented an education and notification program about wasteful outdoor water use activities, such as spraying or washing down outdoor hardscapes unless required for health and safety purposes; watering landscape in a manner that causes runoff to the sidewalk; and operating a hose without the use of an automatic shut-off spray nozzle. One of the key actions included targeted messaging to top water-using residential accounts, individuals demonstrating outdoor water waste, and commercial properties performing maintenance of outdoor hardscapes. The SFPUC also established a public water waste reporting and tracking system through the City of San Francisco's centralized 3-1-1 online and telephone response center.

Retail customers collectively saved 3.3 MGD, or 4.8%, in CY 2014 compared to CY 2013. Wholesale customers collectively saved 13.4 MGD, or 8.9%, of RWS supplies compared to CY 2013. Both sets of customers fell short of the voluntary system-wide goal of 10% that was declared in January 2014. Taking both the retail and wholesale service areas into account, system-wide savings in CY 2014 was 16.7 MGD, or 7.7%, compared to CY 2013 and did not meet the voluntary 10% goal.

Summary of Activities in Calendar Year 2015

In 2015, California was experiencing its fourth year of a severe drought and entering into a fifth year. The drought State of Emergency issued by Governor Brown in January 2014 remained in effect, and the SWRCB enacted additional emergency conservation regulations to promote even more conservation throughout the State (Resolution 2014-0013). These included mandatory restrictions on outdoor water use, as well as prohibitions on water use by businesses, which the SFPUC then adopted locally (Resolution 15-0102). Shortly thereafter, under an Executive Order (EO) issued by the Governor in April 2015 (EO B-29-15), a mandatory Statewide water use reduction of 25%, compared to a 2013 baseline, took effect starting June 2015 (Resolution 2015-0032). When the regulations were initially adopted by the SWRCB, this mandatory reduction was intended to remain in place until February 2016 unless extended or modified if the drought continued.

To help achieve the Statewide conservation goal of 25%, the SWRCB assigned the SFPUC a conservation standard of 8% in recognition of its low residential per capita water use. The 8% standard represents the lowest tier in the SWRCB emergency regulations. In response to the mandatory reduction issued by the State, the SFPUC adopted the 2015-2016 Drought Program (Resolution 15-0119 and 15-0149), which:

- Continued the call for a 10% reduction in water use by all customers system-wide;
- Increased the mandatory reduction in water use by dedicated irrigation customers from 10% to 25%, subject to excess use charges of 100% ("1x");
- Established a mandatory reduction in water use by Interruptible Water Service accounts at 30%, subject to excess use charges of 300% ("3x");
- Adjusted existing reduced wastewater flow factors to reflect a 25% reduction in irrigation usage

The SFPUC decided to maintain its call for a voluntary 10% reduction system-wide for continuity in messaging because (1) retail customers had already achieved about 9% through the first restriction period (i.e., 10% Mandatory Irrigation Allocation Program starting in October 2014), and (2) supply was being successfully managed such that further reductions were not needed. However, a further reduction on irrigation use was imposed in order to provide additional assurance that the 8% reduction mandated by the SWRCB could be met. The SFPUC continued to target dedicated irrigation customers because, similar as for initiation of the 10% Mandatory Irrigation Allocation Program in October 2014, this sector was considered to have the highest potential for savings and could be most feasibility managed through CC&B. Mandatory rationing for other sectors was discussed, but it would have been difficult to set targets equitably and to determine a sensible way to track water use (i.e., volume normalized per dwelling unit, square foot, or occupant). Any additional savings that could have been achieved through rationing would not have been worth the effort to implement rationing given the significant savings already achieved. Ultimately, SFPUC management desired a program that would avoid mandatory rationing while achieving the targeted level of savings.

It should be noted that in February 2015, prior to development of the 2015-2016 Drought Program and unrelated to the drought, the SFPUC adopted rules and regulations for administering Interruptible Water Service (Resolution 15-0040). The rules and regulations allow eligible irrigation customers to opt

into the Interruptible Water Service program and receive water service at a reduced rate (about 9% lower than regular commercial water rates). By opting in, these customers would be subject to service interruption and/or greater mandatory water use reductions, along with greater excess use charges, during water shortages and other emergencies at the discretion of the SFPUC Water Enterprise. The Interruptible Water Service rules had to be amended as part of the 2015-2016 Drought Program because the existing rules did not include a water shortage scenario (or stage) that was set forth by the Drought Program. Specifically, reductions and excess use charges were not defined for interruptible customers during a stage corresponding to a 10% system-wide water reduction with a mandatory reduction on dedicated irrigation. SFPUC staff initially proposed that interruptible customers should be subject to a 25% reduction and excess use charge of 200% ("2x") (Resolution 15-0119). However, the Commission requested that staff evaluate the feasibility and potential impacts of imposing more stringent reductions and excess use charges on interruptible customers. Based on an analysis of hypothetical financial impacts to existing interruptible customers assuming historical water use, with a focus on the largest interruptible customer (the San Francisco Recreation and Parks Department), staff recommended that interruptible customers be subject to a 30% reduction and excess use charge of 300% ("3x"). This proposal was adopted by the Commission and the 2015-2016 Drought Program was amended accordingly (Resolution 15-0149).

With the launch of the 2015-2016 Drought Program in July 2015, the workaround system that was created for the initial 10% Mandatory Irrigation Allocation Program was replaced with full integration of the 25% Mandatory Irrigation Allocation Program in CC&B. However, there was a delay in implementing the rationing program specific to Interruptible Water Service accounts until November 2015 because it took more time than expected to aggregate allocations and usage at the department level.

Although mandatory reductions were not imposed on residential and commercial customers, the SFPUC provided guidance and outreach to those customers on how to track and achieve water savings. In the SFPUC's on-line bill management system My Account, a Drought Water Use Target line was added to daily use charts for each single-family residential, multi-family residential, and non-residential account. The target reflected a 10% reduction from the account's historic 2013 water use. To aid customers in tracking their conservation in the future, the SFPUC started investigating the feasibility of fractional billing which was eventually implemented and launched in January 2017.

In addition to imposing conservation standards on individual urban water suppliers, the emergency regulations adopted by the SWRCB in May 2015 included additional water use prohibitions (Resolution 2015-0032). The SFPUC adopted additional mandatory restrictions to impose the State's prohibitions in the SFPUC retail service area if they had not already been addressed by existing SFPUC water use restrictions. The restrictions adopted by the SFPUC in CY 2015 are listed below:

- Watering outdoor landscapes with potable water during and within forty-eight (48) hours after a rain event (Resolution 15-0102)
- Not providing guests the option to refuse daily laundering of towels and linens at hotels and motels, and not prominently displaying notice of this option in each guestroom (Resolution 15-0102)

- Irrigation with potable water of ornamental turf on public street medians (Resolution 15-0119)

The SFPUC expanded its efforts to educate the public about wasteful water use activities restricted by the State, including runoff from irrigation and hardscape washing. SFPUC field inspectors continued to keep an eye out for water waste during daily rounds, and conservation staff responded to an increasing number of water waste reports submitted through San Francisco's 3-1-1 online and telephone response center.

The SFPUC continued to inform customers on the drought, water efficient practices, and new regulations through a variety of means in addition to those described above. The drought outreach campaign from the previous summer was updated and re-launched. In June 2015, irrigation customers were sent letters describing the Mandatory Irrigation Allocation Program and providing monthly account allocations through February 2016. The letters also provided an opportunity for the account holder to participate in or opt out of the Interruptible Service Program. The SFPUC also sent letters to account holders with reduced flow factors to notify them of adjustments to their reduced flow factor, or lack thereof in the case of adjustments that were too small to implement.

As the 2015-2016 Drought Program was being developed, SFPUC management and staff contemplated temporarily suspending high bill appeals, flow factor appeals, and interruptible rates during the drought as these processes could be considered counterproductive to conservation. However, the City Attorney's Office advised against suspending these processes, and instead, the SFPUC proceeded with the adjustment to reduced flow factors.

In December 2015, SFPUC management and staff met to discuss the effectiveness of the 2015-2016 Drought Program to date in anticipation of an extension to the State mandates in the beginning of 2016 as directed by the Governor (EO B-36-15). In brief, the Drought Program was effective at reducing water use across all customer sectors (except industrial, which is a small sector), and was on track to meet its objectives. Challenges in implementing program criteria and modifications to the billing system (CC&B) were also discussed at this meeting as well as at a follow-up meeting specifically regarding CC&B held in May 2016.

The April 2015 EO B-29-15 directed the California Department of Water Resources (DWR) to update the State's Model Water Efficient Landscape Ordinance (MWELO) to increase water efficiency standards for new and existing landscapes. In July 2015, the California Water Commission approved a revised MWELO. Accordingly, the SFPUC adopted amendments to San Francisco's Water Efficient Irrigation Ordinances and the related SFPUC rules (Section F of the Rules and Regulations Governing Water Service to Customers) to comply with the State's revisions (Resolution 15-0221).

The next few pages provide a timeline of the State and local regulatory actions described above, retail water use by sector compared to the CY 2013 baseline, and monthly production data submitted to the SWRCB per the emergency regulations adopted in July 2014. The monthly reports to the SWRCB include residential per capita estimates as well as implementation and enforcement metrics. For metrics related to excess use charges, see the summary provided in the introduction of this report.

Retail customers collectively saved 7.9 MGD, or 11.7%, in CY 2015 compared to CY 2013, thus exceeding the voluntary system-wide goal of 10%. Looking specifically at retail irrigation use, dedicated irrigation customers collectively saved 0.7 MGD, or 27.9%, over the course of the 10% Mandatory Irrigation Allocation Program (October 2014 through June 2015), far exceeding program's goal. Wholesale customers also exceeded the voluntary system-wide goal of 10% by collectively saving 33.7 MGD, or 22.4%, of RWS supplies compared to CY 2013. Taking both the retail and wholesale service areas into account, system-wide savings in CY 2015 was 41.6 MGD, or 19.1%, compared to CY 2013 and exceeded the voluntary 10% goal.

Summary of Activities in Calendar Year 2016

Although hydrologic conditions improved during the winter of 2015/2016, the Statewide drought continued into its fifth consecutive year. In anticipation of a dry winter, the Governor issued EO B-36-15 in November 2015 directing the SWRCB to extend the emergency regulations adopted in May 2015 beyond their initial expiration date in February 2016. In response, the SWRCB updated and extended the emergency regulations through October 2016 (Resolution 2016-0007). The most significant update to the emergency regulations was the addition of credits and adjustments to urban water suppliers' conservation standards that consider the differences in climate, growth, and investments in creating new, local, drought-resilient sources of potable water supply.

To comply with the SWRCB's extended emergency regulations, the SFPUC maintained its 2015-2016 Drought Program. The SFPUC did not apply for an adjustment to its existing 8% conservation standard because its customers were doing well to conserve well beyond that system-wide. Letters were sent to irrigation customers notifying them of the extension of the 25% Mandatory Irrigation Allocation Program, and included a new batch of monthly allocations from March through October 2016.

Despite improved conditions during the past winter, Governor Brown issued EO B-37-16 in May 2016 aiming to make water conservation a California way of life. Among other directives, the EO directed the SWRCB to extend its emergency regulations, which had previously been extended through October 2016, through January 2017[1]. Additionally, the EO called for the emergency regulations to be adjusted in recognition of differing water supply conditions throughout the State. In response, the SWRCB required that all urban water suppliers self-certify their water supply reliability and corresponding conservation standard by June 2016 (Resolution 2016-0029). The self-certification process, also referred to as a "stress test," assumed three additional dry years. The self-certified conservation standard replaces the existing State-developed conservation standard (i.e., 8% for SFPUC), and will remain in effect through January 2017[2]. SFPUC staff analyzed the regulations and described proposed actions for its Commissioners in a memo dated May 18, 2016.

To comply with the revised emergency regulations, the SFPUC conducted the self-certification procedures and determined that potable water supplies would be sufficient to meet both retail and wholesale demands over the next three years. Thus, the revised conservation standard for the SFPUC retail system was established to be 0%, rather than the existing 8% conservation standard. Despite its self-certified conservation standard of 0%, the SFPUC continued to promote and encourage conservation in line with the State mandates. Specifically, the SFPUC maintained its call for a voluntary 10% system-wide reduction in water use over the 2013 baseline in light of the proposed SWRCB emergency regulations and the fact that the Hetch Hetchy Regional Water System was still recovering from the drought. System storage was not anticipated to fill in 2016, and the next year's hydrology remained uncertain.

[1] The regulation was set to expire in February 28, 2017 per the Office of Administrative Law.
[2] Same as previous footnote.

However, in recognition of improved hydrologic conditions and the reduced conservation standard, the SFPUC adopted changes to the 2015-2016 Drought Program in June 2016 to ease mandatory reductions on outdoor irrigation with potable water (Resolution 16-0130). These changes included:

- Ceasing the 25% mandatory reduction in water use by dedicated irrigation customers and corresponding excess use charges;
- Reducing the mandatory reduction in water use by interruptible customers from 30% to 10%, subject to excess use charges; and
- Reverting reduced wastewater flow factors that had been adjusted to reflect a 25% reduction in irrigation usage back to their pre-adjusted reduced values.

In July 2016, the SFPUC sent letters to irrigation customers and customers with adjusted flow factors regarding the lifted restrictions. The letters to irrigation customers offered account holders the opportunity to participate in the Interruptible Water Service program for FY 2016-17 effective August 2016.

EO B-37-16 also directed the SWRCB to permanently prohibit practices that waste potable water. While the SWRCB has yet to take action to make the prohibitions permanent, the SFPUC updated its water waste restrictions and made temporary restrictions permanent in line with the Executive Order (Resolution 16-0127).

In June 2016, the SFPUC surveyed San Francisco residents to learn what they did at home to achieve water savings during the drought, how long water-savings from these actions might last, and how people got information about the drought and ways to conserve. Overall, the poll showed that most respondents are informed about the drought, cut back their water use, feel they and others could conserve even more but need direction on what more they should do. The SFPUC will use the results to help shape continued outreach about all the ways people can save water whether they own or rent, and live in an apartment or single family home.

In addition to addressing the current drought through temporary regulations, EO B-37-16 also builds on the conservation accomplished during the current drought and seeks to establish longer-term water conservation and efficiency measures through the following directives:

- Use Water More Wisely – Develop new urban water use targets that generate more water conservation than existing SBX7-7 requirements.
- Eliminate Water Waste – Reduce water loss.
- Strengthen Local Drought Resilience – Improve urban Water Shortage Contingency Plans and reporting requirements.

The EO calls for DWR, SWRCB, and the California Department of Food and Agricultural (CDFA), in coordination with the California Public Utilities Commission (CPUC) and California Energy Commission (CEC) (collectively referred to as the "EO State Agencies") to seek input from stakeholders on implementation of EO B-37-16. The Urban Advisory Group (UAG) was formed by the EO State Agencies

to provide input and advice on recommendations and approaches regarding EO directives applicable to urban water use.

Although the SFPUC is not a member of the UAG, SFPUC staff closely monitored the development of the recommendations and framework report that was finalized by the EO Agencies in April 2017. SFPUC staff continue to track the development of the resulting legislation. Because this long-term water use efficiency framework was not intended to influence the current drought, ***this Drought Summary does not cover activities related to the long-term directives of EO B-37-16***.

Separate from SWRCB emergency regulations and Governor EOs, State legislation was signed by the Governor on August 29, 2016 requiring urban retail water suppliers to set rules for identifying and discouraging excessive residential water consumption during a prescribed statewide or local drought. The provisions of this legislation, known as Senate Bill (SB) 814, took effect January 1, 2017 and are described further in the next chapter as the SFPUC took action in January 2017 to implement the provisions.

Retail customers collectively saved 8.8 MGD, or 13.0%, in CY 2016 compared to CY 2013, thus exceeding the voluntary system-wide goal of 10%. Looking specifically at retail irrigation use, dedicated irrigation customers collectively saved 1.2 MGD, or 38.5%, over the course of the 25% Mandatory Irrigation Allocation Program (July 2015 through June 2016), far exceeding program's goal. Wholesale customers also exceeded the voluntary system-wide goal of 10% by collectively saving 31.7 MGD, or 21.1%, of RWS supplies compared to CY 2013. Taking both the retail and wholesale service areas into account, system-wide savings in CY 2016 was 40.5 MGD, or 18.6%, compared to CY 2013 and exceeded the voluntary 10% goal.

Summary of Activities in Calendar Year 2017 (through June 2017)

The winter of 2016/2017 was one of California's wettest winters on record and marked the end of the five-year drought in most of the State. Despite much improved hydrologic conditions, portions of state remained dry and groundwater basins remained depleted. Thus, in February 2017, the SWRCB readopted its emergency regulations (i.e., the stress test approach) and extended them through October 2017 with the intent to reconsider repealing the regulations in May should Statewide water supply conditions improve (Resolution 2017-0004). However, on April 7, 2017, Governor Brown issued EO B-40-17 to lift the drought emergency throughout the State except for four counties that continue to suffer from water supply shortages (Fresno, Kings, Tulare, and Tuolumne). In response to this EO, on April 26, 2017, the SWRCB rescinded the stress test and conservation standard portions of its emergency regulations for all of California except for the four counties identified in the EO (Resolution 2017-0024). Monthly water use reporting and water waste prohibitions remain in place until the emergency regulations expire in November 2017, though the SWRCB is working to make these requirements permanent as directed by EO B-37-16.

While EO B-40-17 ended the Statewide emergency drought proclamation put in place by the Governor in January 2014 (Proclamation 1-17-2014), it also marks a transition to the long-term water use efficiency framework to make water conservation a California way of life under EO B-37-16.

Prior to the Governor issuing EO B-40-17, SFPUC staff reviewed RWS conditions and determined that precipitation and snowpack were well above normal. It was anticipated that the system would fill over the course of the year. Because of these favorable supply conditions and because the SFPUC was subject to a 0% self-certified conservation standard per the SWRCB emergency regulations at the time, the SFPUC lifted its call for a voluntary 10% reduction in water use system-wide on April 11, 2017 (Resolution 17-0075). The SFPUC also notified its wholesale customers that it would no longer be requesting voluntary reductions.

As noted in the chapter for CY 2016, the Governor signed into law SB 814, which required urban retail water suppliers to set rules for identifying and discouraging excessive residential water consumption during a prescribed statewide or local drought. To implement this legislation locally, in January 2017, the SFPUC adopted rules and regulations to establish a 500-gallon-per-day threshold for single-family households and individually-metered multi-family units (Resolution 17-0010). The threshold would be effective during designated drought periods in which mandatory reduction on residential customers are imposed, and result in a $150 excess use fine for each 30-day period a customer's average daily water use exceeds the threshold.

During the 12-month period of July 2016 to June 2017, retail customers collectively saved slightly less water in FY 2016-17 (with only the voluntary 10% system-wide reduction in place) compared to FY 2015-16 (when 25% Mandatory Irrigation Allocation Program was in place): 8.6 MGD (12.7%) compared to 9.1 MGD (13.4%) savings. For the same periods of time, dedicated irrigation customers also saved slightly less water: 1.1 MGD (35.2%) compared to 1.2 MGD (38.5%) savings. However, both retail and wholesale customers still exceeded the voluntary 10% goal.

APPENDIX D

San Francisco Public Utilities Commission Resolution Adopting 2020 Water Shortage Contingency Plan

JUNE 2021
WATER SHORTAGE CONTINGENCY PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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PUBLIC UTILITIES COMMISSION

City and County of San Francisco

RESOLUTION NO. **21-0100**

WHEREAS, The Urban Water Management Planning Act of 1983, as amended through 2020 (the Act), requires that an urban water supplier serving 3,000 customers or 3,000 acre-feet per year must prepare an Urban Water Management Plan (Plan or UWMP) update every five years; and

WHEREAS, On June 14, 2016, by Resolution No. 16-0118, the San Francisco Public Utilities Commission (SFPUC) adopted the 2015 Urban Water Management Plan; and

WHEREAS, The SFPUC, in compliance with the Act, has prepared a 2020 update to its Plan, including the 2020 Water Shortage Contingency Plan; and

WHEREAS, The preparation of the Plan update has been coordinated with the City's wholesale water customers and other public agencies to the extent practicable, and staff has encouraged the active involvement of diverse social, cultural and economic elements of the population within the SFPUC's retail water service area during preparation of the Plan; and

WHEREAS, At this Commission's regular public meeting on April 13, 2021, a Draft Plan was presented to the Commission and a Public Hearing was held during the Commission meeting in order to receive public comment on the Draft Plan; and

WHEREAS, Minor revisions to the Draft Plan have been made based on public comments received at the Public Hearing and during the public comment period of April 5, 2021 through May 5, 2021; and

WHEREAS, The San Francisco Planning Department issued a statutory exemption determination on May 25, 2021 under California Environmental Quality Act Guidelines section 15282(v), under Planning Department Case Number 2021-005261ENV; and

WHEREAS, This action constitutes the Approval Action for the project for the purposes of CEQA, pursuant to Section 31.04(h) of the San Francisco Administrative Code; and

WHEREAS, A Final 2020 Urban Water Management Plan was presented to the Commission at its public meeting on June 8, 2021 for consideration and adoption in advance of the July 1, 2021 deadline for submittal to the State and copy of the Final Plan is on file with the Commission Secretary; now, therefore, be it

RESOLVED, That this Commission hereby adopts the 2020 Urban Water Management Plan for the City and County of San Francisco, including the 2020 Water Shortage Contingency Plan, and directs the General Manager to submit it to the California Department of Water Resources by July 1, 2021.

I hereby certify that the foregoing resolution was adopted by the Public Utilities Commission at its meeting of June 11, 2021.

Donna Hood

Secretary, Public Utilities Commission

2020
WATER SHORTAGE CONTINGENCY PLAN
for the City and County of San Francisco

PUBLIC REVIEW DRAFT

April 2021

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

APPENDIX L

Resolution to Adopt the 2020 Urban Water Management Plan

JUNE 2021
2020 URBAN WATER MANAGEMENT PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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PUBLIC UTILITIES COMMISSION

City and County of San Francisco

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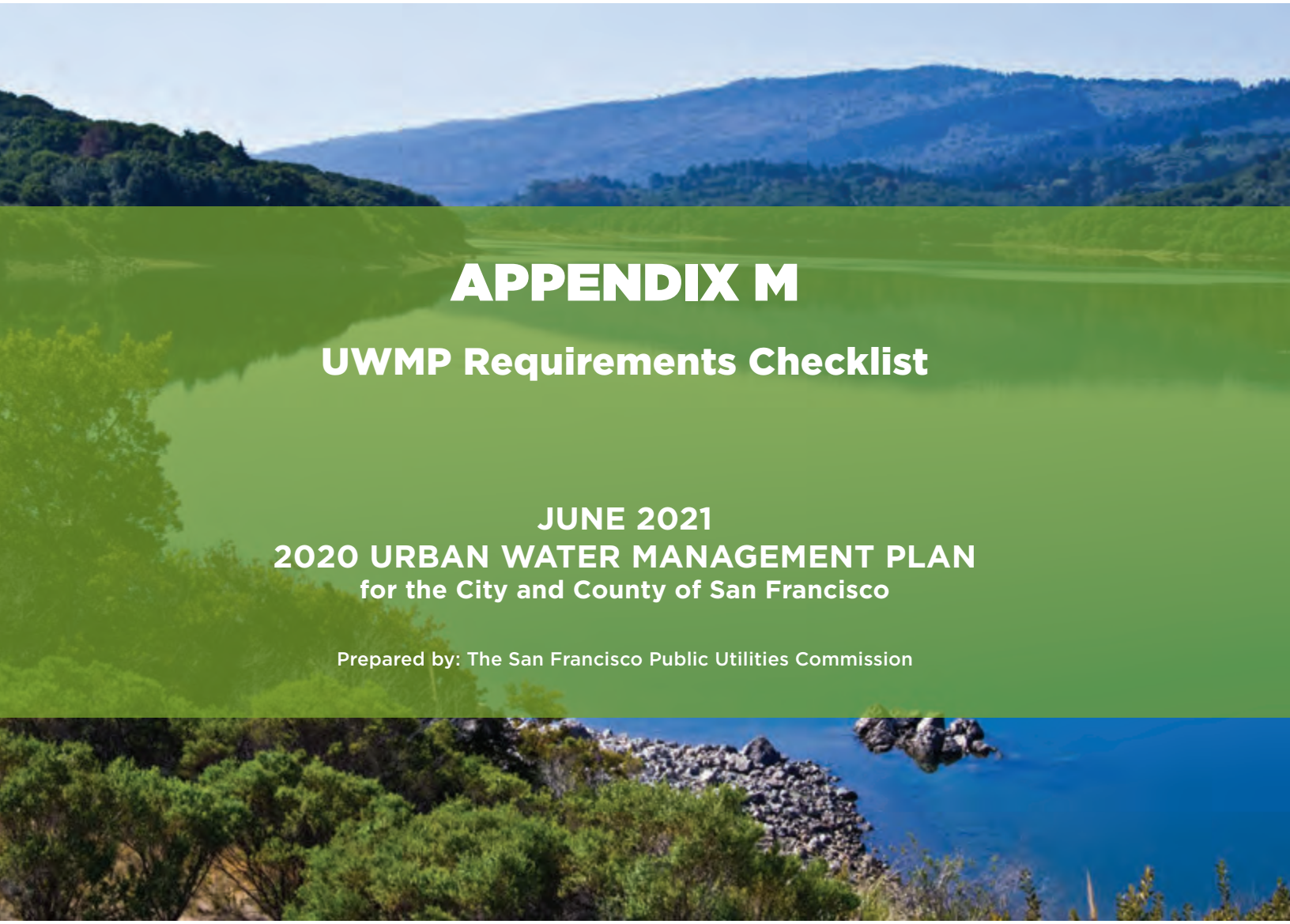

APPENDIX M

UWMP Requirements Checklist

JUNE 2021
2020 URBAN WATER MANAGEMENT PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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Water Code Section	Summary as Applies to UWMP	2020 UWMP Location	
		Retail	Wholesale
Summary			
10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information.	Section 1	Section 1
Plan Preparation			
10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Section 10.1	Section 10.1
10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Section 2.3.1 and Appendix C	Section 2.3.1 and Appendix C
10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Appendix C	Appendix C
System Description			
10631(a)	Describe the water supplier service area.	Section 3.2	Section 3.3
10631(a)	Describe the climate of the service area of the supplier.	Section 3.2.1	section 3.3.1
10631(a)	Indicate the current population of the service area.	Table 3-3 & Table 5-1	Table 3-4
10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	Table 3-3	Table 3-4
10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	Section 3.2.2	Section 3.3.2
10631(a)	Describe the land uses within the service area.	Section 3.2.2	Section 3.3.2
System Water Use			
10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	Section 4.1	Section 4.2
10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	Section 4.1.3	N.A.
10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	Section 4.1.3	N.A.
10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	Section 4.1.5	N.A.
System Description and Baselines and Targets			

10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Section 5.1 & Appendix D	N.A.
10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Section 5.2	N.A.
10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Section 5.3	N.A.
10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	N.A.	N.A.
10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	N.A	Section 5.4 & Section 10.3
10608.4	Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form.	Appendix D	N.A.
10631(a)	Indicate the current population of the service area.	Table 3-3 & Table 5-1	N.A.
System Supplies			
10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	Table 6-3 & Table 6-5	Table 6-3
10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	Section 6.2.1.1	N.A
10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	Section 8.2	Section 8.2
10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	Section 6.2.5	N.A
10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	Section 6.2.2 & Section 7.4	N.A
10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater	Section 6.2.1.1	N.A

	management. Include a copy of the plan or authorization.		
10631(b)(4)(B)	Describe the groundwater basin.	Section 6.2.1.1	N.A
10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	Section 6.2.1.1	N.A
10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	Section 6.2.1.1	N.A
10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	Section 6.2.1.1 & Table 6-2	N.A
10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	Section 6.2.1.1 & Table 6-5	N.A
10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	Section 7.4.2 & Section 7.5	Section 7.4.2 & Section 7.5
10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	Section 7.4	Section 7.4
10631(g)	Describe desalinated water project opportunities for long-term supply.	Section 7.4.2	Section 7.4.2
10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	N.A	N.A
10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	N.A	Appendix C
System Supplies (Recycled Water)			
10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	Table 6-4	N.A
10633(c)	Describe the recycled water currently being used in the supplier's service area.	Section 6.2.1.3	N.A

10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	Section 6.2.2 & Table 6-5	N.A
10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	Table 6-5 & Table 6-3	N.A
10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	Section 6.2.2.3	N.A
10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	Section 6.2.2.3	N.A
Water Supply Reliability Assessment			
10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Section 6.2.2, Section 7.4	Section 7.2, Section 7.4 & Section 7.5
10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Section 6.1.2 & Section 6.2.3	Section 6.1.2
10635(a)	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Section 8.3 & Section 8.4	Section 8.3 & Section 8.4
10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Section 8.5	N.A
10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Section 8.5.1, Section 8.5.2, Section 8.2	N.A
10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Section 8.5.2, Section 8.5.3	N.A
10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Section 8.5.4	N.A

10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change condition, anticipated regulatory changes, and other locally applicable criteria.	Section 8.2.2 & Section 8.5.4	N.A
Water Shortage Contingency Planning			
10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Appendix K	Appendix K
10632(a)(2)(A)	Provide the written decision-making process and other methods that the supplier will use each year to determine its water reliability.	Appendix K Section 2.5 & Figure 2-1	Appendix K Section 2.5 & Figure 2-1
10632(a)(2)(B)	Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Appendix K Section 2	Appendix K Section 2
10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Appendix K, Section 3, Table 3-1, Table 3-2	Appendix K, Section 3.1, Table 3-1
10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Not Applicable; supplier uses 6 standard categories	Not Applicable; supplier uses 6 standard categories
10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Not Applicable; supplier will meet shortage with demand reduction actions as described in Appendix K, Section 4	Not Applicable; supplier will meet shortage with Water Shortage Allocation Plan as described in Appendix K, Section 3
10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Appendix K Section 4, Table 4-2	Supplier will meet shortage with Water Shortage Allocation Plan as described in Appendix K, Section 3
10632(a)(4)(C)	Specify locally appropriate operational changes.	Appendix M Section 4.4	Supplier will meet shortage with Water Shortage Allocation Plan as described in Appendix K, Section 3
10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated	Appendix K Section 4.2, Table 4-1, Table 4-2	Supplier will meet shortage with Water Shortage Allocation

	prohibitions are appropriate to local conditions.		Plan as described in Appendix K, Section 3
10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Appendix K Table 4-2	Supplier will meet shortage with Water Shortage Allocation Plan as described in Appendix K, Section 3
10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Appendix K Section 2.5, Figure 2-1, Section 5	Appendix K Section 2.5, Figure 2-1, Section 5
10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Appendix K Section 2.5, Figure 2-1, Section 5	Appendix K Section 2.5, Figure 2-1, Section 5
10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Appendix K Section 7	Appendix K Section 7
10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Appendix K Section 7	Appendix K Section 7
10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Appendix K Section 7	Appendix K Section 7
10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Appendix K Section 8	Appendix K Section 8
10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Appendix K Section 8	Appendix K Section 8
10632(a)(8)(C)	Describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought.	Appendix K Section 8	Appendix K Section 8
10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Appendix K Section 9	N.A
10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Appendix K Section 11	Appendix K Section 11
10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Appendix K Section 4	N.A

Demand Management Measures			
10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years.	Section 10.1	N.A
10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	N.A	Section 10.2
Plan Adoption, Submittal and Implementation			
10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets.	Section 11.1 and Appendix L	N.A
10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.	Section 11.1 and Appendix C	Section 11.1 and Appendix C
10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Section 11.1 and Appendix C	Section 11.1 and Appendix C
10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 60 days after the submission of the plan to DWR.	Section 11.1, Appendix C, Appendix K Section 12	Section 11.1 and Appendix C, Appendix K Section 12
10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing.	Section 11.1 and Appendix C	Section 11.1 and Appendix C
10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Section 11.1 and Appendix C	Section 11.1 and Appendix C
10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Section 11.1 and Appendix C	Section 11.1 and Appendix C
10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Section 11.1 and Appendix C	Section 11.1 and Appendix C
10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Section 11.1 and Appendix C	Section 11.1 and Appendix C
10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Section 11.1 and Appendix C	Section 11.1 and Appendix C

10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Section 11.1 and Appendix C	Section 11.1 and Appendix C
10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Section 11.1 and Appendix C	Section 11.1 and Appendix C
Energy Intensity			
10631.2(a)	The UWMP must include energy intensity information as stated in the code.	Appendix I	Appendix I

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2020 URBAN WATER MANAGEMENT PLAN

for the City and County of San Francisco

June 2021

Prepared by:
The San Francisco
Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

CITY OF MENLO PARK HOUSING ELEMENT UPDATE

Water Supply Assessment for the Water Service Provided by California Water Service (Bear Gulch District) and Menlo Park Municipal Water

Prepared for
City of Menlo Park
On October 18, 2022 the City Council of the
City of Menlo Park Adopted by Resolution 6783
this Water Supply Assessment

November 2022

ESA

CITY OF MENLO PARK HOUSING ELEMENT UPDATE

Water Supply Assessment for the Water Service Provided by California Water Service (Bear Gulch District) and Menlo Park Municipal Water

Prepared for
City of Menlo Park

November 2022

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CONTENTS

City of Menlo Park Housing Element Update Water Supply Assessment for the Water Service Provided by California Water Service (Bear Gulch District), and Menlo Park Municipal Water

Page

Acronyms and Abbreviations ..... **v**

Section 1, Introduction **1-1**
1.1 Project Overview 1-2
1.2 Project Location 1-2
1.3 Project Summary 1-2
1.4 Document Structure 1-4

Section 2, Background Information and Land Use Planning **2-1**
2.1 ConnectMenlo and Land Use and Circulation Elements 2-1
2.2 Land Use, Zoning and Project Elements and Characteristics 2-2
2.3 Growth Projections 2-3

Section 3, Water Supply Planning **3-1**
3.1 Water Supply Planning Under SB 610 and SB 221 3-2
3.2 Water Supply Assessment Approval Process 3-13

Section 4, Water Supply Setting **4-1**
4.1 Climate 4-1
4.2 Water Supply Entitlements, Water Rights and Contracts 4-2
4.3 Water Contracts and Agreements 4-6
4.4 Individual Supply Guarantees 4-8
4.5 Cal Water Bear Gulch District's Surface Water Supply (Local Watershed) 4-10
4.6 Total Water Supplies 4-11

Section 5, Water Demand Analysis **5-1**
5.1 Proposed Project Water Demand 5-1
5.2 Historical and Existing Demand 5-4
5.3 Projected System Demand Forecasts 5-5

Section 6, Comparison of Available Water Supplies versus Demand **6-1**
6.1 Bear Gulch District Supply and Demand Considerations 6-1
6.2 Cal Water Bear Gulch District Supply and Demand in a Normal Year 6-1
6.3 Cal Water Bear Gulch District Water Service Reliability – Single Dry and Multiple Dry Years with Bay-Delta Plan Amendment 6-3

6.4 MPMW Supply and Demand in a Normal Year 6-6
6.5 MPMW Water Service Reliability – Single Dry and Multiple Dry Years with Bay-Delta Plan Amendment 6-6
6.6 MPMW Water Service Reliability – Normal, Single Dry and Multiple Dry Years without the Bay-Delta Plan Amendment 6-9
6.7 Uncertainties in Dry Year Water Supply Projections 6-11
6.8 Alternative Supplies 6-13
6.9 Strategies and Actions to Address Dry Year Supply Shortfalls 6-13
6.10 Alternative Water Supply Program 6-14
6.11 Local Strategies and Actions 6-17
6.12 Water Demand Reductions and Conservation Savings 6-17
6.13 Demand Management Measures 6-17
6.14 Demand Management Measures Implementation over the Past Five Years 6-18
6.15 Dry-Year Shortage and Demand Reduction 6-18

Section 7, Conclusion 7-1
7.1 WSA Findings 7-2
7.2 Water Supply Assessment Approval Process 7-3

Section 8, References 8-1

Appendices

A. California Water Service, Bear Gulch District, 2020 Urban Water Management Plan
B. Menlo Park Municipal Water, 2020 Urban Water Management Plan
C. SFPUC 2020 Urban Water Management Plan

List of Tables

Table 2-1 Major Pipeline Projects 2-3
Table 2-2 Updated Project Baseline and Projections 2-5
Table 4-1 City of Menlo Park Climate Summary 4-1
Table 4-2 Supply Sources and System-wide Reductions 4-2
Table 4-3 Cal Water Peninsula District Water Supplies (Purchased and Local) 4-12
Table 4-4 Cal Water Bear Gulch District Projected Future Water Supplies – Normal Years 4-13
Table 4-5 MPMW Current and Projected Future Water Supplies – Normal Years (MG) . 4-13
Table 5-1 Water Demand - Housing Element Update and Additional 2040 Growth Projections 5-2
Table 5-2 HEU Residential Units, Distribution in Water Service Areas and Demand 5-3
Table 5-3 Bear Gulch District Historical and Current Water Use (AFY) 5-4
Table 5-4 MPMW Historical and Current Water Use 5-5
Table 5-5 Bear Gulch District Service Area Projected Growth in Water Demand (AFY) 5-6
Table 5-6 MPMW Service Area Projected Growth in Water Demand (MG and AFY) 5-7
Table 6-1 Projected SFPUC Purchases with HEU (AFY) 6-2
Table 6-2 Bear Gulch District Normal Year Supply and Demand Projections (AFY) 6-2
Table 6-3 Bear Gulch District Single Dry Year Potable Water Supply and Demand Projections (AFY) with Bay-Delta Plan Amendment 6-4
Table 6-4 Bear Gulch District Multiple Dry Years Potable Water Supply and Demand Comparison (AFY) with Bay-Delta Plan Amendment 6-4
Table 6-5 MPMW Normal Year Water Supply and Demand Comparison (AFY) 6-6

Table 6-6 MPMW Single-Dry-Year Potable Water Supply and Demand Comparison (AFY) with Bay-Delta Plan Amendment 6-7
Table 6-7 MPMW Multiple Dry Years Supply and Demand Comparison (AFY) with Bay-Delta Plan Amendment 6-7
Table 6-8 MPMW Normal, Single Dry and Multiple Dry Years Supply and Demand Comparison (AFY) without the Bay-Delta Plan Amendment 6-9

List of Figures

Figure A Housing Sites and Water Service Areas 1-3
Figure B Water Suppliers in Menlo Park 3-5
Figure C Bear Gulch District Service Area 3-7
Figure D Menlo Park Municipal Water 3-8
Figure E Regional Water Supply System 4-4
Figure F BAWSCA Member Agencies 4-7

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
ABAG	Association of Bay Area Governments
ADU	accessory dwelling unit
AF	acre-feet
AFY	acre-feet per year
Agreement	Water Supply Agreement
BAWSCA	Bay Area Water Supply and Conservation Agency
BMP	best management practice
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CIP	Capital Improvement Program
CPUC	California Public Utilities Commission
CUWCC	California Urban Water Conservation Council
Cal Water	California Water Service
Demand Study	SFPUC 2004 Wholesale Customer Water Demand Projections study
DWR	Department of Water Resources
EIR	environmental impact report
GMP	groundwater management plan
gpd	gallons per day
HEU	Housing Element Update
ILTWSP	integrated long-term water supply plan
IRWMP	integrated regional water management plan
ISG	Individual Supply Guarantee
LAFCO	Local Area Formation Commission
MPMW	Menlo Park Municipal Water
MG	million gallons
mgd	million gallons per day
MID	Modesto Irrigation District
MOU	memorandum of understanding

Acronym/Abbreviation	Definition
MSA	Settlement Agreement and Master Water Sales Contract
MSR	Municipal Service Review
PEIR	program environmental impact report
RHNA	Regional Housing Needs Allocation
RWS	Regional Water System
SAA	Supply Assurance Allocation
San Francisco	City and County of San Francisco
SB	Senate Bill
SEIR	Subsequent Environmental Impact Report
SFPUC	San Francisco Public Utilities Commission
SR	State Route
Strategy	Long-Term Reliable Water Supply Strategy
SVWTP	Sunol Valley Water Treatment Plant
SWRCB	State Water Resources Control Board
TID	Turlock Irrigation District
UWMP	urban water management plan
Water Code	California Water Code
WSA	water supply assessment
WSAP	water supply allocation plan
WSIP	Water System Improvement Program
WSV	Water Supply Verification

SECTION 1
Introduction

In 2001, California adopted Senate Bill (SB) 610 and SB 221, thereby amending the California Water Code (Water Code). Under these laws, certain types of development projects are required to provide detailed water supply assessments to planning agencies. The requirements for a water supply assessment (WSA) are set forth in the California Water Code (Water Code) Sections 10910 et seq. A WSA connects water supply and land use planning with the environmental review process. The law also reflects the growing awareness of the need to incorporate water supply and demand analysis at the earliest possible stage in the land use planning process. Any proposed project that is subject to the California Environmental Quality Act (CEQA) and would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project, is subject to SB 610 and is required to prepare a WSA.

The primary purpose of a WSA is to determine whether the identified water supply or water supplier will be able to meet projected demands for the Project, in addition to existing and planned future uses, over a 20-year planning period in normal, single-dry, and multiple-dry water years. Secondarily, a WSA provides decision-makers a regional framework on which to base a decision about the sufficiency of water supplies for the proposed Project.

The proposed Project is subject to CEQA and would allow for residential and mixed-use developments that may include more than 500 units. In fact, the proposed Project would allow up to 4,000 new dwelling units as a result of proposed land use strategies and rezoning, and assumes an additional 85 accessory dwelling units (ADUs), within City Council Districts 2, 3, 4 and 5. Therefore, this WSA was prepared in accordance with SB 610 and the Water Code. The SB 610 requirements and their applicability to the proposed Project are addressed in detail in Section 3, Water Supply Planning.

This WSA assesses the availability of identified water supplies under normal-, single-dry-, and multiple-dry-year conditions, accounting for the projected water demand of the proposed Project in addition to other existing and planned future uses of the identified water supply. This WSA examines the regional water providers and their supplies (Section 4.2), the reliability of these sources (Section 4.4), the projected short-term and long-term water demand of the proposed Project (Section 5), and a comparison of supply and demand as required in a WSA (Section 6) and Conclusion (Section 7).

The Project Site is located in the City of Menlo Park (City), within the service areas of Menlo Park Municipal Water (MPMW) and the California Water Service (Cal Water) Bear Gulch District. Therefore, with respect to the proposed Project, Cal Water's Bear Gulch District and MPMW are the water suppliers responsible for preparing WSAs.

1.1 Project Overview

The City is conducting an environmental review under the requirements of CEQA for its Housing Element Update (HEU). This WSA will provide information for use in the CEQA analysis for the proposed project. The City is preparing a Subsequent Environmental Impact Report (SEIR) regarding the HEU, which relies on and supplements information and analyses contained in the Environmental Impact Report (EIR) the City certified in 2016 as part of adopting the ConnectMenlo General Plan Update.

1.2 Project Location

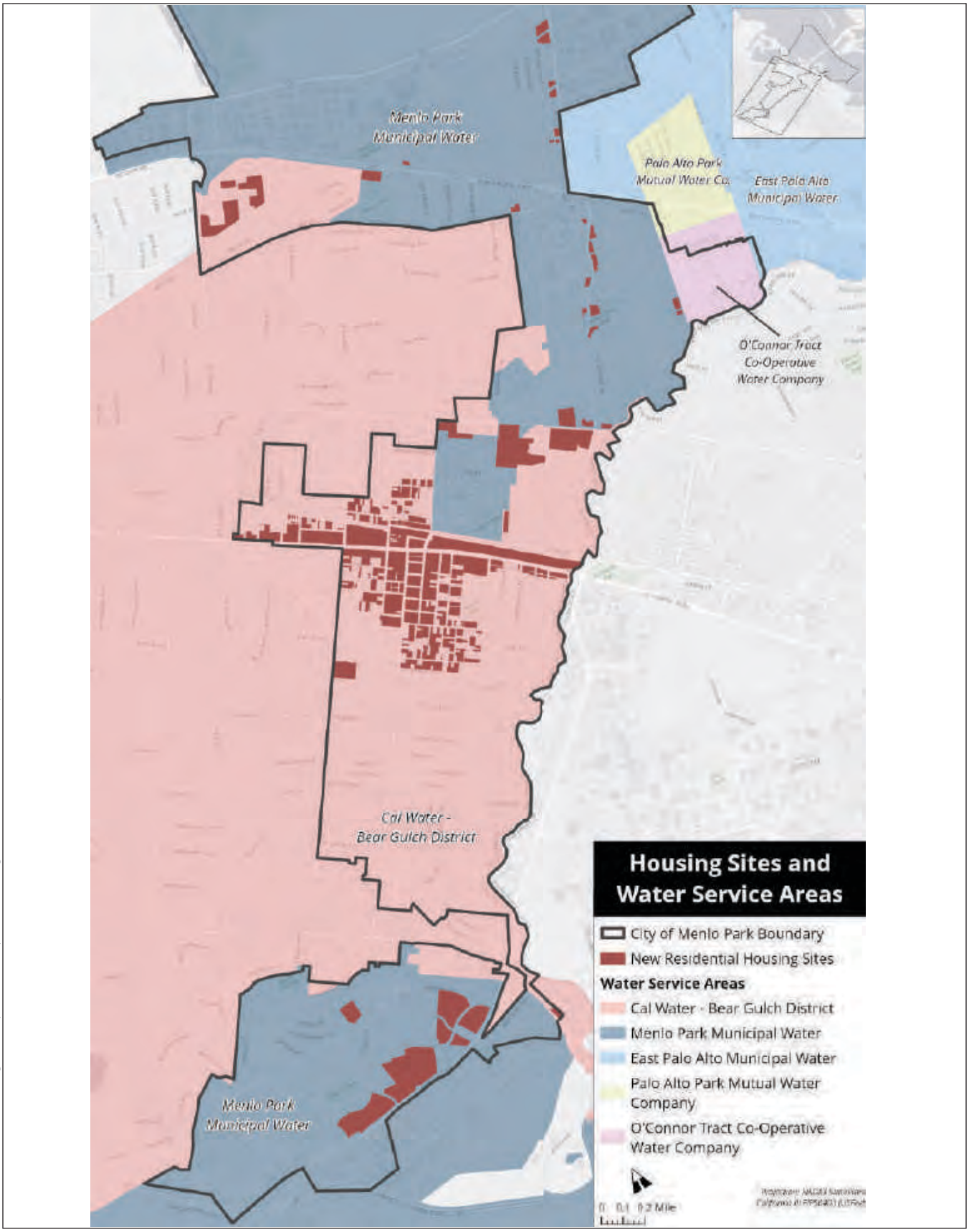
The City is located approximately 30 miles south of San Francisco on the San Francisco Peninsula about 20 miles northwest of San Jose. The City is located at the southern edge of San Mateo County. The City encompasses approximately 17 square miles (approximately seven square miles of which is water) with a population of approximately 35,000 people. The City boundaries and its regional location are shown in **Figure A**.

The City is generally bounded by San Francisco Bay to the north and east; the cities of East Palo Alto and Palo Alto and Stanford University to the southeast; and Atherton, unincorporated North Fair Oaks, and Redwood City to the northwest. The City is accessed by Interstate 280 (I-280), U.S. Highway 101 (US-101), Caltrain, State Route 84 (SR-84, or Bayfront Expressway) via the Dumbarton Bridge, and a variety of arterial roadways, as well as regional and local pedestrian and bicycles routes. The City has a Caltrain station located near the downtown area and is less than one hour from downtown San Francisco via train. The City has a range of urban and suburban land uses, including residential neighborhoods of varied densities, its downtown, parks, established business centers, and an emerging center for innovation and technology.

1.3 Project Summary

The City's current General Plan was last updated in 2016, when ConnectMenlo, an update of the Land Use and Circulation Elements, was adopted. The City's Housing Element was last adopted on April 1, 2014, and in accordance with State law, addresses the planning period from January 31, 2015, through January 31, 2023. As the end of this period is near, State law [Government Code Section 65588] requires the City to update its Housing Element with a due date of January 31, 2023. In accordance with State law, the planning period for the updated "6th Cycle" Housing Element will extend from January 31, 2023 through January 31, 2031.

Concurrent with updating the Housing Element, the City proposes to update the General Plan's Safety Element, prepare and adopt a new Environmental Justice Element, and make conforming amendments to other elements of the General Plan, as needed, to maintain internal consistency. The City also proposes to undertake changes to the City's Zoning Ordinance (Menlo Park Municipal Code Title 16) and the El Camino Real/Downtown Specific Plan (adopted June 12, 2012) that are needed to reflect the updated Housing Element and to maintain consistency with the General Plan, and proposes to rezone housing opportunity sites identified in the Housing Element.



D202100009.00 - Menlo Park Housing Element Update EIR\05 Graphics-GIS-Modeling-USE AZURE\Illustrator\Technical Report

Menlo Park Housing Element Update

Figure A
Housing Sites and Water Service Areas

ESA

1.4 Document Structure

This WSA is organized following a basic hierarchy to describe each issue: regional context (San Francisco Public Utilities Commission (SFPUC) service area); local context (Cal Water Bear Gulch District and MPMW service areas), Project-level analysis for the proposed Project; the assessment as a comparison of water supply and demand for the Project; and existing and future demand in all water year types. The report organization is as follows:

1. Introduction; project overview, location, and description; and document structure
2. City background information and land use planning
3. General information on water supply planning under SB 610
4. Water supply setting including local climate, water supplies, capacities, and reliability
5. Regional, city, and project water demands, including historical, projected, and projected dry-year demands
6. Supply-demand comparisons on a regional, city, and project-level basis
7. Conclusions

SECTION 2
Background Information and Land Use Planning

The City is proposing to update the Housing Element of its General Plan, update the Safety Element, and add a new Environmental Justice Element. These actions would build upon changes to the City's General Plan Update adopted in 2016 and would ensure the City's compliance with state law. The 2016 ConnectMenlo General Plan Update is briefly described below, along with relevant requirements of state law.

2.1 ConnectMenlo and Land Use and Circulation Elements

The purpose of ConnectMenlo was to update the Land Use and Circulation Elements of the City's General Plan, with a particular geographical focus on the Bayfront Area, and to update the zoning provisions to reflect the proposed land use changes within the Bayfront Area. The updated Land Use Element included goals, policies, and programs to guide local decisions regarding land use, and framed the type and scope of potential development that may occur in the City. The updated Circulation Element addressed transportation throughout the City and aimed to improve mobility connections citywide for all modes of travel. The General Plan amendments were accompanied by Zoning Ordinance amendments to foster a new live/work/play environment in the Bayfront Area. The City Council adopted three new zoning districts: Office (O), Life Sciences (LS), and Residential Mixed Use (R-MU) to set the framework for creating the live/work/play concept.

A primary focus of ConnectMenlo was to balance the potential for development impacts with providing community amenities, especially for the Belle Haven neighborhood. Bayfront Area projects may propose development at the bonus level, which allows additional height, floor area ratio (FAR), and/or density above the base level of zoning regulations in exchange for community amenities. Highlighted community amenities included improved transportation alternatives, affordable housing to support both the adjacent neighborhood and the growing workforce, and expanded service and community-serving retail uses.

The new development potential created in the Bayfront Area was analyzed in the ConnectMenlo EIR, along with remaining development potential under the General Plan. The ConnectMenlo EIR was adopted in 2016.

2.2 Land Use, Zoning and Project Elements and Characteristics

2.2.1 Housing Element Update Project Components

The Housing Element Update (HEU) would include adoption of General Plan amendments that would add or modify goals, objectives, policies, and implementation programs related to housing, safety, and environmental justice. General Plan amendments would also include conforming amendments to other elements of the General Plan, as needed, to ensure internal consistency. Amendments to the Housing Element would address among other things, the maintenance, preservation, improvement, and development of housing in the city. In addition, the HEU would include a housing sites inventory with sufficient existing and new housing sites at appropriate densities to meet the City's Regional Housing Needs Allocation (RHNA) requirement plus an ample buffer, and the City would modify provisions of its zoning ordinance, zoning map, and El Camino Real/Downtown Specific Plan as necessary to reflect the housing sites inventory and strategies to meet the City's RHNA.

2.2.2 Housing Sites Inventory

The HEU identifies specific sites appropriate for development of housing (especially affordable units), and the City would rezone those sites as necessary to meet the requirements of State law. The final housing sites inventory will be refined based on additional community input and analysis. The HEU SEIR evaluates the environmental effects of adding up to 4,000 new residential units in the City within the eight-year planning period via a variety of strategies in addition to possible pipeline projects and an additional 85 ADUs, as described below.

2.2.3 Pipeline Projects

Pipeline projects are new housing projects that have been recently approved but not yet occupied or are pending (in review). At the time the Notice of Preparation (NOP) for the HEU SEIR was published (December 23, 2021), there were seven major residential projects in the "pipeline" as either approved or pending housing developments that would provide approximately 3,642 new units. These units, as well as smaller projects in the City, could potentially count towards Menlo Park's RHNA requirement if the residential units were not completed and occupied prior to June 30, 2022. Major pipeline projects are listed in **Table 2-1** and are identified as either "approved" or "pending." Approved projects are considered part of the baseline, and pending projects are considered part of the Project being analyzed. (See the discussion of Growth Projections below.)

2.2.4 Accessory Dwelling Units

California Department of Housing and Community Development allows the City to develop a projection of ADUs that will be built within the planning period based on average annual production between 2018 and 2020. Because the City permitted an average of 10.6 ADUs per year between 2018 and 2020, the City can anticipate development of 85 units during the 6th Cycle Housing Element planning period. These units could potentially count towards Menlo Park's RHNA requirement.

TABLE 2-1
MAJOR PIPELINE PROJECTS

Project	Status	Net New Units
Approved Projects		
111 Independence Dr.	Approved	105
115 Independence Dr. (Menlo Portal)	Approved	335
141 Jefferson Dr. (Menlo Uptown)	Approved	483
Subtotal Approved Projects		*923*
Pending Projects		
123 Independence Dr.	Pending	432
165 Jefferson Dr. (Menlo Flats)	Pending	158
Willow Village	Pending	1,729
333 Ravenswood Ave. (Parkline)	Pending	400
Subtotal Pending Projects		*2,719*
Total		***3,642***

SOURCE: City Council Staff Report #21-210-CC (October 26, 2021), Table 3, Major Pipeline Projects.

NOTE: This table shows major pipeline projects yielding greater than 10 units.

2.3 Growth Projections

Changes to the City's General Plan proposed as part of the HEU would build on the changes adopted in November 2016, when the Land Use and Circulation Elements were comprehensively updated as part of the ConnectMenlo General Plan Update. To assess the increase in residential development planned with the proposed Project, the SEIR will use an updated baseline and updated projections for 2040. The updated baseline and projections are shown in **Table 2-2** and are explained briefly here:

- 2015 Existing Conditions from the ConnectMenlo EIR column is included for informational purposes. Comparison with the 2021 Baseline Conditions allows readers to understand changes since the ConnectMenlo EIR was prepared.
- 2021 Baseline Conditions column reflects conditions on the ground in the City when the NOP for the HEU SEIR was published in December 2021 and also includes development projects that have been approved and are either under construction or expected to commence construction shortly.
- The HEU columns reflect pending (proposed but not yet approved) projects and ADUs that would count towards the City's RHNA along with the 4,000 additional units anticipated as a result of proposed land use strategies and rezoning. Taken together, these represent the Project being analyzed in the HEU SEIR.
- The 2040 Cumulative (Maximum Buildout) Projections from the ConnectMenlo EIR are included for informational purposes and allows readers to understand the maximum buildout of the General Plan that was anticipated in the ConnectMenlo EIR.

- The Updated 2040 Cumulative (Maximum Buildout) Projections with the HEU column provides a summary of the maximum buildout of the General Plan as a result of the proposed Project plus other past, present, and reasonably foreseeable development projects that were not reflected in the ConnectMenlo 2040 projections. The data reflects the ConnectMenlo 2040 projections plus the 85 ADUs and the 4,000 additional units anticipated as a result of the HEU between 2023 and 2031, plus the 123 Independence Drive pipeline project, as well as an increment of additional growth that may occur between 2031 and 2040, in part due to the zoning and specific plan changes that would accompany the HEU. The additional increment of 299 units over nine years is relatively modest because the housing inventory sites included in the HEU represent those parcels most likely to develop by 2031, leaving smaller sites that are less likely to develop in later years.

TABLE 2-2
UPDATED PROJECT BASELINE AND PROJECTIONS

	2015 Baseline (Existing) Conditions from ConnectMenlo EIR	2021 Baseline Conditions[a]		Housing Element Update			2040 Cumulative (Maximum Buildout) Projections from ConnectMenlo EIR	Updated 2040 Cumulative (Maximum Buildout) Projections with Housing Element Update[d]
		Existing	Approved Projects[a]	Pending Projects[b]	ADUs[c]	Additional Units		
Bayfront Areae								
Residential Units	0	735	923	2,319		0	5,430	5,581
Population[f]	0	1,874	2,373	5,960		0	13,960	14,343
Non-Residential SF	8.7 million	9.74 million				0	13.4 million	13.4 million
Hotel Rooms	0	250				0	850	850
Jobs	19,800	32,275[g]	(213)			0	39,950	39,950
Remainder of City								
Residential Units	13,100	13,281	525	414	85	4,000	14,450	19,248
Population[f]	32,900	34,841	1,350	1,064	218	10,280	36,390	49,467
Non-Residential SF	5.9 million	5.93 million				0	6.8 million	6.8 million
Hotel Rooms	570	631				0	640	640
Jobs	11,100	11,416[h]	1,470			0	13,300	13,300
Citywide Totals								
Residential Units	13,100	14,016	1,448	2,733	85	4,000	19,880	24,829
Population[f]	32,900	36,715	3,723	7,024	218	10,280	50,350	63,810
Non-Residential SF	14.6 million	15.7 million				0	20.6 million	20.6 million
Hotel Rooms	570	881				0	1,490	1,490
Jobs	30,900	43,691	1,257			0	53,250	53,250

SOURCE: City of Menlo Park, March 2022.

NOTES:

a. 2021 Baseline conditions reflect existing conditions plus approved projects that are in construction or likely to commence construction in the near term. The approved projects include 111 Independence Drive; Menlo Uptown (141 Jefferson Drive, 180-186 Constitution Drive); and Menlo Portal (104-110 Constitution Drive, 115 Independence Drive) in the Bayfront Area. In the remainder of the City, approved projects include 1275 El Camino Real, 500 El Camino Real, Springline (1300 El Camino Real), 1021 Evelyn Street, 1540 El Camino Real, 115 El Camino Real, 409 Glenwood Avenue, 706-716 Santa Cruz Avenue, 1300 Block of Willow Road, 201 El Camino Real, 1162 El Camino Real, 975 Florence Lane, and 661-687 Partridge Avenue.
b. Pending projects reflect residential development applications that are currently on file for residential development in the City. These projects include Willow Village, Menlo Flats (165 Jefferson Drive), and 123 Independence Drive in the Bayfront Area. In the remainder of the City, pending projects include 1550 El Camino Real, Parkline (333 Ravenswood Avenue), and 1220 Hoover Street.
c. Because the location of future ADUs is unknown, the units are not distributed between the Bayfront Area and the Remainder of the City, and are instead included in the Citywide Totals.
d. The Updated 2040 Cumulative represents the *ConnectMenlo* 2040 Cumulative plus approved and pipeline projects that were not anticipated in the *ConnectMenlo* EIR, plus the 85 ADUs and 4,000 units being zoned for in the Housing Element Update, plus an estimated 299 units that may result from development on small sites affected by zoning and Specific Plan changes as part of the HEU after the end of the planning period in 2031. The estimate of 299 units is based on the assumption that the best sites are those included in the Housing Sites Inventory that are assumed to be built-out by 2031, and the smaller sites remaining may see modest development in later years. Projects that were not anticipated in *ConnectMenlo* include 123 Independence Drive in the Bayfront Area. The 2040 "No Project" condition would include the housing unit and population values in this column, less the 4,000 units from the HEU (10,280 persons), and the 299 additional units noted above (768 persons). Thus the Citywide unit count for the "No Project" condition would be 20,530 units, with a resultant Citywide population of 52,762 persons.
e. The Bayfront Area as defined in the *ConnectMenlo* EIR refers to areas on the Bay side of US-101 with the exception of the Belle Haven neighborhood.
f. Population estimates presented for the *ConnectMenlo* existing baseline and 2040 Cumulative are based on the assumption of 2.57 persons per household used in the *ConnectMenlo* EIR which aligns with the City's transportation model.
g. This number represents the 19,800 jobs from *ConnectMenlo* EIR Table 3-2 plus 5,412 from the occupied portion of Facebook Campus Expansion Project and 7,063 from space occupied from 2015 through 2021.
h. This number represents the 11,100 jobs from *ConnectMenlo* EIR Table 3-2 plus 316 jobs in space occupied from 2015 through 2021.

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SECTION 3
Water Supply Planning

California has many different processes through which the development and/or maintenance of water supplies are planned on a local and regional level. Urban Water Management Plans (UWMPs), Groundwater Management Plans (GMPs), Integrated Regional Water Management Plans (IRWMPs), Municipal Service Reviews (MSRs) and water resources components of General Plans all integrate a degree of regional planning of water supply and demand. The following are brief descriptions of the plans mentioned above:

- Urban Water Management Plans (UWMP), pursuant to Water Code sections 10610 et seq. are long-range water supply and demand planning documents that provide a connection between land use planning and available water supplies. The UWMPs should make every effort to ensure the appropriate level of reliability in a water service area sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry years.

- Groundwater Management Plans (GMPs) are adaptive management tools and represent a critical step in establishing a framework for maintaining a sustainable groundwater resource for the various users overlying the basins. The GMPs are consistent with the provisions of California Water Code sections 10750 et seq. GMPs are developed in a consensus-based process, and include stakeholders throughout the overlying basins.

- Integrated Regional Water Management Plans (IRWMPs) are collaborative efforts to manage all aspects of water resources in a region. IRWMPs cross jurisdictional, watershed, and political boundaries; involve multiple agencies, stakeholders, individuals, and groups; and attempt to address the issues and differing perspectives of all the entities involved through mutually beneficial solutions.

- Municipal Service Reviews (MSR) are comprehensive studies designed to better inform Local Area Formation Commissions (LAFCO), local agencies, and the community about the provision of municipal services. Service reviews capture and analyze information about the governance structures and efficiencies of service providers and identify opportunities for greater coordination and cooperation between providers. The MSR is a prerequisite to a Sphere of Influence determination and may also lead a LAFCO to take other actions under its authority.

- General Plans are required by California law. The General Plan is designed to guide the long-term physical development and conservation of a city or county's land and environment through a framework of goals, policies, and implementation programs. The General Plan also provides a foundation for more detailed plans and implementation programs to be conducted, such as area or community plans, zoning ordinances, and specific plans.

To complement these large-scale planning processes, California enacted Senate Bill (SB) 610 and 221 in 2002, both of which emphasize the interrelationships between land use and water supply planning, and require the incorporation of water supply and demand analysis at the earliest

possible stage in the planning process for sizeable land use projects. These statutes primarily apply to the planning of water supplies and identification of sources for defined "projects" (Water Code, Section 10912) in the case of SB 610 and for individual residential subdivision projects of more than 500 units in the case of SB 221. SB 610 amended portions of the Water Code, including Section 10631, which contains the Urban Water Management Planning Act, and added Sections 10910, 10911, 10912, 10913, and 10915, which describe the required elements of a WSA to be prepared and relied upon during the CEQA process. WSAs are prepared in connection with the environmental review process for defined "projects" (generally very similar to "projects of statewide, regional, or area wide significance," as defined in "CEQA Guidelines" Section 15206), and provide information (along with EIR analysis) to be considered by agency decision-makers at the time of project approval. Nothing in SB 610 prevents a city or county from approving a proposed project even in the face of information concluding that there is not sufficient water supply for build-out of the project.

Under both laws, agencies are required to consider water demands over a 20-year planning horizon, considering normal, single dry, and multiple dry year scenarios in light of the water provider's existing and planned future uses, including agricultural and manufacturing uses.

3.1 Water Supply Planning Under SB 610 and SB 221

As the "public water system" that supplies water to portions of the City including the proposed Project housing sites, Cal Water Bear Gulch District and MPMW are required to prepare WSAs and water supply verifications (WSVs), under the requirements of Senate Bills 610 and 221, and the Government Code (Sections 65867.5, 66455.3 and 66473.7). There are three primary areas to be addressed in a WSA:

(1) A description of all relevant water supply entitlements, water rights, and/or water contracts;

(2) A description of the available water supplies and the infrastructure, either existing or proposed, to deliver the water; and

(3) An analysis of the demand placed on those supplies, by the project, and relevant existing and planned future uses in the area.

Where the description of existing water supply entitlements, water rights, and/or water contracts shows insufficient water supplies to serve the proposed project as well as existing and planned uses over the 20-year planning horizon, additional information is required to describe how and where sufficient supplies may be obtained. Such information must include the estimated costs, financing methods, and regulatory approvals needed to obtain new supplies, as well as a projected time frame for obtaining them. WSVs must also contain information regarding existing supplies, as well as more detailed confirmation that the appropriate infrastructure planning and funding is in place to fully commit water supplies to a project. Senate Bill 610, which is applicable to certain large projects subject to CEQA or considered a "project" under Water Code Section 10912(a) or (b), builds on the information that is typically contained in an UWMP. The amendments to Water Code Section 10631 were designed to make WSAs and UWMPs consistent. A key difference between the WSAs and UWMPs is that pursuant to Water Code Section 10621, UWMPs are required to be updated every five years on or before July 1, in years ending in one and six, while

WSAs are required as part of the environmental review process for each individually qualifying project. As a result, the 20-year planning horizons for each type of document may cover slightly different planning periods. Additionally, not all water providers who must prepare a WSA under SB 610 are required to prepare an UWMP because these water systems do not meet the requirements in Water Code section 10631. As stated above, only public water systems providing water for municipal purposes to more than 3,000 customers, or supplying more than 3,000 acre-feet (AF) annually must prepare UWMPs.

3.1.1 SB 610 Water Supply Assessment

The SB 610 water supply assessment process involves answering the following questions:

- Is the project subject to CEQA?
- Is it a project under SB 610?
- Is there a public water system?
- Is there a current UWMP that accounts for the project demand?
- Is groundwater a component of the supplies for the project?
- Are there sufficient supplies available to serve the project over the next 20 years?

"Is the Project Subject to CEQA?"

The first step in the SB 610 process is determining whether the project is subject to CEQA. SB 610 amended Public Resources Code Section 21151.9 to read: "Whenever a City or county determines that a project, as defined in Section 10912 of the Water Code, is subject to this division [i.e., CEQA], it shall comply with part 2.10 (commencing with Section 10910) of Division 6 of the Water Code." The City has determined that the proposed Project is a project subject to CEQA. The information contained in this assessment will be used to inform and support the SEIR for the HEU, and will be appended thereto.

"Is It a Project Under SB 610?"

The second step in the SB 610 process is to determine if a project meets the definition of a "Project" under Water Code Section 10912(a). Under this section, a "Project" is defined as meeting any of the following criteria:

- A proposed residential development of more than 500 dwelling units;
- A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet (ft2) of floor space;
- A commercial building employing more than 1,000 persons or having more than 250,000 ft2 of floor space;
- A hotel or motel with more than 500 rooms;
- A proposed industrial, manufacturing, or processing plant, or industrial park, planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 ft2 of floor area;

- A mixed-use project that includes one or more of these elements; or
- A project creating the equivalent demand of 500 residential units.

Alternately, if a public water system has less than 5,000 service connections, the definition of a "Project" also includes any proposed residential, business, commercial, hotel or motel, or industrial development that would account for an increase of 10 percent or more in the number of service connections for the public water system.

As previously stated, the proposed Project would allow for residential and mixed-use developments that may include more than 500 units. In fact, the proposed Project would allow up to 4,000 new dwelling units through zoning modifications, and for that reason, it meets the requirements as a "Project" under the Water Code. As a result, a WSA pursuant to Water Code Section 10912 (a) will need to be prepared prior to completion of the HEU SEIR. (It should be noted that there is some question whether adoption or amendment of a general plan fits the definition of a "project" for purposes of requiring a WSA, as it does not directly create demand for water but instead authorizes the use of land that may be proposed for development requiring water. Notwithstanding this question, the City has determined that a WSA is required as part of the CEQA analysis of the Housing Element Update.)

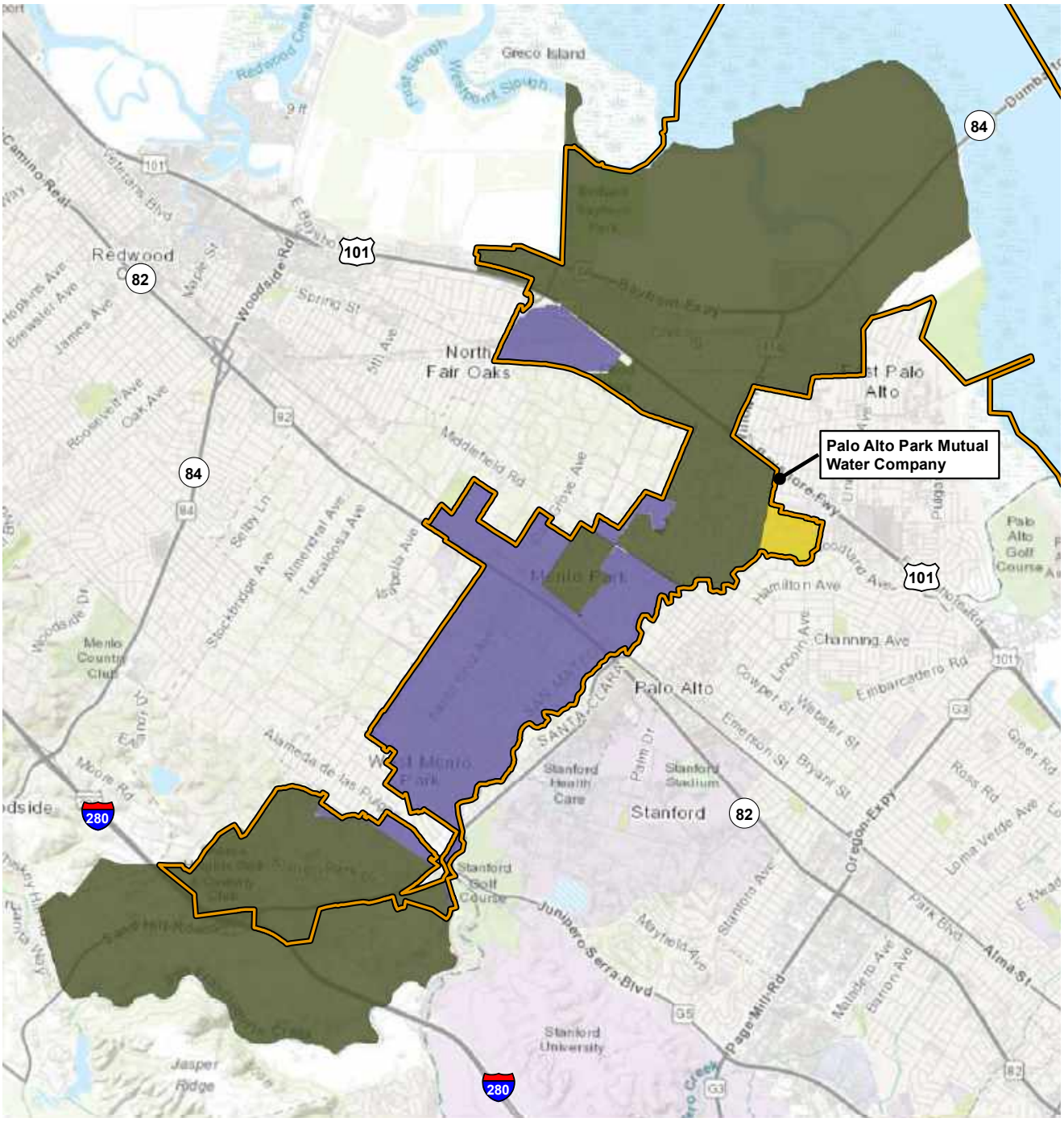
"Is There a Public Water System?"

The third step in the SB 610 process is determining if there is a "public water system" to serve the project. Section 10912(c) of the California Water Code states: "[A] public water system means a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections."

The City is served by four water systems: Cal Water Bear Gulch District, MPMW, O'Connor Tract Co-operative Water Company, and Palo Alto Park Mutual Water Company. The City has determined that two (Cal Water's Bear Gulch District and MPMW, as described in detail below) qualify as public water systems pursuant to Water Code section 10912(c) that would serve the proposed Project's additional housing and therefore require preparation of a WSA. The City does not require WSA's by O'Connor Tract Co-operative Water Company or Palo Alto Park Mutual Water Company, because the new residential development proposed under the Housing Element Update all is outside their service areas. **Figure B** provides an overview of all water suppliers within the City and their service area boundaries.

Cal Water Bear Gulch District

California Water Service Company is an investor-owned private utility supplying water service to 1.7 million Californians through over 440,000 connections. Its twenty-five separate water districts serve over fifty communities from Chico in the north to the Palos Verdes Peninsula in Southern California. Cal Water's operations for individual service districts are regulated by the California Public Utilities Commission (CPUC). CPUC sets different tariff rates for each of Cal Water's individual districts. Cal Water incorporated in 1926, and has provided water service to the Bear Gulch District since 1936.



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Menlo Park Housing Element Update EIR

Figure B
Water Suppliers in Menlo Park

ESA

Cal Water's Bear Gulch District is located in San Mateo County approximately 30 miles south-southeast of the City of San Francisco. The area served by Cal Water Bear Gulch District includes the communities of Atherton; Portola Valley; Woodside; portions of Menlo Park including the HEU plan area; and adjacent unincorporated portions of San Mateo County including West Menlo Park, Ladera, North Fair Oaks, and Menlo Oaks. Cal Water's Bear Gulch District's system is bordered on the north by Redwood City; on the east by Palo Alto, Stanford University, and unincorporated Santa Clara County; and on the south and west by unincorporated San Mateo County. Current land uses within the Cal Water's Bear Gulch District are a mixture of low, medium, and high density residential, mixed use, commercial, public facilities, and parks/open space.

Cal Water expanded its Bear Gulch District service area by acquiring three neighboring water service providers (Los Trancos County Water District, Skyline County Water District, and Woodside Mutual Water Company), and in 2020 it served more than 18,000 connections. Residential customers account for most of Bear Gulch District's service connections and 84 percent of its total water use. Non-residential water uses account for 11 percent of total demand while distribution system losses account for five percent.

Cal Water's Bear Gulch District serves approximately one-half of the City's residential population through its distribution system and smaller portion is delivered to commercial customers. **Figure C** illustrates Cal Water's Bear Gulch District's service area, its relationship to the City, and the locations within its service area where implementation of the HEU would support additional housing development.

Menlo Park Municipal Water

MPMW provides retail water service to approximately half of the City's population, in 2020 MPMW served about 4,296 connections. Land uses in the MPMW service area consist of residential, commercial, industrial and institutional. Customer service connections include residential users, industrial connections, commercial service connections, irrigation accounts, institutional and governmental accounts and other connections (including temporary services, private fire services, and hydrant services). **Figure D** illustrates MPMW's service area and its relationship to the City, and the locations within its service area where implementation of the HEU would authorize additional housing development.

"Is There a Current Urban Water Management Plan That Accounts for the Project Demand?"

Step four in the SB 610 process involves determining if there is a current UWMP that considers the projected water demand for the project area. The Water Code requires that all public water systems providing water for municipal purposes to more than 3,000 customers, or supplying more than 3,000 AF annually must prepare an UWMP. Pursuant to Water Code Section 10621, UWMPs are required to be updated every five years on or before July 1, in years ending in one and six.

Cal Water Bear Gulch District prepared an UWMP in 2020 (**Appendix A**), which was adopted in June 2021. MPMW's most recently adopted UWMP is the 2020 UWMP, which was adopted in May 2021 (**Appendix B**). Both of the aforementioned 2020 UWMP's are incorporated by reference into this WSA.

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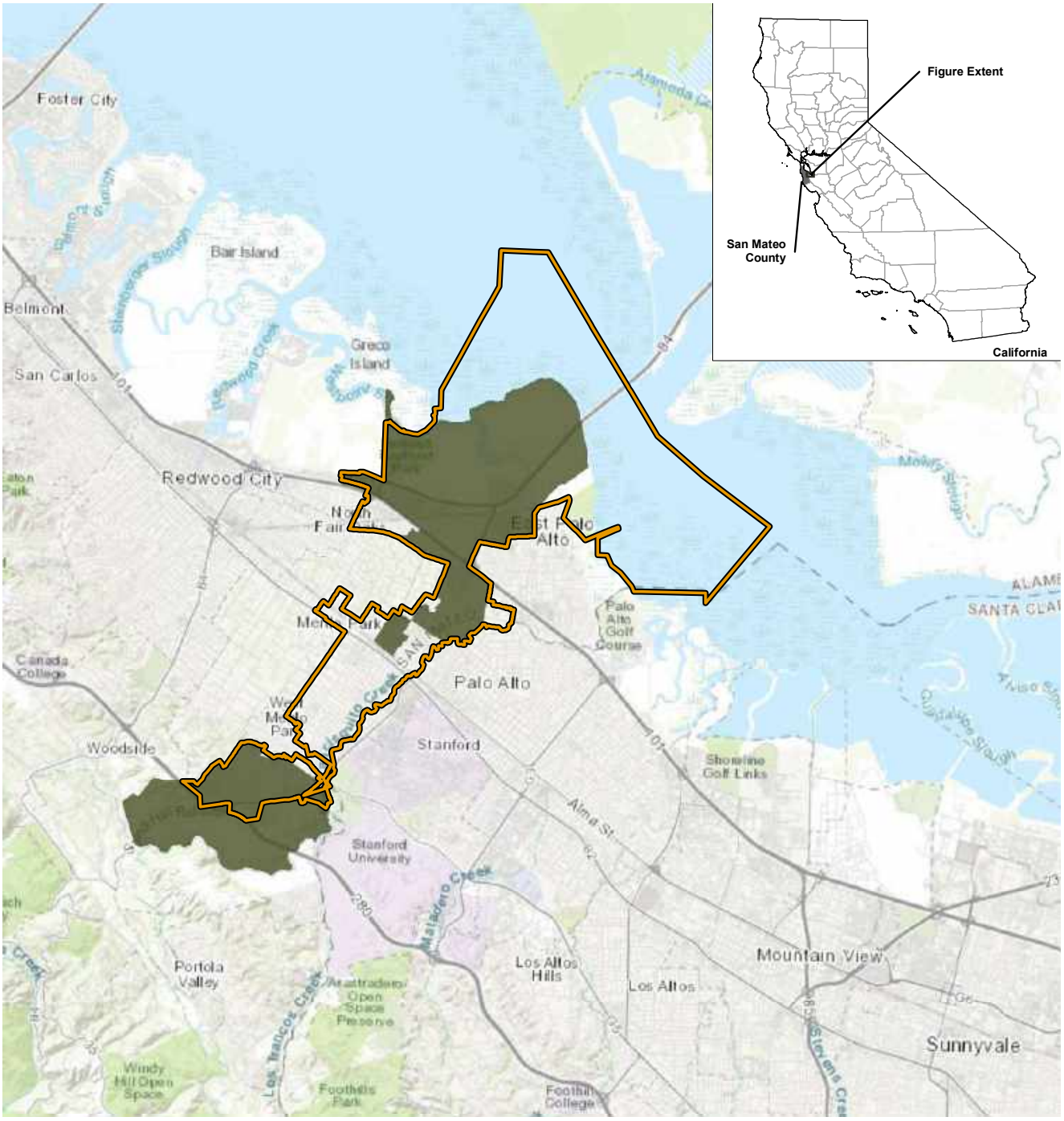
SOURCE: M-Group, 2022

Menlo Park Housing Element Update EIR

Figure C
Bear Gulch District Service Area

ESA



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Menlo Park Housing Element Update EIR

Figure D
Menlo Park Municipal Water

ESA

Water Code Section 10910(c)(2) states: "If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f), and (g) [i.e., the WSA]." If projected water demand associated with the proposed project was not accounted for in the most recently adopted urban management plan, Water Code Section 10910(c)(3) states: "the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses."

The Cal Water Bear Gulch District's 2020 UWMP is currently available online at the Department of Water Resources (DWR) website and MPMW's 2020 UWMP is available at the City's website. As shown in Figure C and Figure D, portions of proposed growth associated with implementation of the HEU and additional projected cumulative growth would occur within each of the water suppliers' service areas. Therefore, new water demand associated with projected growth and implementation of the HEU is also expected to occur within each of the water suppliers' service areas. Both water suppliers' 2020 UWMPs accounted for proportional future growth in demand above the average water demand in each service area over a five-year period (from 2016 through 2020), however, implementation of the HEU and other projected growth forecasted by respective planning agencies was not accounted for in the growth forecasts when Cal Water Bear Gulch District was preparing its 2020 UWMP. Furthermore, additional growth in demand in the MPMW 2020 UWMP did not account for implementation of the HEU, and this WSA, consistent with Water Code Section 10910(c)(3) provides an assessment of supply and demand including new demand associated with implementation of the HEU and other projected growth. Projected growth in residential development in each of the respective water service areas is provided in greater detail below.

It is estimated that Cal Water Bear Gulch District's service area population was 60,814 in 2020. Cal Water Bear Gulch District estimates its service area population using census block population counts from decadal Census data. The decadal Census estimates are converted to average population per single- and multi-family service, which are applied to service counts for years between the decadal Censuses. This method is similar to the approach used by the California DWR Population Tool and population estimates generated by the two methods have been shown to differ by less than one percent in most cases.

Cal Water Bear Gulch District's population and service growth projections are tied to Association of Bay Area Governments (ABAG) census tract level projections of population, housing, and employment. These projections, in turn, are developed by ABAG through detailed land use modeling of the Bay Area. Parcels, or individual units of land ownership, provide the fundamental building block for the ABAG land use model. The land use database includes information linking the parcels to zones they are within, buildings within each parcel, their size, their monetary value, and their current planning constraints. The base year database contains 1.9 million buildings categorized into different land use types, ranging from detached single-

family housing to heavy industrial. The ABAG land use model relies on current zoning for all parcels in the region as a representation of the land use controls in place in the base year. Zoning codes, general plans, and specific plans were processed by ABAG to obtain a consistent indication of each jurisdiction's long-term vision for land use type, residential dwelling units per acre, and commercial floor area ratio. However, as previously discussed, the water demand for the proposed Project was not accounted for within projected growth in water demand described in Cal Water Bear Gulch District's 2020 UWMP. Therefore, this WSA, consistent with the City's HEU conducted an analysis of water demand associated with implementation of the HEU and additional growth anticipated in the Updated 2040 Cumulative Growth (Section 5) and evaluated the current and future water supply and demand scenarios in Section 6.

The MPMW 2020 UWMP incorporated the future population, employment and water demand projections for buildout of the General Plan, including the additional allowable development associated with ConnectMenlo and other major development projects within the MPMW service area. As previously described in this WSA, ConnectMenlo identifies the maximum development potential that could occur within the ConnectMenlo study area, including potential bonus-level increased development, and the associated program-level EIR further defines the maximum development that can occur by specific land uses. MPMW and the City's Planning Division are actively tracking projects within the ConnectMenlo study area on a cumulative basis to ensure that developed projects remain within the maximum development permitted in ConnectMenlo and would be consistent with the program-level EIR. The potential units located within the MPMW service area for the proposed Project, if approved, would be in addition to the remaining unallocated total residential development potential for ConnectMenlo, and are being evaluated within the program-level SEIR being prepared for the HEU. Water demand for the proposed Project is described in Section 5.1 and illustrated in Table 5-1 of this WSA.

Additional discussion on the Cal Water Bear Gulch District and MPMW's existing and projected water demands is provided in Section 5 of this WSA.

"Is Groundwater a Component of the Supplies for the Project?"

According to the requirements of SB 610, if groundwater is identified as a possible source, Section 10910(f) of the Water Code also applies and a description of the groundwater basin or basins from which the proposed project will be supplied must be included in the WSA. Groundwater is a small component of the SFPUC's Retail supply but is not used to provide water to any of the Suburban wholesale customers including the Cal Water Bear Gulch District and MPMW. As recipients of treated water through the SFPUC Regional Water System (RWS), neither the Cal Water Bear Gulch District nor the MPMW use groundwater to meet customer demand within their respective service areas. However, MPMW may use groundwater for emergency purposes and has undertaken a multi-year Emergency Water Storage/Supply Project to construct groundwater wells and storage. As such, this WSA evaluates groundwater basin conditions pursuant to Section 10910(f).

Groundwater Basin Description

The MPMW service area overlies the southern end of the Santa Clara Valley Groundwater Basin's San Mateo Plain Groundwater Subbasin (DWR basin number 2-9.03; DWR, 2004; or "subbasin"). The subbasin is not adjudicated, nor has it been found by DWR to be in a condition of overdraft. As part of the implementation of the Sustainable Groundwater Management Act (SGMA), the subbasin was ranked as a "very low priority" basin under the California Statewide Groundwater Elevation Monitoring basin prioritization process. As such, the subbasin is not subject to the requirements of SGMA.

Located within the 45-square mile San Francisquito Creek Watershed, the MPMW service area contains both mountainous bedrock terrain and comparatively flat alluvial deposits. Coarse- and fine-grained alluvial deposits from the San Francisquito Creek can be found in the MPMW service area. There is a shallow aquifer and a deep aquifer that has an upper and a lower zone in the MPMW service area. Both aquifers lie beneath a laterally extensive confining layer. The shallow aquifer is unconfined while the deep aquifer is semi-confined. Pump tests and empirical transmissivity data show that it is feasible to develop a municipal supply from the groundwater subbasin. It is estimated that the groundwater subbasin can be as thick as 1,000 feet in some locations.

Groundwater in the Santa Clara Valley Groundwater Basin naturally flows toward the San Francisco Bay from the uplands in the southwest. Reverse groundwater gradients, from the San Francisco Bay toward the uplands, have been seen when pumping has exceeded the rate of recharge. The estimated annual recharge rate of the San Francisquito Creek watershed ranges from 4,000 to 8,000 acre-feet per year, equivalent to 3.6 to 7.2 mgd.

Additional discussion of the groundwater conditions and groundwater management is provided in MPMW's 2020 UWMP.

MPMW Emergency Water Storage/Supply Project

The MPMW Emergency Water Storage/Supply Project intends to provide a backup water supply to MPMW's Lower Zone, which lacks emergency storage, in the event water from the SFPUC RWS is reduced or unavailable. The MPMW Emergency Water Storage/Supply Project goal is to provide a total capacity of up to 3,000 gpm, or approximately 4.32 mgd, between two to three wells at separate locations. MPMW initiated this project in 2010 and completed site screening, site ranking, and detailed engineering and hydrologic evaluation in 2013, including extensive community engagement. The City selected the Corporation Yard at 333 Burgess Drive for the first well, completed the CEQA evaluation in 2016, and drilled the well in 2017. Construction of the well facility (e.g., generator, disinfection equipment, associated piping) was completed in late 2020, and MPMW is working with the SWRCB to permit the well.

The MPMW Emergency Water Storage/Supply Project also consists of constructing an underground reservoir and pump station. The wells, underground reservoir, and pump station are identified in the 2018 Water System Master Plan as priority projects and funding has been included in the current five-year capital improvement program. MPMW is currently in the process of identifying locations for the two other wells, the underground reservoir, and pump station.

In addition, MPMW's 2020 UWMP includes utilizing well water for drought stage 5 (up to 50% reduction) and drought stage 6 (greater than 50% reduction) to augment supplies if necessary as part of its Water Shortage Contingency Plan.

The SWRCB Division of Drinking Water classifies wells as "active" or "standby." Active wells require regular, frequent testing to meet Safe Drinking Water Standards; standby wells are tested less frequently. Additionally, standby wells, must meet all primary standards (but not secondary standards) and have restrictions that the well cannot be used for more than 14 days per year or more than five consecutive days. To provide flexibility, the City plans to permit its emergency wells as "active" wells as long as primary and secondary standards can be met. The City's plan is to use the wells for emergency purposes only, but have the flexibility to provide well water during emergencies that last more than 14 days per year or more than five consecutive days.

"Are There Sufficient Supplies to Serve the Project over the Next 20 Years?"

The final step in the SB 610 process is to illustrate the available water supplies, including the availability of these supplies in all water-year conditions (normal year, single dry year, and multiple dry years) over a 20-year planning horizon, and an assessment of how these supplies relate to project-specific and cumulative demands over 20- and 25-year planning periods as compared to the Cal Water Bear Gulch District and MPMW 2020 UWMPs. In this case, the period is projected to 2045 for Cal Water's Bear Gulch District and to 2040 for MPMW. The water supply and demand comparisons are presented and discussed in Section 6. Section 7 of this WSA provides a conclusion. For convenience, the WSA findings are also presented below.

WSA Findings

Regarding the availability of water supplies to serve the HEU, consistent with the findings in their 2020 UWMPs, this WSA presents water supply scenarios with and without implementation of the Bay-Delta Plan Amendment. An explanation of the Bay-Delta Plan Amendment is found in section 4.2.3 and explained in detail in the SFPUC's 2020 UWMP and used to support the results found in the Cal Water Bear Gulch District's and MPMW's 2020 UWMPs.

Water supply scenario **without implementation** of the Bay-Delta Plan Amendment:

- In years of normal and above-normal precipitation and including local water supply sources, the Cal Water Bear Gulch District and MPMW have adequate supplies to serve 100 percent of normal demand beginning in 2025 and through each of their respective planning horizons.
- SFPUC would be able to meet 100 percent of its water supply guarantees during all water year types through 2045 except during the 4th and 5th consecutive dry years for base year 2045 when 15 percent shortages are projected within the RWS. In these years, Cal Water Bear Gulch District and MPMW would not have sufficient supplies to meet demand and would need to activate their water shortage contingency plans. The projected multiple dry year shortfalls in 2045 would require implementation of Stage 2 of the Cal Water Bear Gulch District and MPMW WSCPs.
- As discussed in Section 6.7 and presented in Table 6-8, MPMW through its ISG with SFPUC will meet the projected water demand associated with the Updated 2040 Cumulative Demand.

If and when supply shortfalls occur in single dry and multiple dry years as soon as 2025, MPMW expects to meet these supply shortfalls through water demand reductions through implementation of its DMMs.

Water supply scenario **with implementation** of the Bay-Delta Plan Amendment:

- SFPUC will be able to meet its contractual obligations to its wholesale customers in normal years but would experience significant supply shortages in dry years. In these years, Cal Water Bear Gulch District and MPMW would not have sufficient supplies to meet demand and would need to activate their water shortage contingency plans. The projected single dry year and multiple dry year shortfalls would require implementation of Stages 3, 4, 5 and/or 6 of their WSCPs.
- In single dry years, supply shortages in the RWS would range from 36 to 46 percent. In multiple dry years, supply shortages would range from 36 to 54 percent. Notably, implementation of the Bay-Delta Plan Amendment would reduce SFPUC's primary supply source and require rationing in all single dry and multiple dry years through 2040 and 2045. In these years, Cal Water Bear Gulch District and MPMW would not have sufficient supplies to meet demand and would need to activate their water shortage contingency plans. The projected single dry year and multiple dry year shortfalls would require implementation of Stages 3, 4, 5 and/or 6 of their WSCPs.

As discussed in sections 6.9 through 6.15, SFPUC, BAWSCA, Cal Water and MPMW are working to develop regional and local projects to shore up local supplies and reduce the projected shortfall. If conditions for large drought cutbacks to the RWS persist, Cal Water Bear Gulch District and MPMW will need to implement additional demand management practices and prohibitions on potable water use and accelerate efforts to develop alternative supplies of water.

3.2 Water Supply Assessment Approval Process

On October 18, 2022, the City Council of the City of Menlo Park, by resolution adopted this WSA as it pertains to MPMW's service area and new dwelling units contemplated in the HEU and within MPMW's service area boundaries pursuant to California Water Code 1910 et seq. and CEQA Guidelines 15155. The resolution is attached to the WSA. Notably, Cal Water Bear Gulch District has the same responsibility and will take a similar action to consider and approve this WSA through its own approval process. Cal Water Bear Gulch District's approval is pending and upon approval will the appended to the final WSA.

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SECTION 4
Water Supply Setting

This section presents local climate conditions and reviews water supply sources, entitlements, water rights and contracts.

4.1 Climate

The City has a Mediterranean climate with cool, wet winters and warm, dry summers. Climatic statistics are shown in **Table 4-1**. Rainfall in the area averages 15.28 inches per year and is generally confined to the "wet" season from late October to early May. The average reference evapotranspiration (ETo) for the region is 44 inches per year. The ETo is a standard measurement related to the water demand by plants in a specific region. Because the average annual ETo is approximately 30 inches more than the average annual precipitation, and because 90 percent of the annual precipitation occurs between the months of November and April, growing turf or other plantings in this region requires a significant amount of irrigation during the dry season. This irrigation demand contributes to the overall and observed seasonal variation in water demand throughout Cal Water Bear Gulch District's and MPMW's service areas.

TABLE 4-1
CITY OF MENLO PARK CLIMATE SUMMARY

Month	Maximum Average Temperature (°F)	Minimum Average Temperature (°F)	Standard Average ETo (inches)	Average Monthly Rainfall (inches)
January	57.5	39.0	1.4	3.23
February	61.3	41.3	2	2.88
March	64.1	43.2	3.3	2.22
April	68.4	44.8	4.4	0.99
May	72.8	48.5	5.4	0.37
June	77.4	52.5	6	0.08
July	78.2	54.8	6.2	0.02
August	78.5	55.0	5.4	0.05
September	78.2	52.8	4.4	0.18
October	73.1	48.0	3.1	0.71
November	64.5	42.5	1.7	1.86
December	58.0	38.2	1.2	2.69
Annual Average	**69.3**	**46.7**	**44**	**15.28**

SOURCE: City of Menlo Park, *Urban Water Management Plan* (2020)

a. Temperature and precipitation data are from the Western Regional Climate Center for Station #046646 PALO ALTO from September 1, 1953 to June 4, 2016. https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca6646. Accessed July 2022.
b. Reference evapotranspiration data for Union City station #171 are from the Department of Water Resources, California Irrigation Management Information System.

4.2 Water Supply Entitlements, Water Rights and Contracts

Water Code Section 10910(d)(1) states: "The assessment required by this section shall include an identification of any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and a description of the quantities of water received in prior years by the public water system, or the City or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights or water service contracts."

4.2.1 Water Supply Sources

All of MPMW's potable water and the majority of potable water for Cal Water Bear Gulch District is provided through the SFPUC of the City and County of San Francisco. The SFPUC, through its Regional Water System (RWS) currently delivers an annual average of approximately 265 million gallons per day (mgd) to retail and wholesale customers primarily within the San Francisco Bay Area. Approximately 85 percent of that water supply is provided by the Hetch Hetchy system, which diverts water from the Tuolumne River in the Sierra Nevada. The balance (approximately 15 percent) comes from runoff in the Alameda Creek watershed, which is stored in the Calaveras and San Antonio reservoirs, and runoff from the San Francisco Peninsula, which is stored in the Crystal Springs, San Andreas, and Pilarcitos reservoirs (which also provide storage for water delivered from the Hetch Hetchy Project).

Table 4-2 shows the quantities and volumes of supply and the respective percentages. The table also shows the approximate volume of supply when a 20 percent system-wide reduction is imposed by the SFPUC on the retail and wholesale customers within the regional Bay Area conveyance system over multiple dry years.

TABLE 4-2
SUPPLY SOURCES AND SYSTEM-WIDE REDUCTIONS

SFPUC Water Sources	Normal-Year Supply Source		Approximate Multiple-Dry-Year Supply Source (20% System-wide Reduction)		
	Origin/System	mgd	Approximate Percent of Supply	mgd	Approximate % of Supply
Local Source	Alameda Systema	39.75	15	14.84	7
	Peninsula Systemb				
Imported Source	Hetch Hetchy Systemc	225.25	85	197.16	93
	Total	***265.00***	***100***	***212.00***	***100***

SOURCE: San Francisco Public Utilities Commission. 2020 Urban Water Management Plan.

a. Calaveras Reservoir, San Antonio Reservoir.
b. Crystal Springs Reservoirs, San Andreas Reservoir, Pilarcitos Reservoir.
c. Hetch Hetchy Reservoir, Lake Lloyd, Lake Eleanor, New Don Pedro Reservoir, Tuolumne River System.

4.2.2 Surface Water

Appropriative water rights allow the holder to divert water from a source to a place of use not connected to the water source. These rights are based on seniority and use of water must be reasonable, beneficial, and not wasteful. In 1914, California established a formal water rights permit system, which is administered by the SWRCB. The SWRCB has sole authority to issue new appropriative water rights (i.e., permits and licenses) but cannot alter property rights created under a pre-1914 appropriative water right.

The City and County of San Francisco (San Francisco) hold pre-1914 appropriative water rights to store and deliver water from the Tuolumne River in the Sierra Nevada and locally from the Alameda and Peninsula watersheds. San Francisco also diverts and stores water in the San Antonio Reservoir under an appropriative water right license granted by the SWRCB in 1959. The 1912 Freeman Report identified the ultimate diversion rate from the Tuolumne River to the Bay Area as 400 mgd (448,220 acre-feet per year (AFY)) and San Francisco used this as the basis for designing the export capacity of the Hetch Hetchy project for water supply deliveries to San Francisco. San Francisco has sufficient water rights for current diversions and the ultimate planned diversion rate of the Hetch Hetchy Project.[1]

The federal Raker Act, enacted on December 19, 1913, grants to San Francisco rights-of-way and public land use on federal property in the Sierra Nevada Mountains to construct, operate, and maintain reservoirs, dams, conduits, and other structures necessary or incidental to developing and using water and power. It also imposes restrictions, and specific terms and conditions on use of the Hetch Hetchy Reservoir. In terms of water rights, the requirement that San Francisco recognizes the senior water rights of the Turlock and Modesto Irrigation Districts (TID and MID) to divert water from the Tuolumne River. Specifically, the Raker Act requires San Francisco to bypass certain flows through its Tuolumne River reservoirs to TID and MID for beneficial use. By agreement, San Francisco, TID, and MID have supplemented these Raker Act obligations to increase the TID and MID entitlements to account for other senior Tuolumne River water rights and to allow San Francisco to "pre-pay" TID and MID their entitlement by storing water in the Don Pedro water bank. San Francisco is required to bypass inflow to TID and MID sufficient to allow these districts to divert 2,416 cubic feet per second (cfs) or natural daily flow, whichever is less, at all times (as measured at La Grange), except for April 15 to June 13, when the requirement is 4,066 cfs or natural daily flow as measured at La Grange, whichever is less. Other terms and conditions specific to SFPUC's Settlement Agreement and Master Water Sales Contract (MSA) with the 26 member agencies of the BAWSCA are described in section 4.2.1.1 of SFPUC's 2020 UWMP (**Appendix C**).

[1] San Francisco made numerous water-rights filings on the Tuolumne River between 1901 and 1911. The Tuolumne River water-rights filings support a *prima facie* diversion rate well over 400 mgd. The 1912 Freeman Report, which provided the basis for San Francisco's proposals to Congress to develop the Hetch Hetchy Project, identified 400 mgd as the ultimate diversion from the Tuolumne River. SF Planning Department, pg. 2-39, SFPUC Water System Improvement Program PEIR

4.2.3 SFPUC Regional Water System

In 1934, in order to create the RWS, San Francisco combined its newly operational Hetch Hetchy water conveyance system and the existing Spring Valley system, which it had recently acquired with the purchase of the Spring Valley Water Company. With this acquisition, San Francisco also gained water rights to local diversions off existing streams on the San Francisco Peninsula that were originally held by the Spring Valley Water Company.

The RWS currently delivers water to 2.5 million users in Tuolumne, Alameda, Santa Clara, San Mateo, and San Francisco counties. As introduced above, the RWS delivers an annual average of approximately 265 mgd—of this, 81 mgd serves the retail customers within the City and County boundaries of San Francisco, and the other 184 mgd is delivered to the Wholesale customers based primarily on the San Francisco Bay Peninsula, and then the Wholesale customers sell water to its consumers within the individual service areas.

The RWS is a complex system, shown in **Figure E**, and supplies water from two primary sources:

- Tuolumne River through the Hetch Hetchy Reservoir, and
- Local runoff into reservoirs in Bay Area reservoirs in the Alameda and Peninsula watersheds.

Figure E
Regional Water Supply System

Water from Hetch Hetchy Reservoir, through the Hetch Hetchy facilities, represents the majority of the water supply available to the SFPUC. During drought periods of low precipitation in the San Francisco Bay Area, water from the Hetch Hetchy system can amount to over 93 percent of the total water delivered through the RWS.

Bay Area reservoirs provide on average approximately 15 percent of the water delivered by the SFPUC RWS. The local watershed facilities are operated to conserve local runoff for delivery. On the San Francisco Peninsula, the SFPUC utilizes Crystal Springs Reservoir, San Andreas

Reservoir, and Pilarcitos Reservoir to capture local watershed runoff. In the Alameda Creek watershed, the SFPUC constructed the Calaveras Reservoir and San Antonio Reservoir. In addition to capturing runoff, San Antonio, Crystal Springs, and San Andreas reservoirs also provide storage for Hetch Hetchy diversions. The local watershed facilities also serve as an emergency water supply in the event of an interruption to Hetch Hetchy diversions.

Bay-Delta Plan Amendment and Uncertainty in Tuolumne River Water Supply

In December 2018, the SWRCB adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento San Joaquin Delta Estuary (Bay-Delta Plan Amendment) to establish water quality objectives to maintain the health of the Bay-Delta ecosystem. The SWRCB is required by law to regularly review this plan. The adopted Bay-Delta Plan Amendment was developed with the stated goal of increasing salmon populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay-Delta. The Bay-Delta Plan Amendment requires the release of 30-50 percent of the "unimpaired flow"[2] on the three tributaries from February through June in every water year type including below normal, dry and critical dry years. In SFPUC modeling of the new flow standard, it is assumed that the required release is 40 percent of unimpaired flow.

The SWRCB has stated that it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, assuming all required approvals are obtained by that time. However, implementation of the Bay-Delta Plan Amendment is uncertain for multiple reasons.

First, since adoption of the Bay-Delta Plan Amendment, over a dozen lawsuits have been filed in both state and federal courts, challenging the SWRCB's adoption of the Bay-Delta Plan Amendment, including a legal challenge filed by the federal government, at the request of the U.S. Department of Interior, Bureau of Reclamation. This litigation is in the early stages and there have been no dispositive court rulings as of this date.

Second, the Bay-Delta Plan Amendment is not self-implementing and does not automatically allocate responsibility for meeting its new flow requirements to the SFPUC or any other water rights holders. Rather, the Bay-Delta Plan Amendment merely provides a regulatory framework for flow allocation, which must be accomplished by other regulatory and/or adjudicatory proceedings, such as a comprehensive water rights adjudication or, in the case of the Tuolumne River, may be implemented through the water quality certification process set forth in section 401 of the Clean Water Act as part of the Federal Energy Regulatory Commission's licensing proceedings for the Don Pedro and La Grange hydroelectric projects. It is currently unclear when the license amendment process is expected to be completed. This process and the other regulatory and/or adjudicatory proceedings would likely face legal challenges and have lengthy timelines, and quite possibly could result in a different assignment of flow responsibility (and therefore a different water supply impact on the SFPUC).

[2] "Unimpaired flow represents the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds." (Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Dec. 12, 2018) p.17, fn. 14, available at https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf.

Third, in recognition of the obstacles to implementation of the Bay-Delta Plan Amendment, the SWRCB Resolution No. 2018-0059 adopting the Bay-Delta Plan Amendment directed staff to help complete a "Delta watershed-wide agreement, including potential flow measures for the Tuolumne River" by March 1, 2019, and to incorporate such agreements as an "alternative" for a future amendment to the Bay-Delta Plan to be presented to the SWRCB "as early as possible after December 1, 2019." In accordance with the SWRCB's instruction, on March 1, 2019, SFPUC, in partnership with other key stakeholders, submitted a proposed project description for the Tuolumne River that could be the basis for a voluntary substitute agreement with the SWRCB ("March 1st Proposed Voluntary Agreement"). On March 26, 2019, the Commission adopted Resolution No. 19-0057 to support the SFPUC's participation in the Voluntary Agreement negotiation process. To date, those negotiations are ongoing under the California Natural Resources Agency and the leadership of the Newsom administration.[3]

4.2.4 Water Supply Sources for Cal Water Bear Gulch District and Menlo Park Municipal Water

The potable water furnished to customers within the City is a combination of purchased water and treated surface water.

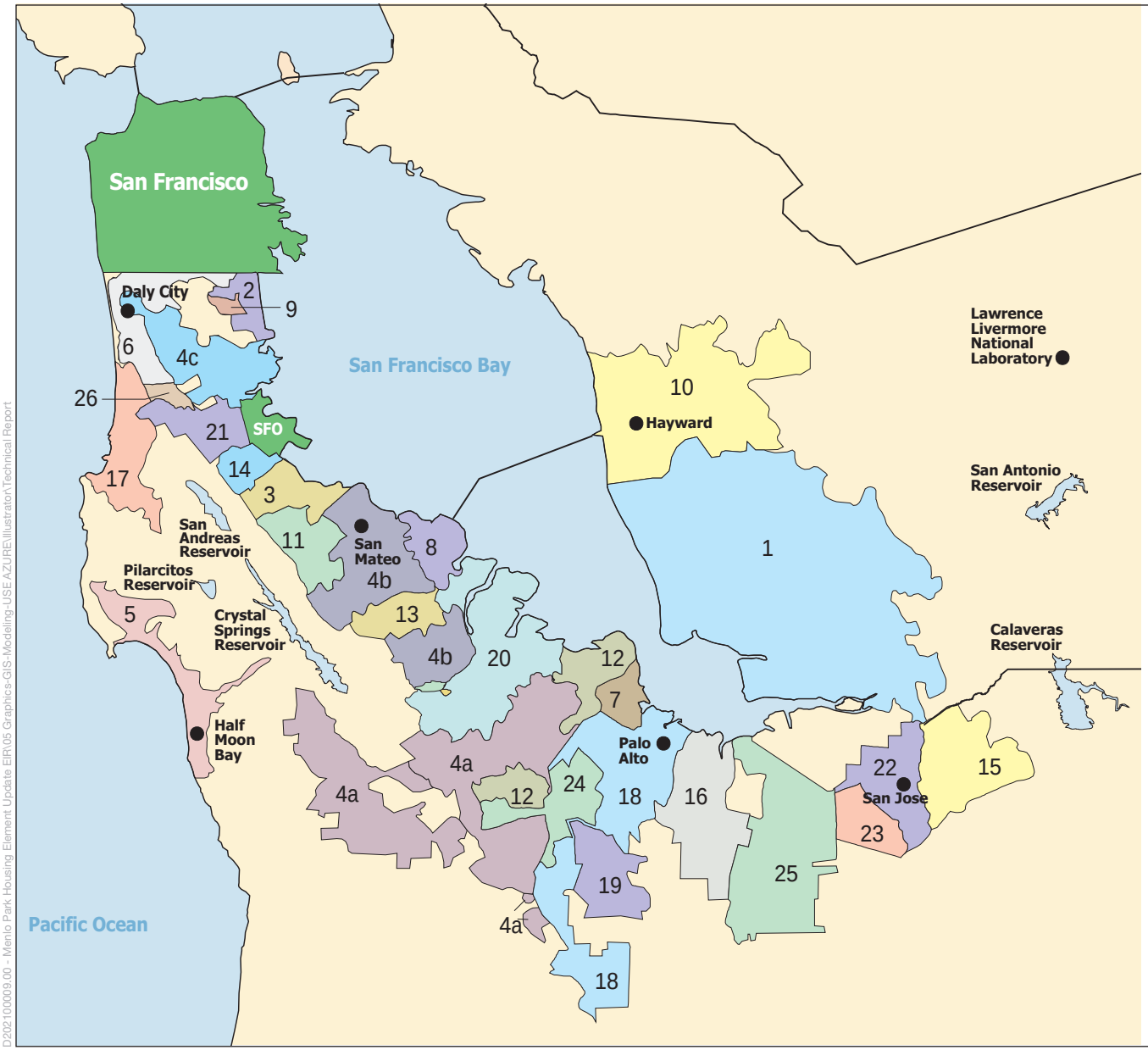
4.2.5 Imported Purchased Water from SFPUC

MPMW and Cal Water's Peninsula's districts including Bear Gulch District, Mid-Peninsula and South San Francisco all receive purchased treated water from SFPUC's RWS. SFPUC utilizes storage and conveyance systems within the RWS to serve all its retail and wholesale water demands with an integrated operation of imported water from Hetch Hetchy and/or locally produced Bay Area water collected and stored in several reservoirs some of which reside on the Peninsula. Notably, the federal Raker Act, as described above, imposes restrictions and specific terms and conditions on use of the Hetch Hetchy Reservoir, preventing privately-owned utilities, like Cal Water, from receiving water from the Hetch Hetchy system, but allows purchases of treated water from local supply sources and storage reservoirs such as Crystal Springs Reservoir, San Andreas Reservoir, and Pilarcitos Reservoir.

4.3 Water Contracts and Agreements

In 1984, the SFPUC executed the Settlement Agreement and Master Water Sales Contract (MSA) with the 26 member agencies of Bay Area Water Supply and Conservation Agency (BAWSA). The BAWSCA members purchase approximately two-thirds of the water delivered by the SFPUC system and the balance is delivered to the City and County of San Francisco and its retail customers. **Figure F** represents the BAWSCA member agencies and their locations and respective service areas. The MSA primarily addressed the rate-making methodology used by SFPUC in setting wholesale water rates for its wholesale customers, in addition to addressing water supply and water shortages within the regional water system. The MSA provides 184 mgd as an annual average of "Supply Assurance" to all BAWSCA wholesale customers, but is subject

[3] California Natural Resources Agency, "Voluntary Agreements to Improve Habitat and Flow in the Delta and its Watersheds," available at https://files.resources.ca.gov/voluntary-agreements/.



BAWSCA MEMBERS

Agency Name	Agency Number
Alameda County Water District	1
City of Brisbane	2
City of Burlingame	3
Cal Water Service Co. - Bear Gulch	4a
Cal Water Service Co. - Mid-Peninsula	4b
Cal Water Service Co. - SSF	4c
Coastside County Water District	5
City of Daly City	6
East Palo Alto	7
Estero Municipal Improvement District	8
Guadalupe Valley Municipal Improvement District	9
City of Hayward	10
Town of Hillsborough	11
City of Menlo Park	12
Mid-Peninsula Water District	13
City of Millbrae	14
City of Milpitas	15
City of Mountain View	16
North Coast County Water District	17
City of Palo Alto	18
Purissima Hills Water District	19
City of Redwood City	20
City of San Bruno	21
City of San Jose	22
City of Santa Clara	23
Stanford University	24
City of Sunnyvale	25
Westborough Water District	26

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Menlo Park Housing Element Update EIR

Figure F
BAWSCA Member Agencies

ESA

to reductions in the event of droughts, water shortages, earthquakes, other acts of God or system maintenance and rehabilitation. Almost all members hold an individual water supply contract and the MSA governs the contract. The original 25-year contract ended on June 30, 2009.

The SFPUC approved the new 25-year contract, now known as the Water Supply Agreement (Agreement), in June 2009 and the BAWSCA agencies completed their approval of the Agreement in October 2009. This Agreement was amended in 2018 (known as the 2018 Amended and Restated WSA) and expires on June 30, 2034. Section 7.01 of the 1984 MSA states "Supply Assurance continues in effect indefinitely, even after expiration of the MSA in 2009" and this is still the case in the new Agreement. The condition is a reflection of case law, which holds that a municipal utility acts in a trust capacity with respect to water supplied to outside communities (Durant v. City of Beverly Hills, 39 Cal. App. 2d 133, 102 P.2d 759 (1940); and Hansen v. City of San Buenaventura, 42 Cal. 3d 1172 (1986)). In other words, entire communities have developed in reliance on these water supplies. Consequently, the Supply Assurance of up to 184 mgd will survive the termination of the Agreement and the Individual Contracts.

4.4 Individual Supply Guarantees

SFPUC has a perpetual commitment (Supply Assurance) to deliver 184 mgd to the 24 permanent BAWSCA Wholesale Customers collectively. San Jose and Santa Clara are not included in the Supply Assurance commitment and each has temporary and interruptible water supply contracts with San Francisco. The Supply Assurance is allocated among the 24 permanent Wholesale Customers through Individual Supply Guarantees (ISG), which represent each Wholesale Customer's allocation of the 184 mgd Supply Assurance.

Cal Water's ISG is 35.68 mgd, or 39,993 acre-feet per year (AFY), which is shared among its Bear Gulch, Mid-Peninsula, and South San Francisco Districts (also referred to herein as the "Peninsula Districts").

MPMW's ISG is 4.456 mgd, or 5,002 AFY, which is the equivalent of roughly 1,630 million gallons per year (mgy). Between 2016 and 2020, MPMW purchased between 52 percent and 66 percent of its ISG. MPMW's 2020 UWMP presented its purchased supplies and demand in millions of gallons. For purposes of consistency between Cal Water Bear Gulch District and MPMW in describing water supply, water use, and HEU water demand, and for comparison purposes, in Section 6, this WSA converted million gallons to acre-feet (AF) or million gallons per year to AFY.

Additional agreements and plans have been developed over the last 25 years. In the early 1990s, for planning and reliability purposes, BAWSCA negotiated, and then formally adopted in 1993, the Supply Assurance Allocation (SAA), which is now referred to as the ISG under the current Agreement. The ISG, like the SAA, quantifies SFPUC's contract obligation to supply water to each of the BAWSCA members. The Agreement does not guarantee that SFPUC will meet peak or hourly demands if the individual wholesaler's annual usage exceeds the Supply Assurance Allocation. The ISG helps the wholesaler plan for future demands and growth within their service area; for that reason, the ISG transcends the Agreement expiration and continues indefinitely. The

ISG for Cal Water's Peninsula districts secures 35.68 mgd for normal year deliveries; MPMW's ISG secures 4.456 mgd for normal year deliveries. However, some Wholesale agencies (Hayward, the cities of Santa Clara and San Jose) have been guaranteed the ability to increase water demands at the potential expense of other communities. Hayward and San Francisco executed a contract in 1962. This contract does not place a limit on Hayward's original ISG and SFPUC is contractually bound to meet these increasing demands. The contract stipulates that if Hayward purchases 22.1 mgd for three consecutive years, then SFPUC will recalculate the supply deliveries to the other BAWSCA agencies with an appropriate reduction. This has the potential in the future to affect the ISG for other communities and their water suppliers, including Cal Water's Peninsula Districts and MPMW.

In addition, the cities of San Jose and Santa Clara are also included in the Suburban Wholesalers and receive portions of the 184.0 mgd from SFPUC allocated to wholesale customers. These cities have both been granted 4.5 mgd for a total of 9.0 mgd of the 184.0 mgd. This routinely creates issues with regard to allocating supply shortages and could potentially affect the supply deliveries to Cal Water's Peninsula Districts and MPMW and the other Wholesalers in times of RWS reductions.

In terms of water supply reliability, the SFPUC's UWMP assumes "firm" delivery as "the amount the system can be expected to deliver during historically experienced drought periods." The 1987 to 1992 drought is the basis for this plan, plus an additional period of limited water availability. The SFPUC plans its water deliveries assuming that the worst drought experience is likely to reoccur and then adds an additional period of limited water availability. An 8.5-year drought scenario is referred to as the "design drought" and is ultimately the basis for SFPUC water resource planning and modeling. The "design drought" is based on the 1986-1992 drought plus 2.5 years of "prospective drought", which includes a 6-month recovery period.

Water Shortage Allocation Plan

The SFPUC and the wholesale members developed a long-term strategy to accommodate or rectify the potential of future water shortages throughout its wholesale and retail operations. The methodology for determining water supply reliability during drought years is the Water Shortage Allocation Plan (WSAP). The SFPUC and BAWSCA members agreed upon and adopted the WSAP. Under this plan, the SFPUC will determine the available water supply in drought years for shortages up to 20 percent on an average, system-wide basis.

The WSAP has two components. The Tier One component of the WSAP allocates water between San Francisco and the wholesale customer agencies collectively. In a 20 percent reduction implemented by the SFPUC, the City and County of San Francisco will only face an 18 percent reduction. The Tier Two component of the WSAP allocates the collective wholesale customer share among each of the 26 wholesale customers. This allocation is based on a formula that considers three factors, the first two of which are fixed: (1) each agency's Supply Assurance from SFPUC, with certain exceptions, and (2) each agency's purchases from SFPUC during the three years preceding adoption of the Plan. The third factor is the agency's rolling average of purchases of water from SFPUC during the three years immediately preceding the onset of shortage. The WSAP, also known as the Tier One Plan, was amended in the 2018 Amended and Restated WSA.

The SFPUC 2004 Wholesale Customer Water Demand Projections study (Demand Study) analyzed water demands associated with each customer sector and then forecasted demands over a 25-year planning horizon. The Tier One (SFPUC to BAWSCA) and Tier Two (BAWSCA to wholesale customers) allocation plans were used to determine supply reductions in single and multiple dry year scenarios.

As amended in 2018, the Tier One Plan requires Retail Customers to conserve a minimum of 5 percent during droughts. If Retail Customer demands are lower than the Retail Customer allocation (resulting in a "positive allocation" to Retail) then the excess percentage would be re-allocated to the Wholesale Customers' share. The additional water conserved by Retail Customers up to the minimum 5 percent level is deemed to remain in storage for allocation in future successive dry years.

The Tier One Plan will expire at the end of the term of the WSA in 2034, unless mutually extended by San Francisco and the Wholesale Customers.

The Tier One Plan applies only when the SFPUC determines that a system-wide water shortage exists and issues a declaration of a water shortage emergency under California Water Code Section 350. Separate from a declaration of a water shortage emergency, the SFPUC may opt to request voluntary cutbacks from its Retail and Wholesale Customers to achieve necessary water use reductions during drought periods.

The Tier Two Plan, the second component of the WSAP, allocates the collective wholesale customer share among each of the 26 wholesale customers. It was last adopted in 2011 by the governing bodies of each wholesale customer and originally expired in 2018. However, use of the Tier Two Plan has been extended by the BAWSCA Board on an annual basis, most recently in November 2021 (which extended use of the Tier Two Plan through December 31, 2022). The BAWSCA wholesale customers are currently in discussions about jointly developing an alternative allocation method that would consider additional equity factors if SFPUC is unable to deliver its contractual supply volume and cutbacks to the RWS supply exceed 20 percent.

Because water use efficiency and conservation efforts are needed to accommodate new growth throughout the Bay Area and it is unknown how or if new supplies would be available in the RWS, the SFPUC assumes that the wholesale customers will purchase 184 mgd from the RWS through 2045. Therefore, this WSA assumes wholesale supplies remain at 184.0 mgd and each of the ISGs are subject to their existing agreements with SFPUC, with no increases: Cal Water's ISG is 35.68 mgd (39,993 AFY) for all its Peninsula districts and MPMW's ISG is 4.456 mgd (5,002 AFY).

4.5 Cal Water Bear Gulch District's Surface Water Supply (Local Watershed)

The Cal Water Bear Gulch District obtains a small fraction of its supplies (approximately 9 percent of annual deliveries during the 1980-2020 time period) from surface water diverted from Bear Gulch Creek, a perennial stream that flows from a watershed in the Coast Range Mountains northeast to its confluence with San Francisquito Creek and eventually into San Francisco Bay.

Cal Water Bear Gulch District diverts water from two points of diversion (PODs) along the creek – the Upper POD (with an upstream watershed area of 2.5 square miles) and the Lower POD (with an upstream watershed area of 9.4 square miles).

Diversions from the Upper and Lower PODs are each governed by separate SWRCB-administered water rights (i.e., pre-1914 claimed water rights and post-1914 SWRCB-issued diversion permits/licenses) that specify the volumes, rates, and timing of allowed diversions at each POD. In addition to these SWRCB-administered water rights, diversions are further constrained by certain diversion limitations and minimum instream flow requirements imposed by the California Department of Fish and Wildlife (CDFW) at the Upper POD and by the National Oceanic and Atmospheric Administration (NOAA) at the Lower POD. There also exists a 1936 agreement with Stanford University that prohibits Cal Water Bear Gulch District from diverting more than 50 percent of the flows that pass by (i.e., are not diverted at) the Upper POD.

Water diverted from the Upper POD flows through a gravity conveyance pipeline to a junction point where it is joined by water diverted from the Lower POD, at which point the water is pumped into the Cal Water Bear Gulch District-owned Bear Gulch Reservoir, a man-made storage facility impounded by an earthen dam. The Bear Gulch Reservoir is operated to have a minimum "dead pool" storage of 50 million gallons (MG), or approximately 153 acre-feet (AF). The maximum storage estimate of the reservoir has been reduced from 149 MG (547 AF) to 142.7 MG (438 AF), a limit imposed by the California Division of Safety of Dams (DSOD), based on a maximum storage elevation of 230 feet above mean sea level. Cal Water Bear Gulch District is undertaking capital improvements to Bear Gulch Reservoir to address DSOD's seismic safety concerns, and may also consider increasing the maximum storage capacity. Outflows from Bear Gulch Reservoir are currently limited by the DSOD to the rate that causes a water surface elevation decline of 0.3 feet per day.

Water stored in Bear Gulch Reservoir is released and sent through the Cal Water Bear Gulch District-owned Bear Gulch Water Treatment Plant (BGWTP) prior to addition to the distribution system. The Bear Gulch Water Treatment Plant, which was placed into operation in 1977, has a rated capacity of 6.0 MGD. There the water is clarified, filtered, and chloraminated[4] in compliance with the Surface Water Treatment Rule and the Safe Drinking Water Act.

4.6 Total Water Supplies

4.6.1 Normal-Year Supplies for Bear Gulch District and MPMW

Purchased supplies from the SFPUC RWS are delivered in millions of gallons per day. Cal Water's ISG of 35.68 mgd or 39,993 AFY is shared among all three of its Peninsula districts, which provides operational flexibility to distribute the supply as needed in each system depending on the availability of local supplies and conditions within each service area. Cal Water's

[4] Chloramination is the treatment of drinking water with a chloramine disinfectant. Both chlorine and small amounts of ammonia are added to the water one at a time which react together to form chloramine (also called combined chlorine), a long lasting disinfectant. Chloramine disinfection is used in both small and large water treatment plants.

collective total from the RWS for the three Peninsula districts is equal to its ISG. **Table 4-3** is adapted from Table 6-9a of Cal Water Bear Gulch District's 2020 UWMP and illustrates the projected distribution of SFPUC water supplies to each of Cal Water Peninsula Districts in addition to local water supplies available to individual districts. As shown in the table, total projected supplies purchased from SFPUC over the next 25 years are less than Cal Water's ISG of 39,993 as a result, Cal Water could purchase supplemental supplies from the SFPUC.

TABLE 4-3
CAL WATER PENINSULA DISTRICT WATER SUPPLIES (PURCHASED AND LOCAL)

Districts	Supply Type	Source	2025	2030	2035	2040	2045
South San Francisco	Purchased or Imported Water	SFPUC	6,009	5949	6,101	6466	6,889
	Groundwater/In-Lieu Surface Water	Westside Basin	1,534	1,534	1,534	1,534	1,534
	TOTAL		**7,543**	**7,483**	**7,635**	**8,000**	**8,423**
Bear Gulch	Purchased or Imported Water	SFPUC	11,956	11,859	11,890	11,835	11,854
	Groundwater/In-Lieu Surface Water	Bear Gulch Reservoir	840	840	840	840	840
	TOTAL		**12,796**	**12,699**	**12,730**	**12,675**	**12,694**
Mid-Peninsula	Purchased or Imported Water	SFPUC	14,418	14,530	14,786	14,977	15,279
	Other Water Sources	None	0	0	0	0	0
	TOTAL		**14,418**	**14,530**	**14,786**	**14,977**	**15,279**
SFPUC Purchases			**32,383**	**32,338**	**32,777**	**33,278**	**34,022**
Peninsula Districts Supply Totals			**34,757**	**34,712**	**35,151**	**35,652**	**36,396**

Source: 2020 Cal Water Bear Gulch District 2020 UWMP. Table 6-9A. Water Supplies (Combined Peninsula Districts) – Projected

However, the "Reasonably Available Volume" shown in the Cal Water Bear Gulch District 2020 UWMP is only a portion of Cal Water's ISG to meet demand within its service area through 2045.

An estimate of projected SFPUC supply available to the Cal Water Bear Gulch District (i.e., the "Reasonably Available Volume") was calculated by subtracting the Cal Water Bear Gulch District's local surface water supply from the Cal Water Bear Gulch District's total demand over the planning horizon. The reasonably available volume of local surface water (840 AFY) is the projected long-term average diversion amount based on analysis conducted by Cal Water Bear Gulch District considering hydrology and all applicable constraints. The "Total Right or Safe Yield" (1,520 AFY) is based on the upper limit volume of diversion to storage under the Cal Water Bear Gulch District's SWRCB-administered surface water rights. The local surface water supply amounts in Cal Water Bear Gulch District's 2020 UWMP are presented in **Table 4-4**. Purchased supplies from the SFPUC RWS, along with local surface water supply to the Cal Water Bear Gulch District, will be sufficient to serve normal year demands through 2045. The availability and reliability of Cal Water Bear Gulch District's water supplies in dry years is discussed in Section 6 of this WSA.

TABLE 4-4
CAL WATER BEAR GULCH DISTRICT PROJECTED FUTURE WATER SUPPLIES – NORMAL YEARS

	2025	2030	2035	2040	2045
Potable Water – Purchased from SFPUC RWS	11,956	11,859	11,890	11,835	11,854
Bear Gulch Reservoir	840	840	840	840	840
Total	**12,796**	**12,699**	**12,730**	**12,675**	**12,694**

SOURCE: 2020 Cal Water Bear Gulch District 2020 UWMP. Table 6-9A. Water Supplies (Combined Peninsula Districts) – Projected

Table 4-5 provides a summary of MPMW's current and projected future normal year supplies as presented in MPMW's 2020 UWMP. Recycled water is estimated to be available at all times and in all water year types. MPMW expects to receive 120 MG (368 AF) of recycled water from the Sharon Heights and Bayfront recycled water facilities. As previously mentioned, MPMW's 2020 UWMP presented purchased supplies and demand in million gallons; for consistency between Cal Water Bear Gulch District and MPMW and for comparison purposes, this WSA converted million gallons to acre-feet or acre-feet per year. The availability and reliability of MPMW's water supplies in dry years is discussed in Section 6 of this WSA.

TABLE 4-5
MPMW CURRENT AND PROJECTED FUTURE WATER SUPPLIES – NORMAL YEARS (MG)

	2020	2025	2030	2035	2040
Potable Water - Purchased from SFPUC RWS	1,069	1,630	1,630	1,630	1,630
Recycled Water – Sharon Heights Recycled Water Facility[a]	20	48	48	48	48
Recycled Water – Bayfront Recycled Water Facility[a]	—	0	72	72	72
Total Recycled Water			**120**	**120**	**120**
Total	**1,089**	**1,678**	**1,750**	**1,750**	**1,750**
Total (AFY)	**3,342**	**5,150**	**5,371**	**5,371**	**5,371**

SOURCE: 2020 MPMW 2020 UWMP. Table 6-9 Water Supplies – Projected

NOTE:
a. MPMW expects to receive 120 MG (368 AF) of recycled water from the Sharon Heights and Bayfront recycled water facilities.

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SECTION 5
Water Demand Analysis

This section shows the calculated water demand for the proposed project as well as projected demand for Cal Water's Bear Gulch District and MPMW systems and then compares the demand to the supply.

5.1 Proposed Project Water Demand

The expected water use of the HEU was determined by analyzing similar land uses and assigning a demand factor for residential water use. For consistency with the ConnectMenlo Water Supply Evaluation (WSE), this WSA used the identical residential demand factor to evaluate the net demand at the project level within the HEU Plan area. For conservative water supply planning purposes, water demand associated with the HEU area is assumed to occur immediately and is added to existing demand to present the quantitative data needed to analyze current and future demand within Cal Water Bear Gulch District's and MPMW's service areas. It should be noted and recognized that actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment. This also aligns more closely with the State's goal for the City to achieve development of its RHNA housing allocation by 2031. As discussed in Section 5.3, projected demand from the HEU, existing demand, and planned future water demands are extended over a 25-year planning horizon for consistency with growth projections in population, household and jobs growth throughout the regional Bay Area.

As stated above, for consistency with the ConnectMenlo WSE, this WSA used identical residential demand factors of 127 gallons per day per residential dwelling unit, which is based on occupancy of 2.57 persons per household multiplied by 49.4 gallons per capita per day (gpcd).[5] Additional outdoor water demand is calculated to be 5.9 gallons per day per residential dwelling unit (2.57 persons per household multiplied by 2.3 gpcd[6]) and is consistent with the outdoor water demand calculated in the ConnectMenlo WSE. In addition to estimating demand associated with implementation of the HEU, the City anticipates population increases through 2040. For water supply planning purposes, HEU water demand per residential unit is calculated to be approximately 133 gallons per day (127 gallons indoor and 5.9 gallons outdoor).[7]

5 Calculated indoor water demand, 2016 ConnectMenlo WSE, page 10.

6 Calculated outdoor water use, 2016 ConnectMenlo WSE, page 11.

7 Calculated indoor and outdoor per residential unit, 2016 ConnectMenlo WSE, page 11.

At the time the ConnectMenlo WSE was prepared, based on the then-current land use assumptions, the per capita residential water use at Project buildout was estimated to be 52 gpcd.[8] As shown in **Table 5-1**, this WSA estimates water use per residential unit, which closely aligns with Executive Order B-37-16, Making Water Conservation a Way of Life of 50 gpcd. Notably, with installation of high-efficiency, low-water use fixtures throughout the new facilities, along with plumbing code changes and little to no outdoor water use or installation of drought-tolerant landscaping materials, water demands from the proposed development components of the HEU could be further reduced.

TABLE 5-1
WATER DEMAND - HOUSING ELEMENT UPDATE AND ADDITIONAL 2040 GROWTH PROJECTIONS

	New Residential Units			Demand Factor (GPD/DU)[d]	GPD[e]	AFY[e]
	Pending Projects[a]	ADUs[b]	Residential Units			
Housing Element Update (HEU) Demand	414	85	4,000	133	598,367	670
Additional 2040 Cumulative Demand	0	0	299[c]		39,767	45
New Residential Units			4,299			
Totals	**414**	**85**	**4,798**		**638,134**	**715**

SOURCE: Menlo Park Housing Element Update, Table 2-2.

NOTES: ADU = accessory dwelling unit; GPD = gallons per day; AFY = acre-feet per year

a. Pending projects (414) reflect applications that are currently on file for residential development. Water demand generated by these Pending Projects was not accounted for in the adopted 2020 UWMPs and would contribute to new water demand associated with implementation of the HEU.
b. Future locations of ADUs are currently unknown and contribute to the Citywide Totals. For water supply planning purposes, these ADUs would be assumed to be developed throughout MPMW's service area.
c. 299 units that may result from development on small sites between 2031 and 2040 affected by zoning and Specific Plan changes as part of the HEU.
d. The estimated annual indoor and outdoor water demand at buildout is based on and consistent with the Water Supply Evaluation Study, ConnectMenlo – General Plan and M-2 Area Zoning Update, pages 9-10.
e. The estimated total annual water demand for residential units is calculated in gallons per day and acre-feet per year and is the sum of indoor and outdoor water demands. Totals may not sum exactly due to rounding.

Table 5-1 shows the land uses, residential units, and population growth that could occur as a result of implementation of the HEU, which is also the City's anticipated buildout scenario. Table 5-1 was derived from Table 2-1 and shows the total residential units that could occur as a result of implementation of the HEU (4,000 dwelling units and 85 ADUs) plus 414 new residential dwelling units outside of the Bayfront that are already on file and pending review by the City. As shown in Table 5-1, an additional 299 residential dwelling units are also anticipated to be implemented under the City's 2040 buildout scenario. Table 5-1 demonstrates the new water demand that is anticipated to occur under the proposed HEU associated zoning and Specific Plan changes.

The land use changes proposed in the HEU would potentially create a net increase in water demand of 670 AFY or an average demand of 598,367 gallons per day (gpd) (0.598 MGD). The

[8] Calculated indoor and outdoor per residential unit, 2016 ConnectMenlo WSE, page 11.

zoning and Specific Plan changes proposed to occur by 2040 under the Cumulative (Maximum Buildout) scenario would potentially create an additional net increase in water demand of 45 AFY or an average demand of 39,767gpd (0.040 MGD). The calculated demand associated with implementation of the HEU is assumed to be new demand that would be served by either Cal Water Bear Gulch District or MPMW. However, the actual net change in water demand would be lower as some existing uses on the housing opportunity sites would be removed to accommodate new residential units. It is anticipated that actual demand increases at housing opportunity sites may be lower than calculated demand because of the net change from existing uses to new residential uses. This WSA is a program-level analysis of water supply and demand; therefore, at this time it is not feasible to accurately calculate the net change in demand from replacing existing uses with new residential uses. In addition, as previously mentioned, the HEU would be implemented over a 25-year planning horizon and the net change in demand would likely occur over time commensurate with new development proposals. Considering the net increase of 670 AFY generated from the HEU and 45 AFY from additional cumulative growth, the Updated 2040 Cumulative Growth Build Out scenario is calculated to be 715 AFY or 0.638 MGD.

As previously discussed in Section 2, Cal Water Bear Gulch District and MPMW would provide water service to the new developments proposed in the HEU and also to the additional 299 residential units of cumulative growth expected to be developed by 2040. As shown in Table 5-1, up to approximately 4,085 new units (4,000 residential units plus 85 ADUs) are proposed under the HEU, in addition to 414 pending projects already under review (the proposed distribution of new residential units is shown in Figure A). As shown in Table 5-1, a total of 4,798 new residential units are proposed (including the 299 units from additional cumulative growth) and could be constructed between 2024 and 2040 when the City reaches its proposed cumulative build out scenario.

As shown in **Table 5-2**, based on the proposed distribution of new residential dwelling units (see Figure A) Cal Water Bear Gulch District would serve approximately 63 percent or 3,008 new residential units and MPMW would serve approximately 37 percent or 1,790 new residential units.

TABLE 5-2
HEU RESIDENTIAL UNITS, DISTRIBUTION IN WATER SERVICE AREAS AND DEMAND

	New Residential Units	Percent of new Residential Units	GPD	MGD	AFY
Cal Water Bear Gulch District	3,008	63%	400,064	0.400	448
MPMW	1,790	37%	238,070	0.238	267
Totals	**4,798**	**100%**	**638,134**	**0.638**	**715**

SOURCE: Menlo Park Housing Element Update, Table 2-2; Menlo Park Water Supply Assessment, Housing Element Update, ESA 2022

NOTES: ADU = accessory dwelling unit; GPD = gallons per day; AFY = acre-feet per year

Cal Water Bear Gulch District would provide water service to 3,008 new residential units (2,793 + 201 +14 = 3,008) and the MPMW would provide water service to 1,790 new residential units (1,207 + 85 + 98 + 400 = 1,790).

For water supply planning purposes, as shown in Table 5-2, this distribution of water service equates to 400,064 gallons per day (0.400 MGD) or 448 AFY within the Cal Water Bear Gulch District's service area and 238,070 gallons per day (0.238 MGD) or 267 AFY within MPMW's service area.

5.2 Historical and Existing Demand

5.2.1 Bear Gulch District

Table 5-3 presents water uses in the Cal Water Bear Gulch District's service area from 2016 to 2020 and shows the actual demand in each water use category over this same year period. The table shows growth in demand over the last five years with an average of approximately 11,600 AFY.

TABLE 5-3
BEAR GULCH DISTRICT HISTORICAL AND CURRENT WATER USE (AFY)

	2016	2017	2018	2019	2020
Single Family	8,001	9,000	9,742	9,361	10,598
Multi-Family	235	264	285	242	279
Commercial	980	1,048	1,111	1,152	1,038
Institutional/Government	218	292	323	299	303
Industrial	2	2	2	2	3
Other Potable	54	59	28	35	20
Landscape	24	26	29	27	21
Losses[a]	591	705	416	752	711
Total	**10,105**	**11,395**	**11,936**	**11,869**	**12,972**

SOURCE: 2020 Cal Water Bear Gulch District 2020 UWMP. Table 4-1. Demands for Potable and Non-Potable Water – Actual

NOTE:

a. Real and apparent losses

5.2.2 Menlo Park Municipal Water

Prior to 2020, all potable water demands within the MPMW service area were met with water purchased from the SFPUC RWS (**Table 5-4**). Starting in July 2020, recycled water became available and was used to meet a portion of the irrigation demand. The historical and current total water demands within the MPMW service area include the water consumed by metered accounts in the service area ("metered water consumption"), unmetered water used for fire services and flushing ("unmetered water consumption"), and the water that is lost within the distribution system ("losses"). The table shows growth in demand over the last five years with an average of approximately 3,134 AFY.

TABLE 5-4
MPMW HISTORICAL AND CURRENT WATER USE

	2016	2017	2018	2019	2020
Single Family	277	306	315	309	361
Multi-Family	95	106	101	97	113
Commercial	157	179	245	244	203
Industrial	222	240	140	143	140
Institutional/Governmental	42	58	58	67	98
Landscape[a]	97	116	125	122	139
Losses[b]	4	-4[c]	120	42	12
Other[d]	5	2	4	2	3
Total (MG)	**898**	**1,003**	**1,108**	**1,028**	**1,069**
Total (AFY)	**2,756**	**3,078**	**3,400**	**3,155**	**3,281**

SOURCE: 2020 MPMW 2020 UWMP. Table 4-1. Demands for Potable and Non-Potable Water - Actual

NOTES:

Demand data provided by MPMW. Demands did not include accounts that received water from East Palo Alto but were billed by MPMW.

a. Irrigation water use includes water use recorded at dedicated irrigation meters and does not represent all of the outdoor irrigation water use within MPMW.
b. Losses were obtained from the AWWA Water Audit Reports. 2020 water loss was estimated as the difference between production and consumption.
c. The high variability of water losses during this period and the negative value of water losses in 2017 were likely due to the quality of the billing data and differences in meter reading cycles between the SFPUC supply meters and MPMW's meters.
d. Other water uses include other billed metered consumption (e.g., temporary meters and hydrant), billed unmetered consumption and unbilled consumption which are obtained from the AWWA Water Audit Reports.

5.3 Projected System Demand Forecasts

5.3.1 Bear Gulch District Projected Demand

As shown in **Table 5-5**, the projected water demands to year 2030 are based on projected purchases from SFPUC as shown in the Cal Water Bear Gulch District's 2020 UWMP. Although the Cal Water Bear Gulch District's projected water demands delivered from SFPUC include growth beyond current demand, the projections did not include the water demands from specific projects but do include growth in demand from new employment centers, residential housing units and other projects. Notably, according to Cal Water Bear Gulch District's 2020 UWMP, average water use per service is adjusted over the forecast period to account for anticipated reductions in water use from the ongoing effects of domestic appliance standards and plumbing codes, conservation and customer assistance programs, and growth in the inflation-adjusted cost of water service and household income. These factors, in combination, are anticipated to attenuate the projected increase in water use associated with projected growth in Cal Water Bear Gulch District's service area.

Because the demand associated with implementation of the HEU was not included in Cal Water Bear Gulch District's 2020 UWMP, an additional 448 AFY of water demand (as calculated in Section 5.1 of this WSA) must be added to account for the proposed HEU units and additional cumulative residential growth in the Cal Water Bear Gulch District service area. The updated growth in water demand through 2040 is provided in Table 5-5 below. As discussed in

TABLE 5-5
BEAR GULCH DISTRICT SERVICE AREA PROJECTED GROWTH IN WATER DEMAND (AFY)

	2025	2030	2035	2040	2045
Single Family	10,591	10,595	10,629	10,605	10,647
Multi-Family	264	267	277	281	286
Commercial	957	913	897	864	836
Institutional/Government	286	278	279	274	270
Industrial	3	3	3	3	3
Other Potable	18	18	18	18	18
Landscape	21	21	21	21	21
Losses[a]	657	604	607	610	614
2020 UWMP Demand Total (AFY)	**12,796**	**12,699**	**12,730**	**12,675**	**12,694**
HEU Demand plus Cumulative 2040 Demand[b]	448	448	448	448	448
Updated 2040 Cumulative Demand	**13,244**	**13,147**	**13,178**	**13,123**	**13,142**

SOURCE: 2020 Cal Water Bear Gulch District 2020 UWMP. Table 4-2. Use for Potable and Non-Potable Water – Projected

NOTES:

a. Real and apparent losses
b. City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – Cal Water Bear Gulch District portion of 715 AFY of new demand generated by implementation of the HEU and Additional 2040 Growth. New water demand of 448 AFY associated with the HEU area is assumed to occur instantaneously. Actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.

Section 5.1, for conservative water resources planning purposes, water demand associated with the HEU (448 AFY) is assumed to occur instantaneously as shown in Tables 5-5, 6-1, 6-2, 6-3 and 6-4. The additional 448 AFY is added to projected demand in five-year increments to present the quantitative data needed to analyze current and future demand within Cal Water Bear Gulch District's service area. It should be recognized that actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.

5.3.2 Menlo Park Municipal Water Projected Demand

In 2020, future water demands for MPMW's service area were projected by BAWSCA on behalf of MPMW. Future water demands were projected using the Demand Management Decision Support System Model (DSS Model) and were based on population and employment projections within MPMW's service area. The DSS Model and the associated water demand and conservation projection methodology is documented in detail in the Regional Water Demand and Conservation Projections Report (BAWSCA 2020b).

In 2021, as part of the 2020 UWMP update, MPMW's DSS Model was revised to account for several changes since the demand projections were estimated by BAWSCA. The baseline year for projections was updated to 2019, which was the most recent year with full data. Population and

employment inputs were revised by the City's Planning Division based on information related to the City's recently approved projects and the current General Plan.

Demands are projected through 2040 to be consistent with the General Plan's planning horizon. There is a significant increase in demand projected over the next five years (i.e., a 19 percent increase between 2020 and 2025) which reflects conservative assumptions regarding: (1) a potential rebound from the drought-suppressed water demands, and (2) the accelerated growth between 2020 and 2025 attributable to the City's approved and planned projects and implementation of new residential units like those contemplated in the HEU.

After accounting for the recycled water use of 48 MG applied at the Sharon Heights Golf and Country Club, the remaining demand is anticipated to be supplied by potable water from the SFPUC RWS. Potable water demand is anticipated to be approximately 1,363 MG in 2040, an increase of 28 percent compared to 2020. MPMW's projected potable water demand in five-year increments, as outlined in the 2020 UWMP, is summarized in **Table 5-6**.

TABLE 5-6
MPMW SERVICE AREA PROJECTED GROWTH IN WATER DEMAND (MG AND AFY)

	2025	2030	2035	2040
Single Family	306	299	293	288
Multi-Family	158	176	203	230
Commercial	346	345	373	401
Industrial	134	122	112	102
Institutional/Governmental	98	105	115	126
Landscape	95	61	71	85
Losses	110	116	122	128
Other Potable	1	1	1	2
Total (MG)	**1,248**	**1,225**	**1,290**	**1,363**
2020 UWMP Demand Total (AFY)	**3,830**	**3,759**	**3,959**	**4,183**
HEU Demand plus Cumulative 2040 Demand[a]	267	267	267	267
Updated 2040 Cumulative Demand	**4,097**	**4,026**	**4,226**	**4,450**

SOURCE: 2020 MPMW 2020 UWMP. Table 4-6. Use for Potable and Non-Potable Water – Projected

NOTE: Recycled water is not included in total projected water demand.

a. City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – MPMW portion of 715 AFY of new demand generated by implementation of the HEU and Additional 2040 Growth. New water demand of 267 AFY associated with the HEU area is assumed to occur instantaneously. Actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.

Because the demand associated with implementation of the HEU was not included in MPMW's 2020 UWMP, an additional 267 AFY of water demand (as calculated in Section 5.1 of this WSA) must be added to account for the proposed HEU units and additional cumulative residential growth in the MPMW service area. The updated growth in water demand through 2040 is provided in Table 5-6. As discussed in Section 5.1, for conservative water resources planning

purposes, water demand associated with the HEU (267 AFY) is assumed to occur instantaneously as shown in Tables 5-6, 6-5, 6-6, 6-7 and 6-8. The additional 267 AFY is added to projected demand in five-year increments to present the quantitative data needed to analyze current and future demand within Cal Water Bear Gulch District's service area. It should be recognized that actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.

SECTION 6
Comparison of Available Water Supplies versus Demand

Section 10910(c)(3) of the Water Code states, "the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available for normal, dry and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses."

6.1 Bear Gulch District Supply and Demand Considerations

In order to present a conservative water supply analysis, the supply and demand models in this section assume that the supplies from the SFPUC would be held to 11.18 mgd (12,523 AFY) and surface water from the Cal Water Bear Gulch District's Bear Gulch Reservoir is limited to 1.12 mgd (1,254 AFY) for a total supply of 12.30 mgd or 13,778 AFY. With this understanding, each growth in demand scenario is compared to the Cal Water Bear Gulch District's available supplies. Furthermore, this WSA recognizes that the Cal Water Bear Gulch District could use additional supplies within its ISG to meet demand and because the aggregated demand within the BAWSCA members has not reached its maximum of 184.0 mgd, no supply limitations are being enforced. Therefore, Cal Water could purchase supplemental supplies from the SFPUC and, in fact, Cal Water has purchased additional supplies in the past to meet demand in its service areas.

6.2 Cal Water Bear Gulch District Supply and Demand in a Normal Year

Table 6-1 illustrates Cal Water's Peninsula Districts water supply purchases from SPFUC without local supplies (refer to Table 4-3 for more detail) and shows the additional demand (448 AFY) within Cal Water's Bear Gulch District generated by implementation of the HEU through 2045.

Table 6-2 shows the projected supply and demand totals for a normal year. The supply and demand totals are consistent with those in Table 6-9B and Table 4-3 in the 2020 Cal Water Bear Gulch District UWMP. The Cal Water Bear Gulch District is expected to have adequate water supplies during normal years to meet its projected demands through 2045. It should be noted that supply reflects 12.30 mgd (13,778 AFY) of committed supplies (SFPUC and Bear Gulch Reservoir water) plus additional SFPUC purchases within Cal Water's ISG to meet 448 AFY of new demand generated by implementation of the HEU that can be purchased from SFPUC or

transferred within Cal Water's Peninsula Districts and distributed within Cal Water Bear Gulch District. It should be noted that projected demand shown in 2025, 2030, 2035, 2040 and 2045 is carried through the remainder of this WSA and used in subsequent tables and discussions.

TABLE 6-1
PROJECTED SFPUC PURCHASES WITH HEU (AFY)

	2025	2030	2035	2040	2045
SFPUC Purchases by Cal Water Peninsula Districts[a]	32,383	32,338	32,777	33,278	34,022
Additional SFPUC Purchases to meet HEU Demand[b]	448	448	448	448	448
SFPUC Purchases inclusive of HEU Demand[b]	32,831	32,786	33,225	33,726	34,470
Remaining Cal Water Peninsula District ISG Supply	**7,162**	**7,207**	**6,768**	**6,267**	**5,523**
Percent of Cal Water Peninsula Districts ISG	82%	82%	83%	84%	86%

Source: Cal Water Bear Gulch District 2020 UWMP. Table 6-9A. Cal Water Peninsula District Supplies

NOTES:

a. Cal Water Bear Gulch District 2020 UWMP. Table 6-9A.
b. City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – Cal Water Bear Gulch District portion of 715 AFY of new demand generated by implementation of the HEU and Additional 2040 Growth. New water demand of 448 AFY associated with the HEU area is assumed to occur instantaneously. Actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.

TABLE 6-2
BEAR GULCH DISTRICT NORMAL YEAR SUPPLY AND DEMAND PROJECTIONS (AFY)

	2025	2030	2035	2040	2045
2020 UWMP Supply[a]	13,244	13,147	13,178	13,123	13,142
2020 UWMP Demand	12,796	12,699	12,730	12,675	12,694
HEU Demand plus Additional 2040 Demand[b]	448	448	448	448	448
HEU Demand plus Cumulative 2040 Demand[c]	**13,244**	**13,147**	**13,178**	**13,123**	**13,142**
Difference [Surplus/(Deficit)]	**0**	**0**	**0**	**0**	

SOURCE: Cal Water Bear Gulch District 2020 UWMP. Table 7-3. Normal Year Supply and Demand Comparison

NOTES:

a SFPUC Supply plus additional SFPUC purchases within Cal Water's ISG to meet 448 AFY of new demand generated by implementation of the HEU purchased from SFPUC or transferred within Cal Water's Peninsula Districts and distributed within Cal Water Bear Gulch District.
b City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – Cal Water Bear Gulch District portion of 715 AFY of new demand generated by implementation of the HEU and Additional 2040 Growth. New water demand of 448 AFY associated with the HEU area is assumed to occur instantaneously. Actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.
c City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – Cal Water Bear Gulch District 2020 UWMP Demand plus demand generated by implementation of the HEU and Additional 2040 Growth.

6.3 Cal Water Bear Gulch District Water Service Reliability – Single Dry and Multiple Dry Years with Bay-Delta Plan Amendment

The reliability of the RWS is anticipated to vary greatly in different year types. Cal Water Bear Gulch District and MPMW have relied on the supply reliability estimates provided by the SFPUC for the RWS and the drought allocation structure provided by SFPUC and BAWSCA to estimate available RWS supplies in dry year types through 2045. For conservative water supply planning purposes, water demand of 448 AFY associated with the HEU area is assumed to occur instantaneously and is added to existing demand in five-year increments to present the quantitative data needed to analyze current and future demand within Cal Water Bear Gulch District's service area. As previously mentioned that actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment. These projections indicated that without implementation of the Bay-Delta Plan Amendment, SFPUC would be able to supply 100 percent of projected RWS demands in all year types through 2045, except for the 4th and 5th consecutive dry year in 2045, during which 90 percent of projected RWS demands (85 percent of the Wholesale demands) would be met.

As shown in the tables below, significant water supply shortfalls are currently projected in future single and multiple dry years if the Bay-Delta Plan Amendment is implemented. However, numerous uncertainties remain regarding implementation of the Bay Delta Plan Amendment. The water supply projections presented below likely represent a worst-case scenario in which the Bay-Delta Plan Amendment is implemented without the SFPUC and the SWRCB reaching a Voluntary Agreement, and do not account for implementation of SFPUC's AWSP, described further in Section 6.7 under Alternative Supplies. Under this supply scenario, as modeled, SFPUC would not be able to meet its contractual obligations (i.e., Level of Service Goals) and Cal Water Bear Gulch District's forecasted demands during droughts. **Table 6-3** shows the Cal Water Bear Gulch District projected supply and demand totals for the single dry year. As shown in Table 6-3, demand exceeds supply by greater than 50 percent and Cal Water Bear Gulch District would not be able to meet demand within its service area under single dry years through 2045. Under this water supply and demand scenario as shown in Table 6-3, Cal Water Bear Gulch District would be in Stages 3 and 4 of its Water Shortage Contingency Plan (discussed in Section 6.16). Cal Water Bear Gulch District customers would need to reduce their demand by at least 38 percent in 2025 and up to 48 percent in 2045 to balance demand against significant supply reductions.

As discussed in Cal Water Bear Gulch District's 2020 UWMP, SFPUC also provided water supply reliability projections without the Bay-Delta Plan Amendment (Cal Water Bear Gulch District, 2020 UWMP Appendix I), which represents a highly optimistic water supply reliability.[9] The large disparity in projected water supply reliability between these two scenarios demonstrates the current level of uncertainty. **Table 6-4** shows the Cal Water Bear Gulch District projected supply and demand totals for multiple dry year periods extending five years with the more conservative Bay-Delta Plan Amendment in effect. As shown in the table, demand exceeds supply by greater than 50 percent and Cal Water Bear Gulch District would not be able to meet demand

[9] City of Menlo Park, 2020 Urban Water Management Plan, page 104.

within its service area under multiple dry years through 2045. Under this water supply and demand scenario as shown in Table 6-4, in the first dry year and identical to the single dry year scenario presented in Table 6-3, Cal Water Bear Gulch District would be in Stages 4 and 5 of its Water Shortage Contingency Plan (discussed Section 6.16). Cal Water Bear Gulch District customers would need to reduce their demand by up to 50 percent in the 3rd year of a multiple dry year and if dry conditions persist up to 55 percent in 2045 in the 5th year to balance demand against significant supply reductions. Under this multiple dry year scenario, Cal Water Bear Gulch District customers would need to reduce their demand significantly to balance city-wide demand against significant supply reductions throughout the RWS. In fact, Stage 6 is an "Emergency Shortage" condition that includes water use allocations and mandatory conservation measures.

TABLE 6-3
BEAR GULCH DISTRICT SINGLE DRY YEAR POTABLE WATER SUPPLY AND DEMAND PROJECTIONS (AFY) WITH BAY-DELTA PLAN AMENDMENT

	2025	2030	2035	2040	2045
2020 UWMP Supply[a]	8,546	8,482	8,503	8,334	7,154
2020 UWMP Demand	13,354	13,253	13,285	13,228	13,248
HEU Demand plus Additional 2040 Demand[b]	448	448	448	448	448
HEU Demand plus Cumulative 2040 Demand[c]	**13,802**	**13,701**	**13,733**	**13,676**	13,696
Difference [Surplus/(Deficit)]	(5,256)	(5,219)	(5,230)	(5,342)	(6,542)
Percent Demand Reduction to balance Supply	**(38%)**	**(38%)**	**(38%)**	**(39%)**	**(48%)**

SOURCE: Cal Water Bear Gulch District 2020 UWMP. Table 7-4. Single Dry Year Supply and Demand Comparison

NOTES:

a. Dry year RWS supply availability is calculated in accordance as a percentage of projected RWS demands for each base year consistent with the revised BAWSCA Drought Methodology that assumes equal percent cutbacks across all Wholesale Agencies. SFPUC Supply plus additional SFPUC purchases within Cal Water's ISG to meet 448 AFY of new demand generated by implementation of the HEU purchased from SFPUC or transferred within Cal Water's Peninsula Districts and distributed within Cal Water Bear Gulch District.
b. City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – Cal Water Bear Gulch District portion of 715 AFY of new demand generated by implementation of the HEU and Additional 2040 Growth. New water demand of 448 AFY associated with the HEU area is assumed to occur instantaneously. Actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.
c. City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – Cal Water Bear Gulch District 2020 UWMP Demand plus demand generated by implementation of the HEU and Additional 2040 Growth.

TABLE 6-4
BEAR GULCH DISTRICT MULTIPLE DRY YEARS POTABLE WATER SUPPLY AND DEMAND COMPARISON (AFY) WITH BAY-DELTA PLAN AMENDMENT

		2025	2030	2035	2040	2045
First Year	2020 UWMP Supply[a]	8,767	8,701	8,722	8,549	7,339
	2020 UWMP Demand[a]	13,699	13,595	13,629	13,570	13,591
	HEU Demand plus Cumulative 2040 Demand[b]	448	448	448	448	448
	Updated 2040 Cumulative Demand	14,147	14,043	14,077	14,018	14,039
	Difference [Surplus/(Deficit)]	(5,380)	(5,342)	(5,355)	(5,469)	(6,700)
Percent Demand Reduction to balance Supply		**(38%)**	**(38%)**	**(38%)**	**(39%)**	**(48%)**

TABLE 6-4
BEAR GULCH DISTRICT MULTIPLE DRY YEARS POTABLE WATER SUPPLY AND DEMAND COMPARISON (AFY) WITH BAY-DELTA PLAN AMENDMENT

		2025	2030	2035	2040	2045
Second Year	2020 UWMP Supply[a]	7,534	7,477	7,360	7,328	7,339
	2020 UWMP Demand[a]	13,699	13,595	13,629	13,570	13,591
	HEU Demand plus Cumulative 2040 Demand[b]	448	448	448	448	448
	Updated 2040 Cumulative Demand	14,147	14,043	14,077	14,018	14,039
	Difference [Surplus/(Deficit)]	(6,613)	(6,566)	(6,717)	(6,690)	(6,700)
Percent Demand Reduction to balance Supply		**(38%)**	**(38%)**	**(38%)**	**(39%)**	**(48%)**
Third Year	2020 UWMP Supply[a]	7,534	7,477	7,360	6,514	6,252
	2020 UWMP Demand[a]	13,699	13,595	13,629	13,570	13,591
	HEU Demand plus Cumulative 2040 Demand[b]	448	448	448	448	448
	Updated 2040 Cumulative Demand	14,147	14,043	14,077	14,018	14,039
	Difference [Surplus/(Deficit)]	(6,613)	(6,566)	(6,717)	(7,504)	(7,787)
Percent Demand Reduction to balance Supply		**(47%)**	**(47%)**	**(48%)**	**(54%)**	**(55%)**
Fourth Year	2020 UWMP Supply[a]	7,534	7,477	7,360	6,514	6,252
	2020 UWMP Demand[a]	13,699	13,595	13,629	13,570	13,591
	HEU Demand plus Cumulative 2040 Demand[b]	448	448	448	448	448
	Updated 2040 Cumulative Demand	14,147	14,043	14,077	14,018	14,039
	Difference [Surplus/(Deficit)]	(6,613)	(6,566)	(6,717)	(7,504)	(7,787)
Percent Demand Reduction to balance Supply		**(47%)**	**(47%)**	**(48%)**	**(54%)**	**(55%)**
Fifth Year	2020 UWMP Supply[a]	7,534	7,477	6,814	6,514	6,252
	2020 UWMP Demand[a]	13,699	13,595	13,629	13,570	13,591
	HEU Demand plus Cumulative 2040 Demand[b]	448	448	448	448	448
	Updated 2040 Cumulative Demand	14,147	14,043	14,077	14,018	14,039
	Difference [Surplus/(Deficit)]	(6,613)	(6,566)	(6,717)	(7,504)	(7,787)
Percent Demand Reduction to balance Supply		**(47%)**	**(47%)**	**(48%)**	**(54%)**	**(55%)**

SOURCE: Cal Water Bear Gulch District 2020 UWMP.

NOTES:

a Table 7-5. Multiple Dry Years Supply and Demand Comparison - Dry year RWS supply availability is calculated in accordance as a percentage of projected RWS demands for each base year consistent with the revised BAWSCA Drought Methodology that assumes equal percent cutbacks across all Wholesale Agencies. SFPUC Supply plus additional SFPUC purchases within Cal Water's ISG to meet 448 AFY of new demand generated by implementation of the HEU purchased from SFPUC or transferred within Cal Water's Peninsula Districts and distributed within Cal Water Bear Gulch District.

b City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – Cal Water Bear Gulch District portion of 715 AFY of new demand generated by implementation of the HEU and Additional 2040 Growth. New water demand of 448 AFY associated with the HEU area is assumed to occur instantaneously. Actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.

6.4 MPMW Supply and Demand in a Normal Year

As presented in MPMW's 2020 UWMP, projected normal year potable water supplies are adequate to satisfy MPMW's projected normal year potable water demands as shown in **Table 6-5** through 2040. Recycled water is estimated to be available at all times at a volume that meets MPMW's projected recycled water demands.

TABLE 6-5
MPMW NORMAL YEAR WATER SUPPLY AND DEMAND COMPARISON (AFY)

	2025	2030	2035	2040
2020 UWMP Supply[a]	5,150	5,371	5,371	5,371
2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
Updated 2040 Cumulative Demand	**4,244**	**4,395**	**4,594**	**4,818**
Difference [Surplus/(Deficit)]	**906**	**976**	**777**	**553**

SOURCE: MPMW 2020 UWMP. Table 7-4 Normal Year Supply and Demand Comparison

NOTES:

a. Supply and demand include both potable water and recycled water. MPMW expects to receive 120 MG (368 AF) of recycled water from the Sharon Heights and Bayfront recycled water facilities.
b. City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – MPMW portion of 715 AFY of new demand generated by implementation of the HEU and Additional 2040 Growth. New water demand of 267 AFY associated with the HEU area is assumed to occur instantaneously. Actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.

6.5 MPMW Water Service Reliability – Single Dry and Multiple Dry Years with Bay-Delta Plan Amendment

The reliability of the SFPUC RWS supply is anticipated to vary greatly in different year types. MPMW has relied on SFPUC's RWS supply reliability estimates and the drought allocation structure provided by SFPUC and BAWSCA to estimate available RWS supplies in dry year types through 2040. This WSA is consistent with MPMW's 2020 UWMP, which recognizes that purchased supplies from the SFPUC RWS assume dry year supply reductions if the Bay-Delta Plan Amendment is implemented, which would significantly reduce dry year allocations for SFPUC wholesale customers. Recycled water supply is expected to be 100 percent reliable in all year types. **Table 6-6** shows the projected potable water supply and demand totals for the single dry year. Under this water supply and demand scenario as shown in Table 6-6, MPMW would be in a Stages 3 and 4 of its Water Shortage Contingency Plan (discussed in Section 6.16). MPMW customers would need to reduce their demand by almost 40 percent in 2025 and up to 32 percent in 2040 to balance demand against significant supply reductions.

TABLE 6-6
MPMW SINGLE-DRY-YEAR POTABLE WATER SUPPLY AND DEMAND COMPARISON (AFY) WITH BAY-DELTA PLAN AMENDMENT

	2025	2030	2035	2040
2020 UWMP Supply[a]	2,691	3,001	3,124	3,259
2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
Updated 2040 Cumulative Demand	**4,244**	**4,395**	**4,594**	**4,818**
Difference [Surplus/(Deficit)]	**(1,553)**	**(1,393)**	**(1,470)**	**(1,559)**
Percent Demand Reduction to balance Supply	**(37%)**	**(32%)**	**(32%)**	**(32%)**

SOURCE: MPMW 2020 UWMP; City of Menlo Park Housing Element Update WSA, ESA 2022

NOTES:

a. Supply and demand include both potable water and recycled water. MPMW expects to receive 120 MG (368 AF) of recycled water from the Sharon Heights and Bayfront recycled water facilities.
b. City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – MPMW portion of 715 AFY of new demand generated by implementation of the HEU and Additional 2040 Growth. New water demand of 267 AFY associated with the HEU area is assumed to occur instantaneously. Actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.

Based on the supply reliability estimates and allocation structure provided by SFPUC and BAWSCA and the assumed 100 percent reliability for recycled water supply, **Table 6-7** shows the projected potable water supply and demand totals for multiple dry year periods extending in five year increments. Recycled water supply is expected to be 100 percent reliable in all year types.

Table 6-7 shows significant shortfalls under multiple dry years beginning in 2025 and through 2040 if the Bay-Delta Plan Amendment is implemented. Under this water supply and demand scenario as shown in Table 6-7, in the first dry year and identical to the single dry year scenario presented in Table 6-6, MPMW would be in a Stages 3 and 4 of its Water Shortage Contingency Plan (discussed Section 6.16). MPMW customers would need to reduce their demand by almost 40 percent in 2025 and up to 32 percent in 2040 to balance demand against significant supply reductions. Over the next four years, if dry conditions persist, MPMW would need to move to Stages 4 and 5 of its WSCP. Under this multiple dry scenario MPMW customers would need to reduce their demand by 40 or 50 percent, respectively through 2040 to balance city-wide demand against significant supply reductions throughout the RWS.

TABLE 6-7
MPMW MULTIPLE DRY YEARS SUPPLY AND DEMAND COMPARISON (AFY) WITH BAY-DELTA PLAN AMENDMENT

		2025	2030	2035	2040
First Year	2020 UWMP Supply[a]	2,691	3,001	3,124	3,259
	2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
	HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
	Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
	Difference [Surplus/(Deficit)]	(1,553)	(1,393)	(1,470)	(1,559)
Demand Reduction needed to balance Supply		**(37%)**	**(32%)**	**(32%)**	**(32%)**

TABLE 6-7
MPMW MULTIPLE DRY YEARS SUPPLY AND DEMAND COMPARISON (AFY) WITH BAY-DELTA PLAN AMENDMENT

		2025	2030	2035	2040
Second Year	2020 UWMP Supply[a]	2,332	2,621	2,722	2,845
	2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
	HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
	Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
	Difference [Surplus/(Deficit)]	(1,912)	(1,774)	(1,872)	(1,973)
Demand Reduction needed to balance Supply		**(45%)**	**(40%)**	**(41%)**	**(41%)**
Third Year	2020 UWMP Supply[a]	2,332	2,621	2,722	2,845
	2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
	HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
	Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
	Difference [Surplus/(Deficit)]	(1,912)	(1,774)	(1,872)	(1,973)
Demand Reduction needed to balance Supply		**(45%)**	**(40%)**	**(41%)**	**(41%)**
Fourth Year	2020 UWMP Supply[a]	2,332	2,621	2,722	2,553
	2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
	HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
	Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
	Difference [Surplus(Deficit)]	(1,912)	(1,774)	(1,872)	(2,265)
Demand Reduction needed to balance Supply		**(45%)**	**(40%)**	**(41%)**	**(47%)**
Fifth Year	2020 UWMP Supply[a]	2,332	2,621	2,529	2,553
	2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
	HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
	Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
	Difference [Surplus/(Deficit)]	(1,912)	(1,774)	(2,065)	(2,265)
Demand Reduction needed to balance Supply		**(45%)**	**(40%)**	**(45%)**	**(47%)**

SOURCE: MPMW 2020 UWMP, Tables 7-4 and 7-5 Single Dry Year Supply and Demand Comparison. Table 7-6 Multiple Dry Years Supply and Demand Comparison, Menlo Park Housing Element WSA Table 5-5

NOTES:

a. Supply and demand include both potable water and recycled water. MPMW expects to receive 120 MG (368 AF) of recycled water from the Sharon Heights and Bayfront recycled water facilities.
b. City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – MPMW portion of 715 AFY of new demand generated by implementation of the HEU and Additional 2040 Growth. New water demand of 267 AFY associated with the HEU area is assumed to occur instantaneously. Actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.

6.6 MPMW Water Service Reliability – Normal, Single Dry and Multiple Dry Years without the Bay-Delta Plan Amendment

Table 6-8 summarizes the water supply and demand scenario if the Bay-Delta Plan Amendment is not implemented as adopted by the SWRCB. Under these water supply and demand conditions, the total projected water supplies available to MPMW through its ISG with SFPUC will meet the projected water demand associated with the Updated 2040 Cumulative Demand.

As described in Section 6.7, based on SFPUC's analysis, a 16.5 percent supply shortfall is projected during the fourth and fifth consecutive dry years after base year 2040. These projected supply shortfalls are significantly less than the projected supply shortfalls if the Bay-Delta Plan Amendment is implemented. If and when supply shortfalls occur in single dry and multiple dry years as soon as 2025, MPMW expects to meet these supply shortfalls through water demand reductions of less than 5 percent pursuant to its Demand Management Measures.

TABLE 6-8
MPMW NORMAL, SINGLE DRY AND MULTIPLE DRY YEARS SUPPLY AND DEMAND COMPARISON (AFY) WITHOUT THE BAY-DELTA PLAN AMENDMENT

	2025	2030	2035	2040
Normal Year				
2020 UWMP Supply[a]	5,150	5,371	5,371	5,371
2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
Difference [Surplus/(Deficit)]	905	976	776	552
Percent Shortfall of Demand	**0%**	**0%**	**0%**	**0%**
Single Dry Year				
2020 UWMP Supply[a]	4,125	4,496	4,695	4,919
2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
Difference [Surplus/(Deficit)]	(120)	101	101	101
Percent Shortfall of Demand	**(3%)**	**0%**	**0%**	**0%**
Multiple Dry Years				
First Year				
2020 UWMP Supply[a]	4,125	4,496	4,695	4,919
2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
Difference [Surplus/(Deficit)]	(120)	101	101	101
Percent Shortfall of Demand	**(3%)**	**0%**	**0%**	**0%**

TABLE 6-8
MPMW NORMAL, SINGLE DRY AND MULTIPLE DRY YEARS SUPPLY AND DEMAND COMPARISON (AFY)
WITHOUT THE BAY-DELTA PLAN AMENDMENT

	2025	2030	2035	2040
Second Year				
2020 UWMP Supply[a]	4,125	4,496	4,695	4,919
2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
Difference [Surplus/(Deficit)]	(120)	101	101	101
Percent Shortfall of Demand	**(3%)**	**0%**	**0%**	**0%**
Third Year				
2020 UWMP Supply[a]	4,125	4,496	4,695	4,919
2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
Difference [Surplus/(Deficit)]	(120)	101	101	101
Percent Shortfall of Demand	**(3%)**	**0%**	**0%**	**0%**
Fourth Year				
2020 UWMP Supply[a]	4,125	4,496	4,695	4,919
2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
Difference [Surplus/(Deficit)]	(120)	101	101	101
Percent Shortfall of Demand	**(3%)**	**0%**	**0%**	**0%**
Fifth Year				
2020 UWMP Supply[a]	4,125	4,496	4,695	4,919
2020 UWMP Demand[a]	3,977	4,128	4,327	4,551
HEU Demand plus Cumulative 2040 Demand[b]	267	267	267	267
Updated 2040 Cumulative Demand	4,244	4,395	4,594	4,818
Difference [Surplus/(Deficit)]	(120)	101	101	101
Percent Shortfall of Demand	**(3%)**	**0%**	**0%**	**0%**

SOURCE: MPMW 2020 UWMP, Table 7-6 Multiple Dry Years Supply and Demand Comparison, Menlo Park Housing Element WSA Table 5-5

NOTES:

a. Tables 7-4 and 7-5 Single Dry Year Supply and Demand Comparison. Supply and demand include both potable water and recycled water. MPMW expects to receive 120 MG (368 AF) of recycled water from the Sharon Heights and Bayfront recycled water facilities.
b. City of Menlo Park, Housing Element Update, Water Supply Assessment, Table 5-1 – MPMW portion of 715 AFY of new demand generated by implementation of the HEU and Additional 2040 Growth. New water demand of 267 AFY associated with the HEU area is assumed to occur instantaneously. Actual build-out of the HEU is expected to occur incrementally or in phases over the next 25 years as changes in the development market create opportunities for redevelopment.

6.7 Uncertainties in Dry Year Water Supply Projections

As shown in the above tables, if the Bay-Delta Plan Amendment is implemented, significant water supply shortfalls are currently projected in future single and multiple dry years. However, numerous uncertainties remain regarding implementation of the Bay-Delta Plan Amendment. The water supply projections presented above likely represent a worst-case scenario in which the Bay-Delta Plan Amendment is implemented without the SFPUC and the SWRCB reaching a Voluntary Agreement, and do not account for implementation of SFPUC's Alternative Water Supply Program (AWSP), described in more detail below. Under this supply scenario, SFPUC appears not to be able to meet its contractual obligations (i.e., Level of Service (LOS) Goals) and Bear Gulch and MPMW's forecasted demands during droughts.

As discussed in Cal Water Bear Gulch District and MPMW UWMP's, SFPUC also provided water supply reliability projections without the Bay-Delta Plan Amendment (refer to Appendix I of each of the 2020 UWMPs), which likely represents a highly optimistic water supply reliability outcome.[10] These projections indicated that without implementation of the Bay-Delta Plan Amendment SFPUC would be able to supply 100 percent of projected RWS demands in all year types through 2045, except for the 4th and 5th consecutive dry years in 2045, during which 90 percent of projected RWS demands (85 percent of the Wholesale demands) would be met.

In addition to these two water supply scenarios, in a March 26, 2021 Special Commission Meeting, SFPUC staff presented Hetch Hetchy and Local Simulation Model modeling results for 10 different scenarios, including scenarios with implementation of the Tuolumne River Voluntary Agreement (TRVA), implementation of the Bay-Delta Plan Amendment and the AWSP, and use of a modified rationing policy and a modified design drought. Results for the scenarios with the TRVA and with the AWSP (particularly with a modified rationing policy and design drought) showed significantly improved RWS supply availability compared to the Bay-Delta Plan Amendment scenario shown herein.

The current sources of uncertainty in the dry year water supply projections are summarized below:

- *Implementation of the Bay-Delta Plan Amendment is under negotiation.* The SFPUC is continuing negotiations with the SWRCB on implementation of the Bay-Delta Plan Amendment for water supply cutbacks, particularly during droughts. The SFPUC, in partnership with other key stakeholders, has proposed a voluntary substitute agreement to the Bay-Delta Plan Amendment, the TRVA, that provides a collaborative approach to protect the environment and plan for a reliable and high-quality future potable water supply. This is a dynamic situation and the projected drought cutback allocations may need to be revised before the next cycle of UWMPs (2025) depending on the outcome of ongoing negotiations.
- *Benefits of the AWSP are not accounted for in current supply projections.* SFPUC is exploring options to increase its supplies through the AWSP. Implementation of feasible projects developed under the AWSP is not yet reflected in the supply reliability scenarios presented herein and is anticipated to reduce the projected RWS supply shortfalls.

[10] City of Menlo Park, 2020 Urban Water Management Plan, page 104

- *SFPUC is considering modifications to its design drought methodology and rationing policy.* Shortening the 8.5-year design drought or modifying the rationing policy to increase rationing in the early years of a drought are anticipated to reduce projected RWS supply shortfalls. On June 7, 2021, MPMW sent a letter to the SFPUC requesting the inclusion of a reduced duration drought scenario, if and when SFPUC's current climate change study merits doing so.

- *Methodology for Tier One and Tier Two Wholesale drought allocations have not been established for wholesale shortages greater than 20%.* As discussed in Cal Water Bear Gulch District's and MPMW 2020 UWMP's, the current Tier One and Tier Two Plans are not designed for RWS supply shortages greater than 20%. According to BAWSCA guidance, the Tier One Wholesale share for a 16 percent to 20 percent supply reduction (62.5 percent) has been applied for reductions greater than 20 percent and an equal percent reduction has been applied across all Wholesale agencies. BAWSCA member agencies have not formally agreed to adopt this shortage allocation methodology and are in discussions about jointly developing an alternative allocation method that would consider additional equity factors if SFPUC is unable to deliver its contractual supply volume and cutbacks to the RWS supply exceed 20 percent.

- *RWS demands are subject to change.* The RWS supply availability is dependent upon the system demands. The supply scenarios are based on the total projected Wholesale Customer purchases provided by BAWSCA to SFPUC in January 2021. During the UWMP process, many of the BASCWA agencies refined their projected demand estimates. It is notable that RWS demand projections are subject to change in the future based upon future housing needs, increased conservation, and development of additional local supplies.

- *Frequency and duration of cutbacks are also uncertain.* While the projected shortfalls presented in SFPUC's UWMP appear severe, the actual frequency and duration of such shortfalls are uncertain. Based on the HHLSM simulations provided by BAWSCA for the "with Bay-Delta Plan Amendment" scenario, rationing is anticipated to be required 20 percent of years for base year 2025 through 2035, 23 percent of years for base year 2040, and 25 percent of years for base year 2045. In addition to the supply volumes, the above listed uncertainties would also impact the projected frequency and duration of shortfalls.

To further evaluate local options to increase supply reliability, Cal Water and MPMW have placed high priority on working with BAWSCA and SFPUC in the upcoming years to better refine the estimates of RWS supply reliability and may need to amend their respective UWMPs when new information becomes available.

The above uncertainties notwithstanding, BAWSCA's current drought allocation cutbacks will require Cal Water Bear Gulch District and MPMW to apply their Water Shortage Contingency Plan (WSCP) Stage 5 for water use restrictions up to 50 percent and will affect Cal Water Bear Gulch District's and MPMW's short- and long-term water management decisions. As described in their UWMPs, Cal Water Bear Gulch District and MPMW are working independently and with the other BAWSCA agencies to identify regional mitigation measures to improve reliability for regional and local water supplies and meet its customers' water needs. If conditions for large drought cutbacks to the RWS persist, Cal Water Bear Gulch District and MPMW will need to implement additional demand management practices to restrict potable water use and accelerate efforts to develop alternative supplies of water.

6.8 Alternative Supplies

According to the requirements of Water Code Section 10910(c)(3), the water supply assessment shall include a discussion of "whether the public water system's total projected water supplies available…will meet the projected water demand associated with proposed project, in addition to the public water system's existing and planned future uses." According to the requirements of Water Code Section 10911(a), if the results of the assessment conclude that the water supplies are, or will be, insufficient, the water supply assessment shall include plans for acquiring additional water supplies. Those plans may include, but are not limited to, information on costs, financing, permits, and timeframes.

In normal years and above-normal years, Cal Water Bear Gulch District and MPMW have sufficient supplies within their water supply portfolio to meet demand over the 25-year planning horizon. As discussed in the previous section, water supplies are insufficient to meet projected demands of the HEU, in addition to existing and planned uses within the Cal Water Bear Gulch District and the MPMW service area in single dry years and the 4th and 5th years in multiple-dry years. It should be noted that without implementation of the HEU or projected growth, water supplies are insufficient to meet current demands in the Cal Water Bear Gulch District and MPMW service area under these same dry year conditions.

Based on a determination of insufficient supplies, it is necessary to investigate the potential for acquiring additional supplies to serve the HEU and/or projected demand now and in the future. There are several alternative supply actions, which could be implemented by Cal Water Bear Gulch District and MPMW to assist water supply planning for the projected 25-year horizon.

6.9 Strategies and Actions to Address Dry Year Supply Shortfalls

Although there remains significant uncertainty in future supply availability, as discussed above, Cal Water Bear Gulch District, MPMW, SFPUC, and BAWSCA have developed strategies and actions to address the projected dry year supply shortfalls. Regional and local strategies, plans and programs are discussed below.

6.9.1 SFPUC and Other Regional Strategies and Actions

Dry Year Water Supply Projects

The Water Supply Improvement Program (WSIP) authorized the SFPUC to undertake a number of water supply projects to meet dry-year demands with no greater than 20 percent system-wide rationing in any one year. Implementation of these projects is also expected to mitigate impacts of the implementation of the Bay-Delta Plan Amendment.

Those projects include the following:

- **Calaveras Dam Replacement Project.** The new dam replacement was completed in 2018, and began filling with water in 2019. In December 2020, the Calaveras Reservoir reached 67 percent of capacity but as a result of dry year conditions has subsequently lost water in the

last few years. As the reservoir receives water and is subsequently filling, dam safety inspections evaluate the structural integrity of the dam and its associated facilities. These inspections were on hold during dry years but were reinstated in 2021.

- **Alameda Creek Recapture Project.** The Alameda Creek Recapture Project will recapture the water system yield that is either lost due to instream flow releases at Calaveras Reservoir or bypassed around the Alameda Creek Diversion Dam and return this yield to the RWS through facilities in the Sunol Valley. Construction of this project began in 2021 is currently ongoing and is scheduled to completed in late 2022 or by spring 2023.

- **Lower Crystal Springs Dam Improvements.** The Lower Crystal Springs Dam (LCSD) Improvements Project was completed in May 2012 and associated projects in support of the LCSD were completed in 2019. While the main improvements to the dam have been completed, environmental permitting issues for reservoir operation remain significant, while the endangered Fountain Thistle is incrementally reinstated above reservoir capacity levels. As a result, it may be several years before pre-project water storage volumes can be realized.

- **Regional Groundwater Storage and Recovery Project.** The Regional Groundwater Storage and Recovery (GSR) Project is a partnership between the SFPUC and three San Mateo County agencies: California Water Service Company (serving South San Francisco and Colma), and the cities of Daly City and San Bruno. The GSR is a conjunctive use program to sustainably manage groundwater and surface water resources to provide the RWS with additional supplies during times of drought. In normal or wet years, supplemental surface water would be provided to the San Mateo County partners allowing them to reduce the amount of groundwater extractions. Over time, the groundwater pumping reductions would allow natural recharge to occur and increase groundwater in storage by up to 61,000 acre feet that would be available during dry years.

  Phase 1 of the GSR installed thirteen well sites. Final construction of Phase 1 was completed in 2021. Phase 2 will complete construction of the South San Francisco Main well station. Phase 2 design work began in early 2020 and the 100 percent design commenced in 2021. The new Regional Groundwater Treatment Improvements (RGTI) was approved in the 10-Year Water Enterprise Capital Improvement Program (2021 – 2030). The RGTI includes treatment facilities for several of the GSR wells to address groundwater quality issues. The RGTI commenced in 2021.

- **Dry-year Water Transfer**. The SFPUC pursued a long-term agreement to transfer 2 MGD from MID to the SFPUC in drought years. Unsuccessful negotiations with MID ended in 2012. The dry-year transfer project is now being included as part of the new SFPUC Alternative Water Supply Program, as discussed in the next section.

6.10 Alternative Water Supply Program

In early 2020, the SFPUC began implementation of the Alternative Water Supply Planning Program (AWSP), a program designed to investigate and plan for new water supplies to address future long-term water supply reliability challenges and vulnerabilities on the RWS. Included in the AWSP is a suite of diverse, non-traditional supply projects that, to a great degree, leverage regional partnerships and are designed to meet the water supply needs of the SFPUC Retail and Wholesale Customers through 2045. As of the most recent Alternative Water Supply Planning Quarterly Update, SFPUC has budgeted $264 million over the next ten years to fund water supply projects. BAWSCA is heavily engaged with the SFPUC on its AWSP efforts.

6.10.1 SFPUC's Alternative Water Supply Program

The SFPUC is pursuing additional supplies to meet increasing demand and accelerating its efforts to acquire additional water supplies and explore other projects that would increase overall water supply resilience through the AWSP. The drivers for the program include:

1. The "potential" adoption of the Bay-Delta Plan Amendment and the resulting potential limitations to RWS supply during dry years,
2. The net supply shortfall following the implementation of WSIP,
3. San Francisco's perpetual obligation to supply 184 MGD to the Wholesale Customers,
4. Adopted Level of Service Goals (potable water service deliveries) to limit rationing to no more than 20 percent system-wide during droughts, and
5. The potential need to identify water supplies that would be required to offer permanent status to interruptible customers.

Developing additional supplies through this program would reduce water supply shortfalls and reduce rationing associated with such shortfalls.

The planning priorities guiding the framework of the AWSP are as follows:

1. Offset instream flow needs and meet regulatory requirements,
2. Meet existing obligations to existing permanent customers,
3. Make interruptible customers permanent, and
4. Meet increased demands of existing and interruptible customers.

In conjunction with these planning priorities, the SFPUC considers how the program fits within the Level of Service Goals and Objectives related to water supply and sustainability when considering new water supply opportunities. The key Level of Service Goals and Objectives relevant to this effort can be summarized as:

- Meet dry-year delivery needs while limiting rationing to a maximum of 20 percent system-wide reduction in water service during extended droughts;
- Diversify water supply options during non-drought and drought periods;
- Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers;
- Meet, at a minimum, all current and anticipated legal requirements for protection of fish and wildlife habitat;
- Maintain operational flexibility (although this Level of Service Goal was not intended explicitly for the addition of new supplies, it is applicable here).

Together, the planning priorities and Level of Service Goals and Objectives provide a lens through which the SFPUC considers water supply options and opportunities to meet all foreseeable water supply needs. The SFPUC has taken action to fund the study of potential additional water supply projects.

Following are capital projects under consideration to develop additional water supplies including surface water storage expansion, recycled water expansion, water transfers, desalination, and potable reuse.

- **Daly City Recycled Water Expansion** (Regional, Normal- and Dry-Year Supply): This project can produce up to 3 MGD of tertiary recycled water during the irrigation season (~7 months). On an average annual basis, this is equivalent to 1.25 MGD or 1,400 AFY. This potential project was identified in the SFPUC's 2015 UWMP and has since been approved by the City of Daly City.

- **Alameda County Water District -USD Purified Water Partnership** (Regional, Normal- and Dry-Year Supply). This project could provide a new purified water supply utilizing Union Sanitary District's (USD) treated wastewater. Purified water produced by advanced water treatment at USD could be transmitted to the Quarry Lakes Groundwater Recharge Area to supplement recharge into the Niles Cone Groundwater Basin or put to other uses in Alameda County Water District's service area. With the additional water supply to ACWD, an in-lieu exchange with the SFPUC would result in more water left in the RWS.

- **Crystal Springs Purified Water** (Regional, Normal- and Dry-Year Supply). The Crystal Springs Purified Water Project is a purified water project that could provide 6-12 MGD of water supply through reservoir water augmentation at Crystal Springs Reservoir, which is a facility of the RWS.

- **Los Vaqueros Reservoir Expansion** (Regional, Dry Year Supply). The Los Vaqueros Reservoir Expansion Project is a storage project that will enlarge the existing reservoir located in northeastern Contra Costa County from 160,000 acre-feet to 275,000 acre-feet. While the existing reservoir is owned and operated by the Contra Costa Water District (CCWD), the expansion will have regional benefits and will be managed by a Joint Powers Authority.

- **Bay Area Brackish Water Desalination** (Regional, Normal- and Dry-Year Supply). The Bay Area Brackish Water Desalination (Regional Desalination) Project is a partnership between CCWD, the SFPUC, Santa Clara Valley Water Agency, and Zone 7 Water Agency. The SFPUC is considering a water supply benefit of between 5 and 15 MGD during drought conditions when combined with storage at the LVE Project.

- **Calaveras Reservoir Expansion** (Regional, Dry Year Supply). Calaveras Reservoir would be expanded to create 289,000 acre-feet additional capacity to store excess Regional Water System supplies or other source water in wet and normal years.

- **Groundwater Banking.** Groundwater banking in the MID and TID service areas could be used to provide some additional water supply to meet instream releases in dry years reducing water supply impacts to the SFPUC service area.

- **Inter-Basin Collaborations.** Inter-Basin Collaborations could provide net water supply benefits in dry years by sharing responsibility for in-stream flows in the San Joaquin River and Delta more broadly among several tributary reservoir systems.

If all the projects identified through the current planning process can be implemented, there would still be a supply shortfall to meet projected needs. Furthermore, each of the supply options being considered has its own inherent challenges and uncertainties that may affect the SFPUC's ability to implement it.

Given the limited availability of water supply alternatives - unless the supply risks are significantly reduced or needs change significantly - the SFPUC will continue to plan, develop and implement all project opportunities that can help bridge the anticipated water supply gaps during droughts.

6.11 Local Strategies and Actions

Cal Water Bear Gulch District is currently in the process of developing multiple regional water supply reliability studies using integrated resource planning practices to create a long-term supply reliability strategy through 2050 for Cal Water Bear Gulch District districts throughout California. The studies will create long-term strategies to address a wide range of water supply challenges including climate change, new regulatory requirements (e.g., the Bay-Delta Plan Amendment), and potential growth in demands due to new development. These water supply reliability studies will be completed on a rolling basis over the next several years, with all studies anticipated to be complete by 2024.

Through its Emergency Water Storage/Supply Project, Menlo Park Municipal Water anticipates providing augmented supply in the event of significant water shortage due to severe drought conditions, loss of SFPUC supply, or other emergency. The project consists of constructing up to three wells, an underground reservoir, and pump station. The first well, located at the City's Corporation Yard, has been constructed and is awaiting final approval from the State. MPMW is currently in the process of identifying locations for the two other wells, the underground reservoir, and pump station. The wells, underground reservoir, and pump station are identified in the 2018 Water System Master Plan as priority projects and funding has been included in the current five-year capital improvement program. In addition, MPMW's 2020 UWMP includes utilizing well water for drought stage 5 (up to 50% reduction) and drought stage 6 (greater than 50% reduction) to augment supplies if necessary as part of its Water Shortage Contingency Plan.

6.12 Water Demand Reductions and Conservation Savings

Cal Water Bear Gulch District also has its own aggressive and comprehensive water conservation program that has and will continue to reduce per-capita usage and therefore demands on critical water sources. Cal Water Bear Gulch District is committed to helping its customers use water efficiently and has developed a range of water conservation programs to support this goal. To ensure that it is providing the right mix of programs in the most cost-effective manner possible, Cal Water Bear Gulch District routinely conducts comprehensive conservation program analysis and planning. This is done on a five-year cycle in tandem with the UWMPs.

Cal Water Bear Gulch District's Conservation Master Plan provides the basis for the information on the implementation of and expected water savings from Demand Management Measures (DMMs).

6.13 Demand Management Measures

DMMs are codified in the California Water Code, Sections 10608.12 and 10608.20, and discussed in detail in the Cal Water Bear Gulch District and MPMW UWMPs. DMMs are used

universally across California as the means to achieve water savings through demand reduction. Essentially, DMMs are used to provide education, assistance, and incentives to help customers use water efficiently. These programs have been grouped in accordance with the DMM categories in California Water Code, Section 10631(e). These categories are:

i. Water waste prevention ordinances,
ii. Metering,
iii. Conservation pricing,
iv. Public education and outreach,
v. Programs to assess and manage distribution system real loss,
vi. Water conservation program coordination and staffing support, and
vii. Other demand management measures.

A complete discussion of the Cal Water Bear Gulch District and MPMW DMMs can be found in Section 9 of their respective UWMPs.

6.14 Demand Management Measures Implementation over the Past Five Years

Through implementation of the DMMs, Cal Water Bear Gulch District and MPMW have been able to significantly reduce water demands in their service areas and help customers to achieve water conservation and cost savings. DMMs (e.g., water savings kits, education, rebates, high efficiency (HE) toilet replacements) implemented by Cal Water Bear Gulch District and MPMW over the last five years have proven to be successful to reduce demand within each of their service areas. Within Cal Water Bear Gulch District's service area, estimated reductions do not include savings from water waste prevention ordinances, conservation pricing, public information, or distribution system water loss management.

Ongoing programs and conservation measures are still currently in effect by Cal Water and MPMW. While it is not possible to quantify all the potential water savings associated with these programs, through implementation of DMMs over the five-year period from 2016 through 2020, Cal Water (all Peninsula districts combined) conservatively estimates water savings from its host of DMMs to be 480 AF or an average annual water saving of almost ~100 AF. MPWM has also implemented DMMs over the last five years. Water savings from the high-efficiency toilet (HET) rebates and the Lawn Be Gone! Turf Replacement Program are conservatively estimated to be over 6 million gallons or 18.5 AF. Furthermore, over the 2013–2016 drought, many water service providers observed water-savings of up to 25 percent in their service areas.

6.15 Dry-Year Shortage and Demand Reduction

Pursuant to the Urban Water Management Planning Act (Water Code Section 10632), water suppliers with a water shortage contingency plan can implement subsequent stages of demand reduction measures listed in its UWMP as a strategy to balance supply and demand.

A water shortage contingency plan allows the Cal Water Bear Gulch District and MPMW to reduce water deliveries to customers and implement demand reductions during periods of water shortage. Therefore, to overcome the potential supply deficit expected to occur during critical dry years or over multiple dry years, both the Cal Water Bear Gulch District and MPMW will follow their adopted water shortage contingency plans (WSCPs) to implement drought-planning sequences and associated operating procedures that subsequently initiate different levels of demand management relative to regional water supply rationing imposed by the SFPUC. The WSCPs can be found in each of the UWMPs (Cal Water Bear Gulch District Appendix L and MPMW Appendix K)

The WSCP requires water suppliers to adopt six water shortage stages, which correspond to progressively severe water shortage conditions (up to 10%, 20%, 30%, 40%, 50%, and greater than 50% shortage) as compared to the normal reliability condition. The following six stages list the shortage response actions:

- **Stage 1 (Up to 10% shortage)** – Stage 1 is a "Water Alert" where voluntary conservation is encouraged.
- **Stage 2 (Up to 20% shortage)** – Stage 2 is a "Moderate Shortage" and will be implemented if the Stage 1 restrictions are deemed insufficient to achieve necessary demand reductions due to water supply shortages.
- **Stage 3 (Up to 30% shortage)** – Stage 3 is a "Severe Shortage" that requires water allocations and mandatory conservation.
- **Stage 4 (Up to 40% shortage)** – Stage 4 is a "Critical Shortage" that includes all steps taken in prior stages regarding allocations and mandatory conservation.
- **Stage 5 (Up to 50% shortage)** – Stage 5 is a "Shortage Crisis" that includes all steps taken in prior stages regarding allotments and mandatory conservation. This stage will be implemented in the event that the source of supply is severely curtailed to the level that requires each customer to restrict their water use for only human health and safety purposes.
- **Stage 6 (Greater than 50% shortage)** – Stage 6 is an "Emergency Shortage" condition that includes all steps taken in prior stages regarding allotments and mandatory conservation.

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SECTION 7
Conclusion

According to the requirements of Water Code Section 10910(c)(3) “the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses.”

Implementation of the HEU would result in net increases in total average demand within each of the water supplier’s service areas. At buildout in 2040, new demand associated with the HEU and all other projected growth through 2040 shown in Table 5-1 would increase water demand by 715 AFY, or 0.638 MGD. The Cal Water Bear Gulch District could expect an increase of 448 AFY or 0.400 MGD within its service area, and MPMW is expected to see an increase of 267 AFY or 0.238 MGD in its service area. In years with normal or above-normal precipitation (years of normal supply), Cal Water Bear Gulch District and MPMW as shown in Tables 6.2 and 6.5, respectively, would have sufficient supplies available within its water supply portfolio (imported water, local surface water, and ISG) to serve development implemented under the HEU plus existing demand and planned future uses between 2020 and 2040. If the Bay-Delta Plan Amendment is implemented as adopted and under below-normal rainfall conditions, i.e., single dry years or multiple dry years as discussed in Section 6, Cal Water Bear Gulch District and MPMW would have insufficient water supplies to meet the projected water demands associated with implementation of the HEU, in addition to existing and planned future uses within Cal Water Bear Gulch District and MPMW service areas. In fact, both water supply agencies would be operating under their respective stage levels outlined in the WSCPs to balance water demand against significant water supply reductions throughout the RWS.

As noted in both UWMPs, significant challenges remain within the regional water supply and demand context as well as throughout California; growth in demand is projected while statewide supplies are waning and unreliable. Regionally, as growth continues within the BAWSCA member service areas, demand will incrementally reach BAWSCA’s 184.0 mgd maximum. If the water supplies currently available to the BAWSCA member agencies continue to be unreliable and subject to cutbacks, then all current and future water service connections will be affected. This is true under normal conditions, but as shown in the tables (Section 6) would be exacerbated during droughts and significantly worse with implementation of the Bay-Delta Plan Amendment. BAWSCA is actively planning and investigating numerous ways to improve supply reliability and reduce demand within its service areas. Although these efforts are in the early planning stages, it would appear, based on the projects and programs presented in the BAWSCA’s Long-

Term Reliable Water Supply Strategy document that even modest success in these efforts would improve water supply reliability to all BAWSCA members.

As described in this WSA, the sufficiency of supplies to meet the Updated 2040 Cumulative Demand depends on the assumed reliability of the SFPUC RWS supplies, which depends on whether or not the Bay-Delta Plan Amendment is implemented as adopted. If it is assumed the Bay-Delta Plan Amendment is implemented, projected supplies during normal years are sufficient to meet the Proposed Project demands, but significant supply shortfalls are projected in dry years for BAWSCA agencies including Cal Water Bear Gulch District and MPMW that receive water supplies from the SFPUC RWS, as well as other agencies whose water supplies would be affected by the Bay-Delta Plan Amendment. For Cal Water Bear Gulch District and MPMW, supply shortfalls are projected in single dry years (ranging from 30 to 40 percent) and in multiple dry years (ranging from 30 to 55 percent) through 2040, with similar findings through 2045 based on SFPUC's analysis.

Under the scenario shown in Section 6, which assumes the Bay-Delta Plan Amendment is implemented, the projected single dry year and multiple dry year shortfalls would require implementation of Stages 3, 4, and 5 of each water supplier's WSCP. Cal Water Bear Gulch District would be under Stage 6 in the 5th year of a multiple dry scenario. Units developed from implementation of the HEU would be subject to the same water conservation and water use restrictions as other water users within the Cal Water Bear Gulch District and MPMW systems.

As described in Section 6.6, if the Bay-Delta Plan Amendment is not implemented, projected supplies during normal years, single dry years and multiple dry years are sufficient to meet the demands associated with the Updated 2040 Cumulative Demand; based on SFPUC's analysis, a 16.5 percent supply shortfall is projected during the 4th and 5th consecutive dry years for base year 2045. If supply shortfalls occur, Cal Water Bear Gulch District and MPMW expect to meet these supply shortfalls through water demand reductions and other shortage response actions by implementation of its WSCP. Under the scenario which assumes the Bay-Delta Plan Amendment is not implemented, the projected multiple dry year shortfalls in 2045 would require implementation of Stage 2 of the Cal Water Bear Gulch District and MPMW WSCPs.

7.1 WSA Findings

Regarding the availability of water supplies to serve the HEU, consistent with the findings in their 2020 UWMPs, this WSA presents water supply scenarios with and without implementation of the Bay-Delta Plan Amendment. An explanation of the Bay-Delta Plan Amendment is found in section 4.2.3 and explained in detail in the SFPUC's 2020 UWMP and used to support the results found in the Cal Water Bear Gulch District's and MPMW's 2020 UWMPs.

Water supply scenario **without implementation** of the Bay-Delta Plan Amendment:

- In years of normal and above-normal precipitation and including local water supply sources, the Cal Water Bear Gulch District and MPMW have adequate supplies to serve 100 percent of normal demand beginning in 2025 and through each of their respective planning horizons.

- SFPUC would be able to meet 100 percent of its water supply guarantees during all water year types through 2045 except during the 4th and 5th consecutive dry years for base year 2045 when 15 percent shortages are projected within the RWS. In these years, Cal Water Bear Gulch District and MPMW would not have sufficient supplies to meet demand and would need to activate their water shortage contingency plans. The projected multiple dry year shortfalls in 2045 would require implementation of Stage 2 of the Cal Water Bear Gulch District and MPMW WSCPs.

- As discussed in Section 6.7 and presented in Table 6-8, MPMW through its ISG with SFPUC will meet the projected water demand associated with the Updated 2040 Cumulative Demand. If and when supply shortfalls occur in single dry and multiple dry years as soon as 2025, MPMW expects to meet these supply shortfalls through water demand reductions through implementation of its DMMs.

Water supply scenario **with implementation** of the Bay-Delta Plan Amendment:

- SFPUC will be able to meet its contractual obligations to its wholesale customers in normal years but would experience significant supply shortages in dry years. In these years, Cal Water Bear Gulch District and MPMW would not have sufficient supplies to meet demand and would need to activate their water shortage contingency plans. The projected single dry year and multiple dry year shortfalls would require implementation of Stages 3, 4, 5 and/or 6 of their WSCPs.

- In single dry years, supply shortages in the RWS would range from 36 to 46 percent. In multiple dry years, supply shortages would range from 36 to 54 percent. Notably, implementation of the Bay-Delta Plan Amendment would reduce SFPUC's primary supply source and require rationing in all single dry and multiple dry years through 2040 and 2045. In these years, Cal Water Bear Gulch District and MPMW would not have sufficient supplies to meet demand and would need to activate their water shortage contingency plans. The projected single dry year and multiple dry year shortfalls would require implementation of Stages 3, 4, 5 and/or 6 of their WSCPs.

As discussed in sections 6.9 through 6.15, SFPUC, BAWSCA, Cal Water and MPMW are working to develop regional and local projects to shore up local supplies and reduce the projected shortfall. If conditions for large drought cutbacks to the RWS persist, Cal Water Bear Gulch District and MPMW will need to implement additional demand management practices and prohibitions on potable water use and accelerate efforts to develop alternative supplies of water.

7.2 Water Supply Assessment Approval Process

On October 18, 2022, the City Council of the City of Menlo Park, by resolution adopted this WSA as it pertains to MPMW's service area and new dwelling units contemplated in the HEU and within MPMW's service area boundaries pursuant to California Water Code 1910 et seq. and CEQA Guidelines 15155. The resolution is attached to the WSA. Notably, Cal Water Bear Gulch District has the same responsibility and will take a similar action to consider and approve this WSA through its own approval process. Cal Water Bear Gulch District's approval is pending and upon approval will the appended to the final WSA.

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SECTION 8
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Appendix A

California Water Service, Bear Gulch District, 2020 Urban Water Management Plan

2020 Urban Water Management Plan

Bear Gulch District

June 2021

Table of Contents

Table of Contents 1
List of Tables 6
List of Figures 9
List of Acronyms 10
Chapter 1 Introduction and Overview 13
1.1 Background and Purpose 13
1.2 Urban Water Management Planning and the California Water Code 14
1.3 Relationship to Other Planning Efforts 15
1.4 Plan Organization 15
1.5 Demonstration of Consistency with the Delta Plan for Participants in Covered Actions 16
1.6 Lay Description 16
Chapter 2 Plan Preparation 21
2.1 Public Water Systems 21
2.2 Regional Planning 22
2.3 Individual or Regional Planning and Compliance (Regional Alliance) 22
2.4 Plan Preparation, Standard Units, and Basis for Reporting 23
2.5 Coordination and Outreach 24
2.5.1 Wholesale and Retail Coordination 25
2.5.2 Coordination with and Notice to Other Agencies and the Community 26
2.5.3 Coordination with Land Use Authorities 26
Chapter 3 System Description 27
3.1 General Description 27
3.2 Service Area Boundary Map 28
3.3 Service Area Climate 29
3.4 Service Area Population and Demographics 30
3.5 Land Uses within Service Area 32
Chapter 4 Water Use Characterization 34
4.1 Non-Potable Versus Potable Water Use 34

4.2 Past, Current, and Projected Water Uses by Sector 35
4.2.1 Past and Current Water Use 35
4.2.2 Projected Water Use 36
4.2.3 Distribution System Water Loss 38
4.2.4 Future Water Savings in Projected Water Use 39
4.2.5 Water Use by Lower Income Households in Water Use Projections 42
4.2.6 Characteristic Five-Year Water Use 43
4.3 Climate Change Considerations 43
Chapter 5 SB X7-7 Baseline and Targets 45
5.1 Wholesale Suppliers 46
5.2 Updates to the 2015 UWMP Calculations 46
5.3 Service Area Population 46
5.4 Baseline Periods, Baseline GPCD, and Confirmed SB X7-7 2020 Target 47
5.5 Demonstration of Compliance with SB X7-7 2020 Target 47
5.6 Demonstration of Compliance with Regional Alliance SB X7-7 2020 Target 47
Chapter 6 Water Supply Characterization 49
6.1 Purchased Water 50
6.1.1 Description of SFPUC RWS 50
6.1.2 Water Distribution 51
6.1.3 Water Treatment 52
6.1.4 Water Storage 53
6.1.5 Individual Supply Guarantees 55
6.1.6 2028 SFPUC Decisions (formerly 2018 SFPUC Decisions) 56
6.2 Groundwater 57
6.3 Surface Water 58
6.4 Stormwater 59
6.5 Wastewater and Recycled Water 59
6.5.1 Recycled Water Coordination 59
6.5.2 Wastewater Collection, Treatment, and Disposal 60
6.5.3 Recycled Water System and Recycled Water Beneficial Uses 64
6.5.4 Actions to Encourage and Optimize Future Recycled Water Use 66

6.6 Desalinated Water Opportunities 67
6.7 Water Exchanges and Transfers 68
6.7.1 Exchanges 68
6.7.2 Transfers 68
6.7.3 Emergency Interties 68
6.8 Future Water Projects 68
6.9 Summary of Existing and Planned Sources of Water 70
6.10 Special Conditions 75
6.10.1 Climate Change Effects 75
6.10.2 Regulatory Conditions and Project Development 81
6.10.3 Other Locally Applicable Criteria 81
6.11 Energy Intensity 82
Chapter 7 Water Supply Reliability Assessment 84
7.1 Constraints on Water Sources 84
7.1.1 Regional Water System Supply Availability 85
7.1.2 Local Surface Water Supply Availability 93
7.1.3 Water Quality 93
7.1.4 Climate Change 94
7.2 Reliability by Type of Year 95
7.2.1 SFPUC Supply Modeled RWS Dry Year Supply Availability 96
7.2.2 Cal Water's Year Type Characterization 98
7.3 Supply and Demand Assessment 99
7.3.1 Normal Year Supply and Demand Assessment 99
7.3.2 Dry Year Supply and Demand Assessment (with Bay-Delta Plan) 100
7.3.3 Uncertainties in Dry Year Water Supply Projections 101
7.3.4 Strategies and Actions to Address Dry Year Supply Shortfalls 103
7.4 Water Supply Management Tools and Options 113
7.5 Drought Risk Assessment 114
7.5.1 Data, Methods, and Basis for Water Shortage Condition 114
7.5.2 Drought Risk Assessment Water Source Reliability 115
7.5.3 Drought Risk Assessment Total Water Supply and Use Comparison 116

Chapter 8 Water Shortage Contingency Planning 120
Chapter 9 Demand Management Measures 127
9.1 Demand Management Measures for Wholesale Agencies 128
9.2 Demand Management Measures for Retail Suppliers 128
9.2.1 Water Waste Prevention Ordinances 128
9.2.2 Metering 130
9.2.3 Conservation Pricing 130
9.2.4 Public Education and Outreach 130
9.2.5 Programs to Assess and Manage Distribution System Real Loss 131
9.2.6 Water Conservation Program Coordination and Staffing Support 132
9.2.7 Other Demand Management Measures 132
9.3 Implementation over the Past Five Years 134
9.4 Implementation to Achieve Water Use Targets 135
9.5 Water Use Objectives (Future Requirements) 135
Chapter 10 Plan Adoption, Submittal, and Implementation 138
10.1 Inclusion of All 2020 Data 138
10.2 Notice of Public Hearing 139
10.2.1 Notice to Cities and Counties 139
10.2.2 Notice to the Public 140
10.3 Public Hearing and Adoption 141
10.4 Plan Submittal 142
10.5 Public Availability 142
10.6 Notification of Public Utilities Commission 143
10.7 Amending an Adopted UWMP or Water Shortage Contingency Plan 143
Appendix A: UWMP Act Checklist A-1
Appendix B: Correspondence B-1
Appendix C: Public Meeting Notice C-1
Appendix D: Land Use Map D-1
Appendix E: Summary of Demand Projection Methodology and Assumptions E-1
Appendix F: DWR SB X7-7 Verification Forms F-1
Appendix G: Climate Change Studies – Executive Summaries G-1

Appendix H: SFPUC and BAWSCA Common Language H-1

Appendix I: Regional Water Supply Reliability and BAWSCA Tier 2 Drought Implementation Scenarios I-1

Appendix J: 26 March 2021 SFPUC Commission Special Meeting – Water Workshop Number 3 Water Supply Planning Scenarios SFPUC Staff Presentation Material J-1

Appendix K: Bay-Delta Plan Correspondence K-1

Appendix L: Water Shortage Contingency Plan L-1

Appendix M: Conservation Master Plan M-1

Appendix N: Resolution to Adopt UWMP N-1

List of Tables

Table 2-1. Public Water Systems (DWR Table 2-1) 21
Table 2-2. Plan Identification (DWR Table 2-2) 22
Table 2-3. Supplier Identification (DWR Table 2-3) 24
Table 2-4. Water Supplier Information Exchange (DWR Table 2-4) 25
Table 3-1. Population – Current and Projected (DWR Table 3-1) 31
Table 3-2. Demographic and Housing Characteristics 32
Table 4-1. Demands for Potable and Non-Potable Water - Actual (DWR Table 4-1) 36
Table 4-2. Use for Potable and Non-Potable Water – Projected (DWR Table 4-2) 37
Table 4-3. Total Gross Water Use (Potable and Non-Potable) (DWR Table 4-3) 37
Table 4-4. Last Five Years of Water Loss Audit Reporting (DWR Table 4-4) 38
Table 4-5. Inclusion in Water Use Projections (DWR Table 4-5) 39
Table 4-6. Future Conservation Savings (AF) 41
Table 4-7. Residential Demands of Lower Income Households (AF) 42
Table 4-8. Characteristic Five-Year Water Use (AF) 43
Table 4-9. Climate Change Effect on Demand 44
Table 5-1. SB X7-7 Baselines and Targets Summary (DWR Table 5-1) 47
Table 5-2. SB X7-7 2020 Compliance (DWR Table 5-2) 47
Table 5-3. SB X7-7 Regional Alliance – 2020 GPCD (DWR RA 2020 GPCD Table) 48
Table 5-4. SB X7-7 Regional Alliance – 2020 Compliance (DWR RA 2020 Compliance Table) 48
Table 6-A. Regional Water System Storage Capacity 55
Table 6-1. Groundwater Volume Pumped (DWR Table 6-1) 57

Table 6-2. Wastewater Collected Within Service Area in 2020 (DWR Table 6-2) 62

Table 6-3. Wastewater and Discharge Within Service Area in 2020 (DWR Table 6-3) 63

Table 6-4. Recycled Water Direct Beneficial Uses Within Service Area (DWR Table 6-4) 65

Table 6-5. 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual (DWR Table 6-5) 66

Table 6-6. Methods to Expand Future Recycled Water Use (DWR Table 6-6) 67

Table 6-7. Expected Future Water Supply Projects or Programs (DWR Table 6-7) 69

Table 6-8. Water Supplies – Actual (DWR Table 6-8) 71

Table 6-9A. Water Supplies (Combined Peninsula Districts) – Projected 72

Table 6-9B. Water Supplies – Projected (DWR Table 6-9) 74

Table 6-10. Recommended Energy Intensity – Total Utility Approach (DWR Table O-1B) 83

Table 7-1. Basis of Water Year Data (Reliability Assessment) (DWR Table 7-1) 96

Table 7-2. RWS Wholesale Supply Availability During Normal and Dry Years for Based Years 2025 through 2045 (Responds to DWR Table 7-1) 99

Table 7-3. Normal Year Supply and Demand Comparison (DWR Table 7-2) 99

Table 7-4. Single Dry Year Supply and Demand Comparison (DWR Table 7-3) 100

Table 7-5. Multiple Dry Years Supply and Demand Comparison (DWR Table 7-4) 101

Table 7-6. 2020 Base Year Multiple Dry Year Drought Allocations 116

Table 7-7. Five-Year Drought Risk Assessment Tables (DWR Table 7-5) 118

Table 8-1. Water Shortage Contingency Plan Levels (DWR Table 8-1) 121

Table 8-2. Demand Reduction Actions (DWR Table 8-2) 122

Table 8-3. Supply Augmentation and Other Actions (DWR Table 8-3) 126

Table 9-1. Cal Water DMMs Available to District Customers 134

Table 9-2. Implementation of Customer DMMs: 2016-2020 135

Table 10-1. Notification to Cities and Counties (DWR Table 10-1) 140

List of Figures

Figure 3-1. District Location and Service Boundaries 29

Figure 3-2. 30-Year Normals, Precipitation and Maximum Daily Air Temperature 30

Figure 6-1. Regional Water System 51

List of Acronyms

AB	Assembly Bill
ABAG	Association of Bay Area Governments
ACWD	Alameda County Water District
AF	Acre-Feet
AFY	Acre-Feet Per Year
AMI	Advanced Metering Infrastructure
AMR	Automatic Meter Reading
AWSP	Alternative Water Supply Planning Program
AWWA	American Water Works Association
BAIRWMP	Bay Area Integrated Regional Water Management Plan
BARR	Bay Area Regional Reliability
BAWSCA	Bay Area Water Supply and Conservation Agency
BDPL	Bay Division Pipeline
BG	Billions of Gallons
BGWTP	Bear Gulch Water Treatment Plant
CAP	Customer Assistance Program
CCR	California Code of Regulations
CCWD	Contra Costa Water District
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CII	Commercial, Industrial, and Institutional
CPUC	California Public Utilities Commission
CUWCC	California Urban Water Conservation Council
CWC	California Water Code
DBP	Disinfection By-Product
DDW	Division of Drinking Water
DMM	Demand Management Measure
DRA	Drought Risk Assessment
DSOD	Division of Safety of Dams
DWR	Department of Water Resources
EBMUD	East Bay Municipal Utilities District
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EO	Executive Order
FT	Feet
FY	Fiscal Year
GPCD	gallons per capita per day
GSRP	Groundwater Storage and Recovery Project
HHLSM	Hetch Hetchy and Local Simulation Model

HTWTP	Harry Tracy Water Treatment Plant
ILI	Infrastructure Leakage Index
IRWMP	Integrated Regional Water Management Plan
ISG	Individual Supply Guarantees
JPA	Joint Powers Authority
kWh	Kilowatt Hours
kWh/AF	Kilowatt Hours Per Acre-Foot
LCSD	Lower Crystal Springs Dam
LOS	Level of Service
LVE	Los Vaqueros Reservoir Expansion
MCLs	Maximum Contaminant Levels
MG	Million Gallons
MGD	Million Gallons Per Day
MID	Modesto Irrigation District
MMWD	Marin Municipal Water District
NOAA	National Oceanic and Atmospheric Administration
PODs	Points of Diversion
PREP	Crystal Springs Purified Water Project
PWS	Public Water SystemsPublic Water System
RA	Regional Alliance
RUWMP	Regional Urban Water Management Plan
RWS	Regional Water System
SB	Senate Bill
SFPUC	San Francisco Public Utilities Commission
SGMA	Sustainable Groundwater Management Act
SMP	Surface Mining Permit
SRES	Special Report Emissions Scenarios
SVCW	Silicon Valley Clean Water
SVWTP	Sunol Valley Water Treatment Plant
SWAP	Shared Water Access Program
SWRCB	State Water Resources Control Board
TAP	Technical Assistance Program
TDS	Total Dissolved Solids
TID	Turlock Irrigation District
TRVA	Tuolumne River Voluntary Agreement
USD	Union Sanitary District
USEPA	United States Environmental Protection Agency
UV	Ultraviolet
UWMP	Urban Water Management Plan
WQD	Water Quality Division
WSA	Water Supply Agreement
WSAP	Water Shortage Allocation Plan

WSCP	Water Shortage Contingency Plan
WSIP	Water System Improvement Program
WWTP	Wastewater Treatment Plant

Chapter 1
Introduction and Overview

This chapter discusses the importance and uses of this Urban Water Management Plan (UWMP or Plan), the relationship of this Plan to the California Water Code (CWC), the relationship of this Plan to other local and regional planning efforts, and how this Plan is organized and developed in general accordance with the UWMP Guidebook 2020.[1] Specifically, this chapter contains the following sections:

1.1 Background and Purpose

1.2 Urban Water Management Planning and the California Water Code

1.3 Relationship to Other Planning Efforts

1.4 Plan Organization

1.5 Demonstration of Consistency with the Delta Plan for Participants in Covered Actions

1.6 Lay Description

1.1 Background and Purpose

California Water Service Company (Cal Water) is an investor-owned public utility supplying water service to approximately 1.8 million Californians through over 481,000 connections. Its 25 districts serve 63 communities spanning from the Chico-Hamilton City District in the northern portion of the state to the Palos Verdes District in southern California. California Water Service Group, Cal Water's parent company, also provides water service to communities in Washington, New Mexico, and Hawaii.[2] While water rates are set separately for each of Cal Water's 25 districts, oversight of the water rate setting process and district operations is provided by the California Public Utilities Commission (CPUC).

Cal Water incorporated in 1926 and has provided water service to communities served by the Bear Gulch District since 1936. These communities include Portola Valley, Woodside, Atherton, and portions of Menlo Park, Redwood City, and San Mateo County. Skyline County's water system became part of the Bear Gulch district in 2009.

This UWMP is a foundational document and source of information about the Bear Gulch District's historical and projected water demands, water supplies, supply reliability and potential

[1] The UWMP Guidebook 2020 is available at: https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Urban-Water-Management-Plans

[2] In addition, Cal Water operates the City of Hawthorne's water system on behalf of the City.

vulnerabilities, water shortage contingency planning, and demand management programs. Among other things, it is used as:

- A long-range planning document by Cal Water for water supply and system planning; and
- A source for data on population, housing, water demands, water supplies, and capital improvement projects used in:
    - Regional water resource management plans prepared by wholesale water suppliers and other regional planning authorities (as applicable),
    - General Plans prepared by cities and counties, and
    - Statewide and broad regional water resource plans prepared by the California Department of Water Resources (DWR), the State Water Resources Control Board (SWRCB), or other state agencies.

The District's last UWMP was completed in 2016, referred to herein as the "2015 UWMP." This Plan is an update to the 2015 UWMP and carries forward information from that plan that remains current and relevant, and provides additional information as required by subsequent amendments to the UWMP Act (CWC §10610 – 10657). Although this Plan is an update to the 2015 UWMP, it was developed to be a self-contained, stand-alone document and does not require readers to reference information contained in previous UWMP updates.

1.2 Urban Water Management Planning and the California Water Code

The UWMP Act requires urban water suppliers to prepare an UWMP every five years and to submit this plan to the DWR, the California State Library, and any city or county within which the supplier provides water supplies. All urban water suppliers, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet annually are required to prepare an UWMP (CWC §10617).

The UWMP Act was enacted in 1983. Over the years it has been amended in response to water resource challenges and planning imperatives confronting California. A significant amendment was made in 2009 as a result of the governor's call for a statewide 20 percent reduction in urban water use by 2020, referred to as "20x2020," the Water Conservation Act of 2009, and "SB X7-7." This amendment required urban retail water suppliers to establish water use targets for 2015 and 2020 that would result in statewide water savings of 20 percent by 2020. Beginning in 2016, urban retail water suppliers were required to comply with the water conservation requirements in SB X7-7 in order to be eligible for state water grants or loans. Chapter 5 of this plan contains the data and calculations used to determine compliance with these requirements.

A subsequent substantial revision to the UWMP Act was made in 2018 through a pair of bills (i.e., Assembly Bill 1668 and Senate Bill 606), referred to as "Making Water Conservation a California

Way of Life" or the "2018 Water Conservation Legislation." These changes include, among other things, additional requirements for Water Shortage Contingency Plans (WSCPs), expansion of dry year supply reliability assessments to a five-year drought period, establishment of annual drought risk assessment procedures and reporting, and new conservation targets referred to as "annual water use objectives," which will require retailers to continue to reduce water use beyond the 2020 SB X7-7 targets. The UWMP Act contains numerous other requirements that an UWMP must satisfy. Appendix A to this Plan lists each of these requirements and where in the Plan they are addressed.

1.3 Relationship to Other Planning Efforts

This Plan provides information specific to water management and planning by the Bear Gulch District. However, water management does not happen in isolation; there are other planning processes that integrate with the UWMP to accomplish urban planning. Some of these relevant planning documents include relevant city and county General Plans, Water Master Plans, Recycled Water Master Plans, integrated resource plans, Integrated Regional Water Management Plans, Groundwater Management Plans, Groundwater Sustainability Plans, and others.

This Plan is informed by and helps to inform these other planning efforts. In particular, this Plan utilizes information contained in city and county General Plans and local and regional water resource plans to the extent data from these plans are applicable and available.

1.4 Plan Organization

The organization of this Plan follows the same sequence as outlined in the UWMP Guidebook 2020.[3]

Chapter 1 - Introduction and Overview

Chapter 2- Plan Preparation

Chapter 3 - System Description

Chapter 4 - Water Use Characterization

Chapter 5 - SB X7-7 Baseline and Targets

Chapter 6 - Water Supply Characterization

[3] The UWMP Guidebook 2020 is available at: https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Urban-Water-Management-Plans

Chapter 7 - Water Supply Reliability Assessment

Chapter 8 - Water Shortage Contingency Planning

Chapter 9 - Demand Management Measures

Chapter 10 - Plan Adoption, Submittal, and Implementation

In addition to these ten chapters, this Plan includes a number of appendices providing supporting documentation and supplemental information. Pursuant to CWC §10644(a)(2), this Plan utilizes the standardized forms, tables, and displays developed by DWR for the reporting of water use and supply information required by the UWMP Act. This Plan also includes additional tables, figures, and maps to augment the set developed by DWR, as appropriate. The table headers indicate if the table is part of DWR's standardized set of submittal tables.

1.5 Demonstration of Consistency with the Delta Plan for Participants in Covered Actions

Although not required by the UWMP Act, in the UWMP Guidebook 2020,[4] DWR recommends that all suppliers that are participating in, or may participate in, receiving water from a proposed project that is considered a "covered action" under the Delta Plan—such as a (1) multiyear water transfer; (2) conveyance facility; or (3) new diversion that involves transferring water through, exporting water from, or using water in the Sacramento-San Joaquin Delta (Delta)—provide information in their UWMP to demonstrate consistency with the Delta Plan policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (California Code of Regulations, Title 23, Section 5003). The San Francisco Public Utilities Commission (SFPUC), the District's wholesale agency, has made a legal determination that this requirement does not apply to their water sources.[5]

1.6 Lay Description

☑ ***CWC § 10630.5***

Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.

[4] The UWMP Guidebook 2020 is available at: https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Urban-Water-Management-Plans
[5] Email from BAWSCA, dated 9 February 2021.

This Urban Water Management Plan (UWMP or Plan) is prepared for the Cal Water Bear Gulch District (also referred to as "District"), which serves drinking water to a population of approximately 60,800 in San Mateo County, approximately 30 miles south of the City of San Francisco. This UWMP serves as a foundational planning document and includes descriptions of historical and projected water demands, water supplies, and the resulting reliability during a set of defined water supply conditions over a 20-year planning horizon. This document also describes the actions the District is taking to promote water conservation, both by the District itself and by its customers (referred to as "demand management measures"), and includes a plan to address potential water supply shortages such as drought or other impacts to supply availability (the "Water Shortage Contingency Plan"). This UWMP is updated every five years in accordance with state requirements under the Urban Water Management Planning Act and amendments (Division 6 Part 2.6 of the California Water Code [CWC] §10610 – 10656). Past plans developed for the District are available on the California Department of Water Resources (DWR) Water Use Efficiency Data Portal website: https://wuedata.water.ca.gov/. This document includes 10 chapters, which are summarized below.

Chapter 1- Introduction and Overview

This chapter presents the background and purpose of the UWMP, identifies the Plan organization, and provides this lay description overview of the document. For districts that rely on water from the Sacramento-San Joaquin Delta, this section also discusses and demonstrates consistency with the Delta Plan. Based on information provided by the San Francisco Public Utilities Commission (SFPUC) and the Bay Area Water Supply and Conservation Agency (BAWSCA), the adoption of the Delta Plan is anticipated to impact the reliability of the Regional Water System (RWS) supplies in the future. The San Francisco Public Utilities Commission (SFPUC), the District's wholesale agency, has made a legal determination that this requirement does not apply to their water sources.[6]

Chapter 2 - Plan Preparation

This chapter discusses key structural aspects related to the preparation of the UWMP, and describes the coordination and outreach conducted as part of the preparation of the Plan, including coordination with local agencies (i.e., Town of Atherton, Town of Portola Valley, Town of Woodside, City of Menlo Park, and San Mateo County), and the public.

Chapter 3 - System Description

This chapter provides a description of the Bear Gulch District's water system and the service area, including information related to the climate, population, and demographics. The District is located in San Mateo County. The District has a population of approximately 63,800 and has a

[6] Email from BAWSCA, dated 9 February 2021.

climate characterized by mild summers and cool wet winters. The majority of the 37 inches of average annual precipitation falls between October and May. Current land uses within the District is a mixture of low, medium, and high density residential, mixed use, commercial, public facilities, and parks/open space. All water customers are considered urban (i.e., non-agricultural water users).

Chapter 4 - Water Use Characterization

This chapter provides a description and quantifies the Bear Gulch District's current and projected demands through the year 2045. The District provides drinking water (also referred to as "potable water") to customers. Water demands refer not only to the water used by customers, but also includes the water used as part of the system maintenance and operation, as well as unavoidable losses inherent in the operation of a water distribution system. Water demand within the District was 11,655 acre-feet per year (AFY) on average between 2016 and 2020. Taking into account historical water use, expected population increase and other growth, climatic variability, and other assumptions, water demand within the District is projected to increase to a maximum of 12,796 AFY by 2025, a change of nine percent compared to the 2016-2020 average. In dry year periods, water demands are expected to be somewhat higher, potentially up to a maximum of 13,699 AFY by 2025 during an extended five-year drought.

Chapter 5 - SB X7-7 Baseline and Targets

In this chapter, the Bear Gulch District demonstrates compliance with its per capita water use target for the year 2020. The Water Conservation Act of 2009 (Senate Bill X7-7) was enacted in November 2009 and requires the state of California to achieve a 20 percent reduction in urban per capita water use by December 31, 2020. In order to achieve this, each urban retail water supplier was required to establish water use targets for 2015 and 2020 using methodologies established by DWR. Having reduced its water use in 2020 to 190 gallons per capita per day (GPCD), the Bear Gulch District did not meet its individual 2020 water use target of 187 GPCD. However, the District is a member of the California Water Service – San Francisco Bay Regional Alliance and complies with SB X7-7 requirements via this regional alliance. The Regional Alliance's 2020 water use is 130 GPCD, which is in below (i.e., in compliance with) its 2020 target of 150 GPCD.

Chapter 6 - Water Supply Characterization

This chapter presents an analysis of the Bear Gulch District's water supplies, as well as an estimate of water-related energy-consumption. The intent of this chapter is to present a comprehensive overview of the District's water supplies, estimate the volume of available supplies over the 20-year planning horizon, and assess the sufficiency of the District's supplies to meet projected demands under "normal" hydrologic conditions.

The Bear Gulch District derives its water supply from a combination of both local surface water and imported surface water supply purchased from the SFPUC RWS. California Water Service Company (Cal Water)'s annual allocation of SFPUC supply is shared among the Bear Gulch, Mid-Peninsula, and South San Francisco Districts. Local surface water comprises approximately nine percent of annual deliveries from 1980 to 2020.

Calculating and reporting of water system energy intensity is a new requirement for the 2020 UWMPs. Energy intensity is defined as the net energy used for water treatment, pumping, conveyance, and distribution for all water entering the distribution system, and does not include the energy used to treat wastewater. The energy intensity for the Bear Gulch District is estimated to be 345 kilowatt hours per acre-foot of water (kWh/AF).

Chapter 7 - Water Supply Reliability Assessment

This chapter assesses the reliability of the Bear Gulch District's water supplies, with a specific focus on potential constraints such as purchased water and surface water supply availability, water quality, and climate change. The intent of this chapter is to identify any potential constraints that could affect the reliability of the District's supply (such as drought conditions) to support the District's planning efforts to ensure that its customers are well served. Water service reliability is assessed during normal, single dry-year, and multiple dry-year hydrologic conditions.

The Bear Gulch District's local surface water supply is expected to be 100 percent reliable in normal year types. However, it is conservatively estimated that there will be no local surface water supply in dry year types.

The reliability of the RWS is anticipated to vary greatly in different year types. Cal Water has relied on the supply reliability estimates provided by the SFPUC for the RWS and the drought allocation structure provided by SFPUC and BAWSCA to estimate available RWS supplies in dry year types through 2045.

Based on this analysis, the District's supply is expected to be sufficient to meet demands in normal year conditions. However, the District is expected to experience significant shortfalls during single dry and multiple dry year conditions as a result of Bay-Delta Plan Amendment implementation. At this time numerous uncertainties remain in the implementation of the Bay-Delta Plan Amendment and the resultant allocation of the available supply to the District and the other SFPUC Wholesale Customers. Cal Water has developed a Water Shortage Contingency Plan to address potential water shortage conditions.

Potential water quality issues are not expected to affect the quality of water served to the District's customers, as water quality is routinely monitored and the District is able to make all appropriate adjustments to its treatment and distribution system to ensure only high quality drinking water is served.

Chapter 8 - Water Shortage Contingency Planning

This chapter describes the Water Shortage Contingency Plan (WSCP) for the Bear Gulch District. The WSCP serves as a standalone document to be engaged in the case of a water shortage event, such as a drought or supply interruption, and defines specific policies and actions that will be implemented at various shortage level scenarios. For example, implementing customer water budgets and surcharges, or restricting landscape irrigation to specific days and/or times. Consistent with DWR requirements, the WSCP includes six levels to address shortage conditions ranging from up to 10 percent to greater than 50 percent shortage.

Chapter 9 - Demand Management Measures

This chapter includes descriptions of past and planned conservation programs that Cal Water operates within each demand management measure (DMM) category outlined in the UWMP Act, specifically: (1) water waste prevention ordinances, (2) metering, (3) conservation pricing, (4) public education and outreach, (5) distribution system water loss management, (6) water conservation program coordination and staffing support, and (7) "other" DMMs. Cal Water has developed a suite of conservation programs and policies, which address each DMM category.

Chapter 10 - Plan Adoption, Submittal, and Implementation

This chapter provides information on a public hearing, the adoption process for the UWMP and WSCP, the adopted UWMP and WSCP submittal process, plan implementation, and the process for amending the adopted UWMP and WSCP. Prior to adopting the Plan, Cal Water held a formal public hearing to present information on its Bear Gulch District UWMP and WSCP on June 9, 2021, 5:00 PM. This UWMP and the corresponding WSCP were submitted to DWR within 30 days of adoption and by the July 1, 2021 deadline.

Cal Water recommends that users of its 2020 UWMP contact District staff for potential updates about its water supply reliability before using the 2020 UWMP drought cutback projections for their planning projects and referencing the drought allocations.

Chapter 2
Plan Preparation

This chapter discusses the type of Urban Water Management Plan (UWMP or Plan) the Bear Gulch District (also referred to herein as "District") has prepared and includes information that will apply throughout the Plan. Coordination and outreach during the development of the Plan is also discussed. Specifically, this chapter includes the following sections:

2.1 Public Water Systems

2.2 Regional Planning

2.3 Individual or Regional Planning and Compliance (Regional Alliance)

2.4 Plan Preparation, Standard Units, and Basis for Reporting

2.5 Coordination and Outreach

2.1 Public Water Systems

The Bear Gulch District operates the Public Water System (PWS) listed in Table 2-1. Public Water Systems are the systems that provide drinking water for human consumption and are regulated by the State Water Resources Control Board (SWRCB), Division of Drinking Water. The SWRCB requires that water agencies report water usage and other relevant PWS information via the electronic Annual Reports to the Drinking Water Program (eARDWP). These data are used by the state to determine, among other things, whether an urban retail water supplier has reached the threshold (3,000 or more connections or 3,000 acre-feet of water supplied) for submitting an UWMP.

Table 2-1. Public Water Systems (DWR Table 2-1)

Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020
CA4110006	Bear Gulch	18,561	12,972
	TOTAL	18,561	12,972

NOTES:
(a) Volumes are in units of AF.

2.2 Regional Planning

Regional planning can deliver mutually beneficial solutions to all agencies involved by reducing costs for the individual agency, assessing water resources at the appropriate geographic scale, and allowing for solutions that cross jurisdictional boundaries. California Water Service Company (Cal Water) participates in regional water resources planning initiatives throughout California in the regions in which its 25 water districts are located. In the region in which the Bear Gulch District is located, Cal Water participates in regional planning through the Bay Area Water Supply and Conservation Agency (BAWSCA). As a BAWSCA member, Cal Water assisted with development of the San Francisco Bay Area Integrated Regional Water Management Plan and BAWSCA's Long-Term Reliability Water Supply Strategy, discussed further in Section 7.1.1.

2.3 Individual or Regional Planning and Compliance (Regional Alliance)

Urban water suppliers may elect to prepare individual or regional UWMPs. The Bear Gulch District has elected to prepare an individual UWMP (see Table 2-2).

Urban retail water suppliers may report on the requirements of SB X7-7 (2009 California Conservation Act) individually or as a member of a "Regional Alliance." As described in Chapter 5, the Bear Gulch District is a member of a Regional Alliance and this UWMP provides information on the District's compliance with its SB X7-7 water conservation targets both as an individual urban retail water supplier and as a member of a Regional Alliance.

Table 2-2. Plan Identification (DWR Table 2-2)

Select Only One	Type of Plan		Name of RUWMP or Regional Alliance *if applicable*
X	Individual UWMP		
		Water Supplier is also a member of a RUWMP	
	X	Water Supplier is also a member of a Regional Alliance	California Water Service - San Francisco Bay Regional Alliance
	Regional Urban Water Management Plan (RUWMP)		
NOTES: The Bear Gulch District is a member of a Regional Alliance. Chapter 5 provides information on the District's progress towards meeting its water conservation targets under SB X7-7 both as an individual urban retail water supplier and as a member of its Regional Alliance.			

2.4 Plan Preparation, Standard Units, and Basis for Reporting

☑ ***CWC § 10608.12 (t)***

"Urban retail water supplier" means a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes.

☑ ***CWC § 10617***

"Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

☑ ***CWC § 10621 (a)***

Each urban water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update.

☑ ***CWC § 10621 (f)***

Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.

Per California Water Code (CWC) §10617, the Bear Gulch District is an urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. It is therefore obligated under CWC §10621(f) to develop and submit an UWMP to the California Department of Water Resources (DWR) by July 1, 2021. The Bear Gulch District is an urban retail water supplier, as defined by CWC §10608.12 (t) and §10617, and as identified in Table 2-3. The Bear Gulch District is not a wholesale water supplier.

Annual volumes of water reported in this UWMP are measured in acre-feet (AF) and are reported on a calendar year basis (Table 2-3). Water use and planning data reported in this UWMP for calendar year 2020 cover the full twelve months of the year, as required by the UWMP Guidelines.

Table 2-3. Supplier Identification (DWR Table 2-3)

Type of Supplier	
	Supplier is a wholesaler
X	Supplier is a retailer
Fiscal or Calendar Year	
X	UWMP Tables are in calendar years
	UWMP Tables are in fiscal years
If using fiscal years provide month and date that the fiscal year begins (mm/dd)	
Units of measure used in UWMP	
Unit	AF
NOTES:	

2.5 Coordination and Outreach

☑ ***CWC § 10620 (d) (3)***

Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

☑ ***CWC § 10631 (a)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

☑ ***CWC § 10642***

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. …

Coordination with other water suppliers, cities, counties, and other community organizations in the region is an important part of preparing a UWMP and Water Shortage Contingency Plan

(WSCP). This section identifies the agencies and organizations the Bear Gulch District sought to coordinate with during preparation of this Plan.

2.5.1 Wholesale and Retail Coordination

☑ ***CWC § 10631 (h)***

An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).

Urban retail water suppliers relying on one or more wholesalers for water supply are required to provide these wholesalers with information regarding projected water supply and demand. The Bear Gulch District coordinates with the wholesale supplier shown in Table 2-4.

Table 2-4. Water Supplier Information Exchange (DWR Table 2-4)

The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.
Wholesale Water Supplier Name
San Francisco Public Utilities Commission
NOTES:

2.5.2 Coordination with and Notice to Other Agencies and the Community

☑ ***CWC § 10620 (d) (3)***

Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

☑ ***CWC § 10642***

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

The Bear Gulch District coordinated with cities, counties, and other community organizations during preparation of this UWMP. Cal Water provided notice to these entities and the communities it serves 60 days prior to the public hearing it held on June 9, 2021, to present the draft of the UWMP, address questions, and receive comments. Cities and counties receiving the public hearing notification from Bear Gulch District as required per CWC §10621 (b) are listed in Table 10-1 in Chapter 10 of this Plan.

Copies of correspondence with other agencies and public notices are provided in Appendix B and Appendix C, respectively.

2.5.3 Coordination with Land Use Authorities

☑ ***CWC § 10631 (a)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

Cal Water coordinated with the Town of Atherton, Town of Portola Valley, Town of Woodside, City of Menlo Park, and San Mateo County staff to review and confirm that appropriate land use assumptions were used to develop the UWMP demand projections. Correspondence with land use authorities is included in Appendix B.

Chapter 3
System Description

☑ ***CWC § 10631 (a)***

A plan shall be adopted in accordance with this chapter that shall do all of the following:

Describe the service area of the supplier, including current and projected population, climate, and other social, economic, and demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available. The description shall include the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

This chapter provides a description of the Bear Gulch District (also referred to herein as the "District") water system and service area, including climate, population, demographics, and land uses to help in understanding various elements of water supply and demand. This chapter includes the following sections:

3.1 General Description

3.2 Service Area Boundary Map

3.3 Service Area Climate

3.4 Service Area Population and Demographics

3.5 Land Uses within Service Area

3.1 General Description

The District was formed in 1936 by California Water Service Company (Cal Water), an investor-owned water utility regulated by the California Public Utilities Commission (CPUC), and serves the communities of Portola Valley, Woodside, Atherton, and portions of Menlo Park, Redwood City, and San Mateo County. The District's water supply is comprised of local surface water (approximately nine percent of annual deliveries) and water purchased from the City and County of San Francisco's Hetch Hetchy system. The District delivers roughly 12 million gallons of water per day to more than 18,000 service connections. The District delivers water to residential, commercial, industrial, and governmental customers. Residential customers account for most of

the District's service connections and 84 percent of its water uses. Non-residential water uses account for 11 percent of total demand while distribution system losses account for 5 percent.

3.2 Service Area Boundary Map

Figure 3-1 shows the location of the District and its current service area boundaries. The District is located in San Mateo County approximately 30 miles south of the City of San Francisco. The District is bordered on the north by Redwood City; on the east by Palo Alto, Stanford University, and unincorporated Santa Clara County; and on the south and west by unincorporated San Mateo County. The major transportation links through the District are Interstate 280, U.S. Highway 101, El Camino Real, Woodside Road, and Alpine Road. The Dumbarton Bridge connects the area to the East Bay communities.

Elevations in the service area range from just over sea level on the eastern boundary to nearly 1,100 feet above sea level on the western boundary. This marked variation in elevation requires 33 separate pressure zones for effective system operation. Much of the terrain that bounds the service area on the west is too steep for any type of development.

The San Francisquito Creek and its tributaries provide the principal source of drainage to the area. Bear Gulch Creek, one of these tributaries, drains a 1,500-plus acre watershed of which Cal Water owns 1,306 acres. Storm runoff carried by this creek is captured by two separate diversion facilities on the creek providing the only local source of supply available to the District.

The San Andreas Fault rift zone forms the major geologic features of the area as it passes through the western portion of the service area along with the Monta Vista Fault Line. The Hayward Fault lies along the east side of San Francisco Bay. A major earthquake occurring on any of these faults may disrupt water service in the District.

Figure 3-1. District Location and Service Boundaries

3.3 Service Area Climate

The District's climate is characterized by mild summers and cool wet winters (see Figure 3-2).[7] Most rainfall occurs between October and May. Precipitation totals in the summer months are

[7] Precipitation and temperature data downloaded from: https://prism.oregonstate.edu/explorer/. These data represent a 30-year period from 1980 through 2010. The x-axis reflects the end of the 30-year time series.

negligible. On average, the District receives 37 inches of rainfall annually. Maximum daily air temperature averages 81 degrees Fahrenheit during the summer months. In the winter, it averages 56 degrees Fahrenheit.

Figure 3-2. 30-Year Normals, Precipitation and Maximum Daily Air Temperature

Based on a review of data downloaded from the Oregon State PRISM dataset for 1895 to 2019, rainfall varies significantly from year-to-year, as it does in most of California.[8] The standard deviation in annual rainfall is 11 inches, or approximately one-third of average annual rainfall.[9] Consecutive years of below average rainfall are fairly common. Since 1895, runs of below average rainfall lasting three or more years have occurred ten times and runs lasting five or more years have occurred once, running from 1987 through 1991. While rainfall in the region is highly variable, there has been no statistically significant trend in the mean or variance of annual rainfall since 1895.

The District's climate has been warming. Since 1895, average daily temperature has increased at an average rate of 0.014 degrees Fahrenheit per year. Mean annual temperature for 2010-2019 was 1.7 degrees Fahrenheit higher than for 1900-1909.

3.4 Service Area Population and Demographics

It is estimated that the District's service area population was 60,814 in 2020.

The District estimates its service area population using Census Block population counts from decadal Census data. The decadal Census estimates are converted to average population per single- and multi-family service, which are applied to service counts for years between the

[8] Downloaded from: https://prism.oregonstate.edu/explorer/. The x-axis reflects the end of the 30-year time series.
[9] Standard deviation measures the typical or average year-to-year variation in annual rainfall amount. Thus, it is typical for annual rainfall to fluctuate significantly in the District.

decadal Censuses. This method is similar to the approach used by the California Department of Water Resources (DWR) Population Tool and population estimates generated by the two methods have been shown to differ by less than a percent in most cases.[10]

Current and projected service area population are shown in Table 3-1. Projected population is based on population, housing, and employment projections developed by the Association of Bay Area Governments (ABAG).[11]

Table 3-1. Population – Current and Projected (DWR Table 3-1)

Population Served	2020	2025	2030	2035	2040	2045
	60,814	60,907	61,255	61,778	62,302	62,835
NOTES:						

Demographics for the Atherton, Menlo Park, North Fair Oaks, Portola Valley, West Menlo Park and Woodside are summarized in Table 3-2. These data are from the U.S. Census American Community Survey 2019 5-Year Estimates.[12] Relative to the rest of California, the District's population is older and more racially homogenous. Educational attainment is higher than for the state as a whole, as is median household income.

The District's stock of housing is older than for California as a whole. Only 14.8 percent of homes in the District were built after 1990 compared to 25.5 percent for all of California. Homes built after 1990 are more likely to have plumbing fixtures that are compliant with state and federal water and energy efficiency standards.

[10] California Water Service, 2016. 2015 Urban Water Management Plan: Bear Gulch District, dated June 2016.
[11] Association of Bay Area Governments Projections 2040. Accessed from: http://projections.planbayarea.org/
[12] U.S. Census Bureau, 2019. 2015-2019 American Community Survey 5-year Estimates, dated 2019. Retrieved from: https://data.census.gov/cedsci/.

Table 3-2. Demographic and Housing Characteristics

Demographics	Ather-ton	Menlo Park	North Fair Oaks	Portola Valley	West Menlo Park	Wood-side	Cali-fornia
Median Age (Years)	47.4	37.9	33.1	52.8	39.8	47.5	36.5
Racial Makeup (%)							
White	75.5	71.8	55.5	91.2	83.1	87.6	63.8
Black or African American	1.2	5.8	2.7	1.9	1.7	1.5	7.0
American Indian and Alaska Native	1.8	1.3	1.6	0.1	1.0	1.1	1.9
Asian	24.1	18.2	6.7	10.0	19.1	10.2	16.7
Native Hawaiian	1.2	2.4	0.2	0.0	0.0	0.1	0.8
Some other race	1.3	6.2	38.5	1.3	0.0	4.0	15.1
Hispanic or Latino (of any race) (%)	4.4	15.5	73.4	6.7	4.1	9.1	39.0
Educational Attainment (%)							
Bachelor's Degree or Higher	81.9	69.6	26.4	77.1	83.2	78.7	33.9
Primary Language Spoken at Home (%)							
English Only	77.0	67.2	26.0	87.3	87.9	82.8	82.2
Limited English-Speaking Households	1.2	4.4	16.2	0.0	2.5	0.6	8.9
Median Household Income ($)	250,000+	160,784	77,899	224,554	214,167	250,000+	75,235
Population below Federal Poverty Level (%)	3.7	7.6	15.1	1.8	3.9	4.5	13.4
Housing	Ather-ton	Menlo Park	North Fair Oaks	Portola Valley	West Menlo Park	Wood-side	Cali-fornia
Median Year Built	1959	1959	1959	1969	1959	1964	1975
Year Housing Built (%)							
2010 or Later	7.3	3.9	2.0	4.4	6.9	3.3	3.5
2000 to 2009	9.6	4.4	1.1	9.0	4.6	8.1	11.2
1990 to 1999	8.6	4.5	7.0	5.5	4.8	7.8	10.9
Before 1990	74.5	87.1	89.9	81.1	83.8	80.8	74.5

3.5 Land Uses within Service Area

Current land uses within the District is a mixture of low, medium, and high density residential, mixed use, commercial, public facilities, and parks/open space. Maps showing General Plan land use designations for communities served by the District are provided in Appendix D.

The District's population and service growth projections are tied to ABAG census tract level projections of population, housing, and employment. These projections, in turn, are developed by ABAG through detailed land use modeling of the Bay Area.[13] The areas included in the ABAG land use model include all incorporated and unincorporated areas of the nine-county Bay Area. ABAG's land use model application is comprised of ten sub models:

1. Employment Transition Model
2. Household Transition Model
3. Real Estate Development Model
4. Scheduled Development Events Model
5. Employment Relocation Model
6. Household Relocation Model
7. Government Growth Model
8. Employment Location Choice Model
9. Household Location Choice Model
10. Real Estate Price Model

Parcels, or individual units of land ownership, provide the fundamental building block for the ABAG land use model. The land use database includes information linking the parcels to zones they are within, buildings within each parcel, their size, their monetary value, and their current planning constraints. The base year database contains 1.9 million buildings categorized into 14 different land use types, ranging from detached single-family housing to heavy industrial.

The ABAG land use model relies on current zoning for all parcels in the region as a representation of the land use controls in place in the base year. Zoning codes, general plans, and specific plans were processed by ABAG to obtain a consistent indication of each jurisdiction's long-term vision for land use type, residential dwelling units per acre, and commercial floor-area-ratio.

[13] Association of Bay Area Governments and Metropolitan Transportation Commission (2017). Land Use Modeling Report, Plan Bay Area 2040 Final Supplemental Report, dated July 2017. Accessed from: http://2040.planbayarea.org/files/2020-02/Land_Use_Modeling_PBA2040_Supplemental%20Report_7-2017.pdf

Chapter 4
Water Use Characterization

☑ ***CWC § 10631 (d) (1)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(J) Distribution system water loss.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

This chapter provides a description and quantifies the Bear Gulch District's (also referred to herein as the "District") past, current, and projected water uses through 2045. For the purposes of the Urban Water Management Plan (UWMP or Plan), the terms "water use" and "water demand" are used interchangeably. This chapter is divided into the following subsections:

4.1 Non-Potable Versus Potable Water Use

4.2 Past, Current, and Projected Water Uses by Sector

4.3 Climate Change Considerations

Appendix E provides additional information and data related to the development of the water demand projections presented in this chapter.

4.1 Non-Potable Versus Potable Water Use

This Plan maintains a clear distinction between recycled, potable, and raw water uses and supplies. Recycled water is addressed comprehensively in Chapter 6, but a summary of recycled

water demand is included in Table 4-3 of this chapter. The primary focus of this chapter is the historical and projected potable water uses in the District.

4.2 Past, Current, and Projected Water Uses by Sector

☑ ***CWC § 10631 (d)***

For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(J) Distribution system water loss.

4.2.1 Past and Current Water Use

Table 4-1 shows water use in 2016-2020 by use type (referred to as "sector" in CWC §10631). Water use has been decreasing in the District since the mid-2000s. Several factors have contributed to this reduction. First, California Water Service Company (Cal Water) implemented conservation pricing starting in 2009, supplying stronger financial incentives to use water efficiently. Second, starting around 2012, Cal Water tripled the level of expenditure on conservation programs aimed at helping customers use water more efficiently. Third, appliance efficiency standards and plumbing codes have contributed to significant improvement over time in the average water use efficiency of the installed base of appliances and plumbing fixtures. For example, a new toilet uses roughly one-third the amount of water as a toilet manufactured in the 1980s while a new clothes washer uses about half the amount of water as an older washer.[14] Per capita water use in 2020 was 24 percent below its peak in the early 2000s.

[14] Water Research Foundation, 2016. Residential End Uses of Water, Version 2, prepared by DeOreo, William B., Peter Mayer, Benedykt Dziegielewski, and Jack Kiefer, dated April 2016.

Water use in 2020 was 12,972 acre-feet (AF). Residential customers accounted for most of the District's service connections and 84 percent of its water uses. Non-residential water uses accounted for 11 percent of total demand, while distribution system losses accounted for 5 percent.

Table 4-1. Demands for Potable and Non-Potable Water - Actual (DWR Table 4-1)

Use Type	Additional Description *(as needed)*	Level of Treatment When Delivered	Volume (a)				
			2016	2017	2018	2019	2020
Single Family		Drinking Water	8,001	9,000	9,742	9,361	10,598
Multi-Family		Drinking Water	235	264	285	242	279
Commercial		Drinking Water	980	1,048	1,111	1,152	1,038
Institutional/Gov't		Drinking Water	218	292	323	299	303
Industrial		Drinking Water	2	2	2	2	3
Other Potable		Drinking Water	54	59	28	35	20
Landscape		Drinking Water	24	26	29	27	21
Losses	(b)	Drinking Water	591	705	416	752	711
		TOTAL	10,105	11,395	11,936	11,869	12,972

NOTES:
(a) Volumes are in units of AF.
(b) Real and apparent losses.

4.2.2 Projected Water Use

Projected water use through 2045 is summarized in Table 4-2. Projected water use is estimated as a function of expected service growth and a forecast of average water use per service for each of the use types shown in the table. As discussed in Chapter 3, population and service growth projections are based on population, housing, and employment projections developed by the Association of Bay Area Governments (ABAG).[15]

As described later in the chapter, average water use per service is adjusted over the forecast period to account for anticipated reductions in water use due to the ongoing effects of appliance standards and plumbing codes, conservation and customer assistance programs, and growth in the inflation-adjusted cost of water service and household income. These factors, in combination, are projected to attenuate the projected increase in water use associated with projected service and population growth.

[15] Association of Bay Area Governments Projections 2040. Accessed from: http://projections.planbayarea.org/

Table 4-2. Use for Potable and Non-Potable Water – Projected (DWR Table 4-2)

Use Type	Additional Description *(as needed)*	Projected Water Use				
		2025	2030	2035	2040	2045
Single Family		10,591	10,595	10,629	10,605	10,647
Multi-Family		264	267	277	281	286
Commercial		957	913	897	864	836
Institutional/Gov't		286	278	279	274	270
Industrial		3	3	3	3	3
Other Potable		18	18	18	18	18
Landscape		21	21	21	21	21
Losses	(b)	657	604	607	610	614
TOTAL		12,796	12,699	12,730	12,675	12,694

NOTES:
(a) Volumes are in units of AF.
(b) Real and apparent losses.

Future water demands are expected to be comprised entirely of potable water use, as shown in Table 4-3. Potential opportunities for recycled water use in the District are discussed in Chapter 6.

Table 4-3. Total Gross Water Use (Potable and Non-Potable) (DWR Table 4-3)

	2020	2025	2030	2035	2040	2045
Potable Water, Raw, Other Non-potable *From DWR Tables 4-1 and 4-2*	12,972	12,796	12,699	12,730	12,675	12,694
Recycled Water Demand *From DWR Table 6-4*	0	0	0	0	0	0
Optional Deduction of Recycled Water Put Into Long-Term Storage						
TOTAL WATER USE	12,972	12,796	12,699	12,730	12,675	12,694

NOTES:
(a) Volumes are in units of AF.

4.2.3 Distribution System Water Loss

☑ ***CWC § 10631 (3)***

(A) The distribution system water loss shall be quantified for each of the five years preceding the plan update, in accordance with rules adopted pursuant to Section 10608.34.

(B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.

(C) In the plan due July 1, 2021, and in each update thereafter, data shall be included to show whether the urban retail water supplier met the distribution loss standards enacted by the board pursuant to Section 10608.34.

Table 4-4 shows distribution system water losses for the previous five years. Water loss is the sum of apparent and real losses. Apparent loss is associated with metering inaccuracies, billing and administrative errors, authorized unmetered uses (e.g., system flushing and firefighting), and unauthorized uses. Real loss is associated with physical water lost through line breaks, leaks and seeps, and overflows of storage tanks. Since 2016, urban retail water suppliers have been required under CWC §10608.34 and California Code of Regulations (CCR) §638.1 et seq to quantify distribution system water losses using the American Water Works Association (AWWA) Free Water Audit Software (referred to as "water loss audit reports"). The water loss audit reports the District submits to DWR provide the basis for the 2016-2019 estimates shown in Table 4-4 and are available through DWR's Water Use Efficiency Data Portal.[16] The District's 2020 water loss audit report had not been completed at the time this Plan was prepared.[17] The 2020 estimate shown in Table 4-4 is therefore drawn from the District's preliminary draft water loss audit results.

Table 4-4. Last Five Years of Water Loss Audit Reporting (DWR Table 4-4)

Reporting Period Start Date	Volume of Water Loss (a)
01/2016	591
01/2017	705
01/2018	416
01/2019	752
01/2020	711
NOTES: (a) Volumes are in units of AF.	

CWC §10631 (3)(c) requires that this UWMP demonstrate whether the distribution loss standards

[16] DWR's Water Use Efficiency Data Portal: https://wuedata.water.ca.gov/awwa_plans
[17] The District's regulatory deadline for filing its 2020 water loss audit report to the state is October 1, 2021.

enacted by the State Water resources Control Board (SWRCB) pursuant to §10608.34 have been met. However, the SWRCB has yet to establish these standards, and thus consistency with these standards cannot be demonstrated herein.

4.2.4 Future Water Savings in Projected Water Use

☑ ***CWC § 10631 (d) (4)***

(A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.

(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:

(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.

(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.

As affirmed in Table 4-5, both future water savings (discussed below) and lower income residential demands (discussed in Section 4.2.5) are included in the projections of future water use.

Table 4-5. Inclusion in Water Use Projections (DWR Table 4-5)

Are Future Water Savings Included in Projections?	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, or otherwise are utilized in demand projections are found.	Section 4.2.4
Are Lower Income Residential Demands Included In Projections?	Yes
NOTES:	

As noted above, the District has adjusted the forecast of average water use per service for the effects of appliance standards and plumbing codes, conservation programs, and increases in the real cost of water service and household income. These adjustments are described below.

The District uses forecasts of per capita water savings from appliance standards and plumbing codes prepared for DWR to adjust its projections of average water use per service.[18] These forecasts incorporate the effects of the following codes and regulations:

- Assembly Bill (AB) 715, enacted in 2007, requires that any toilet or urinal sold or installed in California on or after January 1, 2014 cannot have a flush rating exceeding 1.28 and 0.5 gallons per flush, respectively. AB 715 superseded the state's previous standards for toilet and urinal water use set in 1991 of 1.6 and 1.0 gallons per flush, respectively. On April 8, 2015, in response to the Governor's Emergency Drought Response Executive Order (EO B-29-15), the California Energy Commission approved new standards for urinals requiring that they not consume more than 0.125 gallons per flush, 75 percent less than the standard set by AB 715.
- Water use standards for residential and commercial clothes washers and dishwashers are established by the U.S. Department of Energy through its authority under the federal Energy Policy and Conservation Act. Water use efficiency is summarized by the water factor for the appliance which measures the gallons of water used per cycle per cubic foot of capacity. A typical top-loading residential clothes washer manufactured in the 1990s had a water factor of around 12. In 2015, the allowable water factor for top- and front-loading residential clothes was reduced to 8.4 and 4.7, respectively. In 2018, water factor standard for top-loading residential clothes washers will be reduced to 6.5. In 2010 the allowable water factor for top- and front-loading commercial clothes washers was reduced to 8.5 and 5.5, respectively. The maximum water factor for Energy Star compliant top- and front-loading washers is 3.7 and 4.3, respectively. The U.S. Environmental Protection Agency estimates that Energy Star washers made up at least 60 percent of the residential market and 30 percent of the commercial market in 2011.[19] An Energy Star compliant washer uses about two-thirds less water per cycle than washers manufactured in the 1990s. Federal dishwasher water use efficiency standards were last updated in 2013. The maximum water use for standard and compact sized dishwashers is 5.0 and 3.5 gallons per cycle, respectively.
- New construction and renovations in California are now subject to CalGreen Code requirements. CalGreen includes prescriptive indoor provisions for maximum water consumption of plumbing fixtures and fittings in new and renovated properties. CalGreen also allows for an optional performance path to compliance, which requires an overall aggregate 20 percent reduction in indoor water use from a calculated baseline using a set of worksheets provided with the CalGreen guidelines.
- Senate Bill (SB) 407, enacted in 2009, mandates that all buildings in California come up to current State plumbing fixture standards within this decade. This law establishes

[18] M.Cubed, 2016. Projected Statewide and County-Level Effects of Plumbing Codes and Appliance Standards on Indoor GPCD, technical memorandum prepared for the California Department of Water Resources, dated August 2016.
[19] EPA Energy Star Unit Shipment and Market Penetration Report Calendar Year 2011 Summary.

requirements that residential and commercial property built and available for use on or before January 1, 1994 replace plumbing fixtures that are not water conserving, defined as "noncompliant plumbing fixtures." This law also requires effective January 1, 2017 that a seller or transferor of single-family residential property show to the purchaser or transferee, in writing, the specified requirements for replacing plumbing fixtures and whether the real property includes noncompliant plumbing. Similar disclosure requirements went into effect for multi-family and commercial transactions January 1, 2019. SB 837, passed in 2011, reinforces the disclosure requirement by amending the statutorily required transfer disclosure statement to include disclosure about whether the property follows SB 407 requirements.

The District's 2015 Conservation Master Plan forms the basis for the forecast of water savings from conservation programs. Cal Water used the Alliance for Water Efficiency's Water Conservation Tracking Tool to estimate expected water savings from planned program implementation.[20]

Projected increases in water service costs and household income form the basis for the adjustments to average water use due to changes in the real cost of water service. The forecast uses the historical rate of increase in District water rates to project future water service costs. It uses Caltrans income projections for San Mateo County to estimate changes in household income. It uses empirically derived estimates of price and income demand elasticity to adjust future water demand for changes in these variables.[21]

Table 4-6 shows the total water savings from plumbing codes and appliance standards, conservation programs, and increases in the real cost of water service.

Table 4-6. Future Conservation Savings (AF)

2025	2030	2035	2040	2045
165	270	315	443	498

[20] Alliance for Water Efficiency Water Conservation Tracking Tool: https://www.allianceforwaterefficiency.org/resources/topic/water-conservation-tracking-tool

[21] M.Cubed, 2018. California Water Service 2020 Test Year Sales Forecast: 2018 General Rate Case, prepared for California Water Service by M.Cubed, dated January 2018.

4.2.5 Water Use by Lower Income Households in Water Use Projections

☑ ***CWC § 10631.1***

(a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirements under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

California Senate Bill No. 1087 (SB 1087), Chapter 727, passed in 2005, amended Government Code §65589.7 and CWC §10631.1. This law requires that local governments supply a copy of their adopted housing element to water and sewer providers. Additionally, it requires that water providers grant priority for service allocations to developments that include housing units for lower income families and workers. The UWMP Act requires that water providers estimate water demands by lower income single and multi-family households.

Cal Water must serve all development that occurs within its service area, regardless of the income level of the future residents. Cal Water does not keep records of the income level of its customers and does not discriminate when supplying water to any development. It is the responsibility of the city or county with land use authority over a given area to approve or not approve developments within Cal Water's service areas. Cal Water has a Customer Assistance Program (CAP) to help with water service affordability. CAP discounts the monthly service charge of qualifying lower income households.

Table 4-7 shows projected water use by lower income households. These demands are part of the projected residential water use in Table 4-2. Cal Water used the General Plan Housing Elements from the cities in Bear Gulch District to estimate the number of lower income households which is the basis for the estimates in Table 4-7.[22]

Table 4-7. Residential Demands of Lower Income Households (AF)

2025	2030	2035	2040	2045
3,691	3,693	3,708	3,701	3,717

[22] Town of Atherton Housing Element Update 2007-2014, Table HII-7; Town of Woodside General Plan 2012 Housing Element 2007-2014, page 273; City of Menlo Park Housing Element 2015-2023, Page 71; Town of Portola Valley General Plan Housing Element, Adopted January 14, 2015, page 23.

4.2.6 Characteristic Five-Year Water Use

☑ ***CWC § 10635(b)(3)***

(b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following…

(3) A comparison of the total water supply sources available to the water supplier with ***the total projected water use for the drought period.*** (Emphasis added).

CWC §10635(b) is a new requirement for 2020 UWMPs. A critical part of this new statutory language is the requirement to prepare a five-year Drought Risk Assessment (see Section 7.5). As a first step, DWR suggests that water suppliers estimate their unconstrained water demand for the next five years (2021-2025). Unconstrained water demand is water use in the absence of drought water use restrictions. Drought conditions cause unconstrained demands to increase. The Drought Risk Assessment presented in Section 7.5 accounts for this increase in unconstrained water demand. Cal Water's demand forecast model separately estimates water use for normal, wet, and dry weather conditions. Table 4-8 shows unconstrained demands for 2021-2025 for normal weather and multiple-dry-year scenarios.

Table 4-8. Characteristic Five-Year Water Use (AF)

Weather Scenario	2021	2022	2023	2024	2025
Multi-Year Dry	13,690	13,689	13,695	13,707	13,699
Normal	12,790	12,788	12,794	12,805	12,796
NOTES: The table shows unconstrained demand (i.e., demand in the absence of drought water use restrictions).					

4.3 Climate Change Considerations

☑ ***CWC § 10635(b)***

(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.

Climate strongly influences the level and seasonal pattern of District water demands. Cal Water has analyzed the effect of climate and weather variability on both aspects of demand.[23] Using

[23] A&N Technical Services, 2014. Cal Water Long-Term Water Demand Forecast Model. Report prepared for California Water Service Company. December 2014.

this information, Cal Water has estimated the effect of alternative climate warming scenarios on future water demand.[24] Table 4-9 summarizes the results of this analysis. It shows that for plausible emission scenarios and corresponding temperature increases, climate change may, on average, increase future District demands by 2 to 3 percent compared to current climate conditions. Two points are worth noting. First, this is the average effect. There is significant variation about the mean. Second, this is a ceteris paribus, or all else equal, result. It assumes existing levels and types of landscaping. However, landscaping choices are partly a function of climate and as the climate changes, so too may these choices. It is reasonable to think households and businesses will adapt their landscaping as the climate warms. This adaptation may mitigate some of the expected demand increase shown in the table.

Table 4-9. Climate Change Effect on Demand

Emissions Scenario	Change in Mean Temperature by 2040 (degree F)	Change from Current Mean Temperature (%)	Effect on Demand (%)
Lower Emissions Scenario (B1)	2.5	3.4%	2.0%
Higher Emissions Scenario (A2)	2.7	3.7%	2.1%
80%ile Temperature Scenario	3.6	4.9%	2.8%

NOTES:
(a) Predicted temperature increases for Southwest United States for alternative emission scenarios reported in Kunkel et al. (2013). Predicted effect on demand derived from weather response models estimated with historical monthly water use, temperature, and rainfall data.
(b) The physical climate framework for the 2013 National Climate Assessment is based on climate model simulations of the future using the high (A2) and low (B1) Special Report Emissions Scenarios (SRES). The A1B emission scenario reflects a middle case between the A2 and B1 scenarios. The 80%ile scenario is the 80th percentile temperature change across the family of emissions scenarios. Further description of emission scenarios can be found at https://www.ipcc.ch/site/assets/uploads/2018/03/sres-en.pdf

[24] Table 4-9 uses climate scenarios for the southwestern United States. These in turn rely on alternative greenhouse gas emission scenarios. Emissions under scenario A2 are higher than under scenario B2. The 80th percentile scenario is the 80th percentile temperature change for the full suite of emission scenarios. For further information, see Kunkel, K.E, L.E. Stevens, S.E. Stevens, L. Sun, E. Janssen, D. Wuebbles, K.T. Redmond, and J.G. Dobson, 2013. Regional Climate Trends and Scenarios for the U.S. National Climate Assessment. Part 5. Climate of the Southwest U.S., NOAA Technical Report NESDIS 142-5, dated 2013.

Chapter 5
SB X7-7 Baseline and Targets

☑ ***CWC § 10608.24 (b)***

Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

☑ ***CWC § 10608.28***

(a) An urban retail water supplier may meet its urban water use target within its retail service area, or through mutual agreement, by any of the following:

(1) Through an urban wholesale water supplier.

(2) Through a regional agency authorized to plan and implement water conservation, including, but not limited to, an agency established under the Bay Area Water Supply and Conservation Agency Act (Division 31 (commencing with Section 81300)).

(3) Through a regional water management group as defined in Section 10537.

(4) By an integrated regional water management funding area.

(5) By hydrologic region.

(6) Through other appropriate geographic scales for which computation methods have been developed by the department.

(b) A regional water management group, with the written consent of its member agencies, may undertake any or all planning, reporting, and implementation functions under this chapter for the member agencies that consent to those activities. Any data or reports shall provide information both for the regional water management group and separately for each consenting urban retail water supplier and urban wholesale water supplier.

The Water Conservation Act of 2009, also known as Senate Bill (SB) X7-7, requires that urban retail water suppliers reduce their per capita water use by 20 percent by 2020. SB X7-7 defines an urban retail water supplier as "a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes" (CWC §10608.12). The Bear Gulch District meets both criteria. The state will assess each urban retail water supplier's 2020 per capita water use against the target it established in its 2015 urban water management plan (UWMP).

This chapter demonstrates the District's compliance with its SB X7-7 per capita water use target and includes the following sections:

5.1 Wholesale Suppliers

5.2 Updates to the 2015 UWMP Calculations

5.3 Service Area Population

5.4 Baseline Periods, Baseline GPCD, and Confirmed SB X7-7 2020 Target

5.5 Demonstration of Compliance with SB X7-7 2020 Target

5.6 Demonstration of Compliance with Regional Alliance SB X7-7 2020 Target

5.1 Wholesale Suppliers

SB X7-7 does not directly apply to wholesale water suppliers. Wholesale suppliers may adopt programs and policies that support SB X7-7 compliance by the retail water suppliers they serve. They may also take part in a Regional Alliance (discussed below) set up to satisfy SB X7-7 requirements on a regional basis. As discussed in Chapter 2, the District is not a wholesale water supplier.

5.2 Updates to the 2015 UWMP Calculations

Urban retail water suppliers may update or correct the water use and population data they used to set their 2020 target in their 2015 UWMP. The District has not made any changes to these data.

5.3 Service Area Population

Service area population estimation must satisfy the requirements in Methodology 2 – Service Area Population – of DWR's *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use*. California Water Service Company (Cal Water)'s population estimation method is similar to the method used by DWR's Population Tool.[25] DWR reviewed and accepted Cal Water's population estimation method as part of the review of its 2015 UWMPs. Cal Water used this method to estimate the District's 2020 service area population. As reported in Chapter 3, the District's population was 60,814 in 2020.

[25] Cal Water estimates service area population using census block population data with the LandView 5 and MARPLOT software programs. In census years, the method estimates service area population using the population counts of census blocks with centroids falling within the District's service boundary. In off-census years, the method estimates population by adjusting the census year estimates for changes in the number of single- and multi-family service connections and dwelling units. As shown in the District's 2015 UWMP, estimates prepared using this method and DWR's Population Tool typically differ by less than a percent. Cal Water prefers using its method to be consistent with its other planning documents.

5.4 Baseline Periods, Baseline GPCD, and Confirmed SB X7-7 2020 Target

Table 5-1 shows the District's 5- and 10-year baseline periods, its baseline gallons per capita per day (GPCD) for these periods, and its confirmed SB X7-7 2020 target. The data used to calculate the baseline and target GPCD values are provided in Appendix F.

Table 5-1. SB X7-7 Baselines and Targets Summary (DWR Table 5-1)

Baseline Period	Start Year	End Year	Average Baseline GPCD	Confirmed 2020 Target GPCD
10-15 year	2000	2009	233	187
5 Year	2004	2008	237	
NOTES:				

5.5 Demonstration of Compliance with SB X7-7 2020 Target

Service area population and water use in 2020 were 60,814 and 12,972 AF, respectively, resulting in per capita water use of 190 GPCD. This is greater than the SB X7-7 target GPCD, as shown in Table 5-2. Supporting population and water use data are in Appendix F.

Table 5-2. SB X7-7 2020 Compliance (DWR Table 5-2)

2020 GPCD			2020 Confirmed Target GPCD	Did Supplier Achieve Targeted Reduction for 2020?
Actual 2020 GPCD	2020 TOTAL Adjustments	Adjusted 2020 GPCD *(Adjusted if applicable)*		
190			187	No
NOTES:				

Although District per capita water use in 2020 was greater than the SB X7-7 target GPCD, the District has complied with SB X7-7 via its membership in the California Water Service – San Francisco Bay Hydrologic Region, as demonstrated in the next section.

5.6 Demonstration of Compliance with Regional Alliance SB X7-7 2020 Target

An urban retail water supplier can satisfy SB X7-7 requirements either individually or as part of a Regional Alliance. The District formed a regional alliance with other Cal Water districts in the San Francisco Bay Hydrologic Region. The name of this Regional Alliance is California Water Service – San Francisco Bay Regional Alliance. Table 5-3 shows 2020 per capita water use for this Regional

Alliance. Table 5-4 demonstrates compliance with the Regional Alliance's SB X7-7 2020 target GPCD.[26]

Table 5-3. SB X7-7 Regional Alliance – 2020 GPCD (DWR RA 2020 GPCD Table)

Participating Member Agency Name	2020 Actual GPCD*	2020 Population	(2020 GPCD) X (2020 Population)	Regional Alliance 2020 GPCD (Actual)
Cal Water Bear Gulch District	190	60,814	11,554,660	
Cal Water Los Altos District	166	70,161	11,646,726	
Cal Water Livermore District	143	59,814	8,553,402	
Cal Water Mid Peninsula District	94	137,486	12,923,684	
Cal Water South San Francisco District	98	63,319	6,205,262	
Regional Alliance Totals	691	391,594	50,883,734	130

**All participating agencies must submit individual SB X7-7 Tables, as applicable, showing the individual agency's calculations. These tables are: SB X7-7 Tables 0 through 6, Table 7, any required supporting tables (as stated in SB X7-7 Table 7), and SB X7-7 Table 9, as applicable. These individual agency tables will be submitted with the individual or Regional Urban Water Management Plan.*

Table 5-4. SB X7-7 Regional Alliance – 2020 Compliance (DWR RA 2020 Compliance Table)

2020 Actual GPCD	Optional Adjustment for Economic Growth[1]	Adjusted 2020 Actual GPCD	2020 Target GPCD [2]	Did Alliance Achieve Targeted Reduction for 2020?
130			150	Yes

[1]Adjustments for economic growth can be applied to either the individual supplier's data or to the aggregate regional alliance data (but not both), depending upon availability of suitable data and methods. [2] 2020 Target GPCD will be taken from the Regional Alliance's SB X7-7 Verification Form, Weighted Target Table.

[26] The population and water use data used to establish the Regional Alliance's 2020 target GPCD are provided in the District's 2015 UWMP.

Chapter 6
Water Supply Characterization

☑ ***CWC § 10631 (b)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).

This chapter provides a description of the Bear Gulch District's (also referred to herein as "District") current water supplies, including local and imported surface water and other current and potential supply sources, such as groundwater, stormwater, and recycled water, as well as assessment of the energy intensity used to operate the District's treatment and distribution system. This chapter includes the following sections:

6.1 Purchased Water

6.2 Groundwater

6.3 Surface Water

6.4 Stormwater

6.5 Wastewater and Recycled Water

6.6 Desalinated Water Opportunities

6.7 Water Exchanges and Transfers

6.8 Future Water Projects

6.9 Summary of Existing and Planned Sources of Water

6.10 Special Conditions

6.11 Energy Intensity

To maintain consistency with the Urban Water Management Plans prepared by the San Francisco Public Utilities Commission (SFPUC) and the other Bay Area Water Supply and Conservation Agency (BAWSCA) member agencies, much of the language describing the SFPUC wholesale water supply in the following sections is common language provided by BAWSCA, in coordination with the SFPUC.

6.1 Purchased Water

☑ ***CWC § 10631 (h)*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

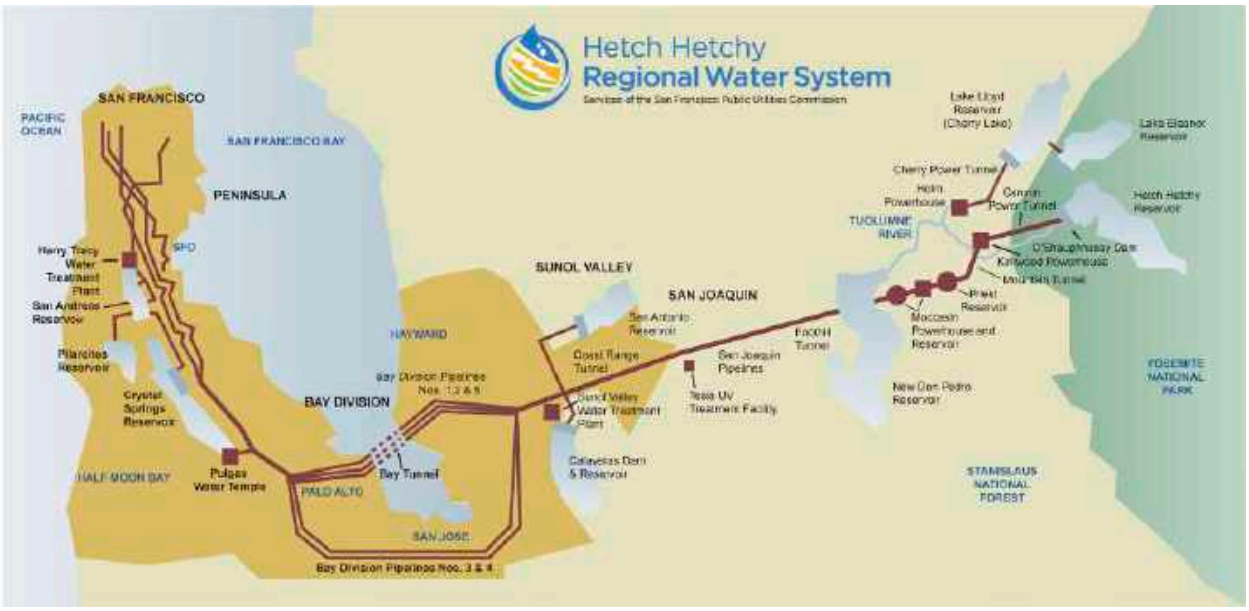
An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).

The majority of the water supply to the California Water Service Company (Cal Water) Bear Gulch District (i.e., approximately 91 percent over the 1980-2020 time period) is treated water purchased from the City and County of San Francisco's Regional Water System (RWS), which is operated by the SFPUC. Detailed information regarding the SFPUC RWS supply is provided below and in Section 7.1.1. Within the District, Cal Water takes delivery from eight turnouts (connections) from RWS transmission lines.

6.1.1 Description of SFPUC RWS

Approximately 85 percent of the water supply to the SFPUC RWS originates in the Hetch Hetchy watershed, located in Yosemite National Park, and flows down the Tuolumne River into the Hetch Hetchy Reservoir. Water from the Hetch Hetchy watershed is managed through the Hetch Hetchy Water and Power Project. The remaining 15 percent of the water supply to the SFPUC RWS originates locally in the Alameda and Peninsula watersheds and is stored in six different reservoirs in Alameda and San Mateo Counties. Details of the various components of the SFPUC RWS are provided below and are shown on Figure 6-1. Information regarding the Hetch Hetchy, Alameda, and Peninsula water systems is sourced from the SFPUC's 2020 UWMP and is provided verbatim below.

Figure 6-1. Regional Water System



6.1.2 Water Distribution

The RWS, shown in Figure 6-1, consists of more than 280 miles of pipelines, 60 miles of tunnels, 11 reservoirs, five pump stations, and two water treatment plants. It includes the Hetch Hetchy Project and the Bay Area water system facilities. The Hetch Hetchy Project is generally composed of the reservoirs, hydroelectric generation and transmission facilities, and water transmission facilities from the Hetch Hetchy Valley west to the Alameda East Portal of the Coast Range Tunnel in Sunol Valley. Water system components of the Hetch Hetchy Project are also referred to as the Hetch Hetchy System. The local Bay Area water system is comprised of two parts—the Alameda System and the Peninsula System—generally consisting of the facilities west of the Alameda East Portal of the Coast Range Tunnel, including the 63,000-acre Alameda and Peninsula watersheds, storage reservoirs, two water treatment plants, and the distribution system that delivers water to both retail and wholesale customers. The Hetch Hetchy, Alameda, and Peninsula Systems are described in more detail below.

Hetch Hetchy System: In the Hetch Hetchy System, water is diverted from Hetch Hetchy Reservoir into a series of tunnels and aqueducts from the Sierra Nevada to the San Joaquin Pipelines that cross the San Joaquin Valley to the Coast Range Tunnel, which connects to the Alameda System at the Alameda East Portal. Hetch Hetchy System water is disinfected at the Tesla Treatment Facility.

Alameda System: The Alameda System includes two reservoirs, San Antonio Reservoir and Calaveras Reservoir, which collect water from the San Antonio Creek, Upper Alameda Creek, and Arroyo Hondo watersheds in Alameda County. San Antonio Reservoir also receives water from the Hetch Hetchy System. Conveyance facilities in the Alameda System connect the Hetch Hetchy System and Alameda water sources to the Peninsula System. The BDPLs cross the South Bay to the Peninsula System delivering water to customers along the pipeline route. The Sunol Valley Water Treatment Plant (SVWTP) filters and disinfects water supplied from San Antonio Reservoir and Calaveras Reservoir.

Peninsula System: The Peninsula System includes conveyance facilities connecting the BDPLs to the in-City distribution system and to other customers on the Peninsula. Two reservoirs, Crystal Springs Reservoir and San Andreas Reservoir, collect runoff from the San Mateo Creek watershed. Crystal Springs Reservoir also receives water from the Hetch Hetchy System. A third reservoir, Pilarcitos Reservoir, collects runoff from the Pilarcitos Creek watershed and directly serves one of the Wholesale Customers, the Coastside County Water District (which includes the City of Half Moon Bay), along with delivering water to Crystal Springs and San Andreas Reservoirs. The Harry Tracy Water Treatment Plant (HTWTP) filters and disinfects water supplied from Crystal Springs Reservoir and San Andreas Reservoir before it is delivered to customers on the Peninsula and the in-City distribution system.

6.1.3 Water Treatment

The Hetch Hetchy Reservoir is the largest unfiltered water supply on the West Coast, and one of only a few large unfiltered municipal water supplies in the nation. The water originates from well-protected wilderness areas in Yosemite National Park, which flows down the Tuolumne River to Hetch Hetchy Reservoir. This water meets or exceeds all federal and State criteria for watershed protection. Water from Hetch Hetchy Reservoir is protected in pipes and tunnels as it is conveyed to the Bay Area, and requires pH adjustment to control pipeline corrosion and disinfection for bacteria control. Based on the SFPUC's disinfection treatment practice, extensive bacteriological quality monitoring, and high operational standards, the U.S. Environmental Protection Agency (USEPA) and the SWRCB Division of Drinking Water (DDW) determined that the Hetch Hetchy water source meets federal and State drinking water quality requirements without the need for filtration.

A new USEPA regulation took effect in 2012 requiring secondary disinfection for all unfiltered drinking water systems to control the waterborne parasite cryptosporidium. To comply with this regulation, the SFPUC completed construction of a new ultraviolet (UV) treatment facility in 2011. The Tesla Treatment Facility is a key component of the Water System Improvement Program (WSIP) and enhances the high-quality water from the

RWS. The facility has a capacity of 315 million gallons per day (mgd), making it the third largest UV drinking water disinfection facility in the U.S.

All water derived from sources other than Hetch Hetchy Reservoir is treated at one of two treatment plants: the SVWTP or the HTWTP. The SVWTP primarily treats water from the Alameda System reservoirs and has both a peak capacity and sustainable capacity of 160 mgd. Treatment processes include coagulation, flocculation, sedimentation, filtration, disinfection, fluoridation, corrosion control treatment, and chloramination. Fluoridation, chloramination, and corrosion control treatment can also be provided for the combined Hetch Hetchy System and SVWTP water at the Sunol Valley Chloramination Facility. The HTWTP treats water from the Peninsula System reservoirs and has a peak capacity of 180 mgd and a sustainable capacity of 140 mgd. Treatment processes include ozonation, coagulation, flocculation, filtration, disinfection, fluoridation, corrosion control treatment, and chloramination. Major upgrades to the SVWTP were completed in 2013 and to the HTWTP in 2015.

6.1.4 Water Storage

The majority of the water delivered by the SFPUC is supplied by runoff from the upper Tuolumne River watershed on the western slope of the central Sierra Nevada. Three major reservoirs collect runoff: Hetch Hetchy Reservoir, Lake Lloyd (a.k.a., Cherry Lake), and Lake Eleanor. A "water bank" in Don Pedro Reservoir is also integrated into system operations.[27] Don Pedro Reservoir, which is jointly owned and operated by Modesto Irrigation District and Turlock Irrigation District (the Districts), is located on the Tuolumne River downstream of the Hetch Hetchy System.

As a by-product of water delivery and water supply management, hydroelectric power is generated by the Hetch Hetchy Water and Power System. Water stored in Hetch Hetchy Reservoir is used for hydroelectric generation and also satisfies instream flow requirements when released downstream. Normally, only Hetch Hetchy Reservoir water supplies are exported to the Bay Area, while releases from Lake Eleanor and Lake Lloyd are used to satisfy instream flow requirements, satisfy Raker Act entitlements to the Districts downstream, and produce hydroelectric power. The Hetch Hetchy Water and Power System includes three major hydroelectric powerhouses along the Tuolumne

[27] The Turlock Irrigation District and Modesto Irrigation District have senior water rights to the City for the Tuolumne River water and are provided the first increment of flow in the Upper Tuolumne River watershed according to the apportionment set forth in the Raker Act of 1913 (38 Stat. 242). The water bank at Don Pedro Reservoir provides a credit and debit system, which allows the City to divert water upstream while meeting its obligations to the Turlock Irrigation District and Modesto Irrigation District. Through this mechanism, the SFPUC may pre-deliver the Turlock Irrigation District's and Modesto Irrigation District's entitlements and credit the water bank so that at other times the SFPUC may retain water upstream while the Turlock Irrigation District and Modesto Irrigation District debit the water bank.

River—Holm, Kirkwood, and Moccasin—that have a collective generating capacity of nearly 400 megawatts.

Downstream of the Hetchy Hetchy System, the SFPUC utilizes local watersheds in the Bay Area. Crystal Springs, San Andreas, and Pilarcitos Reservoirs, located in San Mateo County, capture local runoff in the Peninsula watershed, and Calaveras and San Antonio Reservoirs, located in Alameda Country, capture local runoff in the Alameda watershed. In addition to capturing local runoff, San Andreas, San Antonio, and Crystal Springs Reservoirs also provide storage for water from the Hetch Hetchy System and, along with Calaveras Reservoir, are an important water supply in the event of an interruption to Hetch Hetchy System deliveries.

Calaveras Reservoir had been operating in recent years at one-third of its capacity due to restrictions imposed by the DWR Division of Safety of Dams (DSOD). The Calaveras Dam Replacement Project, which took place from 2011 to 2019, involved the construction of a new dam downstream of the existing dam. The SFPUC began impounding water behind the new dam in the winter of 2018/2019 and continued the initial fill of the reservoir during the 2019/2020 winter season.

Table 6-A. Regional Water System Storage Capacity

Reservoir	Storage	
	Acre-Feet (AF)	**Billions of Gallons (BG)**
Up-Country[a]		
Hetch Hetchy	360,360	117.4
Lake Lloyd[b]	273,300	89.1
Lake Eleanor	27,100	8.8
Subtotal Up-Country	**660,760**	**215.3**
Local		
Calaveras (East Bay)[c]	96,800	31.5
San Antonio (East Bay)	50,500	16.5
Crystal Springs (Peninsula)[d]	69,300	22.6
San Andreas (Peninsula)	19,000	6.2
Pilarcitos (Peninsula)	3,100	1.0
Subtotal Local	**238,700**	**77.8**
Total Regional Water System[e]	**899,460**	**293.1**

a Three other regulating reservoirs are also part of the RWS: Early Intake, Priest, and Moccasin Reservoirs.

b Storage capacity shown includes flashboards, which are structures placed in a spillway to increase the capacity of a reservoir.

c Calaveras Reservoir was constructed with a storage capacity of 96,800 AF. Since December 2001, in response to safety concerns about the seismic stability of the dam and a directive from the Division of Safety of Dams (DSOD), the SFPUC has constructed a new comparably sized replacement dam downstream.

d Crystal Springs Reservoir has a maximum storage capacity of 22.1 BG (at 291.8 feet). When the Lower Crystal Springs Dam Improvement is complete, the reservoir will be operated normally at 287.8 feet (4 feet below capacity) based on permit conditions.

e This includes 63,700 AF in dead storage (i.e., the volume in a reservoir below the lowest controllable level). In addition, the SFPUC may draw against a credit of up to 570,000 AF in storage in a water bank account in Don Pedro Reservoir, for total storage for planning purposes of 1,469,460 AF.

6.1.5 Individual Supply Guarantees

San Francisco has a perpetual commitment (Supply Assurance) to deliver 184 mgd to the 24 permanent Wholesale Customers collectively. San Jose and Santa Clara are not included in the Supply Assurance commitment and each has temporary and interruptible water supply contracts with San Francisco. The Supply Assurance is allocated among the 24 permanent Wholesale Customers through Individual Supply Guarantees (ISG), which represent each Wholesale Customer's allocation of the 184 mgd Supply Assurance.

Cal Water's Individual Supply Guarantee (ISG) is 35.68 MGD (39,993 acre-feet per year; AFY), which is shared among its Bear Gulch, Mid-Peninsula, and South San Francisco Districts (also referred to herein as the "Peninsula Districts").

6.1.6 2028 SFPUC Decisions (formerly 2018 SFPUC Decisions)

Information regarding the 2028 SFPUC Decisions (formerly 2018 SFPUC Decision) was provided by BAWSCA in coordination with SFPUC and is provided verbatim below.

> In the 2009 WSA, the SFPUC committed to make three decisions before 2018 that affect water supply development:
>
> - Whether or not to make the cities of San Jose and Santa Clara permanent customers,
> - Whether or not to supply the additional unmet supply needs of the Wholesale Customers beyond 2018, and
> - Whether or not to increase the wholesale customer Supply Assurance above 184 mgd.
>
> Events since 2009 made it difficult for the SFPUC to conduct the necessary water supply planning and CEQA analysis required to make these three decisions before 2018. Therefore, in the 2018 Amended and Restated WSA, the decisions were deferred for 10 years to 2028.

Additionally, there have been recent changes to instream flow requirements and customer demand projections that have affected water supply planning beyond 2018. As a result, the SFPUC has established an Alternative Water Supply Planning program (AWSP) to evaluate several regional and local water supply options. Through this program, the SFPUC will conduct feasibility studies and develop an Alternative Water Supply Plan by July 2023 to support the continued development of water supplies to meet future needs.

6.2 Groundwater

☑ ***CWC § 10631***

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following:

(4) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information:

(A) The current version of any groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720), any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management for basins underlying the urban water supplier's service area.

(B) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For a basin that has not been adjudicated, information as to whether the department has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to coordinate with groundwater sustainability agencies or groundwater management agencies listed in subdivision (c) of Section 10723 to maintain or achieve sustainable groundwater conditions in accordance with a groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720).

(C) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

As shown in Table 6-1, Cal Water does not operate any groundwater wells to supply water for Bear Gulch District.

Table 6-1. Groundwater Volume Pumped (DWR Table 6-1)

X	Supplier does not pump groundwater. The supplier will not complete the table below.					
	All or part of the groundwater described below is desalinated.					
Groundwater Type	Location or Basin Name	2016	2017	2018	2019	2020
TOTAL						
NOTES:						

6.3 Surface Water

The District obtains a small fraction of its supplies (approximately nine percent of annual deliveries during the 1980-2020 time period) from surface water diverted from Bear Gulch Creek, a perennial stream that flows from a watershed in the Coast Range Mountains northeast to its confluence with San Francisquito Creek and eventually into San Francisco Bay. The District diverts water from two points of diversion (PODs) along the creek – the Upper POD (with an upstream area of 2.5 square miles) and the Lower POD (with an upstream area of 9.4 square miles). Diversions from the Upper and Lower PODs are each governed by separate State Water Resources Control Board (SWRCB)-administered water rights (i.e., pre-1914 claimed water rights and post-1914 SWRCB-issues diversion permits/licenses) that specify the volumes, rates, and timing of allowed diversions at each POD. In addition to these SWRCB-administered water rights, diversions are further constrained by certain diversion limitations and minimum instream flow requirements imposed by the California Department of Fish and Wildlife (CDFW) at the Upper POD and by the National Oceanic and Atmospheric Administration (NOAA) at the Lower POD. There also exists a 1936 agreement with Stanford University that prohibits Cal Water from diverting more than 50 percent of the flows that pass by (i.e., are not diverted at) the Upper POD.

Water diverted from the Upper POD flows through a gravity conveyance pipeline to a junction point where it is joined by water diverted from the Lower POD, at which point the water is pumped into the District-owned Bear Gulch Reservoir, a man-made storage facility impounded by an earthen dam. The Bear Gulch Reservoir is operated to have a minimum “dead pool” storage of 50 million gallons (MG), or approximately 153 acre-feet (AF). The maximum storage capacity of the reservoir has been reduced from 149 MG (547 AF) to 142.7 MG (438 AF), a limit imposed by the California Division of Safety of Dams (DSOD), based on a maximum storage elevation of 230 feet above mean sea level. Cal Water is undertaking capital improvements to Bear Gulch Reservoir to address DSOD’s seismic safety concerns, and may also considered increasing the maximum storage capacity. Outflows from Bear Gulch Reservoir are currently limited by the DSOD to the rate that causes a water surface elevation decline of 0.3 feet per day.

Water stored in Bear Gulch Reservoir is released and sent through the District-owned Bear Gulch Water Treatment Plant (BGWTP) prior to addition to the distribution system. The BGWTP, which was placed into operation in 1977, has a rated capacity of 6.0 MGD. There the water is clarified, filtered, and chloraminated in compliance with the Surface Water Treatment Rule and the Safe Drinking Water Act. Based on data from Water Years 1981 through 2019, annual production from the reservoir has ranged from a high of 2,809 AF (915 MG) in 1983 to a low of 0 AF (0 MG) in 2014.

Recent analysis by the District has shown that the projected long-term average annual diversion amount by the District from the Bear Gulch local surface water system is approximately 840 AFY. This estimate considers the hydrology of the watershed, the various regulatory constraints that

govern diversions (i.e., water rights and instream flow requirements), and current infrastructure limitations (i.e., pump, pipeline and treatment plant capacity). The storage capacity of Bear Gulch Reservoir is relatively small compared to average annual diversion/production, and therefore there is typically no carryover storage from one year to the next. Furthermore, given the various constraints on diversions at the District's two PODs under the SWRCB-administered water rights and the CDFW/NOAA-governed minimum instream flow requirements, the allowable diversions by the District are significantly lower during dry years even though the creek itself maintains flow.

6.4 Stormwater

There are no plans to divert stormwater for beneficial uses in the Bear Gulch District.

6.5 Wastewater and Recycled Water

☑ ***CWC § 10633***

The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.

The recycling of wastewater potentially offers several potential benefits to Cal Water and its customers. Perhaps the greatest of these benefits is to help maintain a sustainable groundwater supply either through direct recharge, or by reducing potable supply needs by utilizing recycled water for appropriate uses (e.g., landscape irrigation) now being served by potable water. Currently, however, no wastewater is recycled for direct reuse within the District.

6.5.1 Recycled Water Coordination

The District relies on and coordinates with the following wastewater collection, treatment and recycling agencies:

- Town of Atherton
- City of Menlo Park
- Town of Portola Valley
- Town of Woodside
- City of Redwood City
- Silicon Valley Clean Water (SVCW)[28]

[28] Formerly known as South Bayside System Authority.

6.5.2 Wastewater Collection, Treatment, and Disposal

☑ ***CWC § 10633 (a)***

A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

☑ ***CWC § 10633 (b)***

A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

Wastewater from the District is treated at the SVCW Wastewater Treatment Plant (WWTP). The SVCW WWTP treats wastewater flows generated from San Carlos, Belmont, Redwood City, Atherton, Menlo Park, East Palo Alto, Woodside, and numerous unincorporated areas in San Mateo County. Municipal wastewater is generated in the SVCW service area by residential and commercial, and industrial sources.

Atherton, Menlo Park, Portola Valley, Woodside, and portions of Redwood City own and operate their own collection systems, while the SVCW owns and operates the regional sewer transmission lines and the associated pump stations. The wastewater at the SVCW WWTP undergoes primary, secondary (activated sludge), dual media filtration, disinfection, and dechlorination treatment before being discharged to a deep-water outfall in the San Francisco Bay. The SVCW WWTP has a capacity to treat 29.5 MGD, but currently receives approximately 20.0 MGD from customers in the SVCW service area. SVCW is currently providing recycled water to sites located in and owned by the Cities of Redwood City and Menlo Park. However, recycled water is not distributed in the District service area at this time.

A summary of wastewater collection for the Bear Gulch District is shown in Table 6-2, including estimates of the volume of wastewater collected from District customers in 2020. The estimate is calculated by annualizing 90 percent of January water use in the service area. As shown in Table 6-3, no wastewater is discharged within the District service area.

As described in Section 6.5.4, there is currently a coordinated effort between Cal Water and other partners to potentially develop recycled water for various uses in the San Francisco Peninsula region. However, a recycled water system for beneficial use within the Bear Gulch District is not planned at this time. Cal Water examined the potential for recycled water use in the Bear Gulch District in the Water Supply and Facilities Master Plan for the District.[29] It was again explored in Cal Water's Integrated Long Term Water Supply Plan for the Three Peninsula Districts. These studies found a potential for 0.76 MGD of recycled water demand in the District. Because of low demand and high unit cost, this supply is not being immediately pursued. Cal Water will continue

[29] California Water Service Company, 2008. Water Supply and Facilities Master Plan – Bear Gulch District.

to evaluate the development of recycled water and will participate in a project if it becomes cost-effective. As such, as shown in Table 6-3, there is no projected recycled water supply for the District through the year 2045, and Cal Water has not implemented any incentive programs to encourage recycled water use.

Table 6-2. Wastewater Collected Within Service Area in 2020 (DWR Table 6-2)

	There is no wastewater collection system. The supplier will not complete the table below.
	Percentage of 2020 service area covered by wastewater collection system *(optional)*
	Percentage of 2020 service area population covered by wastewater collection system *(optional)*

Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected from UWMP Service Area 2020	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party? *(optional)*
Atherton	Estimated	1,345	Silicon Valley Clean Water	Silicon Valley Clean Water Wastewater Treatment Plant	No	
Menlo Park	Estimated	1,594	Silicon Valley Clean Water	Silicon Valley Clean Water Wastewater Treatment Plant	No	
Portola Valley	Estimated	598	Silicon Valley Clean Water	Silicon Valley Clean Water Wastewater Treatment Plant	No	
Woodside	Estimated	996	Silicon Valley Clean Water	Silicon Valley Clean Water Wastewater Treatment Plant	No	
Redwood City	Estimated	448	Silicon Valley Clean Water	Silicon Valley Clean Water Wastewater Treatment Plant	No	
Total Wastewater Collected from Service Area in 2020:		4,981				

NOTES:
(a) Volumes are in units of AF.
(b) The volume of wastewater collected from the Bear Gulch District service area in 2020 is estimated by annualizing 90 percent of January water use in the District.

Table 6-3. Wastewater and Discharge Within Service Area in 2020 (DWR Table 6-3)

X	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.										
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2020 volumes				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
						Total					
NOTES:											

6.5.3 Recycled Water System and Recycled Water Beneficial Uses

☑ ***CWC § 10633 (c-g)***

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

As shown in Table 6-4 and Table 6-5, the Bear Gulch District does not have any current or projected beneficial use of recycled water.

Table 6-4. Recycled Water Direct Beneficial Uses Within Service Area (DWR Table 6-4)

X	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.										
Name of Supplier Producing (Treating) the Recycled Water:											
Name of Supplier Operating the Recycled Water Distribution System:											
Supplemental Water Added in 2020 (volume)											
Source of 2020 Supplemental Water											
Beneficial Use Type	**Potential** Beneficial Uses of Recycled Water (Describe)	Amount of **Potential** Uses of Recycled Water (Quantity)	General Description of 2020 Uses	Level of Treatment	2020	2025	2030	2035	2040	2045	
				Total:							
2020 Internal Reuse											
NOTES:											

Table 6-5. 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual
(DWR Table 6-5)

X	Recycled water was not used in 2015 nor projected for use in 2020. The supplier will not complete the table below.

Beneficial Use Type	2015 Projection for 2020	2020 Actual Use
Total		
NOTES:		

6.5.4 Actions to Encourage and Optimize Future Recycled Water Use

At this time, as shown in Table 6-6, Cal Water does not have plans to initiate/expand the use of recycled water within the Bear Gulch District. Cal Water's supply portfolio in some districts already includes recycled water; elsewhere, Cal Water is participating in studies of the possibility of adding this supply source.

In the Bear Gulch District, Cal Water is participating in the development of the Crystal Springs Purified Water (PREP) Project, a purified water project that could provide 6 to 12 MGD of water supply through reservoir water augmentation at Crystal Springs Reservoir, which is a facility of the RWS. Treated wastewater from Silicon Valley Clean Water (SVCW) and/or the City of San Mateo would go through an advanced water treatment plant to produce purified water that meets state and federal drinking water quality standards. The purified water would then be transmitted 10 to 20 miles (depending on the alignment) to Crystal Springs Reservoir, blended with regional surface water supplies and treated again at Harry Tracy Water Treatment Plant. Project partners include Cal Water, the SFPUC, Bay Area Water Supply and Conservation Agency (BAWSCA), SVCW, Redwood City, Foster City, and the City of San Mateo. Partner agencies are contributing financial and staff resources towards the work effort.

Potential scenarios include a direct connection to the Bear Gulch District or the Mid-Peninsula District. Additional recycled water expansion efforts by SFPUC are described further in Section 7.1.1.

Table 6-6. Methods to Expand Future Recycled Water Use (DWR Table 6-6)

X	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
Section 6.5.4	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
		Total	
NOTES:			

6.6 Desalinated Water Opportunities

☑ ***CWC § 10631 (g)*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

Opportunities to develop desalinated water supplies from ocean water, brackish surface, and brackish groundwater were investigated by BAWSCA as part of Phase II of its Long-Term Reliable Water Supply Strategy (Strategy, see Section 7.1.1). According to BAWSCA, there are high costs and intensive permitting requirements associated with desalination. However, it does potentially provide a substantial yield given the limited options for generating significant new water supplies for the region. The SFPUC is also exploring desalination as part of its Alternative Water Supply Planning (AWSP) Program (see Section 7.1.1) and Cal Water explored the possibility of developing desalinated water as a source of supply in its Water Supply and Facilities Master Plan for the District.[30] At this time, Cal Water has no plans to implement a desalinated water project; however, Cal Water continues to investigate opportunities to add a potential desalination supply to the District's supply portfolio.

[30] California Water Service Company. Water Supply and Facilities Master Plan – Bear Gulch District.

6.7 Water Exchanges and Transfers

☑ ***CWC § 10631 (c)*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

Cal Water is not pursuing water transfers or exchanges involving the Bear Gulch District at this time.

6.7.1 Exchanges

Cal Water is not pursuing water exchanges involving the Bear Gulch District and other entities at this time.

6.7.2 Transfers

Cal Water is not pursuing water transfers involving the Bear Gulch District and other entities at this time. However, the water supply agreements with SFPUC allow the transfer of supply between wholesale customers without penalty, or additional charges. The available transfer mechanisms can be used if other wholesale customers have excess supply, either due to their contract capacity, or if Cal Water were to fund other projects within these agencies that may free up SFPUC supply for transfer.

6.7.3 Emergency Interties

Cal Water has emergency interties with the City of Redwood City and the City of Menlo Park.

6.8 Future Water Projects

☑ ***CWC § 10631*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

(b) (3) For any planned sources of water supply, a description of the measures that are being undertaken to acquire and develop those water supplies.

(f) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in normal and single-dry water years and for a period of drought lasting five consecutive water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

As shown in Table 6-7, there are no currently planned future water supply projects or programs that are expected to provide a quantifiable increase to the District's water supply. However, Cal Water is planning improvement efforts to benefit the Bear Gulch Reservoir including construction of an earth fill buttress to increase the seismic stability of the dam to acceptable DSOD levels and to maintain maximum reservoir operating pool elevation. This project could increase the yield of the local surface water supply source, but the volumetric benefit is not known at this time.

Furthermore, Cal Water is currently in the process of developing a regional water supply reliability study using integrated resource planning practices to create a long-term supply reliability strategy through 2050 for Cal Water districts in the Bay Area. It is anticipated that the forthcoming study will identify feasible water supply projects which may benefit the Bear Gulch District.

The SFPUC has been implementing its Water System Improvement Plan (WSIP) since it was adopted in 2008. The WSIP includes several water supply projects to address the Level of Service (LOS) Goals and Objectives established in the WSIP and updated in February 2020. The SFPUC's AWSP is also being implemented to explore other projects that would increase overall water supply resiliency. These programs and future water supply projects are described in Section 7.1.1.

Cal Water will continue its annual main replacement program to upgrade and improve the distribution system of the Bear Gulch District. To meet the average day and maximum day requirements of District customers, new booster stations and storage facilities will be constructed and replaced as needed.

Table 6-7. Expected Future Water Supply Projects or Programs (DWR Table 6-7)

	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
X	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
Section 7.3.4	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other suppliers?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier
	Y/N	*If Yes, Supplier Name*				
NOTES:						

6.9 Summary of Existing and Planned Sources of Water

☑ ***CWC § 10631 (b)*** *Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).*

☑ ***CWC § 10631 (b) (2)*** *When multiple sources of water supply are identified, a description of the management of each supply in correlation with the other identified supplies.*

☑ ***CWC § 10631 (b) (4) (D)*** *A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

Table 6-8 summarizes the actual volumes of purchased water and local surface water for the Bear Gulch District in 2020. It should be noted that the District-owned BGWTP was not operated in 2020 due to lack of rainfall and surface water diversions. Thus, surface water diverted from Bear Gulch Creek did not serve as a supply source to the District in 2020.

As discussed above, Cal Water's ISG of 39,993 AFY is shared among all three of its districts on the San Francisco Peninsula to provide the operational flexibility to distribute the supply as needed in each system depending on the availability of local supplies and conditions within each district. As such, the collective "Total Right or Safe Yield" from the RWS shown for the three districts in Table 6-8, Table 6-9A, and Table 6-9B is equal to the ISG. However, the "Reasonably Available Volume" shown in the tables is equal to each District's projected RWS demands through 2045, which are collectively less than the ISG.

An estimate of projected SFPUC supply available to the Bear Gulch District (i.e., the "Reasonably Available Volume") was calculated by subtracting the District's local surface water supply from the District's total demand over the planning horizon. The reasonably available volume of local surface water (840 AFY) is the projected long-term average diversion amount based on analysis conducted by Cal Water considering hydrology and all applicable constraints. The "Total Right or Safe Yield" (1,520 AFY) is based on the upper limit volume of diversion to storage under the District's SWRCB-administered surface water rights. Therefore, the local surface water supply amounts shown in Table 6-9A and Table 6-9B equal 840 AFY.

Consistent with the water supply reliability projections that are discussed in Chapter 7, the purchased supplies from the SFPUC RWS, along with local surface water supply to the Bear Gulch District, will be sufficient to serve normal year demands through 2045.

Table 6-8. Water Supplies – Actual (DWR Table 6-8)

Water Supply	Additional Detail on Water Supply	2020		
		Actual Volume	Water Quality	Total Right or Safe Yield *(optional)*
Surface water (not desalinated)	Bear Gulch Creek	0	Drinking Water	1,520 (b)
Purchased or Imported Water	San Francisco Public Utilities Commission	12,972	Drinking Water	39,993 (c)
	Total	12,972		

NOTES:
(a) Volumes are in units of AF.
(b) The "Total Right or Safe Yield" (1,520 AFY) of local surface water is based on the upper limit volume of diversion to storage under the District's SWRCB-administered surface water rights.
(c) Total SFPUC supply is equal to the ISG shared among Cal Water's three Peninsula districts: South San Francisco, Mid-Peninsula, and Bear Gulch.

Table 6-9A. Water Supplies (Combined Peninsula Districts) – Projected

District	Water Supply	Additional Detail on Water Supply	Projected Water Supply *Report To the Extent Practicable*									
			2025		**2030**		**2035**		**2040**		**2045** *(opt)*	
			Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
South San Francisco	Purchased or Imported Water	San Francisco Public Utilities Commission	6,009	39,993 (b)	5,949	39,993 (b)	6,101	39,993 (b)	6,466	39,993 (b)	6,889	39,993 (b)
	Groundwater/ In-Lieu Surface Water	Westside Basin	1,534	1,534	1,534	1,534	1,534	1,534	1,534	1,534	1,534	1,534
	District Total		7,543		7,483		7,635		8,000		8,423	
Bear Gulch	Purchased or Imported Water	San Francisco Public Utilities Commission	11,956	39,993 (b)	11,859	39,993 (b)	11,890	39,993 (b)	11,835	39,993 (b)	11,854	39,993 (b)
	Surface water (not desalinated)	Bear Gulch Reservoir (c)	840	1,520	840	1,520	840	1,520	840	1,520	840	1,520
	District Total		12,796		12,699		12,730		12,675		12,694	
Mid-Peninsula	Purchased or Imported Water	San Francisco Public Utilities Commission	14,418	39,993 (b)	14,530	39,993 (b)	14,786	39,993 (b)	14,977	39,993 (b)	15,279	39,993 (b)
	District Total		14,418		14,530		14,786		14,977		15,279	
Total			34,757		34,712		35,151		35,652		36,396	

NOTES:
(a) Volumes are in units of AF.
(b) Total SFPUC supply is equal to the ISG shared among Cal Water's three Peninsula districts: South San Francisco, Mid-Peninsula, and Bear Gulch. The reasonably available supply volume is equal to the districts' projected SFPUC purchases. For all years, the total SFPUC purchase volume is within the ISG of 35.68 MGD (39,993 AFY) shared between the three Peninsula districts.
(c) The "Reasonably Available Volume" of local surface water (840 AFY) is the projected long-term average diversion amount based on analysis conducted by Cal Water considering hydrology and all applicable constraints. The “Total Right or Safe Yield” (1,520 AFY) is based on the upper limit volume of diversion to storage under the District’s surface water rights.

Table 6-9B. Water Supplies – Projected (DWR Table 6-9)

Water Supply	Additional Detail on Water Supply	Projected Water Supply									
		2025		2030		2035		2040		2045	
		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Purchased or Imported Water	San Francisco Public Utilities Commission	11,956	39,993 (b)	11,859	39,993 (b)	11,890	39,993 (b)	11,835	39,993 (b)	11,854	39,993 (b)
Surface water (not desalinated)	Bear Gulch Creek (c)	840	1,520	840	1,520	840	1,520	840	1,520	840	1,520
	Total	12,796		12,699		12,730		12,675		12,694	

NOTES:
(a) Volumes are in units of AF.
(b) Total SFPUC supply is equal to the ISG shared among Cal Water's three Peninsula districts: South San Francisco, Mid-Peninsula, and Bear Gulch.
(c) The "Reasonably Available Volume" of local surface water (840 AFY) is the projected long-term average diversion amount based on analysis conducted by Cal Water considering hydrology and all applicable constraints. The “Total Right or Safe Yield” (1,520 AFY) is based on the upper limit volume of diversion to storage under the District’s SWRCB-administered surface water rights.

6.10 Special Conditions

6.10.1 Climate Change Effects

The issue of climate change has become an important factor in water resources planning in California, and is frequently considered in urban water management planning processes, though the extent and precise effects of climate change remain uncertain. There is convincing evidence that increasing concentrations of greenhouse gasses have caused and will continue to cause a rise in temperatures around the world, which will result in a wide range of changes in climate patterns. Moreover, observational data show that a warming trend occurred during the latter part of the 20th century and virtually all projections indicate this will continue through the 21st century. These changes will have a direct effect on water resources in California, and numerous studies have been conducted to determine the potential impacts to water resources. Based on these studies, climate change could result in the following types of water resource impacts, including impacts on the watersheds in the Bay Area:

- Reductions in the average annual snowpack due to a rise in the snowline and a shallower snowpack in the low and medium elevation zones, such as in the Tuolumne River basin, and a shift in snowmelt runoff to earlier in the year;
- Changes in the timing, annual average, intensity and variability of precipitation, and an increased amount of precipitation falling as rain rather than snow;
- Long-term changes in watershed vegetation and increased incidence of wildfires that could affect water quality and quantity;
- Sea level rise and an increase in saltwater intrusion;
- Increased water temperatures with accompanying potential adverse effects on some fisheries and water quality;
- Increases in evaporation and concomitant increased irrigation need; and
- Changes in urban and agricultural water demand.

Both the SFPUC and BAWSCA participated in the 2020 update of the Bay Area Integrated Regional Water Management Plan (BAIRWMP), which includes an assessment of the potential climate change vulnerabilities of the region's water resources and identifies climate change adaptation strategies. In addition, the SFPUC continues to study the effect of climate change on the RWS. These works are summarized below.

Bay Area Integrated Regional Water Management Plan

Climate change adaptation continues to be an overarching theme for the 2019 BAIRWMP update. As stated in the BAIRWMP, identification of watershed characteristics that could potentially be vulnerable to future climate change is the first step in assessing vulnerabilities of water resources in the Bay Area Region (Region). Vulnerability is defined as the degree to which a system is exposed to, susceptible to, and able to cope with or adjust to, the adverse effects of climate change. A vulnerability assessment was conducted in accordance with the DWR's *Climate Change Handbook for Regional Water Planning* and using the most current science available for the Region. The vulnerability assessment, summarized in the table below, provides the main water planning categories applicable to the Region and a general overview of the qualitative assessment of each category with respect to anticipated climate change impacts.

Summary of BAIRWMP Climate Change Vulnerability Assessment

Vulnerability Areas	General Overview of Vulnerabilities
Water Demand	**Urban and Agricultural Water Demand** – Changes to hydrology in the Region as a result of climate change could lead to changes in total water demand and use patterns. Increased irrigation (outdoor landscape or agricultural) is anticipated to occur with temperature rise, increased evaporative losses due to warmer temperature, and a longer growing season. Water treatment and distribution systems are most vulnerable to increases in maximum day demand.
Water Supply	**Imported Water** – Imported water derived from the Sierra Nevada sources and Delta diversions provide 66 percent of the water resources available to the Region. Potential impacts on the availability of these sources resulting from climate change directly affect the amount of imported water supply delivered to the Region. **Regional Surface Water** – Although future projections suggest that small changes in total annual precipitation over the Region will not change much, there may be changes to when precipitation occurs with reductions in the spring and more intense rainfall in the winter. **Regional Groundwater** – Changes in local hydrology could affect natural recharge to the local groundwater aquifers and the quantity of groundwater that could be pumped sustainably over the long-term in

Vulnerability Areas	General Overview of Vulnerabilities
	some areas. Decreased inflow from more flashy or more intense runoff, increased evaporative losses and warmer and shorter winter seasons can alter natural recharge of groundwater. Salinity intrusion into coastal groundwater aquifers due to sea-level rise could interfere with local groundwater uses. Furthermore, additional reductions in imported water supplies would lead to less imported water available for managed recharge of local groundwater basins and potentially more groundwater pumping in lieu of imported water availability.
Water Quality	**Imported Water** – For sources derived from the Delta, sea-level rise could result in increases in chloride and bromide (a disinfection by-product (DBP) precursor that is also a component of sea water), potentially requiring changes in treatment for drinking water. Increased temperature could result in an increase in algal blooms, taste and odor events, and a general increase in DBP formation **Regional Surface Water** – Increased temperature could result in lower dissolved oxygen in streams and prolong thermocline stratification in lakes and reservoirs forming anoxic bottom conditions and algal blooms. Decrease in annual precipitation could result in higher concentrations of contaminants in streams during droughts or in association with flushing rain events. Increased wildfire risk and flashier or more intense storms could increase turbidity loads for water treatment. **Regional Groundwater** – Sea-level rise could result in increases in chlorides and bromide for some coastal groundwater basins in the Region. Water quality changes in imported water used for recharge could also impact groundwater quality.
Sea-Level Rise	Sea-level rise is additive to tidal range, storm surges, stream flows, and wind waves, which together will increase the potential for higher total water levels, overtopping, and erosion. Much of the bay shoreline is comprised of low-lying diked baylands which are already vulnerable to flooding. In addition to rising mean sea

Vulnerability Areas	General Overview of Vulnerabilities
	level, continued subsidence due to tectonic activity will increase the rate of relative sea-level rise. As sea-level rise increases, both the frequency and consequences of coastal storm events, and the cost of damage to the built and natural environment, will increase. Existing coastal armoring (including levees, breakwaters, and other structures) is likely to be insufficient to protect against projected sea-level rise. Crest elevations of structures will have to be raised or structures relocated to reduce hazards from higher total water levels and larger waves.
Flooding	Climate change projections are not sensitive enough to assess localized flooding, but the general expectation is that more intense storms would occur thereby leading to more frequent, longer and deeper flooding. Changes to precipitation regimes may increase flooding. Elevated Bay elevations due to sea-level rise will increase backwater effects exacerbating the effect of fluvial floods and storm drain backwater flooding.
Ecosystem and Habitat	Changes in the seasonal patterns of temperature, precipitation, and fire due to climate change can dramatically alter ecosystems that provide habitats for California's native species. These impacts can result in species loss, increased invasive species ranges, loss of ecosystem functions, and changes in vegetation growing ranges. Reduced rain and changes in the seasonal distribution of rainfall may alter timing of low flows in streams and rivers, which in turn would have consequences for aquatic ecosystems. Changes in rainfall patterns and air temperature may affect water temperatures, potentially affecting coldwater aquatic species. Bay Area ecosystems and habitat provide important ecosystem services, such as: carbon storage, enhanced water supply and quality,

Vulnerability Areas	General Overview of Vulnerabilities
	flood protection, food and fiber production. Climate change is expected to substantially change several of these services. The region provides substantial aquatic and habitat-related recreational opportunities, including: fishing, wildlife viewing, and wine industry tourism (a significant asset to the region) that may be at risk due to climate change effects.
Hydropower	Currently, several agencies in the Region produce or rely on hydropower produced outside of the Region for a portion of their power needs. As the hydropower is produced in the Sierra, there may be changes in the future in the timing and amount of energy produced due to changes in the timing and amount of runoff as a result of climate change. Some hydropower is also produced within the region and could also be affected by changes in the timing and amount of runoff.

Source: 2019 Bay Area Integrated Regional Water Management Plan (BAIRWMP), Table 16-3.

SFPUC Climate Change Studies

The SFPUC views assessment of the effects of climate change as an ongoing project requiring regular updating to reflect improvements in climate science, atmospheric/ocean modeling, and human response to the threat of greenhouse gas emissions. Climate change research by the SFPUC began in 2009 and continues to be refined. In its 2012 report "Sensitivity of Upper Tuolumne River Flow to Climate Change Scenarios," the SFPUC assessed the sensitivity of runoff into Hetch Hetchy Reservoir to a range of changes in temperature and precipitation due to climate change. Key conclusions from the report include the following:

- With differing increases in temperature alone, the median annual runoff at Hetch Hetchy would decrease by 0.7-2.1 percent from present-day conditions by 2040 and by 2.6-10.2 percent from present-day by 2100. Adding differing decreases in precipitation on top of temperature increases, the median annual runoff at Hetch Hetchy would decrease by 7.6-8.6 percent from present-day conditions by 2040 and by 24.7-29.4 percent from present-day conditions by 2100.

- In critically dry years, these reductions in annual runoff at Hetch Hetchy would be significantly greater, with runoff decreasing up to 46.5 percent from present day conditions by 2100 utilizing the same climate change scenarios.

- In addition to the total change in runoff, there will be a shift in the annual distribution of runoff. Winter and early spring runoff would increase and late spring and summer runoff would decrease.

- Under all scenarios, snow accumulation would be reduced and snow would melt earlier in the spring, with significant reductions in maximum peak snow water equivalent under most scenarios.

Currently, the SFPUC is conducting a comprehensive assessment of the potential effects of climate change on water supply using a wide range of plausible increases in temperature and changes in precipitation to address the wide uncertainty in climate projections over the planning horizon 2020 to 2070. There are many uncertain factors such as climate change, changing regulations, water quality, growth and economic cycles that may create vulnerabilities for the Regional Water System's ability to meet levels of service. The uncertainties associated with the degree to which these factors will occur and how much risk they present to the water system is difficult to predict, but nonetheless they need to be considered in SFPUC planning. To address this planning challenge, the project uses a vulnerability-based planning approach to explore a range of future conditions to identify vulnerabilities, assess the risks associated with these vulnerabilities that could lead to developing an adaptation plan that is flexible and robust to a wide range of future outcomes.

Cal Water Climate Change Studies

Cal Water is committed to incorporating climate change into its ongoing water supply planning. Section 4.3 of this Urban Water Management Plan (UWMP or Plan) includes a description of plausible changes to projected demands under climate change conditions, and Cal Water is currently working to consider the effects of climate change in future demand modeling. The impact of climate change on District supplies is addressed in detail in the key resources described below, which are incorporated into this Plan by reference:

- Cal Water is currently in the process of developing a multi-phase climate change study. Phase 1, which primarily consisted of a literature and tools review of previous and complementary studies, was completed in December 2020.[31] Phase 2 will include District-level vulnerability assessments of Cal Water's facilities and operations, including developing an assessment approach that evaluates climate impacts to Cal Water,

[31] ICF, 2020. California Water Service Climate Change – Water Resource Monitoring and Adaptation Plan – Phase 1, prepared by ICF, dated December, 17, 2020.

identifies asset vulnerabilities, and prioritizes climate risks. Phase 3 will focus on an assessment of climate-driven impacts to water supply resources and demand. Phase 2 is expected to be completed by December 2021. The executive summary of Phase 1 of this study is included in this Plan in Appendix G.

- In 2016, Cal Water completed a study of climate change impacts on a representative subset of its districts, including the Bear Gulch District, to gain a better understanding of the potential impacts of climate change on the availability of its diverse supplies.[32] The 2016 study relied on the best available projections of changes in climate (temperature and precipitation) through the end of the century to examine how surface water flows and groundwater recharge rates may change. The executive summary of this study is included in this Plan in Appendix G.

6.10.2 Regulatory Conditions and Project Development

Emerging regulatory conditions (e.g., issues surrounding the Water Quality Control Plan for the San Francisco/Sacramento-San Joaquin Delta Estuary [Bay-Delta Plan]) may affect planned future projects and the characterization of future water supply availability and analysis. A detailed description of the potential impacts of Bay-Delta Plan implementation on RWS supply reliability is included in Section 7.1.1. The District does not have any current plans to develop additional supply sources. If the District does move forward with any plans to develop supply projects, emerging regulatory conditions will be considered, and the associated water supply reliability impacts will be assessed in future UWMP updates.

6.10.3 Other Locally Applicable Criteria

Other locally applicable criteria may affect characterization and availability of an identified water supply (e.g., changes in regional water transfer rules may alter the availability of a water supply that had historically been readily available). Reliability of the RWS is further discussed in Section 7.1.1. The District is exploring potential supply augmentation projects but does not have any current plans to develop additional supply sources. If the District does move forward with any plans to develop supply projects, locally applicable criteria will be considered, and the associated water supply reliability impacts will be assessed in future UWMP updates.

[32] California Water Service Company, 2016. Potential Climate Change Impacts on the Water Supplies of California Water Service, prepared by Gary Fiske and Associates, Inc. and Balance Hydrologics, Inc., dated January 2016.

6.11 Energy Intensity

☑ ***CWC § 10631.2***

(a) In addition to the requirements of Section 10631, an urban water management plan shall include any of the following information that the urban water supplier can readily obtain:
(1) An estimate of the amount of energy used to extract or divert water supplies.
(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.
(3) An estimate of the amount of energy used to treat water supplies.
(4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.
(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.
(6) An estimate of the amount of energy used to place water into or withdraw from storage.
(7) Any other energy-related information the urban water supplier deems appropriate.
(b) The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.
(c) The Legislature finds and declares that energy use is only one factor in water supply planning and shall not be considered independently of other factors.

The "Total Utility Approach" as defined by DWR in the UWMP Guidebook 2020 is used to report water-related energy-consumption data for the Bear Gulch District. Calendar year 2019 is selected as the one-year reporting period, and utility bills for the associated time period are used as the source for energy consumption data. Utility bills reported the following energy consumption data for the Bear Gulch District during calendar year 2019:

$$Total\ Energy\ Consumed\ by\ the\ Bear\ Gulch\ District = 4{,}089{,}238\ kilowatt\ hour\ (kWh)$$

Table 6-10 shows the energy consumed for each acre-foot of water entering the distribution system in the Bear Gulch District, including energy associated with the pumping, treatment, conveyance, and distribution of drinking water, but not including energy associated with the treatment of wastewater. Based on this, the energy intensity is estimated to be 345 kilowatt hours per acre-foot (kWh/AF).

Table 6-10. Recommended Energy Intensity – Total Utility Approach (DWR Table O-1B)

Urban Water Supplier: *Bear Gulch District*

Water Delivery Product

Retail Potable Deliveries

Enter Start Date for Reporting Period	1/1/2019	Urban Water Supplier Operational Control		
End Date	12/31/2019			
Is upstream embedded in the values reported?		Sum of All Water Management Processes	Non-Consequential Hydropower	
Water Volume Units Used	AF	Total Utility	Hydro-power	Net Utility
Volume of Water Entering Process (volume unit)		11,869	0	11,869
Energy Consumed (kWh)		4,089,238	0	4,089,238
Energy Intensity (kWh/volume)		344.5	0.0	344.5

Quantity of Self-Generated Renewable Energy

N/A kWh

Data Quality

Metered Data

Data Quality Narrative:

Utility bills for the associated time period are used as the source for energy consumption data.

Narrative:

Total energy consumption represents the energy consumed during pumping, treatment, conveyance, and distribution.

Chapter 7
Water Supply Reliability Assessment

☑ ***CWC § 10620 (f)***

An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

☑ ***CWC § 10630.5***

Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.

This chapter describes the reliability of the Bear Gulch District's (also referred to herein as "District") water supplies. Assessment of water supply reliability is complex and dependent upon a number of factors, such as the number of water sources, regulatory and legal constraints, hydrological and environmental conditions, climate change, and expected growth, among others. Based on available historical information and projections of future water uses, regulatory and legal constraints, and hydrological and environmental conditions, including climate change, California Water Service Company (Cal Water) has made its best determination of future water supply reliability for the District. This chapter also provides an estimate of the supply volumes available to the District and the corresponding supply and demand reliability assessments in normal years, single dry years, and multiple dry year periods, as well as a drought risk assessment for the next five years. This chapter includes the following sections:

7.1 Constraints on Water Sources

7.2 Reliability by Type of Year

7.3 Supply and Demand Assessment

7.4 Water Supply Management Tools and Options

7.5 Drought Risk Assessment

7.1 Constraints on Water Sources

The Bear Gulch District derives its water supply from a combination of both imported surface water supply purchased from the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS) and local surface water supply from Bear Gulch Creek. Cal Water has relied on the supply reliability estimates provided by the SFPUC for the RWS and the drought allocation structure provided by SFPUC and the Bay Area Water Supply and Conservation Agency (BAWSCA)

to estimate available RWS supplies in dry year types through 2045. Cal Water has identified several potential constraints on future supply availability, water quality, and climate change. These constraints, along with the management strategies that the Bear Gulch District and other affected agencies have employed or will employ to address these constraints are summarized in the following sections.

7.1.1 Regional Water System Supply Availability

☑ ***CWC § 10631 (h)*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).

Detailed information is provided below regarding factors that impact the SFPUC RWS supply reliability. The source for the information is the common language provided by the SFPUC and BAWSCA; see Appendix H.

Level of Service Goals

The SFPUC historically has met demand in its service area in all year types from its watersheds, which consist of:

- Tuolumne River watershed
- Alameda Creek watershed
- San Mateo County watersheds

In general, 85 percent of the supply comes from the Tuolumne River through Hetch Hetchy Reservoir and the remaining 15 percent comes from the local watersheds through the San Antonio, Calaveras, Crystal Springs, Pilarcitos and San Andreas Reservoirs. The adopted Water Supply Improvement Program (WSIP) retains this mix of water supply for all year types.

In 2008, the SFPUC adopted Level of Service (LOS) Goals and Objectives in conjunction with the adoption of the WSIP for the RWS. The SFPUC updated the LOS Goals and

Objectives in February 2020. The SFPUC's LOS Goals and Objectives related to water supply are as follows:

Program Goal	System Performance Objective
Water Supply – *meet customer water needs in non-drought and drought periods*	• Meet all state and federal regulations to support the proper operation of the water system and related power facilities. • Meet average annual water demand of 265 million gallons per day (MGD) from the SFPUC watersheds for retail and Wholesale Customers during non–drought years for system demands consistent with the 2009 Water Supply Agreement (WSA). • Meet dry-year delivery needs while limiting rationing to a maximum 20 percent system-wide reduction in water service during extended droughts. • Diversify water supply options during non-drought and drought periods. • Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers.

Bay-Delta Plan Impacts

Based on information provided by SFPUC and BAWSCA (Appendix H and Appendix I) the adoption of the 2018 Bay-Delta Plan Amendment is anticipated to impact the reliability of the RWS supplies in the future.

In December 2018, the State Water Resources Control Board (SWRCB) adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) to establish water quality objectives to maintain the health of the Bay-Delta ecosystem. The SWRCB is required by law to regularly review this plan. The adopted Bay-Delta Plan Amendment was developed with the stated goal of increasing salmonid populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay-Delta. The Bay-

Delta Plan Amendment requires the release of 30-50% of the "unimpaired flow"[33] on the three tributaries from February through June in every year type. In SFPUC modeling of the new flow standard, it is assumed that the required release is 40% of unimpaired flow.

If the Bay-Delta Plan Amendment is implemented, the SFPUC will be able to meet the projected water demands presented in this Urban Water Management Plan (UWMP) in normal years but would experience supply shortages in single dry years or multiple dry years. Implementation of the Bay-Delta Plan Amendment will require rationing in all single dry years and multiple dry years. The SFPUC has initiated an Alternative Water Supply Planning Program (AWSP) to ensure that San Francisco can meet its Retail and Wholesale Customer water needs, address projected dry years shortages, and limit rationing to a maximum 20 percent system-wide in accordance with adopted SFPUC policies. This program is in early planning stages and is intended to meet future water supply challenges and vulnerabilities such as environmental flow needs and other regulatory changes; earthquakes, disasters, and emergencies; increases in population and employment; and climate change. As the region faces future challenges – both known and unknown – the SFPUC is considering this suite of diverse non-traditional supplies and leveraging regional partnerships to meet Retail and Wholesale Customer needs through 2045.

The SWRCB has stated that it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, assuming all required approvals are obtained by that time. But implementation of the Plan Amendment is uncertain for multiple reasons.

First, since adoption of the Bay-Delta Plan Amendment, over a dozen lawsuits have been filed in both state and federal courts, challenging the SWRCB's adoption of the Bay-Delta Plan Amendment, including a legal challenge filed by the federal government, at the request of the U.S. Department of Interior, Bureau of Reclamation. This litigation is in the early stages and there have been no dispositive court rulings as of this date.

Second, the Bay-Delta Plan Amendment is not self-implementing and does not automatically allocate responsibility for meeting its new flow requirements to the SFPUC or any other water rights holders. Rather, the Bay-Delta Plan Amendment merely provides a regulatory framework for flow allocation, which must be accomplished by other regulatory and/or adjudicatory proceedings, such as a comprehensive water rights adjudication or, in the case of the Tuolumne River, may be implemented through the water quality certification process set forth in section 401 of the Clean Water Act as part

[33] "Unimpaired flow represents the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds." (Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Dec. 12, 2018) p.17, fn. 14, available at https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf.)

of the Federal Energy Regulatory Commission's licensing proceedings for the Don Pedro and La Grange hydroelectric projects. It is currently unclear when the license amendment process is expected to be completed. This process and the other regulatory and/or adjudicatory proceedings would likely face legal challenges and have lengthy timelines, and quite possibly could result in a different assignment of flow responsibility (and therefore a different water supply impact on the SFPUC).

Third, in recognition of the obstacles to implementation of the Bay-Delta Plan Amendment, the SWRCB Resolution No. 2018-0059 adopting the Bay-Delta Plan Amendment directed staff to help complete a "Delta watershed-wide agreement, including potential flow measures for the Tuolumne River" by March 1, 2019, and to incorporate such agreements as an "alternative" for a future amendment to the Bay-Delta Plan to be presented to the SWRCB "as early as possible after December 1, 2019." In accordance with the SWRCB's instruction, on March 1, 2019, SFPUC, in partnership with other key stakeholders, submitted a proposed project description for the Tuolumne River that could be the basis for a voluntary substitute agreement with the SWRCB ("March 1st Proposed Voluntary Agreement"). On March 26, 2019, the Commission adopted Resolution No. 19-0057 to support the SFPUC's participation in the Voluntary Agreement negotiation process. To date, those negotiations are ongoing under the California Natural Resources Agency and the leadership of the Newsom administration.[34]

Drought Allocation Methodology

Given the constraints described above, the SFPUC has provided all of the Wholesale Customers with estimates of the RWS reliability in all year types though 2045, as shown in Appendix I. The Tier One Plan describes the method for allocating RWS water between Retail and Wholesale Customers during system-wide shortages of 20 percent or less. The Tier Two Plan allocates the collective Wholesale Customer share from the Tier One Plan among each of SFPUC's 26 Wholesale Customers.

For the purposes of 2020 UWMP development, BAWSCA provided a revised methodology to allocate RWS supplies during projected future single dry and multiple dry years in the instance where the supply shortfalls are greater than 20 percent. SFPUC and BAWSCA assumed that Tier One allocations for system-wide shortfalls of 16 percent to 20 percent would apply for all shortfalls greater than 20 percent. BAWSCA provided a revised methodology to allocate RWS supplies to Wholesale Agencies. The inclusion of these revised methodologies, which serve as the preliminary basis for UWMP supply reliability analyses, does not in any way imply an agreement by BAWSCA member agencies as to the exact allocation methodologies.

[34] California Natural Resources Agency, "Voluntary Agreements to Improve Habitat and Flow in the Delta and its Watersheds," available at https://files.resources.ca.gov/voluntary-agreements/.

The Tier One and Tier Two Plans and the drought allocation methodologies used in the 2020 UWMP for shortfalls of greater than 20 percent are further described below.

Tier One Drought Allocations

In July 2009, San Francisco and its Wholesale Customers in Alameda County, Santa Clara County, and San Mateo County (Wholesale Customers) adopted the WSA, which includes a Water Shortage Allocation Plan (WSAP) that describes the method for allocating water from the RWS between Retail and Wholesale Customers during system-wide shortages of 20 percent or less. The WSAP, also known as the Tier One Plan, was amended in the 2018 Amended and Restated WSA.

The SFPUC allocates water under the Tier One Plan when it determines that the projected available water supply is up to 20 percent less than projected system-wide water purchases. The following table shows the SFPUC (i.e, Retail Customers) share and the Wholesale Customers' share of the annual water supply available during shortages depending on the level of system-wide reduction in water use that is required. The Wholesale Customers' share will be apportioned among the individual Wholesale Customers based on a separate methodology adopted by the Wholesale Customers, known as the Tier Two Plan, discussed further below.

Level of System-Wide Reduction in Water Use Required	Share of Available Water	
	SFPUC Share	Wholesale Customers Share
5% or less	35.5%	64.5%
6% through 10%	36.0%	64.0%
11% through 15%	37.0%	63.0%
16% through 20%	37.5%	62.5%

The Tier One Plan allows for voluntary transfers of shortage allocations between the SFPUC and any Wholesale Customer as well as between Wholesale Customers themselves. In addition, water "banked" by a Wholesale Customer, through reductions in usage greater than required, may also be transferred.

As amended in 2018, the Tier One Plan requires Retail Customers to conserve a minimum of 5 percent during droughts. If Retail Customer demands are lower than the Retail

Customer allocation (resulting in a "positive allocation" to Retail[35]) then the excess percentage would be re-allocated to the Wholesale Customers' share. The additional water conserved by Retail Customers up to the minimum 5 percent level is deemed to remain in storage for allocation in future successive dry years.

The Tier One Plan will expire at the end of the term of the WSA in 2034, unless mutually extended by San Francisco and the Wholesale Customers.

The Tier One Plan applies only when the SFPUC determines that a system-wide water shortage exists and issues a declaration of a water shortage emergency under California Water Code Section 350. Separate from a declaration of a water shortage emergency, the SFPUC may opt to request voluntary cutbacks from its Retail and Wholesale Customers to achieve necessary water use reductions during drought periods.

As discussed above, the Tier One Plan only applies to system-wide shortages of 20 percent or less, and there is currently no methodology for sharing available water between SFPUC and Wholesale Customers for system-wide shortages of greater than 20 percent. SFPUC and BAWSCA assumed that Tier One allocations for System-Wide shortfalls of 16 percent to 20 percent would apply for all shortfalls greater than 20 percent for purposes of the UWMP supply reliability analyses. The analysis included herein does not in any way imply an agreement by BAWSCA member agencies with the assumed application of the Tier One allocations by SFPUC and BAWSCA for shortages of greater than 20 percent.

Tier Two Drought Allocations

The Wholesale Customers have negotiated and adopted the Tier Two Plan, referenced above, which allocates the collective Wholesale Customer share from the Tier One Plan among each of the 26 Wholesale Customers. These Tier Two allocations are based on a formula that takes into account multiple factors for each Wholesale Customer including:

- Individual Supply Guarantee;
- Seasonal use of all available water supplies; and
- Residential per capita use.

The water made available to the Wholesale Customers collectively will be allocated among them in proportion to each Wholesale Customer's Allocation Basis, expressed in MGD, which in turn is the weighted average of two components. The first component is the Wholesale Customer's Individual Supply Guarantee, as stated in the WSA, and is fixed. The second component, the Base/Seasonal Component, is variable and is calculated using

[35] See Water Supply Agreement, Water Shortage Allocation Plan (Attachment H), Section 2.1.

the monthly water use for three consecutive years prior to the onset of the drought for each of the Wholesale Customers for all available water supplies. The second component is accorded twice the weight of the first, fixed component in calculating the Allocation Basis. Minor adjustments to the Allocation Basis are then made to ensure a minimum cutback level, a maximum cutback level, and a sufficient supply for certain Wholesale Customers.

The Allocation Basis is used in a fraction, as numerator, over the sum of all Wholesale Customers' Allocation Bases to determine each wholesale customer's Allocation Factor. The final shortage allocation for each Wholesale Customer is determined by multiplying the amount of water available to the Wholesale Customers' collectively under the Tier One Plan, by the Wholesale Customer's Allocation Factor.

The Tier Two Plan requires that the Allocation Factors be calculated by BAWSCA each year in preparation for a potential water shortage emergency. As the Wholesale Customers change their water use characteristics (e.g., increases or decreases in SFPUC purchases and use of other water sources, changes in monthly water use patterns, or changes in residential per capita water use), the Allocation Factor for each Wholesale Customer will also change. However, for long-term planning purposes, each Wholesale Customer shall use as its Allocation Factor, the value identified in the Tier Two Plan when adopted.

Per WSA Section 3.11, the Tier One and Tier Two Plans will be used to allocate water from the Regional Water System between Retail and Wholesale Customers during system-wide shortages of 20% or less. For Regional Water System shortages in excess of 20%, San Francisco shall (a) follow the Tier 1 Shortage Plan allocations up to the 20% reduction, (b) meet and discuss how to implement incremental reductions above 20% with the Wholesale Customers, and (c) make a final determination of allocations above the 20% reduction. After the SFPUC has made the final allocation decision, the Wholesale Customers shall be free to challenge the allocation on any applicable legal or equitable basis. For purposes of the 2020 UWMPs, for San Francisco Regional Water System (RWS) shortages in excess of 20%, the allocations among the Wholesale Customers is assumed to be equivalent among them and to equal the drought cutback to Wholesale Customer by the SFPUC.

The Tier Two Plan, which initially expired in 2018, has been extended by the BAWSCA Board of Directors every year since for one additional calendar year. In November 2020, the BAWSCA Board voted to extend the Tier Two Plan through the end of 2021. BAWSCA's workplan for FY 2021-22 includes development of an updated Tier 2 Plan.

BAWSCA's workplan for FY 2021-22 includes development of an updated Tier 2 Plan.

Revised Drought Allocation Plan

As detailed by BAWSCA in multiple memos and workshops (Appendix I), the Tier Two Plan was not designed for RWS shortages greater than 20 percent.[36] In a memoranda dated February 18, 2021, BAWSCA provided a refined methodology to allocate RWS supplies during projected future single dry and multiple dry years in the instance where the supply shortfalls are greater than 20 percent. The revised methodology developed by BAWSCA allocates the wholesale RWS supplies as follows:

1. When the average Wholesale Customers' RWS shortages are 10 percent or less, an equal percent reduction will be applied across all agencies. This is consistent with the existing Tier Two requirement of a minimum 10 percent cutback in any Tier Two application scenario.
2. When average Wholesale Customers' shortages are between 10 and 20 percent, the Tier Two Plan will be applied.
3. When the average Wholesale Customers' RWS shortages are greater than 20 percent, an equal percent reduction will be applied across all agencies.

The associated allocations based on the updated BAWSCA methodology are included as Appendix I. While this allocation methodology has been used herein, Ca Water notes that, per its memoranda dated February 18, 2021 (Appendix I):

> "BAWSCA recognizes that this is not an ideal situation or method for allocation of available drought supplies. In the event of actual RWS shortages greater than 20 percent, the Member Agencies would have the opportunity to negotiate and agree upon a more nuanced and equitable approach. Such an approach would likely consider basic health and safety needs, the water needs to support critical institutions such as hospitals, and minimizing economic impacts on individual communities and the region."

As such, this allocation method is only intended to serve as the preliminary basis for the 2020 UWMP supply reliability analysis. The analysis provided herein does not in any way imply an agreement by BAWSCA member agencies as to the exact allocation methodology. BAWSCA member agencies are in discussions about jointly developing an allocation method that would consider additional multiple equity factors in the event that SFPUC is not able to deliver its contractual supply volume, and its cutbacks to the RWS supply exceed 20 percent.

[36] Note that the Tier One Drought Allocations were also not designed for shortages greater than 20 percent. SFPUC and BAWSCA have assumed for UWMP planning purposes that the Wholesale Share will remain 62.5 percent for all shortfalls greater than 16 percent.

7.1.2 Local Surface Water Supply Availability

The District's local surface water supply is estimated to be available during normal hydrologic years at a volume of 840 acre-feet per year (AFY), based on analysis of the Bear Gulch Creek watershed yield and with consideration of the various diversion constraints under the District's water rights and minimum instream flow requirements. Although local surface water diversions (and subsequent treatment and use of local surface water) have occurred historically during dry years, and the District's analysis indicates that some diversions are likely to occur in future dry years[37], for the purposes of this UWMP the District conservatively assumes that local surface water supplies will be zero during single dry and multiple dry years over the planning horizon.

7.1.3 Water Quality

☑ ***CWC § 10634***

The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Impaired water quality also has the potential to affect water supply reliability. Cal Water has and will continue to meet all state and federal water quality regulations. All drinking water standards are set by the U.S. Environmental Protection Agency (USEPA) under the authorization of the Federal Safe Drinking Water Act of 1974. In California, the State Water Resources Control Board (SWRCB), Division of Drinking Water (DDW) can either adopt the USEPA standards or set more stringent standards, which are then codified in Title 22 of the California Code of Regulations. There are two general types of drinking water standards:

- **Primary Maximum Contaminant Levels (MCLs)** are health protective standards and are established using a very conservative risk-based approach for each constituent that takes into potential health effects, detectability and treatability, and costs of treatment. Public water systems may not serve water that exceeds Primary MCLs for any constituent.

- **Secondary MCLs** are based on the aesthetic qualities of the water such as taste, odor, color, and certain mineral content, and are considered limits for constituents that may affect consumer acceptance of the water.

Cal Water routinely monitors the water that is treated and served to customers to ensure that water delivered to customers meets these drinking water standards. The results of this testing are reported to the SWRCB DDW following each test and are summarized annually in Water Quality Reports (also known as "Consumer Confidence Reports"), which are provided to

[37] Diversions from the Bear Gulch Creek system are estimated at 291 AF with a 90% exceedance probability.

customers by mail and made available on Cal Water's website: https://www.calwater.com/waterquality/water-quality-reports/.

As discussed in Chapter 6, the majority of the water supply to the SFPUC RWS is from the Hetch Hetchy Reservoir in the Sierra Nevada Mountains. The Hetch Hetchy Reservoir is considered a very high-quality water source due to low total dissolved solid (TDS) concentrations and other factors. Additional water supplies from the Alameda and Peninsula sources come from areas with restricted access to protect the source water quality.

The SFPUC's Water Quality Division (WQD) regularly collects and tests water samples from reservoirs and designated sampling points throughout the RWS to ensure that the SFPUC's water meets or exceeds federal and state drinking water standards. In 2019, the WQD conducted more than 53,650 drinking water tests in the sources and transmission systems. This is in addition to the extensive treatment process control monitoring performed by the SFPUC's certified operators and online instruments. The SFPUC also has online instruments providing continuous water quality monitoring at numerous locations.

Given Cal Water and SFPUC's proactive monitoring and management of water quality, water quality is not expected to impact the reliability of the District's available supplies within the planning horizon (i.e., through 2045).

7.1.4 Climate Change

☑ ***CWC § 10631 (b) (1)***

…For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.

Section 6.10.1 provides a summary of the assessments of the applicable climate change on supplies that Cal Water and SFPUC have previously performed and those planned for the near term. The anticipated effects of climate change have been directly factored into the District's assessment of its supply reliability. As discussed in Section 6.10.1, Cal Water is actively working to further quantify and consider future climate change impacts as part of its Cal Water's ongoing supply and operations planning.

7.2 Reliability by Type of Year

☑ ***CWC § 10631 (b)***

Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following:

☑ ***CWC § 10631 (b)(1)***

A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.

☑ ***CWC § 10635 (a)***

Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

Per the UWMP Guidebook 2020, the water service reliability assessment includes three unique year types:

- A normal hydrologic year represents the water supplies available under normal conditions, this could be an averaged range of years or a single representative year,
- A single dry year represents the lowest available water supply, and
- A five-consecutive year drought represents the driest five-year period in the historical record.

Identification of these dry year periods consistent with the UWMP Guidebook 2020 methodology is provided in the language provided by BAWSCA and the SFPUC in Appendix H and Appendix I, and is presented in Table 7-1 and Table 7-2.

Table 7-1. Basis of Water Year Data (Reliability Assessment) (DWR Table 7-1)

Year Type	Base Year	Available Supplies if Year Type Repeats	
		X	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location: Table 7-2
			Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available	% of Average Supply
Average Year			
Single-Dry Year			
Consecutive Dry Years 1st Year			
Consecutive Dry Years 2nd Year			
Consecutive Dry Years 3rd Year			
Consecutive Dry Years 4th Year			
Consecutive Dry Years 5th Year			
NOTES:			

7.2.1 SFPUC Supply Modeled RWS Dry Year Supply Availability

As described in SFPUC's 2020 UWMP, SFPUC used the Hetch Hetchy and Local Simulation Model (HHLSM) to estimate SFPUC RWS supply availability for water service reliability assessment and the drought risk assessment (DRA; Section 7.5). HHLSM simulates supplies over a historical record of hydrology from 1920 through 2017 with a representation of current and planned SFPUC RWS infrastructure and operations.

Water supply shortfalls presented by SFPUC in Appendix I were estimated using SFPUC's design drought methodology. The SFPUC uses a hypothetical 8.5-year design drought that is more severe than what the RWS has historically experienced as the basis for planning and modeling of future scenarios. The design drought consists of the 1987-92 drought, followed by an additional 2.5 years of dry conditions from the hydrologic record that include the 1976-77 drought. The five-consecutive-year dry sequence used for the UWMP represents years 2 through 6 of the design drought. However, the modeling approach assumes water supply rationing each year that is designed to provide sufficient carry-over water in SFPUC reservoirs to continue delivering water, although at reduced levels, during each year of the five-consecutive year drought and the remaining years of the design drought.[38]

[38] SFPUC, 2021. 2020 Urban Water Management Plan, dated June 2021.

SFPUC provided results for two modeled scenarios, which show significantly different supply reliability projections for the RWS:

2. With full implementation of the Bay-Delta Plan Amendment in 2023
3. Without implementation of the Bay-Delta Plan Amendment

The SFPUC decided to present the water reliability analysis with full implementation of the Bay-Delta Plan Amendment in the SFPUC 2020 UWMP Submittal Tables and provided the following rationale for that decision:

> The adoption of the Bay-Delta Plan Amendment may significantly impact the supply available from the RWS. SFPUC recognizes that the Bay-Delta Plan Amendment has been adopted and that, given that it is now state law, we must plan for a future in which it is fully implemented. SFPUC also acknowledges that the plan is not self-implementing and therefore does not automatically go into effect. SFPUC is currently pursuing a voluntary agreement as well as a lawsuit which would limit implementation of the Plan. With both of these processes occurring on an unknown timeline, SFPUC does not know at this time when the Bay-Delta Plan Amendment is likely to go into effect. As a result, it makes sense to conduct future supply modeling for a scenario that doesn't include implementation of the Bay-Delta Plan Amendment, as that represents a potential supply reliability scenario.
>
> Because of the uncertainty surrounding implementation of the Bay-Delta Plan Amendment, the SFPUC conducted water service reliability assessment that includes: (1) a scenario in which the Bay-Delta Plan Amendment is fully implemented in 2023, and (2) a scenario that considers the SFPUC system's current situation without the Bay-Delta Plan Amendment. The two scenarios provide a bookend for the possible future scenarios regarding RWS supplies. The standardized tables associated with the SFPUC's UWMP contain the future scenario that assumes implementation of the Bay-Delta Plan Amendment starting in 2023.
>
> Although the SWRCB has stated it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, given the current level of uncertainty, it is assumed for the purposes of the SFPUC's draft UWMP that the Bay-Delta Plan Amendment will be fully implemented starting in 2023.

As shown in Appendix I, SFPUC also provided results for each of the modeling scenarios described above assuming demands on the RWS equal to both: (1) the total of projected retail demands and projected Wholesale Customer purchases, and (2) a constant water demand of 265 MGD from the SFPUC watersheds for retail and Wholesale Customers, consistent with SFPUC's contractual obligation. According to the SFPUC, the modeling based on a demand of 265 MGD was used to "facilitate planning that supports meeting this Level of Service goal and their

contractual obligations." Supply modeling results presented in the text of the SFPUC's 2020 UWMP reflect an input of projected retail and Wholesale demands on the RWS.

Consistent with SFPUC's approach and guidance from SFPUC and BAWSCA, this UWMP presents results for the water service reliability assessment and the DRA (Section 7.5) based on the modeling scenario that assumes full implementation of the Bay-Delta Plan Amendment in 2023 and uses projected demands on the RWS. SFPUC modeling results for this scenario showing the total RWS supply available to Wholesale Customers during the characteristic year types can be found in Tables 3a-3g of the SFPUC letter dated March 30, 2021. These results show total Wholesale RWS supply shortfalls ranging from 36 percent to 54 percent of projected purchases during dry years after 2023.

For comparison purposes, results for the scenario without the Bay-Delta Plan Amendment can be found in Tables 4a-4g of the same SFPUC letter. These results indicated that the SFPUC would be able to meet 100 percent of Wholesale projected purchases during all year types except during the fourth and fifth consecutive dry years for base year 2045 when 15 percent Wholesale supply shortages are projected.

7.2.2 Cal Water's Year Type Characterization

As discussed in Section 6.1, in accordance with the SFPUC's perpetual obligation to Cal Water's Supply Assurance, Cal Water has an Individual Supply Guarantee (ISG) of 35.68 MGD (39,993 AFY), which is shared among its Bear Gulch, Mid-Peninsula, and South San Francisco Districts (also referred to herein as the "Peninsula Districts"). SFPUC is obligated to provide Cal Water with up to 100 percent of Cal Water's ISG during normal years.

Using the SFPUC modeling results presented in the of the SFPUC letter dated March 30, 2021, BAWSCA provided single and five-consecutive dry-year allocations for each agency based on the methodology described in Section 7.1.1. As discussed therein, for the purposes for the 2020 UWMP supply reliability analysis only, Wholesale Agency drought allocations assume an equal percent reduction across all agencies when the average Wholesale Customers' RWS shortages are greater than 20 percent. These percent reductions for the scenario that assumes the implementation of the Bay-Delta Plan Amendment in 2023 are included in Table E of the BAWSCA updated drought allocation memorandum data April 1, 2021 (Appendix I) and reproduced in Table 7-2, below, for base year 2025 through 2045. The percent reductions shown in Table 7-2 are applied to the District's projected potable demands listed in Table 4-3 for each respective base year to calculate the projected dry-year RWS supplies shown in Table 7-4 and Table 7-5.

Table 7-2. RWS Wholesale Supply Availability During Normal and Dry Years for Based Years 2025 through 2045 (Responds to DWR Table 7-1)

Base Year	Normal Year	Single Dry Year	Multiple Dry Years				
			Year 1	Year 2	Year 3	Year 4	Year 5
2025	100%	64%	64%	55%	55%	55%	55%
2030	100%	64%	64%	55%	55%	55%	55%
2035	100%	64%	64%	54%	54%	54%	50%
2040	100%	63%	63%	54%	54%	48%	48%
2045	100%	54%	54%	54%	54%	46%	46%

NOTES:
(a) Normal-year water supply availability is presented in terms of percentage of Cal Water's ISG (35.68 MGD).
(b) Dry-year water supply availability is presented in terms of percentage of projected RWS demands for each base year consistent the revised BAWSCA Drought Methodology that assumes equal percent cutbacks across all Wholesale Agencies.
(c) Results reflect scenario with Bay-Delta Plan Amendment implemented in 2023 and the use projected RWS purchases.

7.3 Supply and Demand Assessment

Water supply and demand patterns change during normal, single dry, and multiple dry years. Cal Water has relied on the demand modeling described in Chapter 4 to forecast demands for normal, single dry and multiple dry years.

7.3.1 Normal Year Supply and Demand Assessment

Table 7-2 shows the projected supply and demand totals for a normal year. The supply and demand totals are consistent with those in Table 6-9B and Table 4-3, respectively. The District is expected to have adequate water supplies during normal years to meet its projected demands through 2045.

Table 7-3. Normal Year Supply and Demand Comparison (DWR Table 7-2)

	2025	2030	2035	2040	2045
Supply totals *From DWR Table 6-9*	12,796	12,699	12,730	12,675	12,694
Demand totals *From DWR Table 4-3*	12,796	12,699	12,730	12,675	12,694
Difference	0	0	0	0	0

NOTES:
(a) Volumes are in units of AF.

7.3.2 Dry Year Supply and Demand Assessment (with Bay-Delta Plan)

The Bear Gulch District's local surface water supply is conservatively assumed to be zero during single dry and multiple dry years over the planning horizon.

The reliability of the RWS is anticipated to vary greatly in different year types. As described above and detailed in Appendix I, Cal Water has relied on the supply reliability estimates provided by the SFPUC for the RWS and the drought allocation structure provided by SFPUC and BAWSCA to estimate available RWS supplies in dry year types through 2045.[39]

Table 7-4 shows the projected supply and demand totals for the single dry year, and Table 7-5 shows the projected supply and demand totals for multiple dry year periods extending five years.

Dry year RWS supply availability is calculated in accordance with Table 7-2, as a percentage of projected RWS demands for each base year consistent with the revised BAWSCA Drought Methodology that assumes equal percent cutbacks across all Wholesale Agencies.

Table 7-4. Single Dry Year Supply and Demand Comparison (DWR Table 7-3)

	2025	2030	2035	2040	2045
Supply totals	8,546	8,482	8,503	8,334	7,154
Demand totals	13,354	13,253	13,285	13,228	13,248
Difference	(4,808)	(4,771)	(4,782)	(4,894)	(6,094)
NOTES: (a) Volumes are in units of AF.					

[39] The balance between supply and demand totals excludes usage reductions that are not directly a function of Cal Water supplies, but are externally-imposed by other entities, such as the 2015 State-mandated cutbacks.

Table 7-5. Multiple Dry Years Supply and Demand Comparison (DWR Table 7-4)

		2025	2030	2035	2040	2045
First year	Supply totals	8,767	8,701	8,722	8,549	7,339
	Demand totals	13,699	13,595	13,629	13,570	13,591
	Difference	(4,932)	(4,894)	(4,906)	(5,021)	(6,252)
Second year	Supply totals	7,534	7,477	7,360	7,328	7,339
	Demand totals	13,699	13,595	13,629	13,570	13,591
	Difference	(6,164)	(6,118)	(6,269)	(6,242)	(6,252)
Third year	Supply totals	7,534	7,477	7,360	7,328	7,339
	Demand totals	13,699	13,595	13,629	13,570	13,591
	Difference	(6,164)	(6,118)	(6,269)	(6,242)	(6,252)
Fourth year	Supply totals	7,534	7,477	7,360	6,514	6,252
	Demand totals	13,699	13,595	13,629	13,570	13,591
	Difference	(6,164)	(6,118)	(6,269)	(7,057)	(7,339)
Fifth year	Supply totals	7,534	7,477	6,814	6,514	6,252
	Demand totals	13,699	13,595	13,629	13,570	13,591
	Difference	(6,164)	(6,118)	(6,814)	(7,057)	(7,339)

NOTES:
(a) Volumes are in units of AF.

7.3.3 Uncertainties in Dry Year Water Supply Projections

As shown in the above tables, significant water supply shortfalls are currently projected in future single and multiple dry years, directly because of the Bay-Delta Plan Amendment implementation. However, numerous uncertainties remain in the implementation of the Bay-Delta Plan Amendment. The water supply projections presented above likely represent a worst-case scenario in which the Bay-Delta Plan Amendment is implemented without the SFPUC and the SWRCB reaching a Voluntary Agreement and do not account for implementation of SFPUC's AWSP, described in more detail below. Under this supply scenario, SFPUC appears not to be able to meet its contractual obligations (i.e., Level of Service goals) and Cal Water's forecasted demands during droughts.

As discussed in Section 7.2.1, SFPUC also provided water supply reliability projections without the Bay-Delta Plan Amendment (see Appendix I), which likely represents a highly optimistic water supply reliability outcome. These projections indicated that without the Bay-Delta Plan Amendment SFPUC would be able to supply 100 percent of projected RWS demands in all year types through 2045, except for the 4th and 5th consecutive dry year in 2045, during which 90 percent of projected RWS demands (85 percent of the Wholesale demands) would be met. The large disparity in projected water supply reliability between these two scenarios demonstrate the current level uncertainty.

In addition to these two UWMP scenarios, in a March 26, 2021 Special Commission Meeting, SFPUC staff presented HHLSM modeling results for 10 different scenarios, including scenarios with the implementation of the Tuolumne River Voluntary Agreement (TRVA), with the implementation of the Bay-Delta Plan Amendment and the AWSP, and with the use of a modified rationing policy and a modified design drought (Appendix J). Results for the scenarios with the TRVA and with the AWSP (particularly with a modified rationing policy and design drought) showed significantly improved RWS supply availability compared to the Bay-Delta Plan Amendment scenario shown herein.

The current sources of uncertainty in the dry year water supply projections are summarized below:

- *Implementation of the Bay-Delta Plan Amendment is under negotiation.* The SFPUC is continuing negotiations with the SWRCB on implementation of the Bay-Delta Plan Amendment for water supply cutbacks, particularly during droughts. The SFPUC, in partnership with other key stakeholders, has proposed a voluntary substitute agreement to the Bay-Delta Plan Amendment, the TRVA, that provides a collaborative approach to protect the environment and plan for a reliable and high-quality future potable water supply. This is a dynamic situation and the projected drought cutback allocations may need to be revised before the next (i.e., 2025) UWMP depending on the outcome of ongoing negotiations.
- *Benefits of the AWSP are not accounted for in current supply projections.* As discussed in Section 7.3.4 and Appendix I, SFPUC is exploring options to increase its supplies through the AWSP. Implementation of feasible projects developed under the AWSP is not yet reflected in the supply reliability scenarios presented herein and is anticipated to reduce the projected RWS supply shortfalls (Appendix J).
- *SFPUC is considering modifications to its design drought methodology and rationing policy.* Shortening the 8.5-year design drought or modifying the rationing policy to increase rationing in the early years of a drought are anticipated to reduce projected RWS supply shortfalls (Appendix J).
- *Methodology for Tier One and Tier Two Wholesale drought allocations have not been established for wholesale shortages greater than 20 percent.* As discussed in Section 7.1.1, the current Tier One and Tier Two Plans are not designed for RWS supply shortages of greater than 20 percent. For UWMP planning purposes per BAWSCA guidance, the Tier One Wholesale share for a 16 percent to 20 percent supply reduction (62.5 percent) has been applied for reductions greater than 20 percent and an equal percent reduction has been applied across all Wholesale agencies. BAWSCA member agencies have not formally agreed to adopt this shortage allocation methodology and are in discussions about jointly developing an alternative allocation method that would consider additional equity factors

if SFPUC is unable to deliver its contractual supply volume and cutbacks to the RWS supply exceed 20 percent.

- *RWS demands are subject to change.* The RWS supply availability is dependent upon the system demands. As discussed in Section 7.2, the supply scenarios are based on the total projected Wholesale Customer purchases provided by BAWSCA to SFPUC in January 2021. Many BAWSCA agencies have refined their projected demands during the UWMP process after these estimates were provided to SFPUC. Furthermore, the RWS demand projections are subject to change in the future based upon future housing needs, increased conservation, and development of additional local supplies.
- *Frequency and duration of cutbacks are also uncertain.* While the projected shortfalls presented in the UWMP appear severe, the actual frequency and duration of such shortfalls are uncertain. Based on the HHLSM simulations provided by BAWSCA for the with Bay-Delta Plan Amendment scenario (Appendix I), rationing is anticipated to be required 20 percent of years for base year 2025 through 2035, 23 percent of all years for base year 2040, and 25 percent of years for base year 2045. In addition to the supply volumes, the above listed uncertainties would also impact the projected frequency and duration of shortfalls. As such, in addition to evaluating local options to increase supply reliability, Cal Water has placed high priority on working with BAWSCA and SFPUC in the upcoming years to better refine the estimates of RWS supply reliability and may amend this UWMP when new information becomes available.

The above uncertainties notwithstanding, BAWSCA's current drought allocation cutbacks will require the District to apply its Water Shortage Contingency Plan (WSCP) Stage 6, for water use restrictions above 50 percent and will affect Cal Water's short- and long-term water management decisions. As described further below (and in Section 7.4), Cal Water is working independently and with the other BAWSCA agencies to identify regional mitigation measures to improve reliability for regional and local water supplies and meet its customers' water needs. If conditions for large drought cutbacks to the RWS persist, Cal Water will need to implement additional demand management practices to invoke strict restrictions on potable water use, and obtain funding to accelerate developing alternate supplies of water.

Cal Water recommends that users of its 2020 UWMP contact District staff for potential updates about its water supply reliability and the DRA before using the 2020 UWMP drought cutback projections for their planning projects and referencing the drought allocations.

7.3.4 Strategies and Actions to Address Dry Year Supply Shortfalls

Although there remains significant uncertainty in future supply availability, as discussed above, Cal Water, SFPUC, and BAWSCA have developed strategies and actions to address the projected dry year supply shortfalls. These efforts are discussed in the following sections.

SFPUC and Other Regional Strategies and Actions

Dry Year Water Supply Projects

The WSIP authorized the SFPUC to undertake a number of water supply projects to meet dry-year demands with no greater than 20 percent system-wide rationing in any one year. Implementation of these projects is also expected to mitigate impacts of the implementation of the Bay-Delta Plan Amendment. Those projects include the following:

- *Calaveras Dam Replacement Project*. Calaveras Dam is located near a seismically active fault zone and was determined to be seismically vulnerable. To address this vulnerability, the SFPUC constructed a new dam of equal height downstream of the existing dam. Construction on the project occurred between 2011 and July 2019. The SFPUC began impounding water behind the new dam in accordance with California Division of Safety of Dams (DSOD) guidance in the winter of 2018/2019.

- *Alameda Creek Recapture Project*. As a part of the regulatory requirements for future operations of Calaveras Reservoir, the SFPUC must implement bypass and instream flow schedules for Alameda Creek. The Alameda Creek Recapture Project will recapture a portion of the water system yield lost due to the instream flow releases at Calaveras Reservoir or bypassed around the Alameda Creek Diversion Dam and return this yield to the RWS through facilities in the Sunol Valley. Water that naturally infiltrates from Alameda Creek will be recaptured into an existing quarry pond known as SMP (Surface Mining Permit)-24 Pond F2. The project will be designed to allow the recaptured water to be pumped to the Sunol Valley Water Treatment Plant or to San Antonio Reservoir. Construction of this project will occur from spring 2021 to fall 2022.

- *Lower Crystal Springs Dam Improvements*. The Lower Crystal Springs Dam (LCSD) Improvements were substantially completed in November 2011. The joint San Mateo County/SFPUC Bridge Replacement Project to replace the bridge across the dam was completed in January 2019. A WSIP follow up project to modify the LCSD Stilling Basin for fish habitat and upgrade the fish water release and other valves started in April 2019. While the main improvements to the dam have been completed, environmental permitting issues for reservoir operation remain significant. While the reservoir elevation was lowered due to DSOD restrictions, the habitat for the Fountain Thistle, an endangered plant, followed the lowered reservoir elevation. Raising the reservoir elevation now requires that new plant populations be restored incrementally before the reservoir elevation is raised. The result is that it may be several years before pre-project water storage volumes can be restored.

- *Regional Groundwater Storage and Recovery Project*. The Groundwater Storage and Recovery Project (GSRP) is a strategic partnership between SFPUC and three San Mateo County agencies – Cal Water, the City of Daly City, and the City of San Bruno – to conjunctively operate the south Westside Groundwater Basin. The project sustainably manages groundwater and surface water resources in a way that provides supplies during times of drought. During years of normal or heavy rainfall, the project would provide additional surface water to the partner agencies in San Mateo County in lieu of groundwater pumping. Over time, reduced pumping creates water storage through natural recharge of up to 20 billion gallons of new water supply available during dry years.

The project's Final Environmental Impact Report was certified in August 2014, and the project also received Commission approval that month. Phase 1 of this project consists of construction of thirteen well sites and is over 99 percent complete. Phase 2 of this project consists of completing construction of the well station at the South San Francisco Main site and some carryover work that has not been completed from Phase 1. Phase 2 design work began in December 2019.

- *2 MGD Dry-year Water Transfer*. In 2012, the dry-year transfer was proposed between the Modesto Irrigation District and the SFPUC. Negotiations were terminated because an agreement could not be reached. Subsequently, the SFPUC had discussions with the Oakdale Irrigation District for a one-year transfer agreement with the SFPUC for 2 MGD (2,240 acre-feet). No progress towards agreement on a transfer was made in 2019, but the irrigation districts recognize SFPUC's continued interest and SFPUC will continue to pursue transfers.

In order to achieve its target of meeting at least 80 percent of its customer demand during droughts with a system demand of 265 MGD, and to mitigate the impacts of the Bay-Delta Plan, the SFPUC must successfully implement the dry-year water supply projects included in the WSIP.

Furthermore, the permitting obligations for the Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements include a combined commitment of 12.8 MGD for instream flows on average. When this is reduced for an assumed Alameda Creek Recapture Project recovery of 9.3 MGD, the net loss of water supply is 3.5 MGD.

Alternative Water Supply Planning Program

As discussed, below, BAWSCA has taken steps to ensure that SFPUC develops alternative water supplies:

With the adoption of the Bay-Delta Plan Phase 1 (Bay-Delta Plan) by the State Water Resources Control Board in December of 2018, coupled with the uncertainties associated with litigation and the development of Voluntary Agreements that, if successful, would provide an alternative to the 40% unimpaired flow requirement that is required by the Bay-Delta Plan, BAWSCA redoubled its efforts to ensure that the SFPUC took necessary action to develop alternative water supplies such that they would be in place to fill any potential gap in supply by implementation of the Bay-Delta Plan and that the SFPUC would be able to meet its legal and contractual obligations to its Wholesale Customers.

In 2019, BAWSCA held numerous meetings with the SFPUC encouraging them to develop a division within their organization whose chief mission was to spearhead alternative water supply development. On June 25, 2019, BAWSCA provided a written and oral statement to the Commissioners urging the SFPUC to focus on developing new sources of supply in a manner similar to how it addressed the implementation of the Water System Improvement Program (WSIP). BAWSCA urged that a new water supply program was called for, with clear objectives, persistent focus, a dedicated team, adequate funding, and a plan for successful execution. The SFPUC Commission supported BAWSCA's recommendation and directed staff to undertake such an approach.

In early 2020, the SFPUC began implementation of the Alternative Water Supply Planning Program (AWSP), a program designed to investigate and plan for new water supplies to address future long-term water supply reliability challenges and vulnerabilities on the RWS.

Included in the AWSP is a suite of diverse, non-traditional supply projects that, to a great degree, leverage regional partnerships and are designed to meet the water supply needs of the SFPUC Retail and Wholesale Customers through 2045. As of the most recent Alternative Water Supply Planning Quarterly Update, SFPUC has budgeted $264 million over the next ten years to fund water supply projects. BAWSCA is heavily engaged with the SFPUC on its AWSP efforts.

SFPUC's AWSP is described in more detail below:

The SFPUC is increasing and accelerating its efforts to acquire additional water supplies and explore other projects that would increase overall water supply resilience through the AWSP. The drivers for the program include: (1) the adoption of the Bay-Delta Plan Amendment and the resulting potential limitations to RWS supply during dry years, (2) the net supply shortfall following the implementation of WSIP, (3) San Francisco's perpetual obligation to supply 184 MGD to the Wholesale Customers, (4) adopted LOS Goals to limit rationing to no more than 20 percent system-wide during droughts, and (5) the potential need to identify water supplies that would be required to offer permanent status to interruptible customers. Developing additional supplies through this program

would reduce water supply shortfalls and reduce rationing associated with such shortfalls. The planning priorities guiding the framework of the AWSP are as follows:

1. Offset instream flow needs and meet regulatory requirements
2. Meet existing obligations to existing permanent customers
3. Make interruptible customers permanent
4. Meet increased demands of existing and interruptible customers

In conjunction with these planning priorities, the SFPUC considers how the program fits within the LOS Goals and Objectives related to water supply and sustainability when considering new water supply opportunities. The key LOS Goals and Objectives relevant to this effort can be summarized as:

- Meet dry-year delivery needs while limiting rationing to a maximum of 20 percent system-wide reduction in water service during extended droughts;
- Diversify water supply options during non-drought and drought periods;
- Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers;
- Meet, at a minimum, all current and anticipated legal requirements for protection of fish and wildlife habitat;
- Maintain operational flexibility (although this LOS Goal was not intended explicitly for the addition of new supplies, it is applicate here).

Together, the planning priorities and LOS Goals and Objectives provide a lens through which the SFPUC considers water supply options and opportunities to meet all foreseeable water supply needs.

In addition to the Daly City Recycled Water Expansion project[40], which was a potential project identified in the SFPUC's 2015 UWMP and had committed funding at that time, the SFPUC has taken action to fund the study of potential additional water supply projects. Capital projects under consideration to develop additional water supplies include surface water storage expansion, recycled water expansion, water transfers,

[40] While this potential project was identified in the 2015 UWMP, it has since been approved by Daly City following environmental review and has a higher likelihood of being implemented.

desalination, and potable reuse. A more detailed list and descriptions of these efforts are provided below.

The capital projects that are under consideration would be costly and are still in the early feasibility or conceptual planning stages. Because these water supply projects would take 10 to 30 years to implement, and because required environmental permitting negotiations may reduce the amount of water that can be developed, the yield from these projects are not currently incorporated into SFPUC's supply projections. State and federal grants and other financing opportunities would be pursued for eligible projects, to the extent feasible, to offset costs borne by ratepayers.

- *Daly City Recycled Water Expansion (Regional, Normal- and Dry-Year Supply)*. This project can produce up to 3 MGD of tertiary recycled water during the irrigation season (~7 months). On an average annual basis, this is equivalent to 1.25 MGD or 1,400 AFY. The project is envisioned to provide recycled water to 13 cemeteries and other smaller irrigation customers, offsetting existing groundwater pumping from the South Westside Groundwater Basin; this will free up groundwater, enhancing the reliability of the Basin. The project is a regional partnership between the SFPUC and Daly City. The irrigation customers are located largely within California Water Service's (Cal Water's) service area. RWS customers will benefit from the increased reliability of the South Westside Basin for additional drinking water supply during droughts. In this way, this project supports the GSR Project, which is under construction.

- *ACWD-USD Purified Water Partnership (Regional, Normal- and Dry-Year Supply)*. This project could provide a new purified water supply utilizing Union Sanitary District's (USD) treated wastewater. Purified water produced by advanced water treatment at USD could be transmitted to the Quarry Lakes Groundwater Recharge Area to supplement recharge into the Niles Cone Groundwater Basin or put to other uses in Alameda County Water District's (ACWD) service area. With the additional water supply to ACWD, an in-lieu exchange with the SFPUC would result in more water left in the RWS. Additional water supply could also be directly transmitted to the SFPUC through a new intertie between ACWD and the SFPUC.

- *Crystal Springs Purified Water (Regional, Normal- and Dry-Year Supply)*. The Crystal Springs Purified Water (PREP) Project is a purified water project that could provide 6-12 MGD of water supply through reservoir water augmentation at Crystal Springs Reservoir, which is a facility of the RWS. Treated wastewater from Silicon Valley Clean Water (SVCW) and/or the City of San Mateo would go through an advanced water treatment plant to produce purified water that meets state and federal drinking water quality standards. The purified water would then be

transmitted 10 to 20 miles (depending on the alignment) to Crystal Springs Reservoir, blended with regional surface water supplies and treated again at Harry Tracy Water Treatment Plant. Project partners include the SFPUC, Bay Area Water Supply and Conservation Agency (BAWSCA), SVCW, CalWater, Redwood City, Foster City, and the City of San Mateo. Partner agencies are contributing financial and staff resources towards the work effort.

- *Los Vaqueros Reservoir Expansion (Regional, Dry Year Supply)*. The Los Vaqueros Reservoir Expansion (LVE) Project is a storage project that will enlarge the existing reservoir located in northeastern Contra Costa County from 160,000 acre-feet to 275,000 acre-feet. While the existing reservoir is owned and operated by the Contra Costa Water District (CCWD), the expansion will have regional benefits and will be managed by a Joint Powers Authority (JPA) that will be set up prior to construction. Meanwhile, CCWD is leading the planning, design and environmental review efforts. CCWD's Board certified the EIS/EIR and approved the LVE Project on May 13, 2020. The additional storage capacity from the LVE Project would provide a dry year water supply benefit to the SFPUC. BAWSCA is working in concert with the SFPUC to support their work effort on the LVE project.

    - Conveyance Alternatives: The SFPUC is considering two main pathways to move water from storage in a prospective LVE Project to the SFPUC's service area, either directly to RWS facilities or indirectly via an exchange with partner agencies. The SFPUC is evaluating potential alignments for conveyance.

    - Bay Area Regional Reliability Shared Water Access Program (BARR SWAP): As part of the BARR Partnership, a consortium of 8 Bay Area water utilities (including ACWD, BAWSCA, CCWD, EBMUD, Marin Municipal Water District (MMWD), SFPUC, Valley Water, and Zone 7 Water Agency) are exploring opportunities to move water across the region as efficiently as possible, particularly during times of drought and emergencies. The BARR agencies are proposing two separate pilot projects in 2020-2021 through the Shared Water Access Program (SWAP) to test conveyance pathways and identify potential hurdles to better prepare for sharing water during a future drought or emergency. A strategy report identifying opportunities and considerations will accompany these pilot transfers and will be completed in 2021.

- *Bay Area Brackish Water Desalination (Regional, Normal- and Dry-Year Supply)*. The Bay Area Brackish Water Desalination (Regional Desalination) Project is a partnership between CCWD, the SFPUC, Valley Water, and Zone 7 Water Agency.

The East Bay Municipal Utilities District (EBMUD) and ACWD may also participate in the project. The project could provide a new drinking water supply to the region by treating brackish water from CCWD's existing Mallard Slough intake in Contra Costa County. While this project has independent utility as a water supply project, for the current planning effort the SFPUC is considering it as a source of supply for storage in LVE. While the allocations remain to be determined among partners, the SFPUC is considering a water supply benefit of between 5 and 15 MGD during drought conditions when combined with storage at LVE.

- *Calaveras Reservoir Expansion (Regional, Dry Year Supply)*. Calaveras Reservoir would be expanded to create 289,000 acre-feet (AF) additional capacity to store excess Regional Water System supplies or other source water in wet and normal years. In addition to reservoir enlargement, the project would involve infrastructure to pump water to the reservoir, such as pump stations and transmission facilities.

- *Groundwater Banking*. Groundwater banking in the Modesto Irrigation District (MID) and Turlock Irrigation District (TID) service areas could be used to provide some additional water supply to meet instream releases in dry years reducing water supply impacts to the SFPUC service area. For example, additional surface water could be provided to irrigators in wet years, which would offset the use of groundwater, thereby allowing the groundwater to remain in the basin rather than be consumptively used. The groundwater that remains in the basin can then be used in a subsequent dry year for irrigation, freeing up surface water that would have otherwise been delivered to irrigators to meet instream flow requirements.

  A feasibility study of this option is included in the proposed Tuolumne River Voluntary Agreement. Progress on this potential water supply option will depend on the negotiations of the Voluntary Agreement.

- *Inter-Basin Collaborations*. Inter-Basin Collaborations could provide net water supply benefits in dry years by sharing responsibility for in-stream flows in the San Joaquin River and Delta more broadly among several tributary reservoir systems. One mechanism by which this could be accomplished would be to establish a partnership between interests on the Tuolumne River and those on the Stanislaus River, which would allow responsibility for streamflow to be assigned variably based on the annual hydrology.

  As is the case with Groundwater Banking, feasibility of this option is included in the proposed Tuolumne River Voluntary Agreement.

If all the projects identified through the current planning process can be implemented, there would still be a supply shortfall to meet projected needs. Furthermore, each of the supply options being considered has its own inherent challenges and uncertainties that may affect the SFPUC's ability to implement it.

Given the limited availability of water supply alternatives - unless the supply risks are significantly reduced or our needs change significantly - the SFPUC will continue to plan, develop and implement all project opportunities that can help bridge the anticipated water supply gaps during droughts. In 2019, the SFPUC completed a survey among water and wastewater agencies within the service area to identify additional opportunities for purified water. Such opportunities remain limited, but the SFPUC continues to pursue all possibilities.

BAWSCA's Long Term Reliability Water Supply Strategy

BAWSCA's Long-Term Reliable Water Supply Strategy (Strategy), completed in February 2015, quantified the water supply reliability needs of the BAWSCA member agencies through 2040, identified the water supply management projects and/or programs (projects) that could be developed to meet those needs, and prepared an implementation plan for the Strategy's recommendations.

When the 2015 Demand Study concluded it was determined that while there is no longer a regional normal year supply shortfall, there was a regional drought year supply shortfall of up to 43 MGD. In addition, key findings from the Strategy's project evaluation analysis included:

- Water transfers represent a high priority element of the Strategy.
- Desalination potentially provides substantial yield, but its high effective costs and intensive permitting requirements make it a less attractive drought year supply alternative.
- Other potential regional projects provide tangible, though limited, benefit in reducing dry-year shortfalls given the small average yields in drought years.

Since 2015, BAWSCA has completed a comprehensive update of demand projections and engaged in significant efforts to improve regional reliability and reduce the dry-year water supply shortfall.

- *Water Transfers*. BAWSCA successfully facilitated two transfers of portions of Individual Supply Guarantee (ISG) between BAWSCA agencies in 2017 and 2018. Such transfers benefit all BAWSCA agencies by maximizing use of existing supplies.

BAWSCA is currently working on an amendment to the WSA between the SFPUC and BAWSCA agencies to establish a mechanism by which member agencies that have an ISG may participate in expedited transfers of a portion of ISG and a portion of a Minimum Annual Purchase Requirement. In 2019, BAWSCA participated in a pilot water transfer that, while ultimately unsuccessful, surfaced important lessons learned and produced interagency agreements that will serve as a foundation for future transfers. BAWSCA is currently engaged in the Bay Area Regional Reliability Partnership[41] (BARR), a partnership among eight Bay Area water utilities (including the SFPUC, Alameda County Water District, BAWSCA, Contra Costa Water District, Santa Clara Valley Water District) to identify opportunities to move water across the region as efficiently as possible, particularly during times of drought and emergencies.

- *Regional Projects*. Since 2015, BAWSCA has coordinated with local and State agencies on regional projects with potential dry-year water supply benefits for BAWSCA's agencies. These efforts include storage projects, indirect/direct water reuse projects, and studies to evaluate the capacity and potential for various conveyance systems to bring new supplies to the region.

BAWSCA continues to implement the Strategy recommendations in coordination with BAWSCA member agencies. Strategy implementation will be adaptively managed to account for changing conditions and to ensure that the goals of the Strategy are met in an efficient and cost-effective manner. On an annual basis, BAWSCA will reevaluate Strategy recommendations and results in conjunction with development of the BAWSCA's FY 2021-22 Work Plan. In this way, actions can be modified to accommodate changing conditions and new developments.

Cal Water Strategies and Actions

In addition to the management tools and options discussed below, Cal Water has been involved directly and through BAWSCA to advocate for an alternative to the Bay-Delta Plan Amendment, including submitting letters and testimony (see Appendix K) that identify, among other things, the significant impact to local water supply reliability.

Further, as part of this UWMP process, Cal Water submitted a letter to BAWSCA (see Appendix K) enumerating concerns regarding the SFPUC RWS supply allocation methodology. Cal Water's letter to BAWSCA further states that while it is applying BAWSCA's revised Tier Two allocation methodology for RWS shortages greater than 20 percent for preliminary planning purposes, Cal Water is not agreeing to, or adopting, the revised Tier Two methodology. Among other issues,

[41] https://www.bayareareliability.com/

Cal Water notes that the revised Tier Two methodology does not take minimum health and safety standards into account.

As described in Section 7.4, Cal Water is committed to developing a long-term supply reliability strategy for its Peninsula Districts, including evaluation of alternative supply sources and continued commitment to Cal Water's comprehensive water conservation program.

7.4 Water Supply Management Tools and Options

☑ ***CWC § 10620 (f)***

An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

Cal Water coordinates on an ongoing basis with all relevant agencies in the region to optimize the use of regional water supplies. This includes SFPUC, BAWSCA, Town of Atherton, Town of Portola Valley, Town of Woodside, City of Menlo Park, San Mateo County, and other public and private entities with which Cal Water can collaborate to protect and enhance local surface water resources.

In addition to the work being done by SFPUC and BAWSCA, Cal Water is currently in the process of developing multiple regional water supply reliability studies using integrated resource planning practices to create a long-term supply reliability strategy through 2050 for Cal Water districts throughout California. The studies will create long-term strategies to address a wide range of water supply challenges including climate change, new regulatory requirements (e.g., the Bay-Delta Plan), and potential growth in demands due to new development. These water supply reliability studies will be completed on a rolling basis over the next several years, with all studies anticipated to be complete by 2024. The Bear Gulch District will be included in the Bay Area Water Supply Reliability Analysis.

Cal Water also has its own aggressive and comprehensive water conservation program that has and will continue to reduce per-capita usage and therefore demands on critical water sources. Cal Water is committed to helping its customers use water efficiently and has developed a range of water conservation programs to support this goal. To ensure that it is providing the right mix of programs in the most cost-effective manner possible, Cal Water routinely conducts comprehensive conservation program analysis and planning. This is done on a five-year cycle in tandem with the UWMP. Cal Water's Conservation Master Plan provides the basis for the information on the implementation of and expected water savings from Demand Management Measures (DMMs) presented in Chapter 9.

Cal Water also monitors and supports the goals of the Bay Area Integrated Regional Water Management Plan (IRWMP). These goals include:

- Promote environmental, economic, and social sustainability,
- Improve water supply reliability and quality,
- Protect and improve watershed health and function and Bay water quality,
- Improve regional flood management, and
- Create, protect, enhance, and maintain environmental resources and habitats.

7.5 Drought Risk Assessment

☑ ***CWC § 10635(b)***

Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following:

(1) A description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted.

(2) A determination of the reliability of each source of supply under a variety of water shortage conditions. This may include a determination that a particular source of water supply is fully reliable under most, if not all, conditions.

(3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.

(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.

In addition to the long-term water service reliability assessment presented above, the DRA evaluates Cal Water's supply risks under a severe drought period lasting for the next five consecutive years after the assessment is completed, i.e., from 2021 through 2025. The DRA is intended to inform the demand management measures (see Chapter 9) and water supply projects and programs to be included in the UWMP. Suppliers may conduct an interim update or updates to this DRA within the five-year cycle of its urban water management plan update, i.e., before the 2025 UWMP.

7.5.1 Data, Methods, and Basis for Water Shortage Condition

The DRA considers the effects on available water supply sources of an assumed five-year drought commencing the year after the assessment is completed, i.e., from 2021 through 2025. The anticipated effects of climate change have been directly factored into the District's assessment

of its supply reliability. The available potable water supplies assumed in the DRA are based upon the same methodology and assumptions used for the long-term water service reliability assessment (Sections 7.1, 7.2, and 7.3) and relies on information provided by SFPUC and BAWSCA (Appendix H and Appendix I). The available RWS water supplies are estimated based on the following assumptions: (1) The RWS demands are held constant at 132.1 MGD (i.e., 2020 demand levels), (2) implementation of the Bay-Delta Plan Amendment occurs in 2023, and (3) the 2020 infrastructure conditions are maintained (see Table 1 of the January 22, 2021 SFPUC letter in Appendix I). Details of how the District's available supplies are then estimated as part of the DRA are provided below.

7.5.2 Drought Risk Assessment Water Source Reliability

As described in Chapter 6, the Bear Gulch District derives its water supply from a combination of both imported surface water supply purchased from the SFPUC RWS and local surface water supply from Bear Gulch Creek. For the purposes of this UWMP, the District conservatively assumes that local surface water supplies will be zero during single dry and multiple dry years over the planning horizon.

The District*'s* available potable water supplies during the five-consecutive-year drought are based upon information provided by SFPUC and BAWSCA included in Appendix I, as indicated in Section 7.5.1. Specifically, based on the modeling results presented in the March 30, 2021 SFPUC letter, BAWSCA provided percentage-based cutbacks for 2021 to 2025 in Table F1 of the April 1, 2021 BAWSCA drought allocation tables, which are reproduced in Table 7-6, below, and serve as the basis for the RWS Reliability in the DRA.

As shown in Table 7-6, prior to the assumed implementation of the Bay-Delta Plan Amendment in 2023, sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests during the first two consecutive dry years (i.e., 2021 and 2022). Shortages are projected to begin in 2023 with the implementation of the Bay-Delta Plan Amendment. In the event of a shortage, the current Tier 2 Drought Allocation Plan (Section 7.1.1) specifies that each agency's Allocation Factor would be calculated once at the onset of a shortage based on the previous year's use and remain the same until the shortage condition is over. Therefore, for the purpose of drought allocations used in the DRA, the available RWS supply is assumed to remain static in 2023-2025 and the percent cutbacks in 2023-2025 shown in Table 7-6 are presented in terms of the percentage of the District's 2022 projected demands.[42]

[42] Note that this DRA is based on the percentages shown in Table F1 of the April 1, 2021 BAWSCA letter assuming equal percent cutbacks between agencies instead of the volumes shown in Table F2. This DRA does not rely on the supply volumes shown in Table F2 because they are based on outdated RWS supply projections for the District. Specifically, the supply available to the City for years 3, 4 and 5 (i.e., 2023-2025 of the DRA) is estimated as 47% of the District's projected 2022 demand.

Table 7-6. 2020 Base Year Multiple Dry Year Drought Allocations

	2021	2022	2023	2024	2025
SFPUC RWS Supply Cutbacks	0%	0%	47%	47%	47%

NOTES:
(a) With system-wide shortages projected starting in 2023, Wholesale RWS demand is assumed to be static for the remainder of the drought sequence per the Water Supply Agreement. Water supply cutbacks in 2023 to 2025 are presented in terms of percentage of the District's 2022 projected demands.
(b) Source: Table F1 from the BAWSCA drought allocation tables dated April 1, 2021.
(c) Five consecutive year drought assumed to start in 2021.
(d) Scenario reflects implementation of the Bay-Delta Plan Amendment in 2023.
(e) Sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests during the first two consecutive dry years, prior to implementation of the Bay-Delta Plan Amendment.

7.5.3 Drought Risk Assessment Total Water Supply and Use Comparison

As described in Chapter 6, the Bear Gulch District derives its water supply from a combination of both imported surface water supply purchased from the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS) and local surface water supply from Bear Gulch Creek.

As shown in Table 7-3, the District's supply is expected to be sufficient to meet demands in normal year conditions. However, based on SFPUC dry year cutbacks (discussed in further detail in Appendix I), the District is expected to experience significant shortfalls during single dry and multiple dry year conditions, as shown in Table 7-4 and Table 7-5.

For the purposes of this UWMP, the District conservatively assumes that local surface water supplies will be zero during single dry and multiple dry years over the planning horizon. Dry year RWS supply availability is calculated in accordance with Table 7-6, as a percentage of projected RWS demands for each base year consistent the revised BAWSCA Drought Methodology that assumes equal percent cutbacks across all Wholesale Agencies.

Table 7-7 provides a comparison of the water supply sources available to the District with the total projected water use for an assumed drought period of 2021 through 2025. This includes current climate change conditions. As described in Section 4.2.6, the District's demand forecast model generates separate forecasts for: (1) normal weather conditions, (2) wet-year weather conditions, (3) single-year dry weather conditions, and (4) multi-year dry weather conditions. The DRA is based on the District's multi-year dry weather demand forecast.

Cal Water has developed a Water Shortage Contingency Plan (WSCP, Appendix L) to address water shortage conditions resulting from any cause (e.g., droughts, impacted distribution system infrastructure, regulatory-imposed shortage restrictions, etc.). The WSCP identifies a variety of actions that Cal Water will implement to reduce demands and further ensure supply reliability at various levels of water shortage.

Given the current uncertainty, Cal Water could update its DRA prior to the 2025 UWMP update if significant new information becomes available. CWC §10635(b) permits urban water suppliers to conduct an interim update or updates to their DRA within the five-year cycle of its UWMP update. Cal Water anticipates that by the 2025 UWMP update, SFPUC will provide more specific information about the AWSP, with estimated water supply contributions from such projects. Additionally, Cal Water expects that SFPUC will provide more specific information and a refined estimate of the Bay-Delta Plan Amendment impacts to the SFPUC supply. Further, it is anticipated that the Wholesale Customers will negotiate a revised Tier Two allocation formula that could affect each agency's share of available supplies in drought years relative to what has been presented herein.

Cal Water recommends that users of its 2020 UWMP contact District staff for potential updates about its water supply reliability and the DRA before using the 2020 UWMP drought cutback projections for their planning projects and referencing the drought allocations.

Table 7-7. Five-Year Drought Risk Assessment Tables (DWR Table 7-5)

2021	Total
Total Water Use	13,690
Total Supplies	13,690
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	N/A

2022	Total
Total Water Use	13,689
Total Supplies	13,689
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	N/A

2023	Total
Total Water Use	13,695
Total Supplies	7,258
Surplus/Shortfall w/o WSCP Action	(6,437)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	6,437
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	47%

Table 7-7. Five-Year Drought Risk Assessment Tables (DWR Table 7-5)

2024	Total
Total Water Use	13,707
Total Supplies	7,265
Surplus/Shortfall w/o WSCP Action	(6,442)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	6,442
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	47%

2025	Total
Total Water Use	13,699
Total Supplies	7,260
Surplus/Shortfall w/o WSCP Action	(6,438)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	6,438
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	47%
NOTES: (a) Volumes are in units of AF.	

Chapter 8
Water Shortage Contingency Planning

☑ ***CWC § 10640***

(a) Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

(b) Every urban water supplier required to prepare a water shortage contingency plan shall prepare a water shortage contingency plan pursuant to Section 10632. The supplier shall likewise periodically review the water shortage contingency plan as required by paragraph (10) of subdivision (a) of Section 10632 and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

The Water Shortage Contingency Plan (WSCP) for the Bear Gulch District is included in this Urban Water Management Plan (UWMP) as Appendix L. The WSCP serves as a standalone document to be engaged in the case of a water shortage event, such as a drought or supply interruption, and defines specific policies and actions that will be implemented at various shortage level scenarios. The primary objective of the WSCP is to ensure that the District has in place the necessary resources and management responses needed to protect health and human safety, minimize economic disruption, and preserve environmental and community assets during water supply shortages and interruptions. Consistent with CWC §10632, the WSCP includes six levels to address shortage conditions ranging from up to 10 percent to greater than 50 percent shortage, identifies a suite of demand mitigation measures for the District to implement at each level, and identifies procedures for the District to annually assess whether or not a water shortage is likely to occur in the coming year, among other things.

A summary of the key elements of the WSCP including water shortage levels and demand-reduction actions is shown in Table 8-1, Table 8-2, and Table 8-3. Additional details are provided in Appendix L.

Table 8-1. Water Shortage Contingency Plan Levels (DWR Table 8-1)

Shortage Level	Percent Shortage Range	Shortage Response Actions
1	Up to 10%	Demand reduction (See Table 8-2)
2	Up to 20%	Demand reduction (See Table 8-2)
3	Up to 30%	Demand reduction (See Table 8-2)
4	Up to 40%	Demand reduction (See Table 8-2)
5	Up to 50%	Demand reduction (See Table 8-2)
6	>50%	Demand reduction (See Table 8-2)
NOTES:		

Table 8-2. Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
1	Other	8%	1. Limit landscape irrigation to specific times 2. Customers must repair leaks, breaks, and malfunctions in a timely manner 3. Restrict or prohibit runoff from landscape irrigation 4. Prohibit application of potable water to outdoor landscapes within 48 hours of measurable rainfall 5. Prohibit use of potable water for washing hard surfaces 6. Lodging establishments must offer opt out of linen service	Yes
1	Other	--	1. Expand Public Information/Media Campaign 2. Water Bill Inserts 3. Promote online water waste reporting 4. Expand Rebates or Giveaways of Plumbing Fixtures and Devices 5. Expand Rebates for Landscape Irrigation Efficiency 6. Expand CII Water Use Surveys 7. Expand Res Water Use Surveys	No

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
2	Other	16%	1. Continue with Stage 1 restrictions and prohibitions except where superseded by more stringent actions. 2. Prohibit the use of non-recirculating systems in all new conveyer car wash and commercial laundry systems 3. Prohibit the use of single pass cooling systems in new connections 4. Restaurants may only serve water upon request 5. No watering of landscape of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development 6. Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Yes
2	Other	--	1. Continue with Stage 1 actions except where superseded by more stringent actions. 2. Water Efficiency Workshops, Public Events	No

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
			3. Offer Water Use Surveys 4. Provide Rebates or Giveaways of Plumbing Fixtures and Devices 5. Provide Rebates for Landscape Irrigation Efficiency	
3	Other	26%	1. Continue with Stage 1 restrictions and prohibitions except where superseded by more stringent actions. 2. Landscape - Limit landscape irrigation to 1-3 days/week 3. Landscape - Prohibit irrigation of ornamental turf on public street medians with potable water 4. Prohibit Filling Ornamental Lakes or Ponds	Yes
3	Other	--	1. Continue with Stage 1 actions except where superseded by more stringent actions. 2. Home or Mobile Water Use Reports 3. Decrease Frequency and Length of Line Flushing 4. Reduce System Water Loss 5. Increase Water Waste Patrols/Enforcement 6. Implement Drought Rate Structure and Customer Water Budgets (Res)	No

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
			7. Implement Drought Rate Structure and Customer Water Budgets (CII)	
4	Other	34%	1. Continue with Stage 1 restrictions and prohibitions except where superseded by more stringent actions. 2. Prohibit use of potable water for construction and dust control 3. Prohibit use of potable water for street washing 4. Prohibit vehicle washing except with recycled water	Yes
4	Other	35	1. Continue with Stage 1 actions except where superseded by more stringent actions. 2. Promote / Expand Use of Recycled Water	No
5	Other	43%	1. Continue with Stage 1 restrictions and prohibitions except where superseded by more stringent actions. 2. Require net zero demand Increase on new water service connections 3. Prohibit filling of pools 4. Prohibit single-pass cooling systems	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
5	Other	--	1. Continue with Stage 1 actions except where superseded by more stringent actions. 2. Require Pool Covers	No
6	Other	57%	1. Continue with Stage 1 restrictions and prohibitions except where superseded by more stringent actions. 2. Moratorium on new water service connections 3. Prohibit all landscape irrigation	Yes
NOTES:				

Table 8-3. Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*
NOTES:			

Chapter 9
Demand Management Measures

☑ ***CWC § 10631 (e)***

Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:

(i) Water waste prevention ordinances.

(ii) Metering.

(iii) Conservation pricing.

(iv) Public education and outreach.

(v) Programs to assess and manage distribution system real loss.

(vi) Water conservation program coordination and staffing support.

(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.

This chapter provides a summary of past and planned demand management measure (DMM) implementation in the Bear Gulch District (also referred to herein as the "District"), as well as an overview of the expected water savings.

This chapter contains the following sections:

9.1 Demand Management Measures for Wholesale Agencies

9.2 Demand Management Measures for Retail Suppliers

9.3 Implementation over the Past Five Years

9.4 Implementation to Achieve Water Use Targets

9.5 Water Use Objectives

9.1 Demand Management Measures for Wholesale Agencies

Because the District is a retail water supplier, this section does not apply.

9.2 Demand Management Measures for Retail Suppliers

California Water Service Company (Cal Water) centrally administers its conservation programs for all the districts it operates. For purposes of this section, these programs have been grouped in accordance with the DMM categories in CWC §10631(e). These categories are:

(i) Water waste prevention ordinances
(ii) Metering
(iii) Conservation pricing
(iv) Public education and outreach
(v) Programs to assess and manage distribution system real loss
(vi) Water conservation program coordination and staffing support, and
(vii) Other demand management measures

Following are descriptions of the conservation programs Cal Water operates within each of these DMM categories. The District's Conservation Master Plan, provided in Appendix M, contains additional information on Cal Water's conservation programs.

9.2.1 Water Waste Prevention Ordinances

Cal Water's enforcement of water waste prevention and water use restrictions is authorized and overseen by the California Public Utilities Commission via Rule 14.1 or Schedule 14.1. Local government in districts operated by Cal Water may also adopt ordinances regulating water use. Cal Water coordinates its efforts to prevent water waste with the appropriate local governmental entities.

Rule 14.1 defines the District's Water Shortage Contingency Plan (WSCP, Appendix L), including its prohibitions on water waste and restrictions on water use. Prohibitions include:

- Use of potable water through a broken or defective plumbing fixture or irrigation system when Cal Water has notified the customer in writing to repair the broken or defective plumbing fixture or irrigation system, and the customer has failed to effect such repairs within seven (7) business days of receipt of such notice.
- The application of potable water to landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures.
- The use of a hose that dispenses potable water to wash vehicles, including cars, trucks, buses, boats, aircraft, and trailers, whether motorized or not, except where the hose is

fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use.

Restrictions on water use during shortages include, but are not necessarily limited to:

- Outdoor irrigation restrictions in terms of time of day and weekly frequency.
- Obligations to fix leaks, breaks, or malfunctions within five (5) business days of written notification by Cal Water.
- Application of potable water to driveways and sidewalks.
- The use of potable water in a water feature, except where the water is part of a recirculating system.
- The application of potable water to outdoor landscapes during and within 48 hours after measurable rainfall.
- The serving of drinking water other than upon request in eating or drinking establishments.
- Irrigation of ornamental landscape on public street medians.
- Irrigation outside of newly constructed homes and buildings with potable water in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.
- Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guest room using clear and easily understood language.
- Limits on filling ornamental lakes or ponds.
- Use of potable water for street cleaning with trucks, except for initial wash-down for construction purposes.
- Use of potable water for construction purposes, such as consolidation of backfill, dust control, or other uses unless no other source of water or other method can be used.

9.2.2 Metering

☑ ***CWC § 526 (a)***

Notwithstanding any other provision of law, an urban water supplier that, on or after January 1, 2004, receives water from the federal Central Valley Project under a water service contract or subcontract … shall do both of the following:

(1) On or before January 1, 2013, install water meters on all service connections to residential and nonagricultural commercial buildings constructed prior to January 1, 1992, located within its service area.

(2) On and after March 1, 2013, or according to the terms of the Central Valley Project water contract in operation, charge customers for water based on the actual volume of deliveries, as measured by a water meter.

☑ ***CWC § 527 (a)***

(a) An urban water supplier that is not subject to Section 526 shall do both of the following:

(1) Install water meters on all municipal and industrial service connections located within its service area on or before January 1, 2025.

The District meters all service connections and bills customers for water use monthly. Cal Water is also piloting automatic meter reading (AMR) and advanced metering infrastructure (AMI) in several of its districts. AMI may be used by Cal Water in the future to detect and alert households of leaks and other possible problems as well as to provide customers with tailored water use information to help them use water more efficiently.

9.2.3 Conservation Pricing

The CPUC reviews and authorizes District water rates in a General Rate Case every three years. Currently, the District uses a three-tier increasing block rate design for residential water use and a single-tier uniform rate design for non-residential use. The District provides rate assistance to lower income households through its Customer Assistance Program (CAP).

9.2.4 Public Education and Outreach

The District's public outreach program is divided into four components, as follows:

Public Information Program – Cal Water operates an extensive public information program to provide information to customers on ways to use water efficiently and to market its conservation programs through multiple media outlets, including the Cal Water website, direct mail and bills, digital media, social media, and email.

School Education Program - Cal Water's school education program includes the Cal Water H2O Challenge, a project-based learning competition for grades 4-6, individual student competitions

for grades K-12 and general information and learning materials for students and teachers. Cal Water deploys its school education program in all its districts. Cal Water H2O Challenge is a project-based competition for classrooms, grades 4-6. The program is offered in partnership with DoGoodery, the California Association of Science Educators (CASE), and the WestEd K-12 Alliance. The program aligns with the Common Core State Standards and the Next Generation Science Standards. The Cal Water H2O Challenge offers a unique opportunity for upper elementary teachers to facilitate their students' learning of standards-based content, while developing the core understanding of environmental principles necessary to becoming science-literate citizens.

Smart Landscape Tune-Up Program – This program provides customers with an irrigation system evaluation and installation of approved efficient irrigation system equipment, such as a smart irrigation controller and high-efficiency sprinkler nozzles. The program also includes irrigation system adjustments and detection and repair of irrigation system leaks. This program is available to all Cal Water customers at no charge.

Residential Customer Portal – Through its residential customer portal, Cal Water provides tailored assistance to each residential customer via customized water-efficiency targets, water savings calculators, and customer-specific recommendations for programs and water-saving tips.

Non-Residential Customer Assistance – Cal Water provides tailored assistance to commercial customers through customized incentives, commercial water surveys, and large landscape water use surveys. The non-residential assistance program helps commercial customers efficiently use water for sanitation/cleaning, heating/cooling, process, and landscape purposes.

9.2.5 Programs to Assess and Manage Distribution System Real Loss

Cal Water took part in the California Water Loss Technical Assistance Program (TAP) in 2016 and 2017. Cal Water conducts regular distribution system audits using the American Water Works Association (AWWA) Free Water Audit Software. Cal Water is developing a Water Loss Control Optimization Plan and Water Loss Control Policy to guide future water loss management and has solicited technical support with respect to:

- Satisfying current and future CPUC and state water loss standards and regulations
- Improving audit data and validity scores
- Implementing cost-effective water loss control actions

Recently, Cal Water has created a Water Loss Program Analyst position to coordinate and oversee these activities.

9.2.6 Water Conservation Program Coordination and Staffing Support

The CPUC reviews and authorizes Cal Water conservation program and staffing level in a general rate case every three years. Currently, Cal Water has nine full-time conservation positions, as follows:

- Director of Water Resource Sustainability,
- Conservation Program Manager,
- Research, Analytics and Reporting Manager,
- Water Resource Sustainability Analyst,
- Water Loss Program Analyst,
- Three Conservation Program Coordinators, and
- Conservation Assistant.

These staff manage all aspects of Cal Water's conservation programs that are run in 24 districts serving a combined population of 1.8 million people.

9.2.7 Other Demand Management Measures

In addition to the DMM programs described above, Cal Water operates rebate, give-away, and direct installation programs aimed at plumbing fixture replacement and irrigation equipment and landscape efficiency improvements. Following are brief descriptions of each of these DMMs.

High-Efficiency Toilet Replacement – This program replaces old toilets with MaP certified high-efficiency toilets via financial rebates, direct installation, or direct distribution.[43] Current rebate amounts are up to $50/toilet for residential toilet replacement and up to $100/toilet for commercial toilet replacement.

High-Efficiency Urinal Replacement – This program replaces old urinals with high-efficiency urinals meeting the state's 0.125 gallon per flush water use standard via financial rebates and direct installation. While available to all non-residential customers, the program targets sites with higher-than-average bathroom utilization, such as restaurants and office buildings. The current rebate amount is up to $150/urinal.

Clothes Washer Replacement – This program provides a financial rebate to replace an old inefficient clothes washer with a new high-efficiency washer. The program is available to all residential and multi-family customers. The current rebate amount is up to $150/washer.

Residential Conservation Kit Distribution – This program offers residential customers conservation kits featuring a range of water-saving plumbing retrofit devices. The kits are

[43] For information on MaP certified toilets, see: https://www.map-testing.com/.

available at no charge and include two high-efficiency showerheads (1.5 gpm), two bathroom faucet aerators (1.0 gpm), one kitchen faucet aerator (1.5 gpd), toilet leak tablets, and an outside multi-function, full-stop hose nozzle.

Smart Irrigation Controller Installation – This program provides a financial rebate for the installation of a smart irrigation controller that automatically adjusts watering schedule in response to changing weather conditions. The current rebate amount is $125/controller for residential customers and $25/station for commercial customers.

High-Efficiency Sprinkler Nozzle Rebate – This program provides a financial rebate for the installation of high-efficiency sprinkler nozzles. This program is available to all Cal Water customers. The current rebate amount is $5/nozzle.

Large Rotary Nozzle Rebate – This program provides a financial rebate for the installation of high-efficiency large rotary nozzles. This program is available to all Cal Water customers. The current rebate amount is up to $30/nozzle toward the nozzle purchase cost and up to $8/spray body toward installation cost, if installed by a C-27 licensed landscape contractor.

Spray Body with Integrated Pressure Regulation and Check Valve Rebate – This program provides a financial rebate for the installation of high-efficiency spray bodies with integrated pressure regulation. This program is available to all Cal Water customers. The current rebate amount is up to $10/body toward the spray body purchase cost and up to $8/spray body toward installation cost, if installed by a C-27 licensed landscape contractor.

Turf Replacement Rebate – This program provides a financial rebate for replacement of turf with approved drought-tolerant landscaping. Cal Water operated this program in 2015/16 as a drought response measure. The program will be re-started as part of Cal Water's irrigation equipment/landscape upgrade program offerings.

Table 9-1 summarizes the DMMs available to District customers at the time this Plan was prepared.

Table 9-1. Cal Water DMMs Available to District Customers

Programs Offered	Customer Eligibility		
	Single-Family	Multi-Family	Commercial
Plumbing Fixture Replacement			
High-Efficiency Toilet Replacement	✓	✓	✓
High-Efficiency Urinal Replacement			✓
High-Efficiency Clothes Washer Rebate	✓	✓	
Conservation Kits	✓	✓	
Irrigation Equipment/Landscape Upgrades			
Smart Irrigation Controller Rebate	✓	✓	✓
High-Efficiency Sprinkler Nozzle Rebate	✓	✓	✓
Large Rotary Nozzle Rebate		✓	✓
Spray Body Rebate		✓	✓
Turf Replacement Rebate	✓	✓	✓
Customer Assistance			
Smart Landscape Tune-Up Program	✓	✓	✓
Residential Customer Portal	✓		
Non-Residential Customer Assistance		✓	✓

9.3 Implementation over the Past Five Years

Table 9-2 summarizes program implementation for the previous five years. Estimated water savings do not include savings from water waste prevention ordinances, conservation pricing, public information, or distribution system water loss management. Cal Water uses the Alliance for Water Efficiency's Water Conservation Tracking Tool to estimate water savings.

Table 9-2. Implementation of Customer DMMs: 2016-2020

Indoor Programs	2016 – 2020 Total	Average Annual
Toilets & Urinals (number distributed)	1,933	387
Clothes Washers (number distributed)	325	65
Conservation Kits (number distributed)	238	48
Outdoor Programs		
Smart Controllers (number distributed)	422	84
Nozzles & Spray Bodies (number distributed)	1,206	241
Turf Buy-Back (sq ft removed)	52,850	10,570
Residential Assistance Programs		
Surveys/Audits (homes receiving)	60	12
Non-Residential Assistance Programs		
Surveys/Audits (sites receiving)	5	1
Large Landscape Reports (sites receiving)	78	16
Estimated Water Savings (AF)	480	96
NOTES: Estimated water savings for 2016-2020. DMMs will continue to generate savings after 2020 for their useful life.		

9.4 Implementation to Achieve Water Use Targets

All the DMMs described above contributed to the District's compliance with its SB X7-7 2020 target GPCD.

9.5 Water Use Objectives (Future Requirements)

CWC §10609 requires that urban retail water suppliers develop new water use objectives that are based on specific standards for certain water use sectors. These water use objectives will not be developed until 2023. Suppliers are encouraged in this UWMP cycle to consider how they will align their conservation management actions in order to meet these future obligations.

As noted above, Cal Water's conservation programs are subject to review and approval by the CPUC through a General Rate Case every three years. In making conservation program recommendations to the CPUC, Cal Water carefully considers how they will advance multiple objectives, including compliance with the pending water use objectives. Specific objectives identified in Cal Water's most recent General Rate Case included:

- Maintaining continuity with and furthering implementation of conservation programs authorized by the previous General Rate Case.
- Preserving gains in water conservation achieved during the 2013-2017 drought.
- Ensuring Cal Water districts are well-positioned to comply with state regulations and policies pertaining to water conservation, water loss management, and groundwater management, including Executive Order B-37-16, SB 555, and the Sustainable Groundwater Management Act (SGMA).
- Advancing cost-effective water use efficiency alternatives in districts with high water supply costs.

Cal Water developed a scoring methodology to adjust conservation programs and budgets to further these objectives. The methodology specifically considers five distinct conservation policy drivers:

1. State Conservation Standards and Water Use Objectives
2. SGMA Compliance
3. SB 555 Water Loss Management Requirements
4. Commercial, Institutional, and Industrial (CII) Water Management
5. Avoided Water Cost and Affordability

The methodology assigns greater weight to the State Conservation Standards and Water Use Objectives and SGMA Compliance policy drivers, reflecting their importance in terms of overall water resources management.

Scoring for the SGMA Compliance policy driver is based on groundwater basin priority, district dependence on groundwater supply, and basin adjudication status. The highest scores are assigned to districts in unadjudicated and critically overdrafted or high priority basins where groundwater comprises more than 45 percent of the water supply. The Bear Gulch District ranked in the bottom third of Cal Water's districts for this policy driver.

Scoring for the State Conservation Standards and Water Use Objectives policy driver is based on four metrics that are used to gauge which districts are most likely to require adjustments to their conservation program mix or level of implementation to comply with the new standards. These metrics are:

1. Residential per capita landscape area
2. Residential per capita turf area
3. Size and number of large residential landscapes
4. Difference between a simulated water use budget and average water use for 2011-15

The Bear Gulch District ranked in the top third of Cal Water's districts for this policy driver.

Scoring for the SB 555 Water Loss Management Requirements policy driver is based on the district's infrastructure leakage index (ILI) from its most recent validated water loss audit. The ILI is a performance indicator of real (physical) water loss from the water distribution system. A high ILI indicates possible distribution system inefficiencies and may also indicate significant water system leakage. Proposed adjustments to funding for water loss management are based on the ILI scoring criteria. The Bear Gulch District ranked in the bottom third of Cal Water's districts for this policy driver.

Scoring for the CII Water Management policy driver is based on the ratio of CII water uses to total water uses in a district. The Bear Gulch District ranked in the bottom third of Cal Water's districts for this policy driver.

Scoring for the Avoided Water Cost and Affordability policy driver is based on the District's avoided cost of water supply, as estimated by the California Urban Water Conservation Council (CUWCC)/Water Research Foundation Avoided Cost Model. The Bear Gulch District ranked in the top third of Cal Water's districts for this policy driver.

The combination of scores on each policy driver were used by Cal Water to recommend to the CPUC in its most recent General Rate Case adjustments to the conservation budgets of its districts. The purpose of the adjustments is to increase Cal Water's capacity to deploy conservation programs in districts expected to face the most significant regulatory and water management challenges in coming years. Recommended adjustments ranged from a low of 5 percent to a high of 25 percent. The recommended adjustment for the Bear Gulch District was 15 percent.

Chapter 10
Plan Adoption, Submittal, and Implementation

☑ ***CWC § 10621 (b)***

Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

This chapter provides information on a public hearing, the adoption process for the Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP), the adopted UWMP and WSCP submittal process, plan implementation, and the process for amending the adopted UWMP or WSCP. This chapter includes the following sections:

10.1 Inclusion of All 2020 Data

10.2 Notice of Public Hearing

10.3 Public Hearing and Adoption

10.4 Plan Submittal

10.5 Public Availability

10.6 Notification of Public Utilities Commission

10.7 Amending an Adopted UWMP or Water Shortage Contingency Plan

10.1 Inclusion of All 2020 Data

This UWMP includes the water use and planning data for the entire calendar year of 2020, per the UWMP Guidebook 2020.

10.2 Notice of Public Hearing

☑ ***CWC § 10642***

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

Prior to adopting the Plan, California Water Service Company (Cal Water) held a virtual public hearing to present information on its Bear Gulch District (also referred to herein as "District") 2020 UWMP and WSCP on June 9, 2021, 5:00 PM.[44]

Relevant entities were notified of the UWMP and WSCP review at least 60 days prior to the public hearing, including: (1) cities and counties, and (2) the public. These same entities were noticed again with the specific date, time and location of the hearing at least two weeks prior to the public hearing. The notice to the public, as specified in Government Code 6066, and letters to relevant agencies can be found in Appendix C and Appendix B, respectively.

10.2.1 Notice to Cities and Counties

☑ ***CWC § 10631 (a)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

Table 10-1 lists the cities and counties that were notified. Copies of these letters are provided in Appendix B.

[44] Restrictions related to the COVID-19 pandemic prevented the District from holding an in-person public hearing as previously planned.

Table 10-1. Notification to Cities and Counties (DWR Table 10-1)

City Name	60 Day Notice	Notice of Public Hearing
Town of Atherton	X	X
Town of Portola Valley	X	X
Town of Woodside	X	X
City of Menlo Park	X	X
County Name	**60 Day Notice**	**Notice of Public Hearing**
San Mateo County	X	X
Other Agency Name	**60 Day Notice**	**Notice of Public Hearing**
Bay Area Water Supply and Conservation Agency	X	X
San Francisco Public Utilities Commission	X	X
Silicon Valley Clean Water	X	X
Tuolumne River Trust	X	X
NOTES:		

10.2.2 Notice to the Public

Notification to the public and to cities and counties also provided instructions on how to view the 2020 UWMP and WSCP prior to the hearing, the revision schedule, and contact information of the UWMP and WSCP preparer. A copy of this notice is included in Appendix C.

10.3 Public Hearing and Adoption

☑ ***CWC § 10608.26***

(a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:

(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.

(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.

(3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.

☑ ***CWC § 10621 (b)***

Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

The deadline for public comments on the UWMP and WSCP was June 11, 2021. The final Plan was formally adopted by Cal Water's Vice President of Engineering June 20, 2021, and was submitted to California Department of Water Resources (DWR) within 30 days of approval. Appendix N presents a copy of the signed Resolution of Plan Adoption. Appendix B contains the following:

- Letters sent to and received from various agencies regarding this plan, and
- Correspondence between Cal Water and participating agencies.

10.4 Plan Submittal

☑ ***CWC § 10621 (f)***

(1) Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.

☑ ***CWC § 10635 (c)***

The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

☑ ***CWC § 10644 (a)***

(1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1) shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

This UWMP and WSCP were submitted to DWR within 30 days of adoption and by the July 1, 2021 deadline. The submittal was done electronically through Water Use Efficiency Data Portal, an online submittal tool. The adopted UWMP and WSCP were also sent to the California State Library and to the cities and counties listed in Table 10-1 no later than 30 days after adoption.

10.5 Public Availability

☑ ***CWC § 10645***

(a) Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

(b) Not later than 30 days after filing a copy of its water shortage contingency plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

On or about May 10, 2021, a an electronic version of the draft 2020 UWMP and WSCP were made available for review by visiting Cal Water's website: https://www.calwater.com/conservation/uwmp-review/.[45]

[45] Restrictions related to the COVID-19 pandemic prevented the District from making a printed hard-copy available for public review as previously planned.

10.6 Notification of Public Utilities Commission

☑ ***CWC § 10621 (c)***

An urban water supplier regulated by the Public Utilities Commission shall include its most recent plan and water shortage contingency plan as part of the supplier's general rate case filings.

Cal Water is an urban water supplier regulated by the California Public Utilities Commission. Cal Water included the District's 2020 UWMP and WSCP as part of its general rate case filings.

10.7 Amending an Adopted UWMP or Water Shortage Contingency Plan

☑ ***CWC § 10644 (b)***

If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its water shortage contingency plan prepared pursuant to subdivision (a) of Section 10632 no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.

If the 2020 UWMP or WSCP is amended, each of the steps for notification, public hearing, adoption and submittal will also be followed for the amended document.

Appendix A: UWMP Act Checklist

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and Overview	Chapter 1
x	x	Chapter 1	10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a supplier may also choose to include a simple description at the beginning of each chapter.	Summary	Section 1.6
x	x	Section 2.2	10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.4 and Table 2-1
x	x	Section 2.6	10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.5 and Table 2-4
x	x	Section 2.6.2	10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	Section 2.5
x		Section 2.6, Section 6.1	10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	Section 2.5.1
	x	Section 2.6	10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	N/A
x	x	Section 3.1	10631(a)	Describe the water supplier service area.	System Description	Chapter 3
x	x	Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3
x	x	Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Section 3.4 and Table 3-1

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 3.4 and Table 3-2
x	x	Sections 3.4 and 5.4	10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Setion 3.4 and Table 3-2
x	x	Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	Section 3.5
x	x	Section 4.2	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2 and Tables 4-1 to 4-3
x	x	Section 4.2.4	10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Section 4.2.3
x	x	Section 4.2.6	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System Water Use	Section 4.2.4 and Tables 4-5 and 4-6
x	x	Section 4.2.6	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System Water Use	Section 4.2.4
x	optional	Section 4.3.2.4	10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	System Water Use	Section 4.2.3 and Table 4-4
x	optional	Section 4.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.2.5 and Table 4-7
x	x	Section 4.5	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System Water Use	Section 7.5.3
x		Chapter 5	10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Chapter 5
x		Chapter 5	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 5.5 and Table 5-2
	x	Section 5.1	10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	N/A

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x		Section 5.2	10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Section 5.4
x		Section 5.5	10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5-year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.4
x		Section 5.5 and Appendix E	10608.4	Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SBX7-7 2020 Compliance Form.	Baselines and Targets	Section 5.5
x	x	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	System Supplies	Chapter 7
x	x	Sections 6.1	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, *including changes in supply due to climate change.*	System Supplies	Section 7.1.4
x	x	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	Section 6.9 and Table 6-9A and 6-9B
x	x	Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Section 6.8
x	x	Section 6.2.8	10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Section 6.9
x	x	Section 6.2	10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2
x	x	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.2

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 6.2
x	x	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2
x	x	Section 6.2.2.1	10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	Section 6.2
x	x	Section 6.2.2.4	10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years.	System Supplies	Section 6.2 and Table 6-1
x	x	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Section 6.9
x	x	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	System Supplies	Section 6.7
x	x	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.5.2 and Tables 6-4 and 6-5
x	x	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.3 and Table 6-5
x	x	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.5.3
x	x	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.5.3 and Table 6-4
x	x	Section 6.2.5	10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.5.3

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.3 and Table 6-6
x	x	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6
x	x	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area with quantified amount of collection and treatment and the disposal methods.	System Supplies (Recycled Water)	Section 6.5.2 and Table 6-3
x	x	Section 6.2.8, Section 6.3.7	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	Section 6.8 and Table 6-7
x	x	Section 6.4 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a supplier can readily obtain.	System Suppliers, Energy Intensity	Section 6.11 and Table 6-10
x	x	Section 7.2	10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability.	Water Supply Reliability Assessment	Section 7.1.3
x	x	Section 7.2.4	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.4
x	x	Section 7.3	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.2 and 7.3 Tables 7-2 to 7-5
x	x	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Section 7.5
x	x	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	Section 7.5
x	x	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Section 7.5

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Section 7.5 and Table 7-7
x	x	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Section 7.5
x	x	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Appendix L
x	x	Chapter 8	10632(a)(1)	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.2	10632(a)(2)(A)	Provide the written decision- making process and other methods that the supplier will use each year to determine its water reliability.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.3	10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.4	10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	Appendix L

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	Appendix L
x	x	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.5 and 8.6	10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water Shortage Contingency Planning	Appendix L
x		Section 8.6	10632(a)(6)	Retail supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.7	10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.7	10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix L
x	x	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix L

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x		Section 8.8	10632(a)(8)(C)	Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought.	Water Shortage Contingency Planning	Appendix L
x		Section 8.9	10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	Appendix L
x		Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water Shortage Contingency Planning	Appendix L
x	x	Sections 8.12 and 10.4	10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Section 10.3
x	x	Section 8.14	10632(c)	Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan.	Water Shortage Contingency Planning	Section 10.4
	x	Sections 9.1 and 9.3	10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	N/A
x		Sections 9.2 and 9.3	10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Chapter 9
x		Chapter 10	10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan Adoption, Submittal, and Implementation	Section 10.3
x	x	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1.	Plan Adoption, Submittal, and Implementation	Section 10.2

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location (Optional Column for Agency Review Use)
x	x	Section 10.4	10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	Chapter 10
x	x	Section 10.2.2	10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Section 10.2.1
x	x	Section 10.3.2	10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3
x	x	Section 10.4	10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Section 10.4	10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Sections 10.4.1 and 10.4.2	10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5
x	x	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5
x	x	Section 10.6	10621(c)	If supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan Adoption, Submittal, and Implementation	Section 10.6
x	x	Section 10.7.2	10644(b)	If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption.	Plan Adoption, Submittal, and Implementation	Section 10.7

Appendix B: Correspondence

- UWMP Notice of Preparation
- District Mailing List
- Growth Projection and Land Use Letter
- UWMP and WSCP Public Draft Comments

Notice of Preparation of Urban Water Management Plan and Water Shortage Contingency Plan - 2020 Update

The Urban Water Management Planning Act (California Water Code §10608–10656) requires that California Water Service (Cal Water) update its Urban Water Management Plan (UWMP) and associated Water Shortage Contingency Plan (WSCP) every 5 years.

Cal Water is currently reviewing its existing UWMP and associated WSCP, which were updated in 2016, and considering revisions for each plan. Coordination with other water suppliers, cities, counties, and community organizations in the region is an important part of the preparation of Cal Water's UWMP and WSCP. We are available to discuss the assumptions used in the development of the plans including available water supply, water demands, land use, as well as other aspects of the plans.

A draft of the 2020 UWMP and WSCP will be made available for public review and a public hearing will be scheduled in Spring 2021. We will notify you when the draft is available for review, how to access it, and details regarding the public hearing.

The updated UWMP and WSCP are due by July 1, 2021. If you would like more information regarding our 2015 UWMP and WSCP and the schedule for updating these documents, or if you would like to participate in the preparation of the 2020 UWMP and WSCP, please contact:

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Mark Church
County Clerk
San Mateo County
mchurch@smcgov.org

David Canepa
Board President
San Mateo County Board of Supervisors
dcanepa@smcgov.org

Carole Groom
Supervisor
San Mateo County Board of Supervisors
cgroom@smcgov.org

Jeff Aalfs
Council Member
Town of Portola Valley
jaalfs@portolavalley.net

Jeremy Dennis
Town Manager
Town of Portola Valley
jdennis@portolavalley.net

Maryann Derwin
Mayor
Town of Portola Valley
mderwin@portolavalley.net

Don Horsley
Board Vice President
San Mateo County Board of Supervisors
dhorsley@smcgov.org

Dave Pine
Supervisor
San Mateo County Board of Supervisors
dpine@smcgov.org

Warren Slocum
Supervisor
San Mateo County Board of Supervisors
wslocum@smcgov.org

Bolzowski, Michael R.

From: Bolzowski, Michael R.
Sent: Tuesday, June 1, 2021 9:43 PM
To: slrobinson@menlopark.org
Cc: McCusker, Kevin; Smithson, Dawn; Ken Jenkins (kjenkins@calwater.com); Michael Hurley (mhurley@calwater.com); Maximilian Storms (Max) (mstorms@calwater.com)
Subject: Cal Water's 2020 Draft UWMP for Bear Gulch District
Attachments: Bear Gulch (CM MP) - Cal Water UWMP.pdf

Ms. Jerome-Robinson,

California Water Service (Cal Water) is currently updating its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to reflect changed conditions in the Bear Gulch District.

The State requires all urban water suppliers that provide water for municipal purposes either directly or indirectly to more than 3,000 customers or supply more than 3,000 acre-feet of water annually to prepare an UWMP and WSCP at least once every five years. These documents support Cal Water's long-term resource planning to ensure that adequate water supplies are available to meet existing and future water demands under defined conditions.

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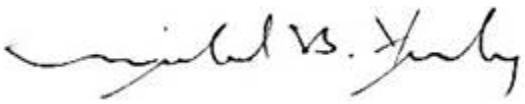
The UWMP also incorporates water supply assessments (WSA) for projects in or near the Bear Gulch District into the demand forecast. As additional large-scale projects and/or specified land use planning processes arise (e.g., general plans, specific plans), additional WSAs will be developed to consider their impacts on available supplies.

We have attached the current public review draft of the UWMP, and incorporated WSCP for your review. Please share this with others in your organization that may be interested in the information.

Cal Water is available to discuss the assumptions used in the development of UWMP for the South San Francisco service area, including available supply, water demands, land use, as well as any other aspects of the plan. Should you have any questions or comments, please contact Michael Bolzowski at mbolzowski@calwater.com.

Sincerely,



Michael Hurley
WATER RESOURCES MANAGER
CALIFORNIA WATER SERVICE
(323) 430-0250

Bolzowski, Michael R.

From: Bolzowski, Michael R.
Sent: Tuesday, June 1, 2021 9:45 PM
To: grodericks@ci.atherton.ca.us
Cc: McCusker, Kevin; Smithson, Dawn; Ken Jenkins (kjenkins@calwater.com); Michael Hurley (mhurley@calwater.com); Maximilian Storms (Max) (mstorms@calwater.com)
Subject: Cal Water's 2020 Draft UWMP for Bear Gulch District
Attachments: Bear Gulch (CM TOA) - Cal Water UWMP.pdf

Mr. Rodericks,

California Water Service (Cal Water) is currently updating its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to reflect changed conditions in the Bear Gulch District.

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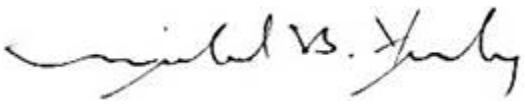
Sincerely,



Michael Hurley
WATER RESOURCES MANAGER
CALIFORNIA WATER SERVICE
(323) 430-0250

Bolzowski, Michael R.

From: Bolzowski, Michael R.
Sent: Tuesday, June 1, 2021 9:39 PM
To: 'mcallagy@smcgov.org'
Cc: McCusker, Kevin; Smithson, Dawn; Ken Jenkins (kjenkins@calwater.com); Michael Hurley (mhurley@calwater.com); Maximilian Storms (Max) (mstorms@calwater.com)
Subject: Cal Water's 2020 Draft UWMP for Bear Gulch District
Attachments: Bear Gulch (CoM) - Cal Water UWMP.pdf

Mr. Callagy,

California Water Service (Cal Water) is currently updating its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to reflect changed conditions in the Bear Gulch District.

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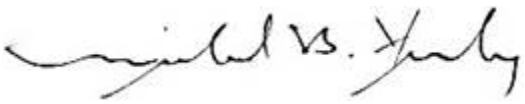
Sincerely,



Michael Hurley
WATER RESOURCES MANAGER
CALIFORNIA WATER SERVICE
(323) 430-0250

Bolzowski, Michael R.

From: Bolzowski, Michael R.
Sent: Tuesday, June 1, 2021 9:49 PM
To: jdennis@portolavalley.net
Cc: McCusker, Kevin; Smithson, Dawn; Ken Jenkins (kjenkins@calwater.com); Michael Hurley (mhurley@calwater.com); Maximilian Storms (Max) (mstorms@calwater.com)
Subject: Cal Water's 2020 Draft UWMP for Bear Gulch District
Attachments: Bear Gulch (TM TOPV) - Cal Water UWMP.pdf

Mr. Dennis,

California Water Service (Cal Water) is currently updating its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to reflect changed conditions in the Bear Gulch District.

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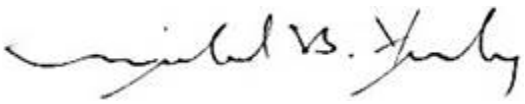
Sincerely,



Michael Hurley
WATER RESOURCES MANAGER
CALIFORNIA WATER SERVICE
(323) 430-0250

Bolzowski, Michael R.

From: Bolzowski, Michael R.
Sent: Tuesday, June 1, 2021 9:57 PM
To: kbryant@woodsidetown.org
Cc: McCusker, Kevin; Smithson, Dawn; Ken Jenkins (kjenkins@calwater.com); Michael Hurley (mhurley@calwater.com); Maximilian Storms (Max) (mstorms@calwater.com)
Subject: Cal Water's 2020 Draft UWMP for Bear Gulch District
Attachments: Bear Gulch (TM TOW) - Cal Water UWMP.pdf

Dear Mr. Bryant,

The attachment with the previous email did not include the draft UWMP. The full attachment is included above.

Sorry for any inconvenience.

Sincerely,

Michael Bolzowski
408-367-8338

From: Bolzowski, Michael R.
Sent: Tuesday, June 1, 2021 9:49 PM
To: kbryant@woodsidetown.org
Cc: McCusker, Kevin <kmccusker@calwater.com>; Smithson, Dawn <dsmithson@calwater.com>; Ken Jenkins (kjenkins@calwater.com) <kjenkins@calwater.com>; Michael Hurley (mhurley@calwater.com) <mhurley@calwater.com>; Maximilian Storms (Max) (mstorms@calwater.com) <mstorms@calwater.com>
Subject: Cal Water's 2020 Draft UWMP for Bear Gulch District

Mr. Bryant,

California Water Service (Cal Water) is currently updating its Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) to reflect changed conditions in the Bear Gulch District.

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Sincerely,

Michael Hurley
WATER RESOURCES MANAGER
CALIFORNIA WATER SERVICE
(323) 430-0250

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calwater.com

Bolzowski, Michael R.

From: Kevin <greenwoodspecialty@gmail.com>
Sent: Wednesday, June 9, 2021 5:03 PM
To: Bolzowski, Michael R.

This is an EXTERNAL EMAIL. Stop and think before clicking a link or opening attachments.

Will Call Water consider a water cut off for abusers. During the last drought Woodside residents averaged 421 gallons p/person p/day. As a household that continues to conserve water we didn't see financial incentives work in the last drought - except your profits may have. Rich people just spent the money rather than any meaningful reduction or restriction.

Kevin Greenwood
(650) 701-7017

Appendix C: Public Meeting Notice

- Public Meeting Notice of Intent
- Proof of Publication
- Public Meeting Presentation

Good afternoon!

We hope that this note finds you well.

We wanted to provide you with an update on the preparation of our updated Urban Water Management Plans and Water Shortage Contingency Plans.

These plans are a critical component of the steps we take to ensure there are sufficient water supplies to meet the current and future water needs of our customers, and we look forward to working with you on this important project.

Please let us know if you have any questions or need any additional information.

Cal Water Community Affairs

Urban Water Management Plan and
Water Shortage Contingency Plan - 2020 Update

As a defined urban water supplier, California Water Service (Cal Water) is preparing an update to its Urban Water Management Plans (UWMP) and Water Shortage Contingency Plans (WSCP) that will address the water service conditions in our service areas. These documents support a water supplier's long-term resource planning to ensure that adequate water supplies are available to meet existing and future water demands under defined conditions. It is Cal Water's intent to adopt the UWMPs, and the incorporated WSCPs, and file the plans as required with the Department of Water Resources, the California State Library, and any city or county within which Cal Water provides service no later than 30 days after adoption.

Schedule of upcoming actions:

After a public review period, a public meeting to receive comments on the Draft UWMP and WSCP will be held. As the information becomes available for each service area, the electronic copy of the UWMP, WSCP, and information on the public meeting, including a link to participate, will be available at the following internet address:

https://www.calwater.com/conservation/uwmp-review/

If you are unable to attend the scheduled public meeting but want to provide comments regarding the proposed UWMP or WSCP, you may send your comments via email to PlanningInfo@calwater.com.

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EMILY HERNANDEZ
CALIFORNIA WATER SERVICE CO/PLANNING DEPT.
1720 NORTH FIRST ST.
SAN JOSE, CA 95112

CNS 3470053

COPY OF NOTICE

Notice Type: GPN GOVT PUBLIC NOTICE

Ad Description CALIFORNIA WATER SERVICE ? BEAR GULCH DISTRICT

To the right is a copy of the notice you sent to us for publication in the THE ALMANAC. Please read this notice carefully and call us with any corrections. The Proof of Publication will be filed with the County Clerk, if required, and mailed to you after the last date below. Publication date(s) for this notice is (are):

05/21/2021 , 05/28/2021

The charge(s) for this order is as follows. An invoice will be sent after the last date of publication. If you prepaid this order in full, you will not receive an invoice.

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THE DAILY TRANSCRIPT, SAN DIEGO	(619) 232-3486
THE INTER-CITY EXPRESS, OAKLAND	(510) 272-4747

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NOTICE OF INTENT TO ADOPT AN URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN AND HOLD A PUBLIC MEETING TO RECEIVE COMMENTS ON THE PROPOSED PLANS CALIFORNIA WATER SERVICE – BEAR GULCH DISTRICT

California Water Code (CWC) sections 10610 through 10656, known as the "Urban Water Management Planning Act" (Act), require all urban water suppliers that provide water for municipal purposes either directly or indirectly to more than 3,000 customers or supply more than 3,000 acre-feet of water annually to prepare an Urban Water Management Plan (UWMP) at least once every five years.

UWMPs support a water supplier's long-term resource planning to ensure that adequate water supplies are available to meet existing and future water demands under defined conditions. The UWMP must describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation, and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The UWMP must also address measures for residential, commercial, governmental, and industrial water demand management. Further, Section 10632 of the CWC requires that every urban water supplier shall prepare and adopt a Water Shortage Contingency Plan (WSCP) as part of its plan (UWMP). Section 10632.2 provides that,

"An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan...or reasonable alternative actions, provided that descriptions of the alternative actions are submitted with the annual water shortage assessment report pursuant to Section 10632.1." The WSCP will be incorporated as an appendix of the UWMP.

One of Cal Water's service areas is the Bear Gulch District, which serves Portola Valley, Woodside, Atherton, and portions of Menlo Park and Redwood City, in San Mateo County. As a defined urban water supplier, Cal Water is preparing an update to its UWMP that will address the water service conditions in the Bear Gulch District. It is Cal Water's intent to adopt that UWMP, and the incorporated WSCP, and file that plan as required with the Department of Water Resources, the California State Library, and any city or county within which Cal Water provides service no later than 30 days after adoption.

Schedule of upcoming actions:

On or about May 10, 2021, an electronic copy of the Draft 2020 UWMP and WSCP will be available for review. After a public review period, a public meeting to receive comments on the Draft UWMP and WSCP Plan for the Bear Gulch District will be held online on June 9, 2021, at 5:00 p.m. The electronic copy of the UWMP, WSCP, and additional information on the public meeting, including a link to participate, is available at the following internet address: https://www.calwater.com/conservation/uwmp-review/

If you are unable to attend the scheduled public meeting but want to provide comments regarding the proposed UWMP or WSCP, you may send your comments via email to PlanningInfo@calwater.com. Cal Water will receive comments on the Draft 2021 UWMP and WSCP from May 10 through June 9, 2021.

Please share this notice with others that may have interest in this matter.

5/21, 5/28/21

CNS-3470053#

THE ALMANAC

California Water Service

June 9, 2021

Quality. Service. Value.

Bear Gulch District

2020 Urban Water Management Plan
2020 Water Shortage Contingency Plan

Meeting Agenda

- Introduce California Water Service (CWS) staff and consultants
- Purpose and objectives
- Presentation of the 2020 Urban Water Management Plan (UWMP)
- Presentation of 2020 Water Shortage Contingency Plan (WSCP)
- Drought update
- Public comments and questions

2020 UWMP Update: Public Outreach

- Preliminary information sent to relevant entities in February 2021
- Second notice sent to relevant entities in May 2021
- Two notices posted in local newspaper
- Draft 2020 UWMP and WSCP available for review at **https://www.calwater.com/conservation/uwmp-review/**
- Public hearing

Urban Water Management Planning Act

- Supports long-term water resource planning to ensure adequate supplies
- California Water Code - Sections 10610-10656
- Threshold: Utilities with 3,000+ services or 3,000+ acre-feet per year (AFY) water sales
- At least a 20-year planning horizon, Cal Water's plan covers 25 years
- Must be updated every 5 years and submitted by July 1, 2021
- Basis for SB-610 Water Supply Assessments and SB-221 Water Supply Verifications

UWMP Elements

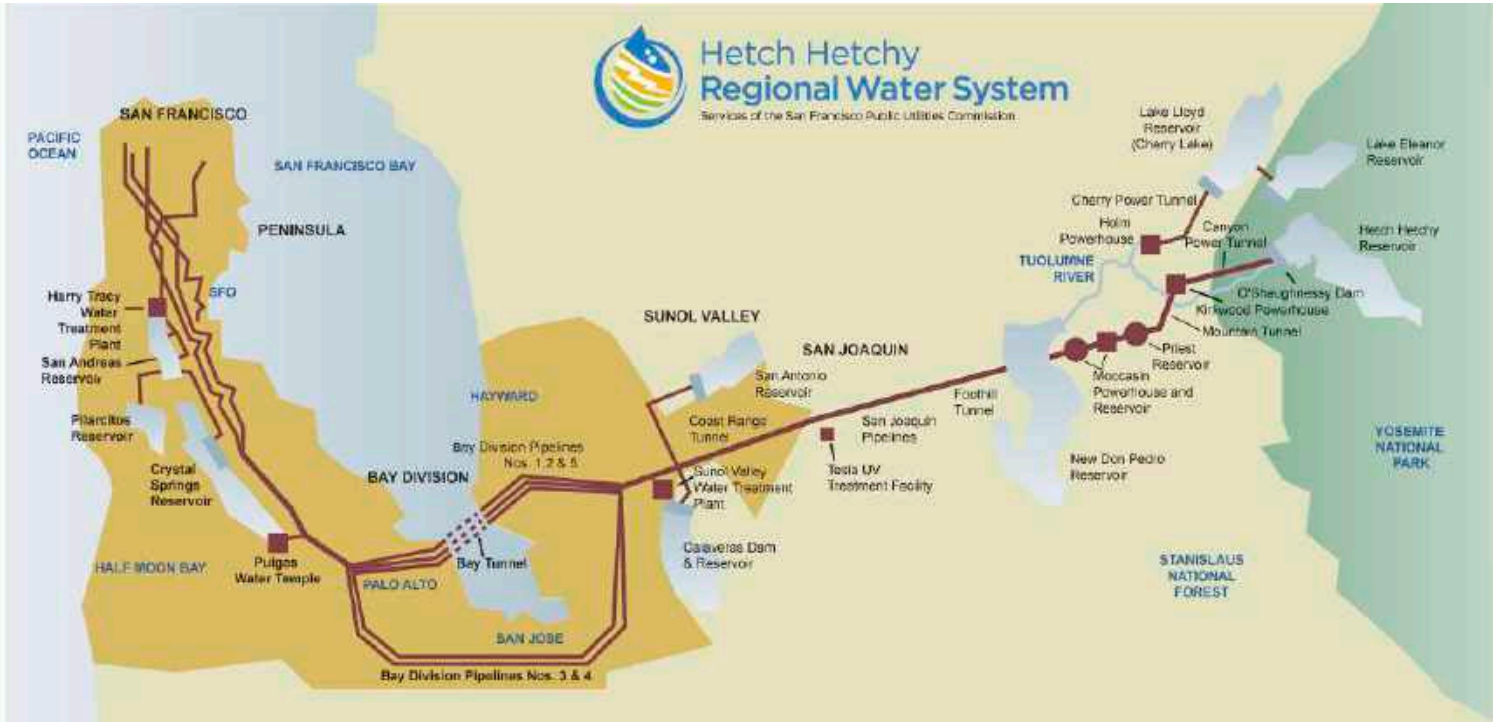
- Service area description
- Population forecast
- Supply and demand projections through 2045 in normal, single dry and multiple dry years
- Water supply reliability
- Conservation/Demand Management Measures
- Climate change
- Water Shortage Contingency Plan

District Overview

- Serving Bear Gulch District since 1936
- One Public Water System
- Surface water purchased from the San Francisco Public Utilities Commission (SFPUC)
- Local surface water diverted from Bear Gulch Creek

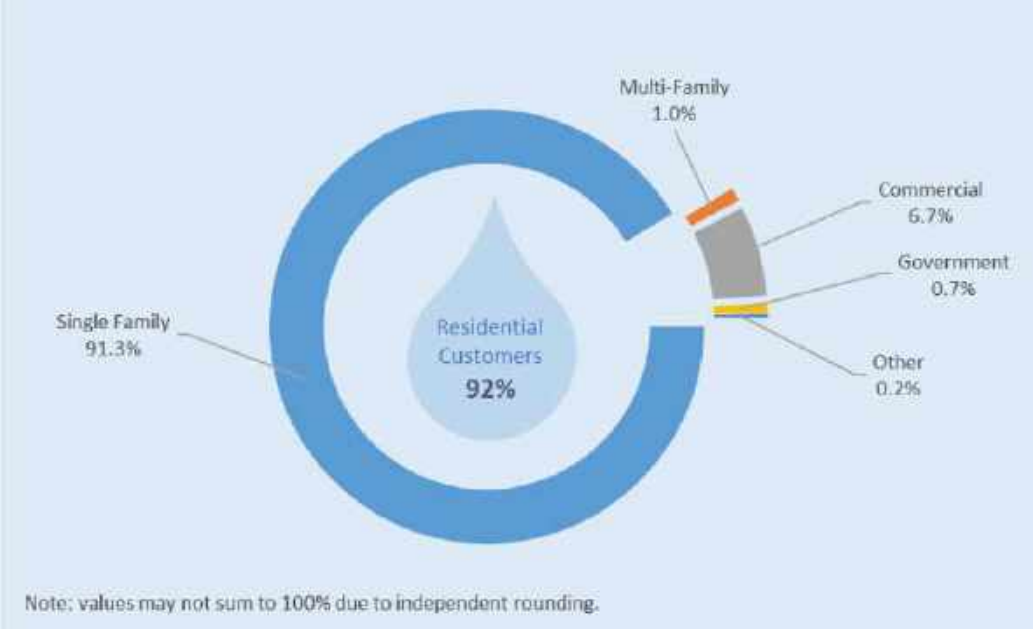
Water Supply Sources

- Main source of water supply is treated water purchased from the SFPUC Regional Water System (RWS)
- Local surface water diverted from Bear Gulch Creek makes up approximately nine percent of annual deliveries
- Cal Water continues to investigate additional supply sources, however there is no current or projected use of recycled water or other supply sources

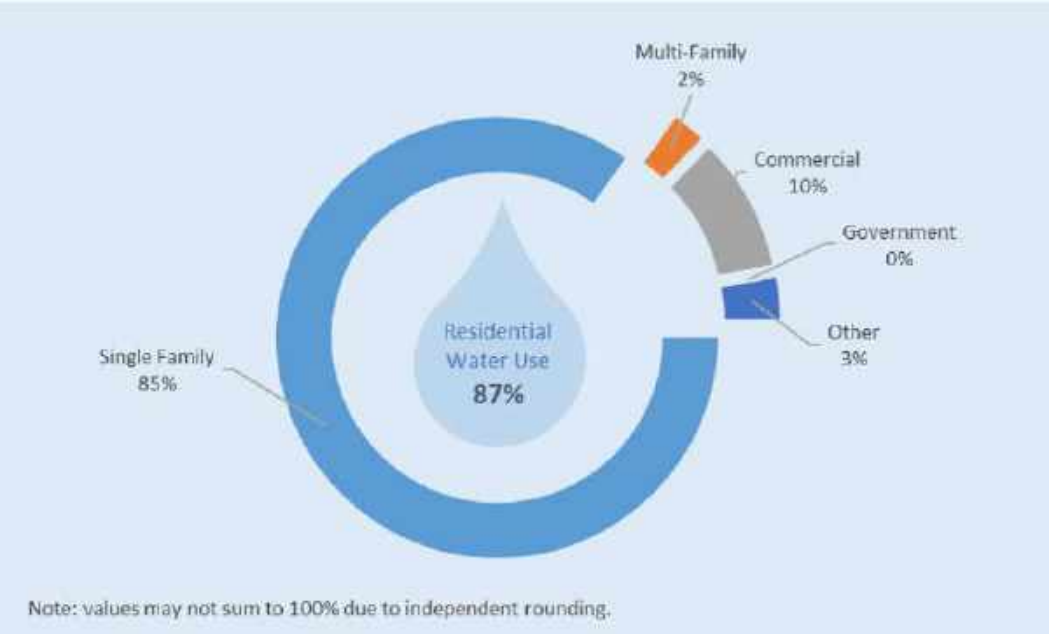


Distribution of Services/Demand

Types of Customers



Demand



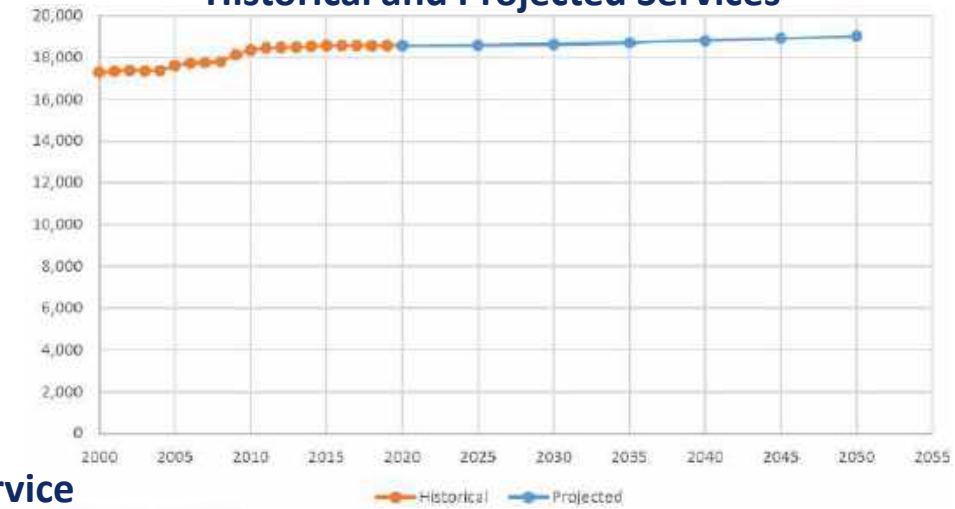
Demand Projection Methodology

- Forecast horizon is beyond 20 years required by UWMP
- Generates normal-, wet-, and dry-year demand forecasts
- Directly considers impacts of climate change
- Demand model uses historical data on services, sales, production, population, and proposed conservation measures
- Regional Growth Forecast: housing and employment growth forecasts based on census-tract level growth forecasts prepared by the Association of Bay Area Governments (ABAG)

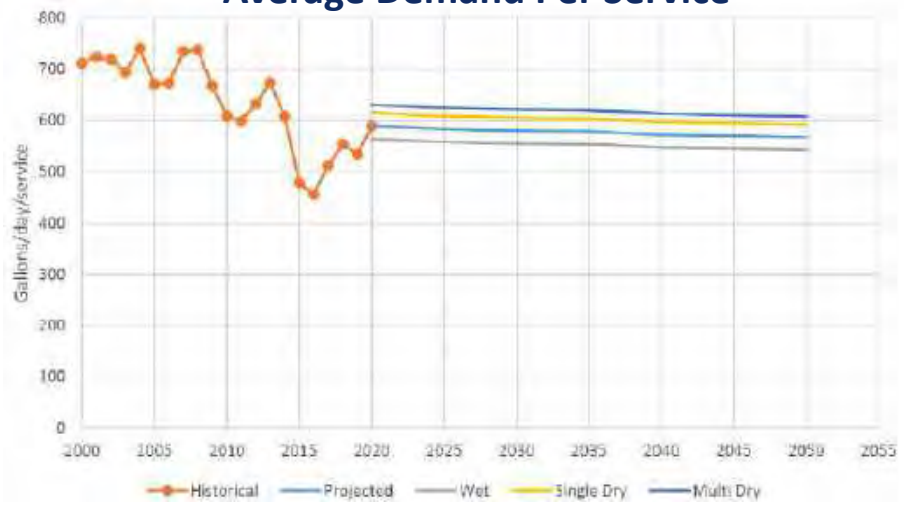
Population & Account Projections

Historical and Projected Population

Historical and Projected Services

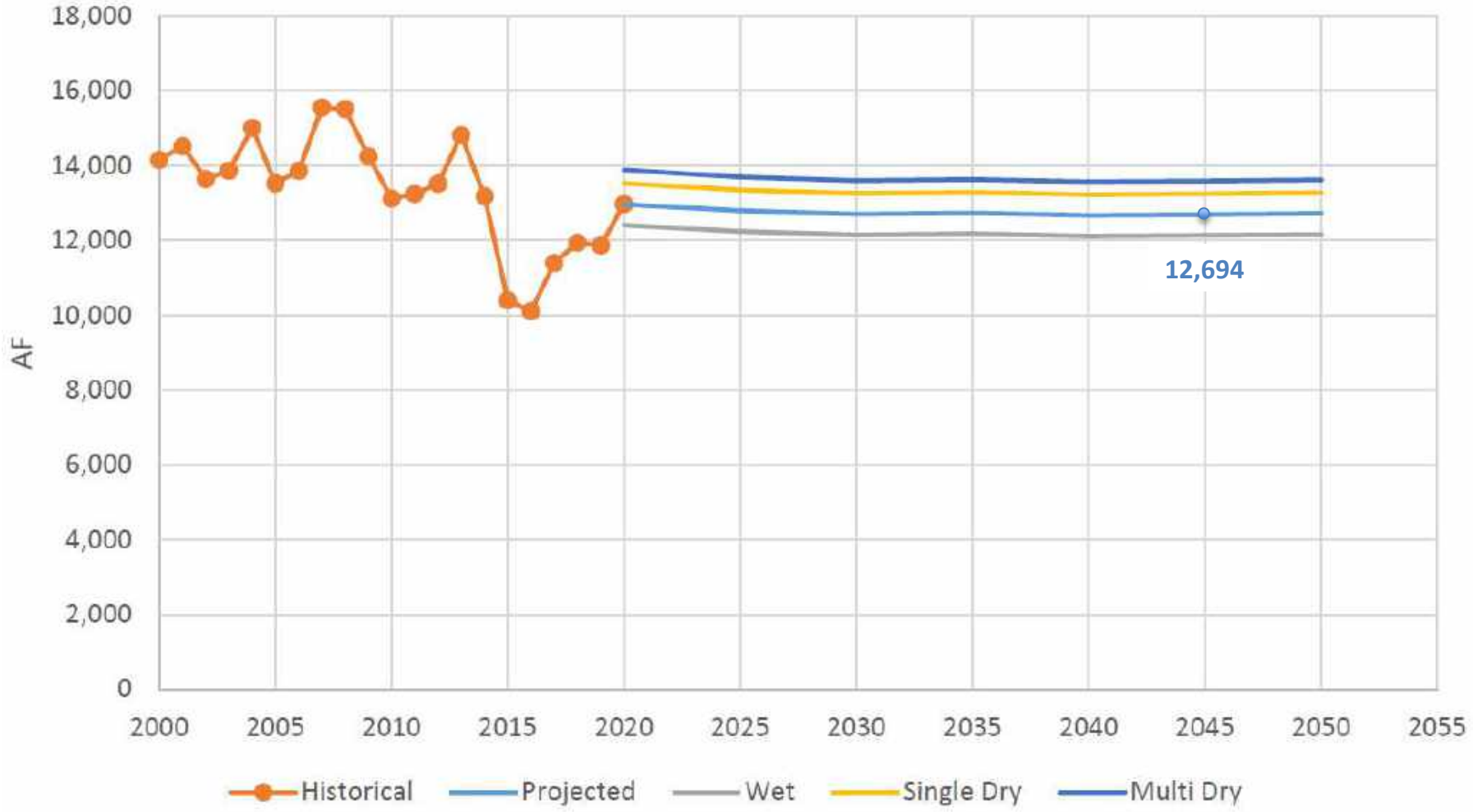


Average Demand Per Service



Demands for Potable Water - Projected

- 2045 demand projected to be 12,694 acre-feet per year
- 2% decrease relative to 2020 demands



SB X7-7 (20% by 2020)

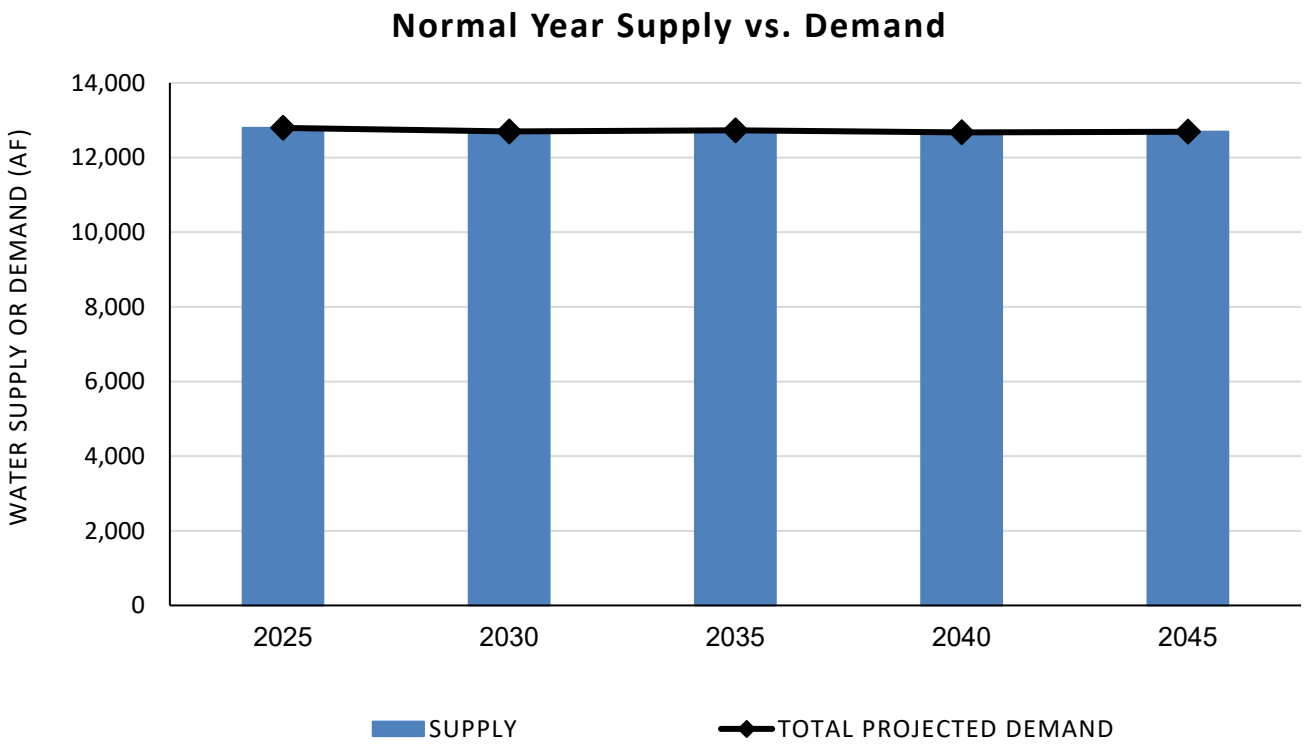
- Goal is to reduce per capita urban water use below baseline by:
  - 10% by Dec. 31, 2015
  - 20% by Dec. 31, 2020
- Bear Gulch District met its 2020 Target via Cal Water - San Francisco Bay Regional Alliance

2020 Actual GPCD	Optional Adjustment for Economic Growth[1]	Adjusted 2020 Actual GPCD	2020 Target GPCD [2]	Did Alliance Achieve Targeted Reduction for 2020?
130			150	Yes

[1]Adjustments for economic growth can be applied to either the individual supplier's data or to the aggregate regional alliance data (but not both), depending upon availability of suitable data and methods. [2] 2020 Target GPCD will be taken from the Regional Alliance's SB X7-7 Verification Form, Weighted Target Table.

Supply Sufficiency

- Supply sufficiency analysis is based on the following:
  - RWS purchased water availability is based on projections provided by BAWSCA and SFPUC
  - Local surface water supply availability during normal hydrologic years estimated to be 840 AFY, conservatively assumed to be zero during dry years
- Supply is projected to be sufficient to meet projected demand under normal year conditions
- Significant shortfalls are projected in single-dry and multiple-dry years if Bay-Delta Plan Amendment is adopted as written, but numerous uncertainties remain
- Any shortages will be addressed by the Water Shortage Contingency Plan

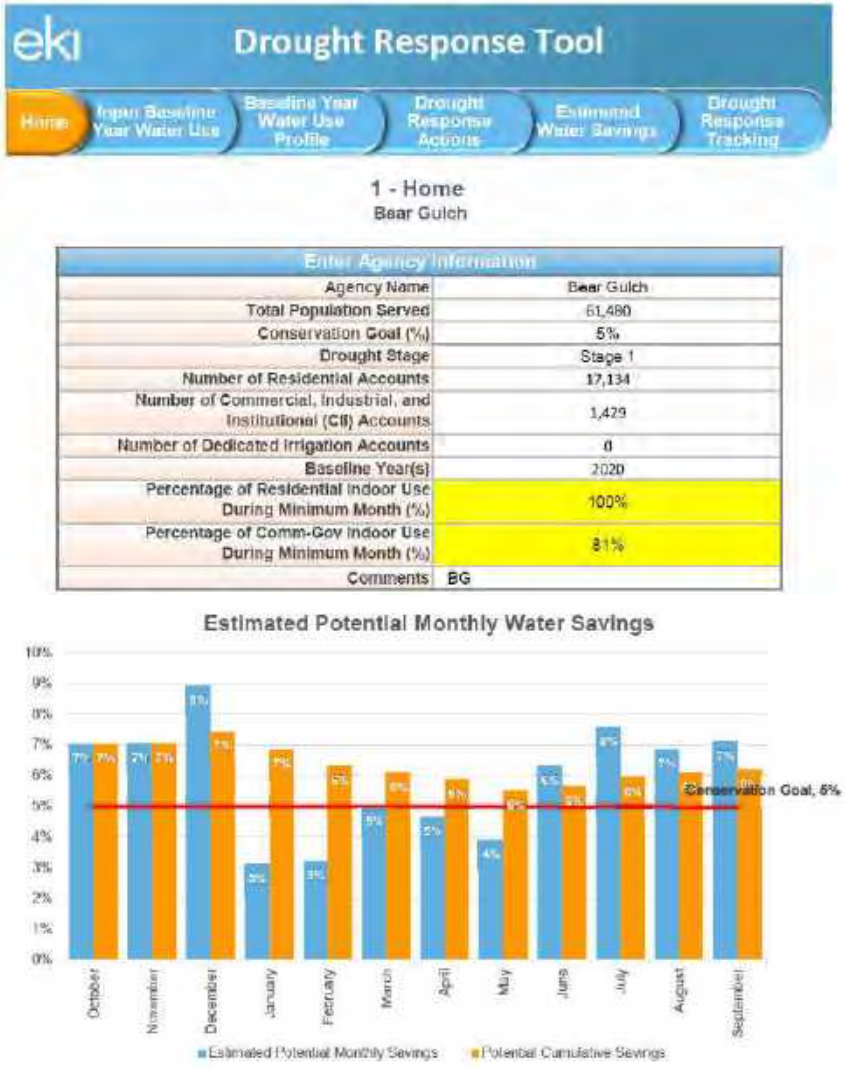


Local Topics – Bear Gulch District

- Implementation of the Bay-Delta Plan Amendment may impact future supply reliability
  - Requires the release of 30-50% of the “unimpaired flow” on the San Joaquin River tributaries from February through June in every year type - SFPUC modeling assumes 40% of unimpaired flow
  - SFPUC has provided all wholesale customers with estimates of RWS reliability, which predict shortfalls in excess of 50% during a five-year extended drought scenario
  - Numerous uncertainties remain and Cal Water is committed to developing a long-term supply reliability strategy for its Peninsula Districts, including evaluation of alternative supply sources and continued commitment to Cal Water’s comprehensive water conservation program

Water Shortage Contingency Plan Elements

- Comprehensive drought response plan
  - Annual assessment of water supply reliability
  - Six standard shortage stages (10% to >50%)
  - Shortage response actions
  - Communication protocols
  - Monitoring, enforcement, and reporting
- Quantitatively assessed using Drought Response Tool



Drought Update

- Governor has issued drought emergencies in the majority of counties in California
- Cal Water is monitoring drought conditions in all of its service territories
  - Established a Drought Response Committee
  - Proactively developing conservation messaging
- Cal Water is closely coordinating its drought response with other water agencies and regulatory bodies
- Cal Water will follow protocols outlined in the WSCP as needed
  - Based on local conditions or state mandates

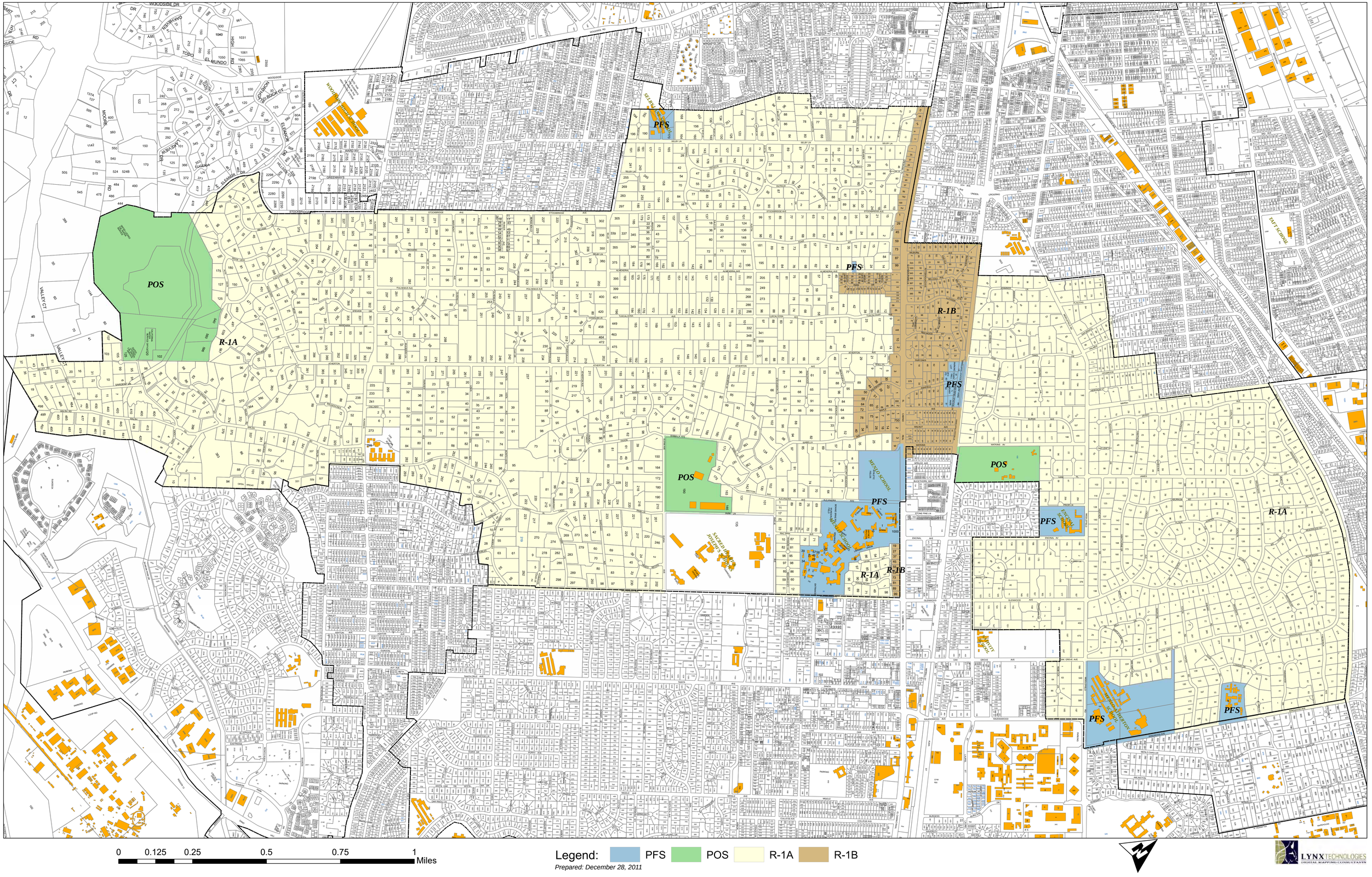
Questions or Comments

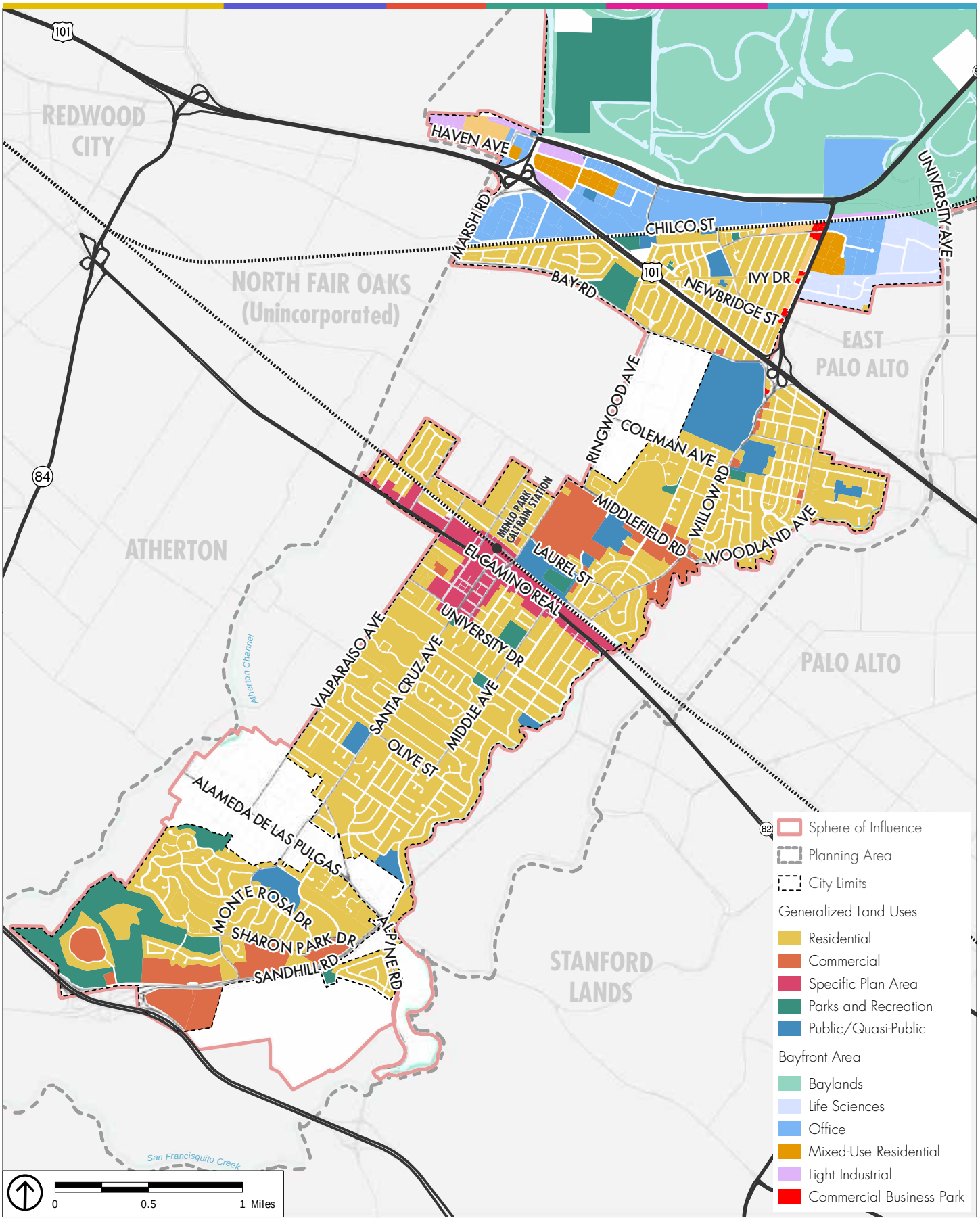
- Draft 2020 UWMP and 2020 WSCP available at **https://www.calwater.com/conservation/uwmp-review/**
- Comments on any parts of the UWMP will be accepted through Friday June 11
- Send 2020 UWMP and WSCP comments to: planninginfo@calwater.com

Appendix D: Land Use Maps

- Town of Atherton Zoning Map
- Menlo Park General Plan Land Use Designations
- North Fair Oaks Land Use Designations
- Town of Portola Valley Comprehensive Plan Diagram
- Town of Woodside Zoning Map

Town of Atherton Zoning Map

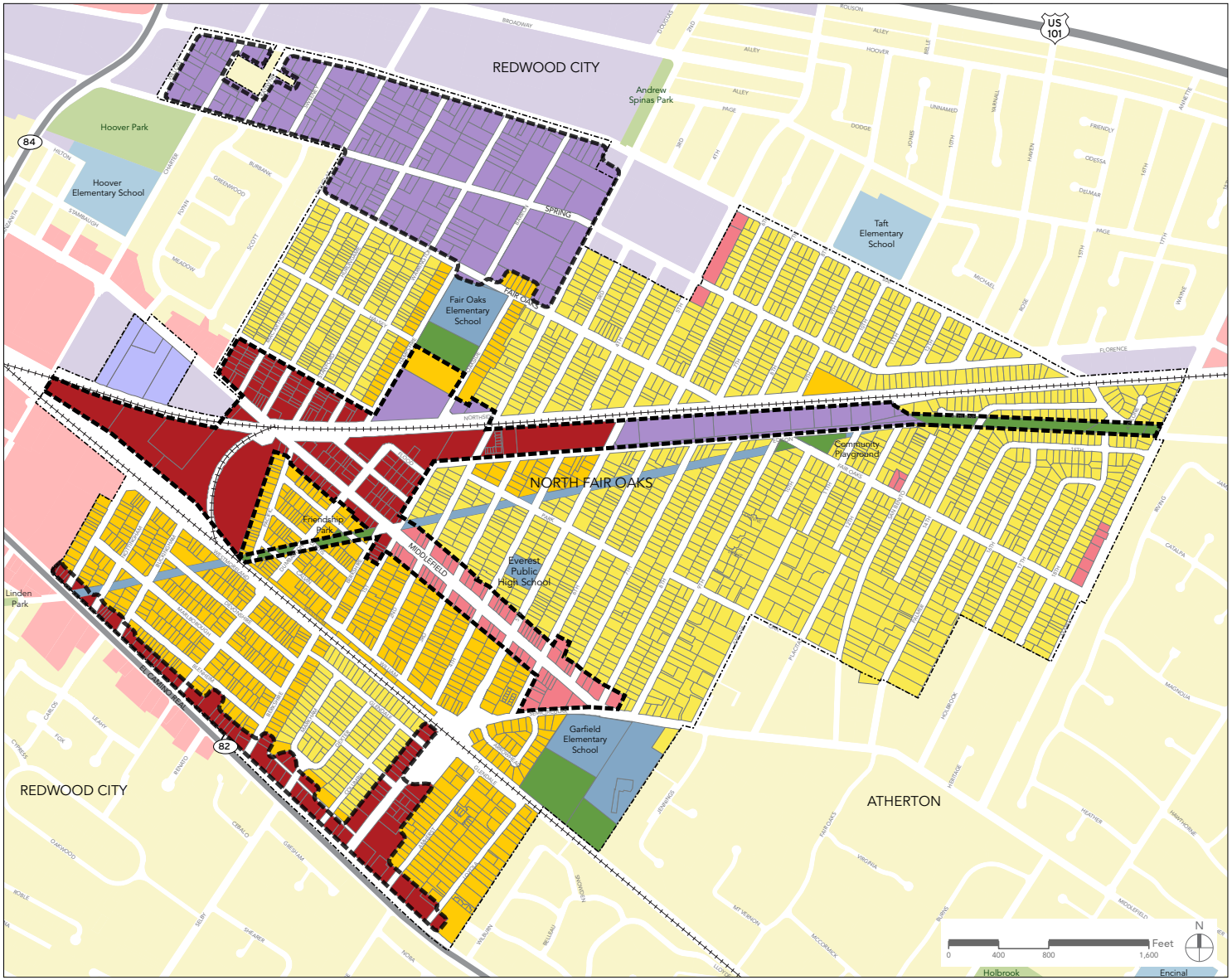




CONNECTMENLO

FIGURE 5: GENERAL PLAN LAND USE DESIGNATIONS

FIGURE 2.5: North Fair Oaks Land Use Designations



North Fair Oaks
Parcel
Highway
Rail Line

Residential
- Single-Family Residential
- Multi-Family Residential

Mixed-Use
- Neighborhood Mixed-Use (Medium Density) Commercial / Residential / Public
- Commercial Mixed-Use (Medium-High Density) Commercial / Residential / Public / Institutional / Industrial with approval
- Industrial Mixed-Use (Medium-High Density) Industrial / Commercial / Public / Institutional / Residential with approval

Industrial
- General Industrial

Public
- Institutional
- Parks

Land Uses in Neighboring Cities
- Residential
- Commercial
- Industrial
- Institutional
- Parks

PARKS, RECREATION AREAS AND OPEN SPACES

Preserve Park (Proposed / Existing)

- NEIGHBORHOOD COMMUNITY
- OTHER COMMUNITY (Labled)
- REGIONAL PARK (Labled)
- PRIVATE REGIONAL FACILITY (Labled)
- OPEN SPACE PRESERVE
- SCENIC CORRIDOR (Labled) & GREENWAY
- SCENIC CORRIDOR CENTER — View, Lookout, Road
- OPEN SPACE - LIMITED DEVELOPMENT
- AGRICULTURE

RESIDENTIAL AREAS

LAND USE INTENSITY

- LOW - MEDIUM
- LOW
- CONSERVATION RESIDENTIAL
- OPEN RESIDENTIAL
- Residential Open Space Preserve

Typical Land Area Per Dwelling Unit	
Low - Medium	< 1 acre
Low	1-2 acres
Conservation - Residential	2-4 acres
Open Residential	> 4 acres

INSTITUTIONS

- SCHOOL
  - Building Area
  - Playfield
  - ▲ Elementary ▲ Intermediate
- CHURCH
- OTHER (Labled)
- LOW INTENSITY ACADEMIC RESERVE

COMMERCIAL AND RESEARCH - ADMINISTRATIVE

- LOCAL SHOPPING & SERVICE
- RESEARCH - ADMINISTRATIVE

CIRCULATION

- FREEWAY
- ARTERIAL
- MAJOR COLLECTOR
- MINOR COLLECTOR
- Proposed

Trails, paths, bicycle routes and bicycle lanes are shown on the Trails and Paths Element of the General Plan. All scenic corridors and greenways are corridors for major trails and paths.

NORTH

0 2,000 4,000

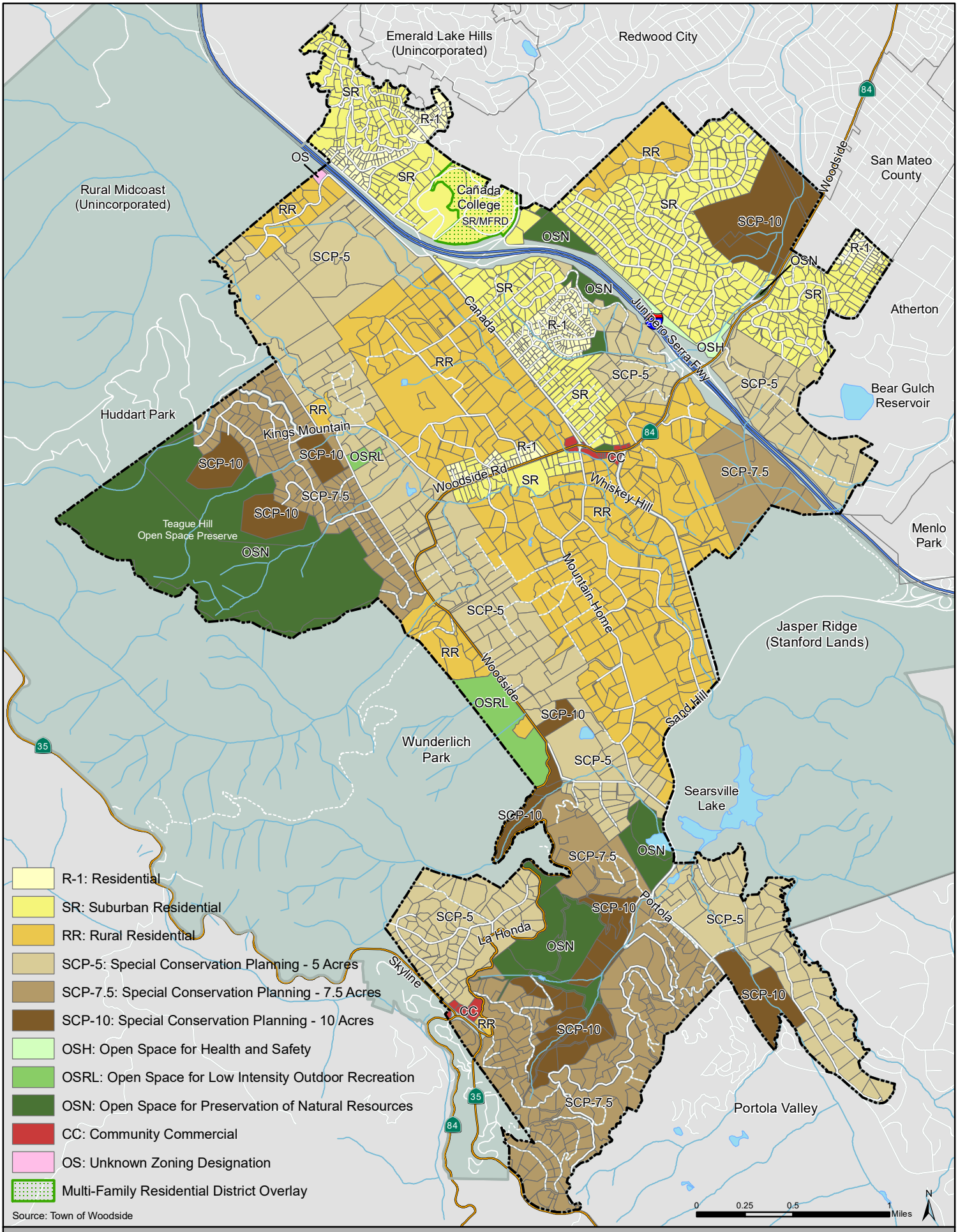
SCALE IN FEET
1" = 2,000'

ADOPTED BY TOWN COUNCIL RESOLUTION
1965-17, 07/08/1965
LAST AMENDED BY TOWN COUNCIL RESOLUTION
NO. 1891-2001, 04/25/2001
REPRINTED, 03/2007

PREPARED BY:
SPANGLE ASSOCIATES
URBAN PLANNING AND RESEARCH
770 MENLO AVE. #200, MENLO PARK, CA 94025

COMPREHENSIVE PLAN DIAGRAM

Part 5 of the General Plan - Town of Portola Valley



Zoning Map

Town of Woodside

Created By Woodside GIS 4/17/2012; Revised 03-26-17

Appendix E: Summary of Demand Projection Methodology and Assumptions

Cal Water Long-Term Demand Forecast Model Overview

Forecast Domain

The forecast model generates separate forecasts for each customer class and distribution system. Table 1 lists Cal Water districts and distribution systems. Table 2 lists customer classes.

Forecast Horizon and Time Step

The forecast horizon is 30 years. The forecast has an annual time-step.

Normal, Wet, and Dry Year Forecasts

The forecast model generates normal-, wet-, and dry-year demand forecasts. The normal-year forecast is the default forecast. The wet- and dry-year forecasts can be substituted for the default forecast as necessary for system planning purposes. The model produces two different dry year forecasts: the single dry year forecast and the multiple dry year forecast. The latter represents the expected effect of prolonged drought conditions on unconstrained water demand.[1]

Relationship to GRC Sales Forecast

The first year of the forecast can be set to the current GRC sales forecast or actual consumption.

Relationship to PAWS

The demand model uses historical data on services, sales, production, and population from Cal Water's Production Analysis Worksheets (PAWS).

Accounting Rules

The model uses the following accounting rules to ensure forecast consistency:

- Population and conservation savings forecasts are functions of the service forecast.
- The sales forecast for a distribution system is the sum of the class-level sales forecasts for the distribution system. The production forecast for a distribution system is the sum of the sales and non-revenue water (NRW) forecasts for the distribution system.
- The sales and production forecasts for a district are the sum of the sales and production forecasts for its distribution systems.

Volume Units

Sales and production forecasts are in acre-feet (AF). Average sales and per capita forecasts are in gallons per day.

Per Capita Water Use

The model generates per capita forecasts for water use by single-family customers, water use by multi-family customers, water use by all residential customers, and water use by all district customers.

[1] Unconstrained demand is what demand would be in the absence of water use restrictions or policies intended to curtail water use.

Service Forecast

The forecast model generates three alternative service forecasts:

- Average Y-Y Change in Services. The model bases the forecast on the historical year-to-year (y-y) change in the number of services. This forecast assumes additive growth.
- Average Y-Y % Change in Services. The model bases the forecast on the historical y-y percentage change in services. This forecast assumes exponential growth.
- Regional Growth Forecast. The model uses regional housing and employment growth forecasts to project future services. Districts in the Bay Area use census-tract level growth forecasts prepared by the Association of Bay Area Governments (ABAG). Districts in Southern California use census-tract-level growth forecasts prepared by the Southern California Association of Governments (SCAG). The remaining districts use county-level forecasts prepared by Caltrans.

Regional Forecasts

Table 3 lists the regional forecasts in the model. Table 4 summarizes how the model uses the regional forecasts to project future services.

Service Floors and Ceilings

The forecast can include floors and ceilings on the service growth. The floor (ceiling) is the minimum (maximum) number of services allowed in the forecast.

User-Specified Growth Rates

The model allows user-specified growth rates.

Water Supply Assessments

The user can add to the forecast projected services and water use from Water Supply Assessments prepared for proposed development projects. The user can specify how much of this projected growth in services and water use the model should treat as additive to the baseline forecast.

Population Forecasts

The population projection is a function of the residential service projections to ensure internal consistency. Population in year t is:

$$_t = \left[\text{———}\right]_{SFR} \cdot \qquad _t + \left[\text{———}\right]_{MFR} \cdot \qquad _t$$

For multi-family services, the calculation of average persons per service uses the equation below. The model uses county assessor data linked to Cal Water customer data to estimate average dwelling units per parcel and average parcels per service. It uses census data to estimate average persons per dwelling unit.

$$\left[\text{———}\right]_{MFR} = \text{———————} \cdot \text{———} \cdot \text{———}$$

Sales/Service Forecast

The model generates separate forecasts of sales/service for each customer class and distribution system.

Sales/Service Initialization

The model user sets sales/service for first year of the forecast to either current year water use or the most recent General Rate Case sales forecast. The 2020 UWMP projections start with 2020 actual sales/service.

Sales/Service Adjustments

In each forecast year, the model adjusts the previous year's sales/service estimate for:

1. Rebound from the 2012-16 drought
2. Passive water savings from plumbing codes and appliance standards
3. Active water savings from Cal Water conservation programs
4. Real changes in the marginal cost of water service
5. Real changes in per capita income

The user can select which adjustments to apply. The 2020 UWMP projections include all the adjustments except the drought rebound adjustment. The 2020 UWMP projections exclude the drought rebound adjustment because analysis of recent consumption trends showed that further rebound from the 2012-2016 drought was unlikely.

A description of each adjustment follows.

Drought Rebound

The model adjusts the sales/service forecast for demand recovery following the 2012-2016 drought. The model makes this adjustment using data on the growth in sales/service between 2016 and 2017. The model assumes some of the savings achieved during the drought will be permanent. The user can set the level of permanent drought savings. The default setting is 20%.

Passive Water Savings

The model uses DWR projections of water savings from plumbing/building codes to forecast passive water savings.[2] The model extends the DWR projections, which run through 2040, to 2050.

Active Water Savings

The model uses conservation program savings projections from Cal Water's 2015 Conservation Master Plans to forecast active water savings.

Price and Income Adjustments

The model adjusts average sales for expected changes in real income and cost of water service. The adjustment equation is:[3]

[2] M.Cubed. 2016. Projected Statewide and County-Level Effects of Plumbing Codes and Appliance Standards on Indoor GPCD. Technical Memorandum prepared by David Mitchell for the California Department of Water Resources. August 30, 2016.

[3] The model uses a constant-elasticity-of-demand specification: $_t = \ _t^{\varepsilon} \ _t^{\delta}$

$$\Delta_t = {}_0\left(1 - \left(\frac{t}{0}\right)^{\varepsilon}\left(\frac{t}{0}\right)^{\delta}\right)$$

where ${}_0$ is sales/service in the base year of the forecast, $\left(\frac{P_t}{P_0}\right)$ and $\left(\frac{I_t}{I_0}\right)$ are the price of water and income relative to the base year of the forecast, and and are empirically derived estimates of price and income elasticity.

Sales Forecast

The sales forecast is the product of the service and average use per service forecasts.

Non-Revenue Water Forecast

The non-revenue water forecast is a function of the services forecast. The forecast starts with an initial estimate of non-revenue water, expressed in gallons/connection/day. The model decomposes this estimate into real and apparent loss. The model assumes future apparent loss is equal to the average apparent loss for the five year before the start of the forecast. In the case of real loss, the model assumes Cal Water's loss management program will reduce real losses over time. The amount of reduction depends on the staring estimate of real loss. If this estimate is 10 gallons/connection/day or less, the model assumes no further reduction. Otherwise, the model assumes real losses (in gallons/connection/day) will decrease until they are equal to 75% of the average real loss for the five years before the start of the forecast or the State Water Board draft real water loss standard for the distribution system, whichever is greater.[4] The model assumes the reduction in real loss will occur between 2020 and 2030.

Production Forecast

The production forecast is the sum of the sales and NRW forecasts.

Normal, Wet, Single Dry, and Multiple Dry Year Projections

The model generates normal, wet, single dry, and multiple dry year forecasts of sales and production. The model bases these forecasts on empirically derived relationships between monthly water sales, rainfall, and air temperature estimated for each Cal Water district.[5]

- Wet year – minus one standard deviation weather effect on sales and production
- Single dry year – plus one standard deviation weather effect on sales and production
- Multiple dry year – plus 1.6 standard deviations weather effect on sales and production

In the case of the dry year forecasts, the model is forecasting demand in the absence of drought water use restrictions or other policies that would limit water use in dry years.

[4] The State Water Board did not develop a draft water loss standard for every Cal Water distribution system. For those without a draft standard, the model assumes real losses will decrease until they are equal to 75% of the average real loss for the five year before the start of the forecast.

[5] A&N Technical Services, Cal Water Long Term Water Demand Forecast Model, December 2014.

Table 1. Long-Term Demand Model Districts and Systems

Label	District-System	Notes
AV	**Antelope Valley District**	
AV-FMT	Fremont System	
AV-LAN	Lancaster System	
AV-LKH	Lake Hughes System	
AV-LVY	Leona Valley System	
BG	**Bear Gulch District**	No sub-systems in district
BK	**Bakersfield District**	
BK-BK	Bakersfield System	
BK-NG	North Garden System	
CH	**Chico District**	
CH-CH	Chico System	
CH-HAM	Hamilton City System	
DIX	**Dixon District**	No sub-systems in district
DOM	**Dominguez District**	No sub-systems in district
ELA	**East Los Angeles District**	No sub-systems in district
HAW	**Hawthorne District**	No sub-systems in district
HR	**Hermosa-Redondo District**	No sub-systems in district
KC	**King City District**	No sub-systems in district
KRV	**Kern River Valley District**	
KRV-BDFLO	Lower Bodfish System	
KRV-BDFUP	Upper Bodfish System	
KRV-KNVARD	Kernville & Arden System	Includes KNV, KRVArdenWaterCo, COUN, MSH, POND
KRV-LKL	Lakeland System	
KRV-ONX	Onyx System	
KRV-SLK	South Lake System	Includes SQM
KRV-SPM	Split Mountain System	
LAS	**Los Altos District**	No sub-systems in district
LIV	**Livermore District**	No sub-systems in district

Label	District-System	Notes
MPS	**Mid-Peninsula District**	
MPS-SM	San Mateo System	
MPS-SC	San Carlos System	
MRL	**Marysville District**	No sub-systems in district
ORO	**Oroville District**	No sub-systems in district
PV	**Palos Verdes District**	No sub-systems in district
RDV	**Redwood Valley District**	
RDV-ARM	Armstrong System	
RDV-CSP	Coast Springs System	
RDV-HKN	Hawkins Water System	
RDV-LUC	Lucerne System	
RDV-NOH	Noel Heights System	
RDV-RPD	Rancho del Paradiso System	
SEL	**Selma District**	No sub-systems in district
SLN	**Salinas District**	
SLN-SLN	Salinas System	Includes Bolsa Knolls, Country Meadows
SLN-SLNH	Salinas Hills System	Includes Buena Vista, Indian Springs
SLN-OH	Oak Hill System	
SLN-LL	Las Lomas System	
SSF	**South San Francisco District**	No sub-systems in district
STK	**Stockton District**	No sub-systems in district
VIS	**Visalia District**	No sub-systems in district
WIL	**Willows District**	No sub-systems in district
WLK	**Westlake District**	No sub-systems in district

Table 2. Long-Term Demand Model Customer Classes

Label	Description	Revenue Class #
SFR	Single-Family Residential	1
FLT	Single-Family Flat Rate	4
RES	SFR + FLT	1, 4
MFR	Multi-Family	15
COM	Commercial/Business	2
GOV	Government/Public Authority	11
IND	Industrial	3
OTH	Other/miscellaneous	8,13
IRR	Dedicated irrigation customers	7

Table 3. Regional Forecasts used in First Generation Long-term Demand Model Forecasts

Regional Forecast	Version	Range
ABAG	Plan Bay Area 2040, GEOID10-level summary	2010 to 2040
SCAG	RTP07 GEOID10-level	2010 to 2035
Caltrans	2017 County Forecasts	2010 to 2050

Table 4. Regional Growth Rates used in the Service Growth Forecasts

Service Class	ABAG	SCAG	Caltrans
SFR	y-y % change in single-family dwelling units	y-y % change in all residential dwelling units	y-y % change in single-family dwelling units
MFR	y-y % change in multi-family dwelling units	y-y % change in all residential dwelling units	y-y % change in multi-family dwelling units
COM	y-y % change in total number of jobs	y-y % change in total number of jobs	y-y % change in county employment in retail, wholesale, information, financial, professional, and leisure sectors
GOV	y-y % change in gov't, information, and construction jobs	y-y % change in total number of jobs	y-y % change in county employment in federal, state, local government and education and healthcare sectors
IND	y-y % change in manufacturing jobs	y-y % change in total number of jobs	y-y % change in county employment in manufacturing sectors

Historical and Projected Services, Water Sales, and Total Production

District Demand Projection Report
Bear Gulch

6/7/2021

General Rate Case Sales Baseline 2020

Historical Data Range
First Year 2000
Last Year 2020

Forecast Range
First Year 2020
Last Year 2050

Service Growth Basis ABAG Growth Forecasts

Service Growth Rates

Class	ABAG Projected	Historical %Y-Y[1] 5-Yr	10-Yr	15-Yr	20-Yr
RES[2]	0.1%	0.0%	0.1%	0.3%	0.3%
MFR	0.7%	10.4%	9.5%	7.5%	5.5%
COM	0.0%	-1.2%	-0.9%	-0.2%	-0.1%
GOV	0.1%	2.7%	1.6%	2.4%	1.7%
IND	-0.7%	0.0%	0.0%	0.0%	0.0%
TOT		0.0%	0.1%	0.4%	0.4%

Water Supply Assessments

	WSA Name	Completion Date	Incorporated into Forecast (Y/N)
1			
2			
3			
4			
5			

Sales Forecast Adjustments

Drought Rebound	OFF
Plumbing Code	ON
Active Conservation	ON
Price Response	ON
Income Response	ON

Non-Revenue Water (NRW) Basis

Real loss (gal/con/day):
2016-2020 average if <= 10 gal/con/day
Draft Water Board standard or 75% of 2016-2020 average, whichever is greater, by 2030.
Apparent loss (gal/con/day): 2016-2020 average.

1. Account reclassifications can impact historical %Y-Y growth rates for individual customer classes.
2. RES = Metered and unmetered single-family residential customers.

Historical Service Counts

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2000	15,816	64	1,276	96	1	34	0	17,288
2001	15,875	64	1,280	95	1	38	0	17,354
2002	15,919	64	1,279	95	1	41	0	17,400
2003	15,890	64	1,278	96	1	31	0	17,359
2004	15,910	64	1,274	97	1	31	2	17,379
2005	16,134	63	1,280	95	1	27	5	17,605
2006	16,256	63	1,274	96	1	23	9	17,721
2007	16,271	63	1,279	96	1	34	10	17,755
2008	16,260	70	1,326	107	1	32	8	17,804
2009	16,528	76	1,364	116	1	28	7	18,119
2010	16,781	75	1,365	116	1	24	7	18,369
2011	16,857	83	1,359	118	1	25	8	18,450
2012	16,884	84	1,351	118	1	27	7	18,473
2013	16,887	85	1,350	117	1	35	8	18,482
2014	16,944	85	1,349	119	1	27	8	18,532
2015	16,970	114	1,326	119	1	23	8	18,560
2016	16,968	175	1,272	119	1	27	8	18,569
2017	16,960	185	1,261	117	1	36	8	18,570
2018	16,958	187	1,250	119	1	35	8	18,558
2019	16,946	187	1,244	136	1	37	8	18,559
2020	16,944	187	1,248	136	1	37	8	18,561
2021								
2022								
2023								
2024								
2025								
2026								
2027								
2028								
2029								
2030								

CAGR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
5-Year	0.0%	10.4%	-1.2%	2.7%	0.0%	10.1%	0.4%	0.0%
10-Year	0.1%	9.5%	-0.9%	1.6%	0.0%	4.4%	1.0%	0.1%
15-Year	0.3%	7.5%	-0.2%	2.4%	0.0%	2.1%	2.7%	0.4%
20-Year	0.3%	5.5%	-0.1%	1.7%	0.0%	0.4%		0.4%

CAGR = Compound Annual Growth Rate

Historical Sales (AF)

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2000	11,552	268	1,544	269	7	139	0	13,779
2001	11,952	265	1,512	279	5	71	0	14,083
2002	11,995	252	1,442	317	8	21	0	14,035
2003	11,534	248	1,375	274	7	56	0	13,495
2004	12,429	248	1,409	293	6	52	-4	14,434
2005	11,285	250	1,363	255	7	48	15	13,223
2006	11,393	251	1,394	260	5	50	14	13,365
2007	12,600	236	1,388	289	6	66	38	14,623
2008	12,615	231	1,449	339	5	49	38	14,726
2009	11,572	244	1,339	322	6	41	29	13,552
2010	10,629	232	1,309	297	4	20	32	12,523
2011	10,478	232	1,313	303	4	20	25	12,375
2012	11,176	228	1,314	321	5	19	28	13,091
2013	11,973	233	1,308	371	5	26	26	13,941
2014	10,853	220	1,212	287	3	28	24	12,627
2015	8,376	223	1,065	220	2	24	26	9,935
2016	8,001	235	980	218	2	31	24	9,491
2017	9,000	264	1,048	292	2	25	26	10,656
2018	9,742	285	1,111	323	2	22	29	11,514
2019	9,361	242	1,152	299	2	22	27	11,104
2020	10,598	279	1,038	303	3	20	21	12,262
2021								
2022								
2023								
2024								
2025								
2026								
2027								
2028								
2029								
2030								

CAGR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
5-Year	4.8%	4.6%	-0.5%	6.6%	9.9%	-4.0%	-3.8%	4.3%
10-Year	0.0%	1.8%	-2.3%	0.2%	-5.0%	0.1%	-4.1%	-0.2%
15-Year	-0.4%	0.7%	-1.8%	1.2%	-6.9%	-5.7%	2.6%	-0.5%
20-Year	-0.4%	0.2%	-2.0%	0.6%	-4.8%	-9.2%		-0.6%

CAGR = Compound Annual Growth Rate

Historical Sales/Service (GPD)

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2000	652	3,744	1,080	2,490	6,082	3,613		712
2001	672	3,693	1,054	2,621	4,183	1,644		725
2002	673	3,520	1,007	2,975	7,433	449		720
2003	648	3,460	960	2,560	6,619	1,646		694
2004	697	3,465	987	2,708	5,168	1,518	-1,748	741
2005	624	3,518	951	2,395	6,609	1,587	2,430	671
2006	626	3,569	977	2,415	4,123	1,913	1,337	673
2007	691	3,358	968	2,676	5,730	1,733	3,288	735
2008	693	2,926	976	2,828	4,681	1,380	4,069	738
2009	625	2,882	876	2,480	5,226	1,324	3,556	668
2010	565	2,748	856	2,290	3,773	737	3,974	609
2011	555	2,489	862	2,294	3,492	715	3,005	599
2012	591	2,429	868	2,422	4,547	637	3,394	633
2013	633	2,454	865	2,822	4,195	662	3,052	673
2014	572	2,308	802	2,166	2,859	927	2,743	608
2015	441	1,746	717	1,655	1,414	959	2,930	478
2016	421	1,200	688	1,640	1,748	1,033	2,705	456
2017	474	1,271	741	2,220	1,920	619	2,893	512
2018	513	1,360	794	2,415	1,916	552	3,219	554
2019	493	1,154	826	1,960	1,842	527	2,991	534
2020	558	1,331	743	1,994	2,267	484	2,364	590
2021								
2022								
2023								
2024								
2025								
2026								
2027								
2028								
2029								
2030								

CAGR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
5-Year	4.9%	-5.3%	0.7%	3.8%	9.9%	-12.8%	-4.2%	4.3%
10-Year	-0.1%	-7.0%	-1.4%	-1.4%	-5.0%	-4.1%	-5.1%	-0.3%
15-Year	-0.7%	-6.3%	-1.6%	-1.2%	-6.9%	-7.6%	-0.2%	-0.9%
20-Year	-0.8%	-5.0%	-1.9%	-1.1%	-4.8%	-9.6%		-0.9%

CAGR = Compound Annual Growth Rate

District Demand Projection Report
Bear Gulch

Historical Production (AF)

YEAR	SALES	NRW	PROD	NRW %	NRW GPD/Svc
2000	13,779	370	14,149	2.6%	19
2001	14,083	435	14,518	3.0%	22
2002	14,035	-396	13,639	-2.9%	-20
2003	13,495	366	13,861	2.6%	19
2004	14,434	574	15,008	3.8%	30
2005	13,223	304	13,527	2.3%	15
2006	13,365	493	13,858	3.6%	25
2007	14,623	931	15,554	6.0%	47
2008	14,726	785	15,510	5.1%	39
2009	13,552	693	14,245	4.9%	34
2010	12,523	598	13,121	4.6%	29
2011	12,375	875	13,250	6.6%	42
2012	13,091	428	13,519	3.2%	21
2013	13,941	872	14,813	5.9%	42
2014	12,627	554	13,181	4.2%	27
2015	9,935	466	10,401	4.5%	22
2016	9,491	614	10,105	6.1%	30
2017	10,656	739	11,395	6.5%	36
2018	11,514	422	11,936	3.5%	20
2019	11,104	766	11,869	6.5%	37
2020	12,262	711	12,972	5.5%	34
2021					
2022					
2023					
2024					
2025					
2026					
2027					
2028					
2029					
2030					

CAGR	SALES	NRW	PROD		NRW GPD/Svc
5-Year	4.3%	8.8%	4.5%		8.8%
10-Year	-0.2%	1.7%	-0.1%		1.6%
15-Year	-0.5%	5.8%	-0.3%		5.4%
20-Year	-0.6%	3.3%	-0.4%		3.0%

CAGR = Compound Annual Growth Rate

Historical GPCD

		GPCD	
YEAR	POPULATION	RESIDENTIAL	TOTAL
2000	53,885	196	234
2001	54,162	201	239
2002	54,392	201	224
2003	54,421	193	227
2004	54,574	207	246
2005	55,252	186	219
2006	55,653	187	222
2007	55,769	205	249
2008	55,812	205	248
2009	56,560	187	225
2010	57,254	169	205
2011	57,876	165	204
2012	58,376	174	207
2013	58,812	185	225
2014	59,387	166	198
2015	59,883	128	155
2016	60,307	122	150
2017	60,719	136	168
2018	60,864	147	175
2019	60,827	141	174
2020	60,814	160	190
2021			
2022			
2023			
2024			
2025			
2026			
2027			
2028			
2029			
2030			

CAGR	POPULATION	RESIDENTIAL GPCD	TOTAL GPCD
5-Year	0.3%	4.5%	4.2%
10-Year	0.6%	-0.6%	-0.7%
15-Year	0.6%	-1.0%	-0.9%
20-Year	0.6%	-1.0%	-1.0%

CAGR = Compound Annual Growth Rate

Projected Services

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2020	16,944	187	1,248	136	1	37	8	18,561
2021	16,945	187	1,251	136	1	33	8	18,561
2022	16,946	187	1,254	136	1	33	8	18,565
2023	16,946	187	1,257	136	1	33	8	18,569
2024	16,947	188	1,260	137	1	33	8	18,574
2025	16,947	189	1,263	137	1	33	8	18,578
2026	16,948	191	1,265	137	1	33	8	18,584
2027	16,949	193	1,268	137	1	33	8	18,589
2028	16,949	195	1,270	137	1	33	8	18,594
2029	16,950	196	1,273	137	1	33	8	18,599
2030	16,956	199	1,279	138	1	33	8	18,615
2031	16,963	201	1,285	139	1	33	8	18,631
2032	16,970	204	1,291	140	1	33	8	18,647
2033	16,977	207	1,297	141	1	33	8	18,663
2034	16,983	209	1,303	142	1	33	8	18,679
2035	17,005	211	1,300	142	1	33	8	18,700
2036	17,027	212	1,298	142	1	33	8	18,721
2037	17,049	213	1,295	142	1	33	8	18,742
2038	17,071	215	1,293	142	1	33	8	18,763
2039	17,094	216	1,290	142	1	33	8	18,784
2040	17,116	217	1,288	142	1	33	8	18,805
2041	17,138	219	1,285	142	1	33	8	18,826
2042	17,160	220	1,283	142	1	33	8	18,847
2043	17,182	222	1,280	142	1	33	8	18,868
2044	17,205	223	1,278	142	1	33	8	18,890
2045	17,227	224	1,275	142	1	33	8	18,911
2046	17,249	226	1,273	142	1	33	8	18,932
2047	17,271	227	1,270	142	1	33	8	18,954
2048	17,294	229	1,268	142	1	33	8	18,975
2049	17,316	230	1,265	142	1	33	8	18,996
2050	17,339	232	1,263	142	1	33	8	19,018

Projected Sales (AF)

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2020	10,598	279	1,038	303	3	20	21	12,262
2021	10,464	271	1,015	298	3	18	21	12,090
2022	10,495	268	999	295	3	18	21	12,099
2023	10,531	266	984	292	3	18	21	12,115
2024	10,572	264	970	289	3	18	21	12,137
2025	10,591	264	957	286	3	18	21	12,139
2026	10,614	264	944	283	3	18	21	12,147
2027	10,597	264	932	281	3	18	21	12,116
2028	10,592	265	922	278	3	18	21	12,099
2029	10,592	266	916	277	3	18	21	12,092
2030	10,595	267	913	278	3	18	21	12,095
2031	10,602	269	910	278	3	18	21	12,101
2032	10,585	271	908	279	3	18	21	12,085
2033	10,603	273	906	280	3	18	21	12,104
2034	10,612	276	904	280	3	18	21	12,114
2035	10,629	277	897	279	3	18	21	12,123
2036	10,620	277	890	278	3	18	21	12,107
2037	10,610	278	883	277	3	18	21	12,090
2038	10,614	279	876	276	3	18	21	12,087
2039	10,608	280	870	275	3	18	21	12,075
2040	10,605	281	864	274	3	18	21	12,065
2041	10,609	282	858	273	3	18	21	12,064
2042	10,617	283	852	272	3	18	21	12,066
2043	10,626	284	847	271	3	18	21	12,070
2044	10,644	285	841	270	3	18	21	12,083
2045	10,647	286	836	270	3	18	21	12,081
2046	10,652	288	830	269	3	18	21	12,081
2047	10,656	289	825	268	3	18	21	12,080
2048	10,664	290	820	267	3	18	21	12,083
2049	10,676	291	815	266	3	18	21	12,090
2050	10,691	293	810	265	3	18	21	12,101

Projected Sales/Service (GPD)

YEAR	RES	MFR	COM	GOV	IND	OTH	IRR	TOT
2020	558	1,331	743	1,994	2,267	484	2,364	590
2021	551	1,294	724	1,957	2,267	484	2,364	581
2022	553	1,279	711	1,932	2,267	484	2,364	582
2023	555	1,267	699	1,910	2,267	484	2,364	582
2024	557	1,255	687	1,888	2,267	484	2,364	583
2025	558	1,244	676	1,867	2,267	484	2,364	583
2026	559	1,234	666	1,846	2,267	484	2,364	584
2027	558	1,224	657	1,828	2,267	484	2,364	582
2028	558	1,215	648	1,811	2,267	484	2,364	581
2029	558	1,207	642	1,801	2,267	484	2,364	580
2030	558	1,200	637	1,793	2,267	484	2,364	580
2031	558	1,193	632	1,785	2,267	484	2,364	580
2032	557	1,187	628	1,777	2,267	484	2,364	579
2033	558	1,182	624	1,769	2,267	484	2,364	579
2034	558	1,177	620	1,762	2,267	484	2,364	579
2035	558	1,173	616	1,755	2,267	484	2,364	579
2036	557	1,168	612	1,748	2,267	484	2,364	577
2037	556	1,164	609	1,741	2,267	484	2,364	576
2038	555	1,160	605	1,735	2,267	484	2,364	575
2039	554	1,157	602	1,728	2,267	484	2,364	574
2040	553	1,153	599	1,722	2,267	484	2,364	573
2041	553	1,150	596	1,716	2,267	484	2,364	572
2042	552	1,147	593	1,710	2,267	484	2,364	572
2043	552	1,145	590	1,704	2,267	484	2,364	571
2044	552	1,142	588	1,698	2,267	484	2,364	571
2045	552	1,140	585	1,692	2,267	484	2,364	570
2046	551	1,137	582	1,687	2,267	484	2,364	570
2047	551	1,134	580	1,681	2,267	484	2,364	569
2048	551	1,132	577	1,675	2,267	484	2,364	568
2049	550	1,130	575	1,670	2,267	484	2,364	568
2050	550	1,128	572	1,664	2,267	484	2,364	568

Projected Production (AF)

YEAR	SALES	NRW	PROD	% NRW	NRW GPD/Svc
2020	12,262	711	12,972	5.5%	34
2021	12,090	700	12,790	5.5%	34
2022	12,099	689	12,788	5.4%	33
2023	12,115	679	12,794	5.3%	33
2024	12,137	668	12,805	5.2%	32
2025	12,139	657	12,796	5.1%	32
2026	12,147	647	12,794	5.1%	31
2027	12,116	636	12,752	5.0%	31
2028	12,099	625	12,724	4.9%	30
2029	12,092	614	12,706	4.8%	29
2030	12,095	604	12,699	4.8%	29
2031	12,101	605	12,706	4.8%	29
2032	12,085	605	12,690	4.8%	29
2033	12,104	606	12,709	4.8%	29
2034	12,114	606	12,720	4.8%	29
2035	12,123	607	12,730	4.8%	29
2036	12,107	608	12,715	4.8%	29
2037	12,090	608	12,698	4.8%	29
2038	12,087	609	12,696	4.8%	29
2039	12,075	610	12,684	4.8%	29
2040	12,065	610	12,675	4.8%	29
2041	12,064	611	12,675	4.8%	29
2042	12,066	612	12,677	4.8%	29
2043	12,070	612	12,682	4.8%	29
2044	12,083	613	12,696	4.8%	29
2045	12,081	614	12,694	4.8%	29
2046	12,081	614	12,695	4.8%	29
2047	12,080	615	12,695	4.8%	29
2048	12,083	616	12,699	4.8%	29
2049	12,090	617	12,707	4.9%	29
2050	12,101	617	12,718	4.9%	29

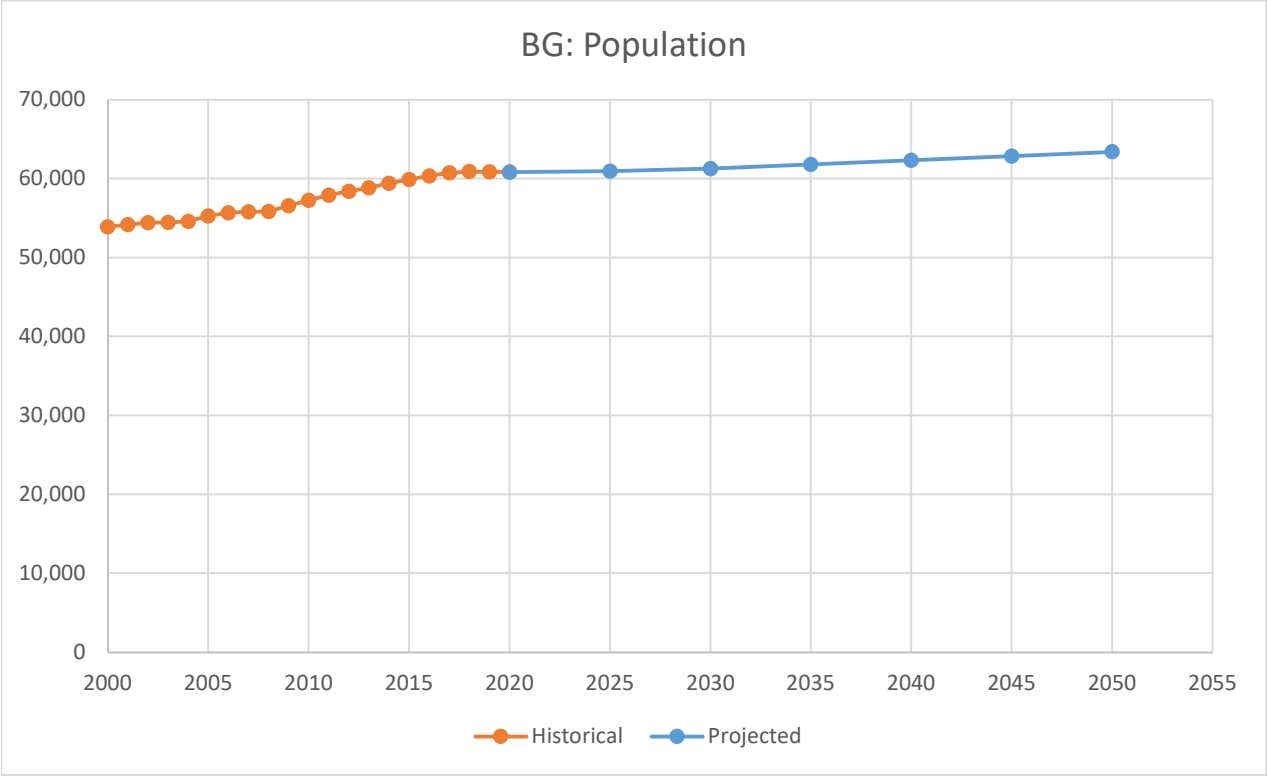
Projected GPCD

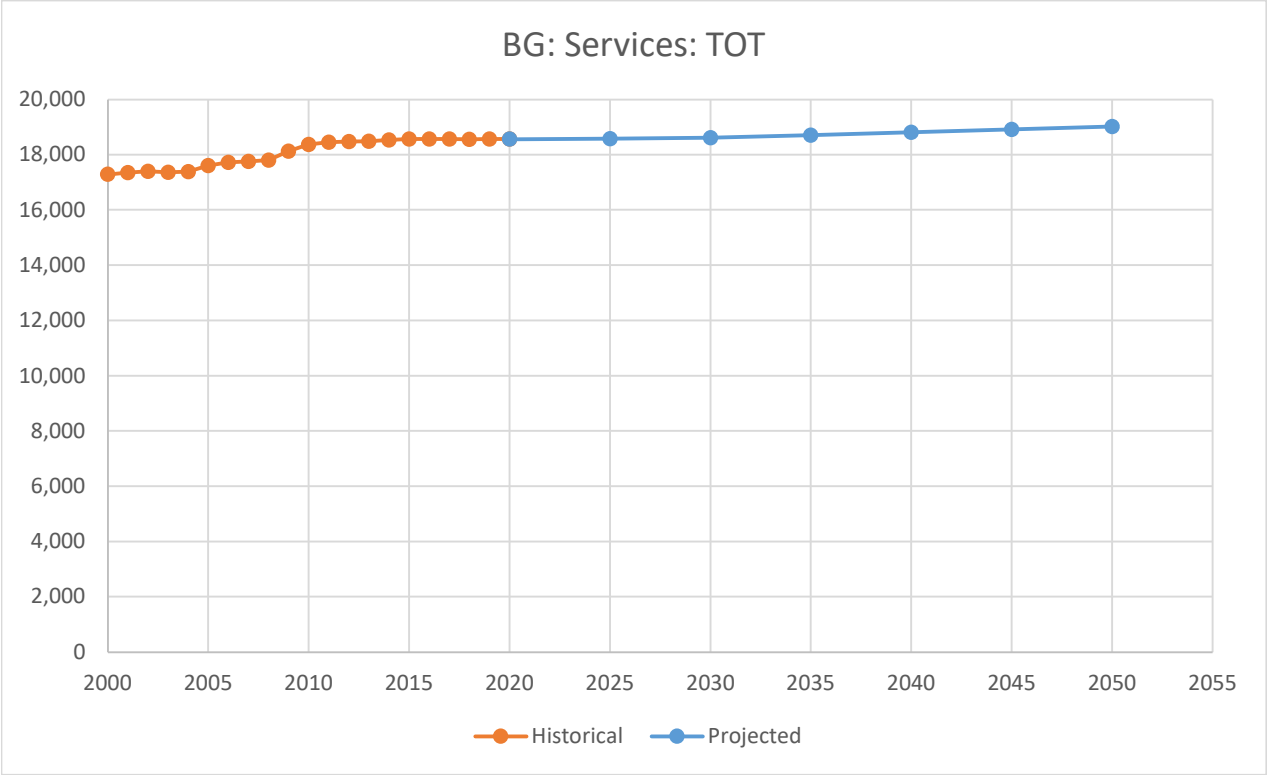
		GPCD	
YEAR	POPULATION	RESIDENTIAL	TOTAL
2020	60,814	189	190
2021	60,822	187	188
2022	60,830	187	188
2023	60,838	188	188
2024	60,846	188	188
2025	60,907	188	188
2026	60,968	189	187
2027	61,029	188	187
2028	61,091	188	186
2029	61,153	188	185
2030	61,255	187	185
2031	61,359	187	185
2032	61,463	187	184
2033	61,568	186	184
2034	61,675	186	184
2035	61,778	186	184
2036	61,882	186	183
2037	61,987	185	183
2038	62,091	185	183
2039	62,196	184	182
2040	62,302	184	182
2041	62,408	184	181
2042	62,514	184	181
2043	62,621	183	181
2044	62,728	183	181
2045	62,835	183	180
2046	62,943	183	180
2047	63,051	182	180
2048	63,159	182	179
2049	63,268	182	179
2050	63,378	182	179

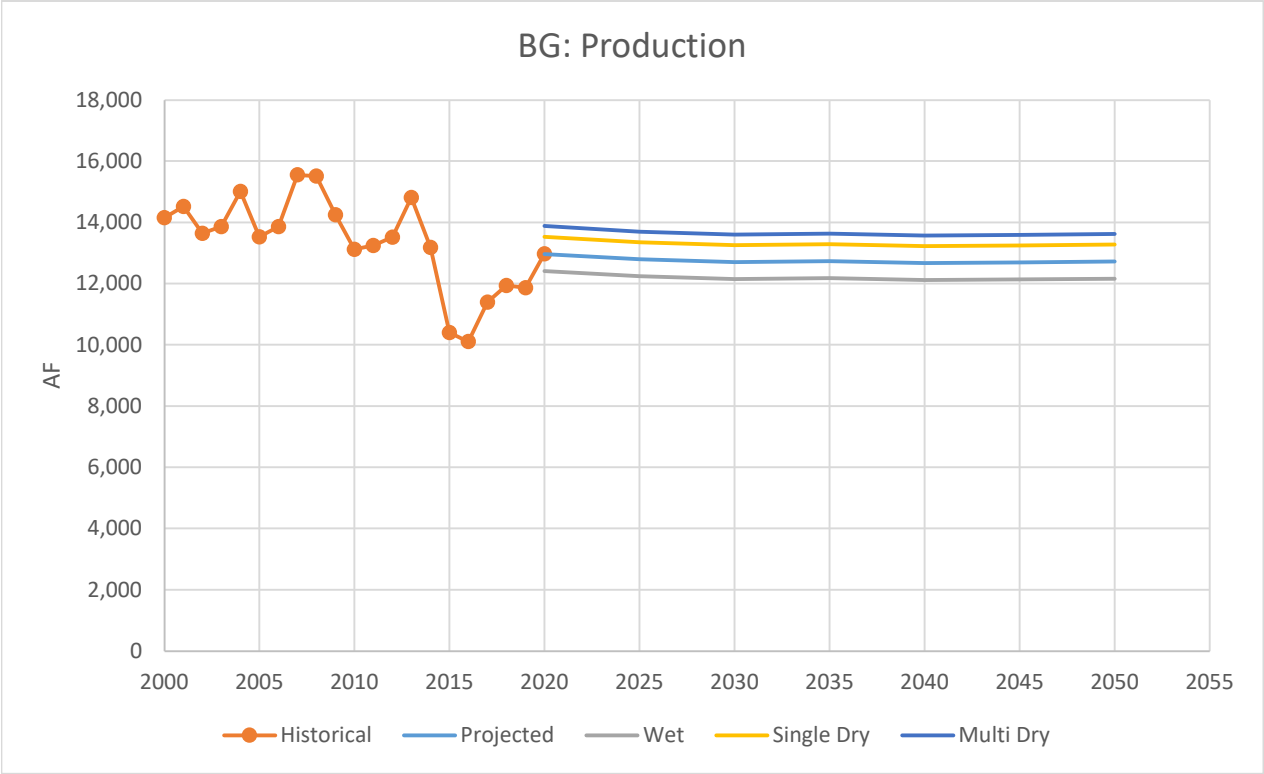
Normal, Single-Year, and Multi-Year Dry Year Demand (AF)

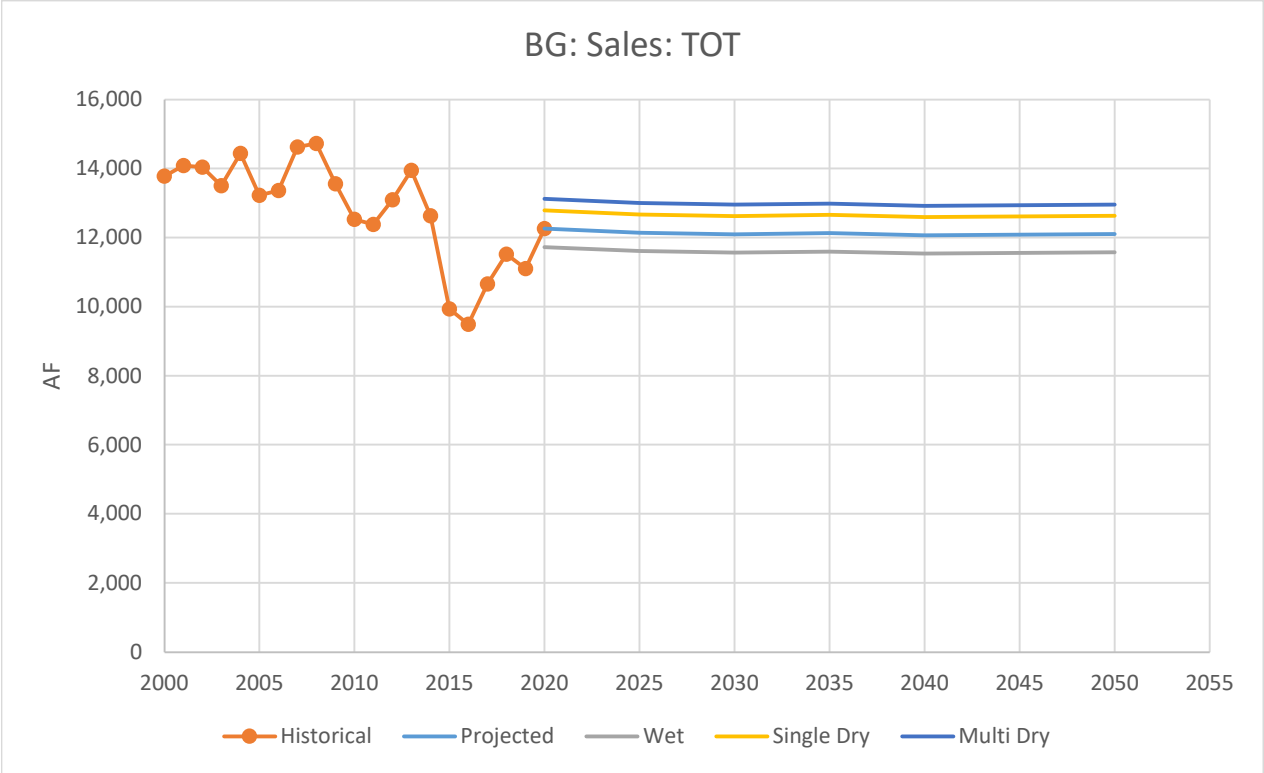
YEAR		NORMAL		SINGLE DRY YEAR	% OF NORMAL		MULTI DRY YEAR	% OF NORMAL
2020		12,972		13,536	104%		13,885	107%
2021		12,790		13,346	104%		13,690	107%
2022		12,788		13,344	104%		13,689	107%
2023		12,794		13,350	104%		13,695	107%
2024		12,805		13,362	104%		13,707	107%
2025		12,796		13,354	104%		13,699	107%
2026		12,794		13,351	104%		13,696	107%
2027		12,752		13,308	104%		13,652	107%
2028		12,724		13,279	104%		13,622	107%
2029		12,706		13,260	104%		13,603	107%
2030		12,699		13,253	104%		13,595	107%
2031		12,706		13,260	104%		13,603	107%
2032		12,690		13,243	104%		13,586	107%
2033		12,709		13,263	104%		13,606	107%
2034		12,720		13,274	104%		13,617	107%
2035		12,730		13,285	104%		13,629	107%
2036		12,715		13,269	104%		13,612	107%
2037		12,698		13,252	104%		13,594	107%
2038		12,696		13,250	104%		13,593	107%
2039		12,684		13,237	104%		13,580	107%
2040		12,675		13,228	104%		13,570	107%
2041		12,675		13,228	104%		13,570	107%
2042		12,677		13,230	104%		13,573	107%
2043		12,682		13,236	104%		13,578	107%
2044		12,696		13,249	104%		13,592	107%
2045		12,694		13,248	104%		13,591	107%
2046		12,695		13,249	104%		13,592	107%
2047		12,695		13,249	104%		13,592	107%
2048		12,699		13,253	104%		13,596	107%
2049		12,707		13,261	104%		13,604	107%
2050		12,718		13,273	104%		13,617	107%

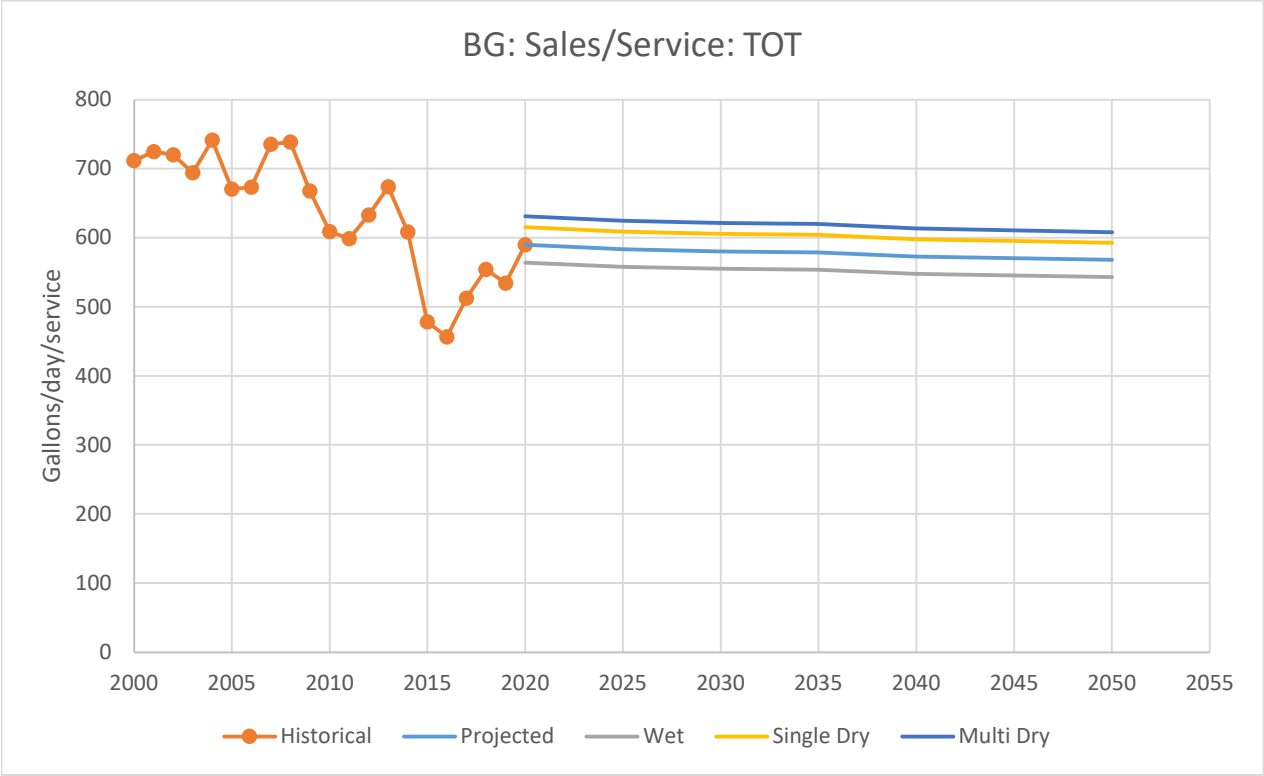
Charts

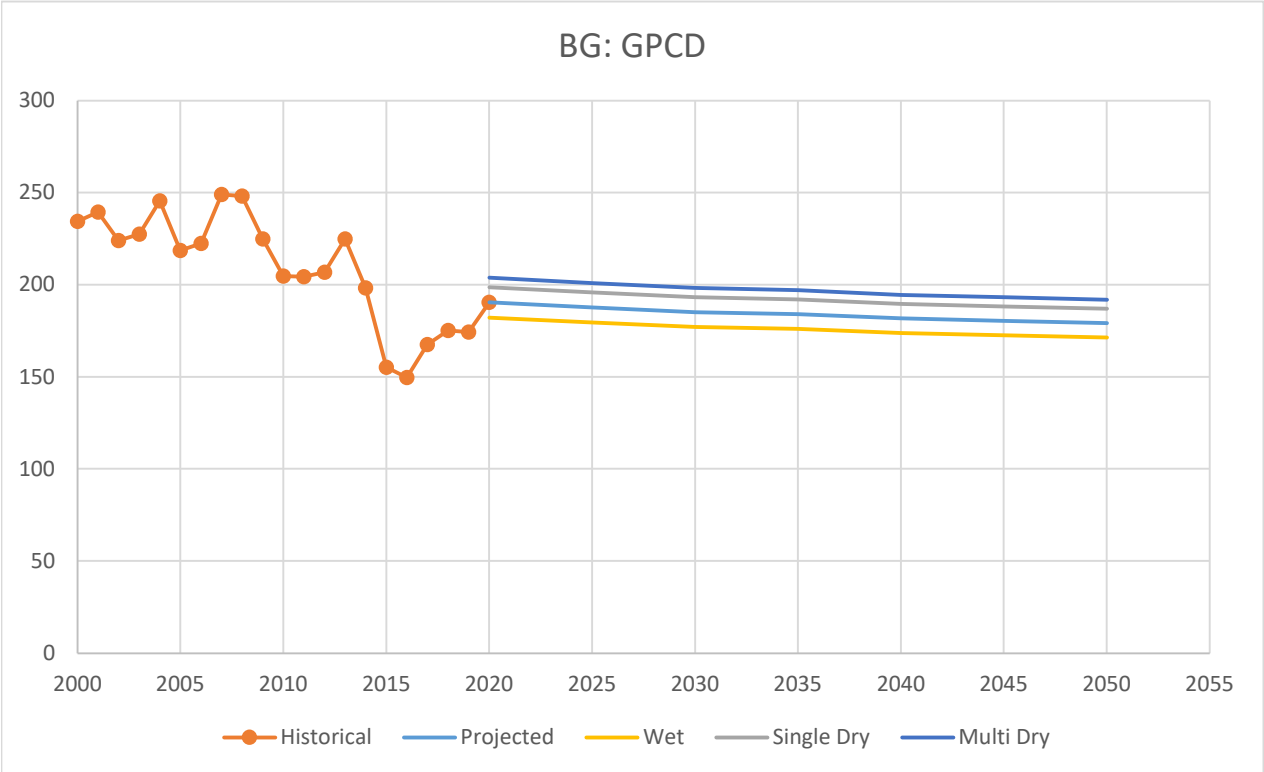

BG: Population
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
2055
Historical
Projected


BG: Services: TOT
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
2055
Historical
Projected


BG: Production
AF
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
2055
Historical
Projected
Wet
Single Dry
Multi Dry


BG: Sales: TOT
AF
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
2055
Historical
Projected
Wet
Single Dry
Multi Dry


BG: Sales/Service: TOT
Gallons/day/service
800
700
600
500
400
300
200
100
0
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
2055
Historical
Projected
Wet
Single Dry
Multi Dry


BG: GPCD
300
250
200
150
100
50
0
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
2055
Historical
Projected
Wet
Single Dry
Multi Dry

Appendix F: DWR SB X7-7 Verification Forms

Water Conservation Act of 2009
SB X7-7
Verification Forms

Bear Gulch District

2020 Urban Water Management Plan
Appendix F

SB X7-7 Table-1: Baseline Period Ranges			
Baseline	**Parameter**	**Value**	**Units**
10- to 15-year baseline period	2008 total water deliveries	15,510	Acre Feet
	2008 total volume of delivered recycled water	-	Acre Feet
	2008 recycled water as a percent of total deliveries	0.00%	Percent
	Number of years in baseline period[1, 2]	10	Years
	Year beginning baseline period range	2000	
	Year ending baseline period range[3]	2009	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2004	
	Year ending baseline period range[4]	2008	

[1] If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period. *[2] The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.*

[3] The ending year must be between December 31, 2004 and December 31, 2010.

[4] The ending year must be between December 31, 2007 and December 31, 2010.

SB X7-7 Table 2: Method for Population Estimates	
Method Used to Determine Population (may check more than one)	
☐	**1. Department of Finance** (DOF) DOF Table E-8 (1990 - 2000) and (2000-2010) and DOF Table E-5 (2011 - 2015) when available
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☑	**4. Other** DWR recommends pre-review

NOTES: Cal Water uses a population estimation methodology based on overlaying Census Block data from the 2000 and 2010 Censuses with the District's service area. LandView 5 and MARPLOT software are used with these data to estimate population per dwelling unit for 2000 and 2010. The per dwelling unit population estimates are then combined with Cal Water data on number of dwelling units served to estimate service area population for non-Census years. Cal Water also estimated service area population using DWR's Population Tool. The estimates prepared using Cal Water's methodology and DWR's Population Tool differed by less than one percent. Cal Water is electing to use the population estimates produced by its methodology in order to maintain consistency with population projections it has prepared in other planning documents and reports.

SB X7-7 Table 3: Service Area Population		
Year		**Population**
10 to 15 Year Baseline Population		
Year 1	2000	53,885
Year 2	2001	54,162
Year 3	2002	54,392
Year 4	2003	54,421
Year 5	2004	54,574
Year 6	2005	55,252
Year 7	2006	55,651
Year 8	2007	55,741
Year 9	2008	55,791
Year 10	2009	56,484
Year 11		
Year 12		
Year 13		
Year 14		
Year 15		
5 Year Baseline Population		
Year 1	2004	54,574
Year 2	2005	55,252
Year 3	2006	55,651
Year 4	2007	55,741
Year 5	2008	55,791
2015 Compliance Year Population		
2015		59,883

SB X7-7 Table 4: Annual Gross Water Use *

Baseline Year *Fm SB X7-7 Table 3*		Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.*	Deductions					Annual Gross Water Use
			Exported Water	Change in Dist. System Storage (+/-)	Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.*	Water Delivered for Agricultural Use	Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.*	
10 to 15 Year Baseline - Gross Water Use								
Year 1	2000	14,149			-		-	14,149
Year 2	2001	14,518			-		-	14,518
Year 3	2002	13,639			-		-	13,639
Year 4	2003	13,861			-		-	13,861
Year 5	2004	15,008			-		-	15,008
Year 6	2005	13,527			-		-	13,527
Year 7	2006	13,858			-		-	13,858
Year 8	2007	15,554			-		-	15,554
Year 9	2008	15,510			-		-	15,510
Year 10	2009	14,245			-		-	14,245
Year 11	0	-			-		-	-
Year 12	0	-			-		-	-
Year 13	0	-			-		-	-
Year 14	0	-			-		-	-
Year 15	0	-			-		-	-
10 - 15 year baseline average gross water use								**14,387**
5 Year Baseline - Gross Water Use								
Year 1	2004	15,008			-		-	15,008
Year 2	2005	13,527			-		-	13,527
Year 3	2006	13,858			-		-	13,858
Year 4	2007	15,554			-		-	15,554
Year 5	2008	15,510			-		-	15,510
5 year baseline average gross water use								**14,692**
2015 Compliance Year - Gross Water Use								
2015		10,401	-		-		-	**10,401**

* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3

SB X7-7 Table 4-A: Volume Entering the Distribution System(s)
Complete one table for each source.

Name of Source	Bear Gulch Creek			
This water source is:				
☑	The supplier's own water source			
☐	A purchased or imported source			
Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	2000	1,557		1,557
Year 2	2001	920		920
Year 3	2002	1,191		1,191
Year 4	2003	1,278		1,278
Year 5	2004	692		692
Year 6	2005	1,774		1,774
Year 7	2006	1,923		1,923
Year 8	2007	754		754
Year 9	2008	528		528
Year 10	2009	716		716
Year 11	0			-
Year 12	0			-
Year 13	0			-
Year 14	0			-
Year 15	0			-
5 Year Baseline - Water into Distribution System				
Year 1	2004	692		692
Year 2	2005	1,774		1,774
Year 3	2006	1,923		1,923
Year 4	2007	754		754
Year 5	2008	528		528
2015 Compliance Year - Water into Distribution System				
2015		437		437

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

SB X7-7 Table 4-A: Volume Entering the Distribution				
Name of Source	SFPUC			
This water source is:				
☐	The supplier's own water source			
☑	A purchased or imported source			
Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	2,000	12592.5139		12,593
Year 2	2,001	13598.3495		13,598
Year 3	2,002	12447.8222		12,448
Year 4	2,003	12582.8346		12,583
Year 5	2,004	14315.7622		14,316
Year 6	2,005	11753.5518		11,754
Year 7	2,006	11935.733		11,936
Year 8	2,007	14800.3297		14,800
Year 9	2,008	14981.9492		14,982
Year 10	2,009	13528.5324		13,529
Year 11	-			0
Year 12	-			0
Year 13	-			0
Year 14	-			0
Year 15	-			0
5 Year Baseline - Water into Distribution System				
Year 1	2,004	14315.7622		14,316
Year 2	2,005	11753.5518		11,754
Year 3	2,006	11935.733		11,936
Year 4	2,007	14800.3297		14,800
Year 5	2,008	14981.9492		14,982
2015 Compliance Year - Water into Distribution System				
2015		9,964		9,964
** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*				
NOTES:				

SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Annual Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	2000	53,885	14,149	234
Year 2	2001	54,162	14,518	239
Year 3	2002	54,392	13,639	224
Year 4	2003	54,421	13,861	227
Year 5	2004	54,574	15,008	246
Year 6	2005	55,252	13,527	219
Year 7	2006	55,651	13,858	222
Year 8	2007	55,741	15,554	249
Year 9	2008	55,791	15,510	248
Year 10	2009	56,484	14,245	225
Year 11	0	-	-	
Year 12	0	-	-	
Year 13	0	-	-	
Year 14	0	-	-	
Year 15	0	-	-	
10-15 Year Average Baseline GPCD				**233**
5 Year Baseline GPCD				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use
Year 1	2004	54,574	15,008	246
Year 2	2005	55,252	13,527	219
Year 3	2006	55,651	13,858	222
Year 4	2007	55,741	15,554	249
Year 5	2008	55,791	15,510	248
5 Year Average Baseline GPCD				**237**
2015 Compliance Year GPCD				
2015		59,883	10,401	**155**

SB X7-7 Table 6: Gallons per Capita per Day *Summary From Table SB X7-7 Table 5*	
10-15 Year Baseline GPCD	233
5 Year Baseline GPCD	237
2015 Compliance Year GPCD	155

SB X7-7 Table 7: 2020 Target Method *Select Only One*		
Target Method		Supporting Documentation
☑	Method 1	SB X7-7 Table 7A
☐	Method 2	SB X7-7 Tables 7B, 7C, and 7D *Contact DWR for these tables*
☐	Method 3	SB X7-7 Table 7-E
☐	Method 4	Method 4 Calculator

SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	**2020 Target GPCD**
233	**187**

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target			
5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target[1]	Calculated 2020 Target[2]	**Confirmed 2020 Target**
237	225	187	**187**

[1] Maximum 2020 Target is 95% of the 5 Year Baseline GPCD *[2] 2020 Target is calculated based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target.*

Appendix G: Climate Change Studies – Executive Summaries

- Climate Change – Water Resource Monitoring and Adaptation Plan – Phase 1
- Potential Climate Change Impacts on the Water Supplies of California Water Service

Climate Change-Water Resource Monitoring and Adaptation Plan – Phase 1

December 17, 2020

California Water Service
1720 North First Street
San Jose, CA 95112

Submitted by:
ICF
555 W 5th St
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Los Angeles, CA 90013

Executive Summary

Shifts in the frequency and severity of natural hazards resulting from climate change, often referred to as climate hazards, increasingly threaten water resources in California. These relevant climate hazards include reductions to snowpack, greater concentrations of precipitation in both a shorter rain season and isolated atmospheric river events, and more volatility between wet and dry water years.

To identify and prepare for impacts from these hazards, California Water Service (Cal Water) is seeking to identify climate change vulnerabilities to water supplies, operations and facilities, and to develop adaptation strategies to address those vulnerabilities through a Climate Change Water Resources Monitoring and Adaptation Plan. This body of work is intended to provide Cal Water with information to inform decisions on water system/asset management and resource planning to better prepare for and respond to current and projected changes to climate. This work represents a forward-looking approach in addressing climate risks for California utilities, as the large majority of water wholesaler and utilities have not completed climate vulnerability and adaptation plans.

In the first phase of this effort, the ICF team collaborated with Cal Water to conduct a literature and tools review as the foundation for subsequent phases of work. In Phase 2 of this project, the ICF team and Cal Water will undertake a vulnerability assessment of Cal Water's facilities and operations by developing an assessment approach that evaluates climate impacts to Cal Water, identifies asset vulnerabilities, and prioritizes climate risks. Phase 3 will focus on an assessment of climate-driven impacts to water supply resources and demand. This first phase of research and assessment will provide Cal Water with a clear "lay of the land" in understanding available methodologies and lessons learned in conducting vulnerability assessments and developing adaptation plans in the water sector. This work can provide key insights for Cal Water, industry practitioners, and Cal Water customers on best practices and needs in climate vulnerability and adaptation efforts.

This first phase will also act as a foundation for Cal Water to build on in subsequent phases of work. ICF and Cal Water will build on research and findings developed in Phase 1 to define the scope of Phases 2 and 3.

In Phase 1, the ICF team undertook three areas of review:

1) Literature and tools related to adaptation planning by water suppliers and other relevant organizations
2) Methods and data in Cal Water's 2016 Vulnerability Study "Potential Climate Change Impacts on the Water Supplies of California Water Service"
3) Climate change impact assessments and adaptation plans beyond Cal Water (wholesalers, state agencies) that could affect Cal Water's vulnerability or adaptive capacity

In the first part of our assessment, the studies we reviewed conclude that there is high certainty of climate-driven reductions to snowpack, wetter winter months, and more volatility between wet and dry water years. While California water systems are designed to operate under a wide

range of hydrologic conditions, they are not designed to absorb and adapt to the projected levels of change, which could have impacts on historical supplies from reservoir systems and groundwater systems. These studies also revealed a suite of potential approaches to vulnerability assessment and risk assessment that are applicable to Phases 2 and 3.

Key studies that the ICF team referenced include Brown and Caldwell's "Impacts of Climate Change on Honolulu Water Supplies and Planning Strategies for Mitigation", the Water Research Foundation's (WRF)'s "Mapping Climate Exposure and Climate Information Needs to Water Utility Business Functions", the Metropolitan Water District's (MWD)'s "2015 Integrated Water Resources Plan" and "2015 Urban Water Management Plan", and the U.S. Environmental Protection Agency's (EPA's) Climate Resilience Evaluation and Awareness Toolkit (CREAT).

In the second part of our review, we found that Cal Water's 2016 Climate Change Vulnerability Study undertook a high-level investigation of impacts of climate change on water supply, including surface water, groundwater, and imported water throughout Cal Water service areas. However, the study did not use uniform metrics across water suppliers, was unable to apply the currently available downscaled climate projections, and did not consider the full suite of potential climate impacts to Cal Water's systems, including impacts of compounding climate hazards and impacts on Cal Water facilities and operations.

In the third part of this work, the ICF team researched and assessed existing climate vulnerability assessments and adaptation efforts that have an impact on Cal Water's ability to mitigate impacts from climate change. This included efforts by water supply wholesalers connected to Cal Water's system, and state agencies that regulate Cal Water's supplies, operations, and planning efforts. This will allow Cal Water to build on existing actions and avoid recreating adaptation efforts that are planned or have been implemented.

Cal Water has undertaken key steps toward adaptation planning since the 2016 Vulnerability Study, such as this work to provide additional vulnerability analysis, working locally to identify and prepare to meet Sustainable Groundwater Management Act (SGMA) requirements, and coordinating with wholesalers on their identified climate-driven vulnerabilities. Phases 2 and 3 of this work will further frame system vulnerabilities within an adaptation planning context for a flexible and anticipatory response.

The ICF team's literature review focused on identifying approaches for assessing water utility vulnerabilities of assets and water resources, and adaptation planning needs (summarized in Table 1). To identify these priority approaches, the team reviewed a list of publications with input from Cal Water on key sources. We reviewed and analyzed the relevant literature for applicability to Cal Water, the advantages and fit within a robust plan for assessment, and the potential disadvantages. We highlighted those approaches in the sections on key takeaways and the applicability of approaches to Cal Water. Table 1 provides important considerations raised by the ICF team during this process.

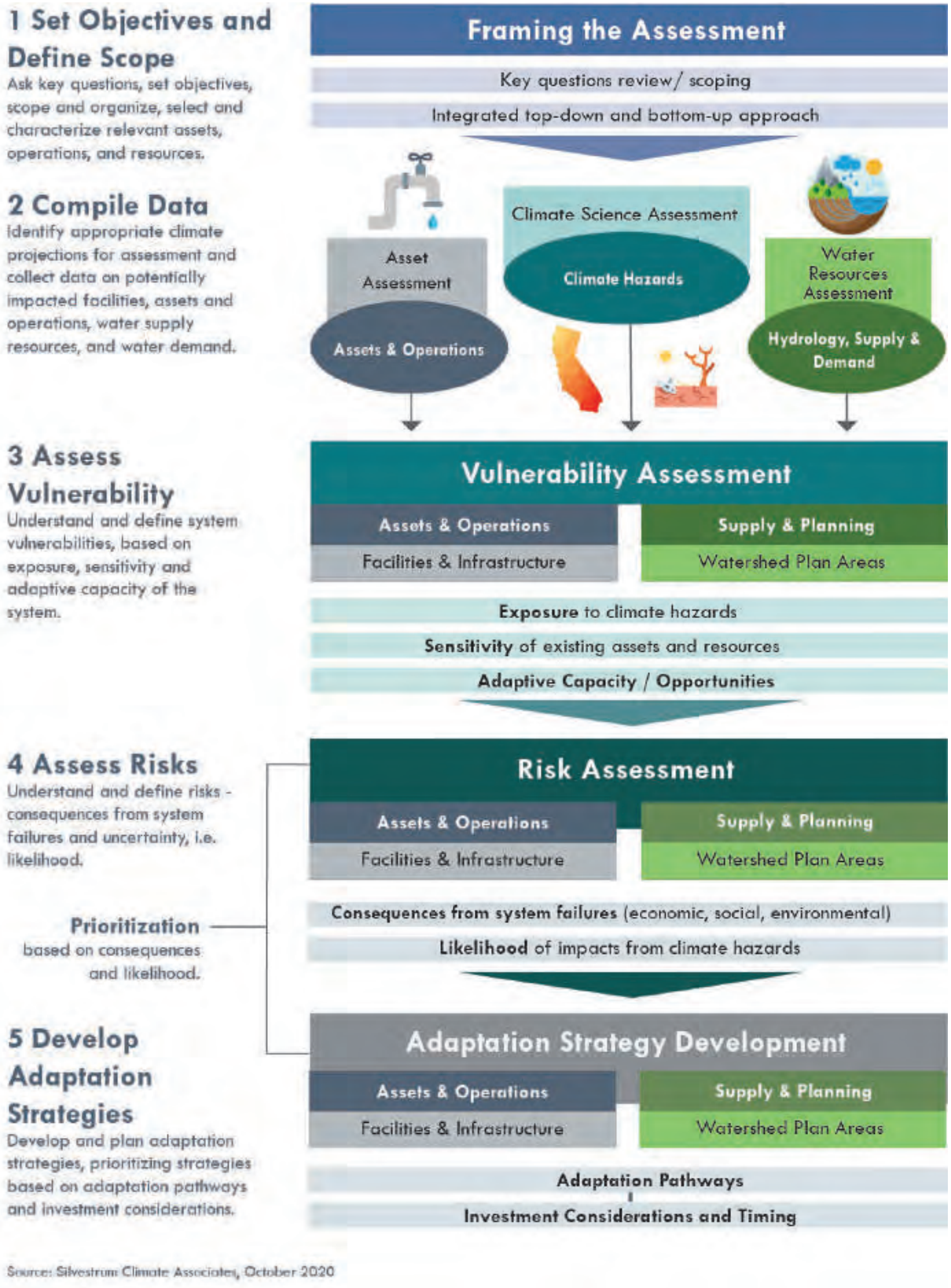
Table 1: Advantages and disadvantages of identified approaches

Identified Approach	Advantages	Disadvantages
Integrated resource-level (i.e., top-down) and asset-level (i.e., bottom-up) approaches to vulnerability assessment	• Allows for matching available information with appropriate methodologies • Supports evaluation of vulnerabilities in both water supply resources and physical systems: an integrated approach can help to address gaps in either area	• Bottom-up approaches can require extensive historical data and asset-level data • Integration of climate projections into hydrological models can be challenging. For example, data inputs for hydrological models and the outputs from climate projections may be incompatible or require additional data processing
Robust Decision-Making	• Supports identification of decisions for response under a range of potential climate futures • Supports alignment between climate impacts and operating units/business functions • Ensures the scope focuses on critical services, assets, and resources • Supports the development of adaptation pathways and measures • Provides a framework for information that can signal the need for critical decisions on adaptation	• Involves significant investment of time to identify performance metrics, business functions, and key variables • Even with significant time invested on the front end, scope can change and require rescoping later in the effort • Requires a strong understanding of utility decision-making
Applying climate projections to hydrologic modeling, future demand and planning scenarios	• Generates better understanding of impacts of extreme scenarios, snowpack loss, drought, increased temperatures, precipitation whiplash, and other hydrologic changes in water supply resources and downstream demands • Allows for modeling of a range of climate scenarios to better account for uncertainties in resource management and climate outcomes • Integrates climate projections with scaled historical time series data	• Can require substantial data, and may introduce bias (due to selected climate scenarios) • It is necessary to identify performance metrics and thresholds related to available climate variables; these can be difficult to identify and thresholds may not exist • Relies on necessary simplifying assumptions to model complex hydrologic systems
Stress testing and scenarios	• Supports management of uncertainty, especially in the absence of data • Allows for understanding of climate impacts on system performance within a risk framework	• Can require refined climate information (e.g. hydrological variables) and detailed asset information • Can require the integration of climate information into hydrological models, which may require

Identified Approach	Advantages	Disadvantages
	• Supports identification of major performance metrics and their potential for failure • Helps in understanding how the severity of impacts varies for facilities, operations, and water supplies under different climate change conditions.	significant data processing to be compatible with one another • Can result in qualitative or directional findings that don't provide straightforward adaptation responses
Engaging staff in climate change vulnerability assessments and adaptation plans	• Provides perspective for setting study parameters • Provides targeted input and data into assessment • Identifies existing data gaps and actions to address gaps • Supports development of institutional capacity for monitoring impacts, adaptation planning, and implementation	• Can be time-consuming for team members attending workshops and interviews; requires a targeted approach to ensure efficiency and that the right data is captured • Requires cross-team coordination that may be outside of "normal" communication pathways, e.g. between engineers and policy specialists
Evaluating costs of inaction	• Helps to prioritize adaptation planning needs • Creates a better understanding of the risks to Cal Water	• Requires scaling information on past costs without clear data on future impacts, creating uncertainties in estimates
Use of Flexible Adaptation Pathways	• Helps to select appropriate timing (including lead time from planning to implementation) and application of adaptation measures • Considers and compares multiple strategies in adaptation planning • Includes triggers that signal when decision-makers should decide on switching to another pathway • Allows for adaptive decisions under uncertainty by integrating points for re-assessing pathway and actions • Considers alternative external developments over time	• Does not provide a fixed timeline for actions • This approach is relatively new and may require coordination with budget cycles and external policy updates, since actions evolve over time • May push decision burden onto future decision-makers who did not develop original pathway

Our team synthesized these identified methodologies, findings, and insights into an overarching approach for characterizing climate vulnerabilities and planning for adaptation at both an asset level and water supply planning level to suit Cal Water's needs in addressing climate change impacts, shown in Figure 1.

Figure 1: Climate Assessment Framework



Source: Silvestrum Climate Associates, October 2020

Based on this review, the ICF team is making the following key recommendations for guiding Cal Water's efforts in identifying climate vulnerabilities and planning for adaptation:

- **Apply a standard conceptual framework to vulnerability assessment which integrates both top-down analysis and bottom-up analysis (see Figure 1).** The standard conceptual framework for assessing climate vulnerabilities and risks includes understanding exposure, sensitivity, and adaptive capacity, and potential impacts as components of vulnerability, and consequence and likelihood as components of risk. Top-down analysis would begin by applying downscaled Global Climate Model (GCM) projections to assess impacts on water supply resources and the bottom-up analysis would begin by identifying system sensitivities to climate hazards. These analyses are complementary.
- **Use a robust decision making (RDM) framework for vulnerability assessment and adaptation planning** by seeking to identify decisions for response under a range of potential climate futures, mapping impacts on operating units/business functions, and ensuring that the scope focuses on critical services, assets, and resources. A robust decision-making framing will support the development of adaptation pathways and measures by monitoring information that signals the need for critical decisions on adaptation.
- **Engage staff and key stakeholders in the planning process** to gain a holistic planning perspective for setting study parameters, providing targeted input into assessment and plan development, and supporting institutional capacity for adaptation.
- **Build off of the 2016 Cal Water Climate Change Impact study by applying updated climate models and projections for additional hydrologic variables** to hydrologic modeling, future demand and planning scenarios, and scaled historical time series data to better understand impacts of extremes, precipitation whiplash, and other hydrologic changes in water supply resources. We recommend presentation of this with uniform metrics for more actionable findings.
- **Assess climate impact consequence by stress-testing key water system performance metrics.** This includes developing a range of impact scenarios to understand how the severity of impacts varies for facilities, operations, and water supplies under different climate change conditions.
- **Evaluating the order of magnitude cost of inaction.** We recommend communicating consequences in terms of direct costs to Cal Water and customers without adaptation actions to prioritize adaptation response.
- **Follow a step-by-step, iterative process to adaptive management which fully aligns with potential exposure to climate hazards and vulnerabilities**, including:
    - Utilizing Flexible Adaptation Pathways in planning for selecting appropriate timing and application of adaptation measures
    - Planning for monitoring and evaluation
    - Evaluating adaptation investment decisions

During Phases 2 and 3 in which Cal Water and the ICF team will further assess vulnerability, we will frame the study outputs within a decision-making context for compatibility with adaptation planning concepts and eventual investment in adaptation measures.

Potential Climate Change Impacts on the Water Supplies of California Water Service

Prepared by

Gary Fiske and Associates, Inc.
Balance Hydrologics, Inc.

January 2016

Executive Summary

Introduction

California Water Service Company (Cal Water) provides water service to roughly 478,000 customers – about 1.7 million people – located in 83 state-wide communities in 24 service districts. Cal Water's districts rely on a variety of supply sources, including local groundwater, local surface water, and imported supplies. It is critical for Cal Water to gain a better understanding of the potential impacts of climate change on the availability of those supplies. Impacts are inherently uncertain, but Cal Water believes that the only responsible course is to carefully incorporate climate change into its ongoing water supply planning.

The present project and report represent a first step in that path. In order for Cal Water to determine how its long-term water supply planning should reflect climate change impacts, it must first have an understanding of what the impacts of climate change on its supply sources might be. That is the purpose of this study.

The work reported on here focuses on the sample of Cal Water districts highlighted in Figure ES-1. These districts account for 85% of Cal Water's total 2014 production and reflect the diversity of all Cal Water districts, including geographic, hydrologic, and climatic conditions and primary and secondary supply sources.

Changes in climate can affect the availability of local groundwater and surface water supplies, as well as purchased imported supplies. This study separately addresses the impacts on each of these for each sample district. It relies on the best available projections of changes in climate (temperature and precipitation) through the end of the century. It then uses the climate projections to examine how surface water flows and groundwater recharge rates may change.

For imported supplies, this study relies on studies already completed by wholesale providers where possible. Where no such studies have been done or where the data from such studies was unavailable, other approaches were developed to estimate climate change impacts on these supplies.

The results reported here provide an integrated view of how projected climate changes may affect water supply availability for Cal Water's service districts. The results also represent a first step in integrating potential future climate change impacts into Cal Water's ongoing supply planning. Because of the inherent uncertainties, a nuanced risk assessment may be needed to guide the incorporation of these results into long-range planning. Beyond the Company's supply/infrastructure planning, the results also can affect the Company's triennial General Rate Cases; they may also have potential operational implications.

Figure ES- 1. Cal Water Service Districts with Sample Districts Highlighted

Estimating Changes in Climate

Climate change is primarily driven by increased concentrations of greenhouse gases (GHGs) in the atmosphere. The trajectory of future climate change is a function of the rate at which those concentrations are projected to increase and the manner in which the atmosphere and oceans respond to increased concentrations. Both are difficult to model. Thus, while the scientific community overwhelmingly agrees that climate change will occur (and indeed may already have begun), the trajectory of those changes is very uncertain.

The projections of temperature and precipitation that underlie this study are based on 40 of the latest Global Circulation Models (GCMs) run as part of the Coupled Model Intercomparison Project Phase 5 (CMIP5). Generally speaking, this type of approach is termed an ensemble analysis, for which the downscaled climate projections for any particular Cal Water Service District were based on the median of the 40 downscaled GCM datasets. The GCMs used by the analysis are driven by two GHG emission pathways that bound the possible trajectories of GHG concentrations.

Impacts of Climate Change on Water Supplies

The supplies for each district consist of a mix of local surface water, local groundwater, and/or purchased imports. Climate change impacts were estimated for each of these components. The approaches used for each are described below. Based on the breakdown of district production among the supply sources, Table ES-1 shows the ranges of projected overall climate change impacts on available supply, relative to the historic average.[1] Table ES-2 groups this vulnerability into 4 categories of expected change, and Figure ES-2 maps the end-of-century vulnerability.

[1] The historical averages used here, and elsewhere in this report, are based on the entire range of historical data available for the district-specific analyses. These ranges vary across districts, and are specified within the district-specific technical memoranda.

Table ES- 1. Projected Changes in Available Supply due to Climate Change

District		Percentage Change in Supply		
		2020	2050	2100
BK	Minimum	-10%	-10%	-12%
	Maximum	-12%	-16%	-20%
VIS	Minimum	-7%	-8%	-8%
	Maximum	-9%	-10%	-14%
KRV	Minimum	-13%	-16%	-19%
	Maximum	-16%	-21%	-31%
MPS/SSF/BG	Minimum	0%	-2%	-6%
	Maximum	0%	-7%	-15%
LAS	Minimum	-3%	-3%	-10%
	Maximum	-4%	-18%	-28%
CH	Minimum	2%	2%	0%
	Maximum	3%	1%	-3%
ORO	Minimum	0%	8%	5%
	Maximum	0%	-8%	-7%
DOM/HR/PV	Minimum	0%	0%	-1%
	Maximum	0%	-2%	-3%
STK	Minimum	0%	0%	-8%
	Maximum	0%	-14%	-17%
SLN	Minimum	-6%	-6%	-6%
	Maximum	-7%	-7%	-7%

Table ES- 2. Categories of Projected Supply Vulnerability

District	Supply Vulnerability		
	2020	2050	2100
KRV	3	4	4
BK	3	3	4
LAS	1	3	4
VIS	2	2	3
STK	1	2	3
SLN	2	2	2
MPS/SSF/BG	1	1	3
DOM/HR/PV	1	1	1
ORO	1	1	1
CH	1	1	1

Districts in Category 1 expect <5% reduction in supply. Category 2 indicates a reduction of 5-10%. Category 3 indicates an expected reduction of 10-15%. Category 4 reductions exceed 15%.

Figure ES- 2. Cal Water 2100 Vulnerability to Climate Change

Vulnerability levels:
Green = Low
Yellow = Moderate
Light Red = High
Dark Red = Very High

Estimating Climate Change Impacts on Local Surface Supplies

For those Cal Water districts that obtain a portion of their water supplies from local surface water, projected average annual precipitation in each of three forecast years (2020, 2050, 2100) were compared to historical precipitation to estimate the projected average annual discharge for that forecast year. Table ES-3 shows the estimated percent changes in surface water availability compared to historical averages.

Table ES- 3. Estimated Impacts on Local Surface Supply Availability

District		Percent Change in Runoff		
		2020	2050	2100
BK	Minimum Impact	-17%	-18%	-19%
	Maximum Impact	-18%	-19%	-23%
KRV	Minimum Impact	-17%	-18%	-19%
	Maximum Impact	-18%	-19%	-23%
MPS/SSF/BG	Minimum Impact	+3%	+6%	+12%
	Maximum Impact	+3%	+5%	+6%

Of the three districts, the two in the southern San Joaquin Valley are projected to experience significant reductions in their local surface supplies. In contrast, the Bear Gulch district surface supply is forecast to increase.

Estimating Climate Change Impacts on Local Groundwater Supplies

Climate change impacts on Cal Water's local groundwater supplies result from changes in projected groundwater recharge. The three groundwater recharge components include:

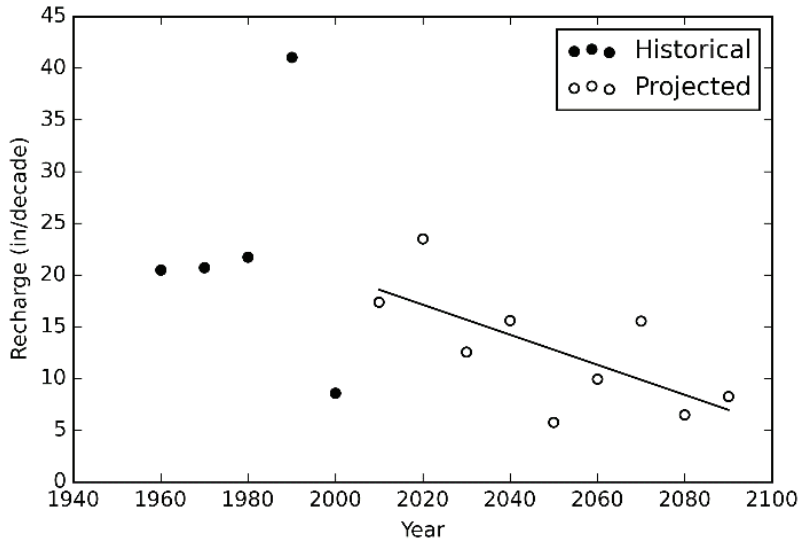
- Local river sources;
- Direct recharge from precipitation on the groundwater basin; and
- Recharge from agricultural and urban deep percolation.

The analysis first estimated the split of local recharge among these three components using geographic and geologic data, geochemical markers, and previously published reports and other supporting information. The climate change impacts on each component were then estimated, consolidated into overall projections of recharge impacts, and compared to estimated historical recharge rates.

Estimates of impacts on river recharge used the methodology for local surface supply described above. For the purposes of this phase of work, it was assumed that the change in recharge from the river is proportional to the change in total annual discharge. The estimated amount of water that will recharge directly into a groundwater basin from rain (or snow) is based on a balance of evapotranspiration (ET), precipitation rates, and soil

water capacity. Recharge is estimated using both historical and projected precipitation and temperature data. Decadal averages in projected recharge are then used to calculate long-term trends. This is illustrated in Figure ES-3 for Kern River Valley.

Figure ES- 3. Historic and Projected Decadal Direct-Precipitation Recharge for Kern River Valley



A quantitative projection of recharge from deep percolation beneath irrigated fields and urban areas is beyond the scope of this phase. Instead, districts for which a significant proportion of recharge is from agricultural and urban water are identified and expected trends under climate change of this water source for those districts are estimated. At-risk service areas with decreasing agricultural and urban water sources can be explored further in future work.

The estimated percentage impacts on each of the recharge components are multiplied by the expected fractions that each component is of total recharge to calculate the range of expected recharge reductions. Table ES-4 shows those results for each district, excluding the impacts of urban/agricultural applied water percolation.

Actual impacts on Cal Water's ability to pump groundwater may be less than these recharge reductions because the storage volumes in different basins have differing degrees of responsiveness to changes in recharge. The degree to which changes in recharge volumes translate into available groundwater supply is a function of the hydrogeologic attributes of the basin. A detailed understanding of those characteristics would require a level of modeling that is well beyond the scope of this phase of work. Instead, the estimates of basin responsiveness were based on the historical record of how the basin's water level has varied with recent climate variability. For some districts, the basin appears to be highly responsive, while for others changes in climate do not have much impact.

Table ES- 4. Projected Changes in Average Annual Groundwater Recharge

District		Percentage Change in Recharge		
		2020	2050	2100
BK	Minimum	-14%	-15%	-15%
	Maximum	-14%	-15%	-18%
VIS	Minimum	-9%	-10%	-11%
	Maximum	-9%	-10%	-14%
KRV	Minimum	-13.4%	-19%	-23%
	Maximum	-15%	-22%	-35%
MPS/SSF/BG	Minimum	-2%	-4%	-6%
	Maximum	-2%	-6%	-12%
LAS	Minimum	-7%	-8%	-13%
	Maximum	-8%	-18%	-25%
CH	Minimum	6%	4%	1%
	Maximum	6%	2%	-4%
ORO	Minimum	0%	0%	0%
	Maximum	0%	0%	0%
DOM/HR/PV	Minimum	0%	0%	0%
	Maximum	0%	0%	0%
STK	Minimum	-2%	-3%	-6%
	Maximum	-2%	-4%	-7%
SLN	Minimum	-7%	-7%	-7%
	Maximum	-7%	-7%	-7%

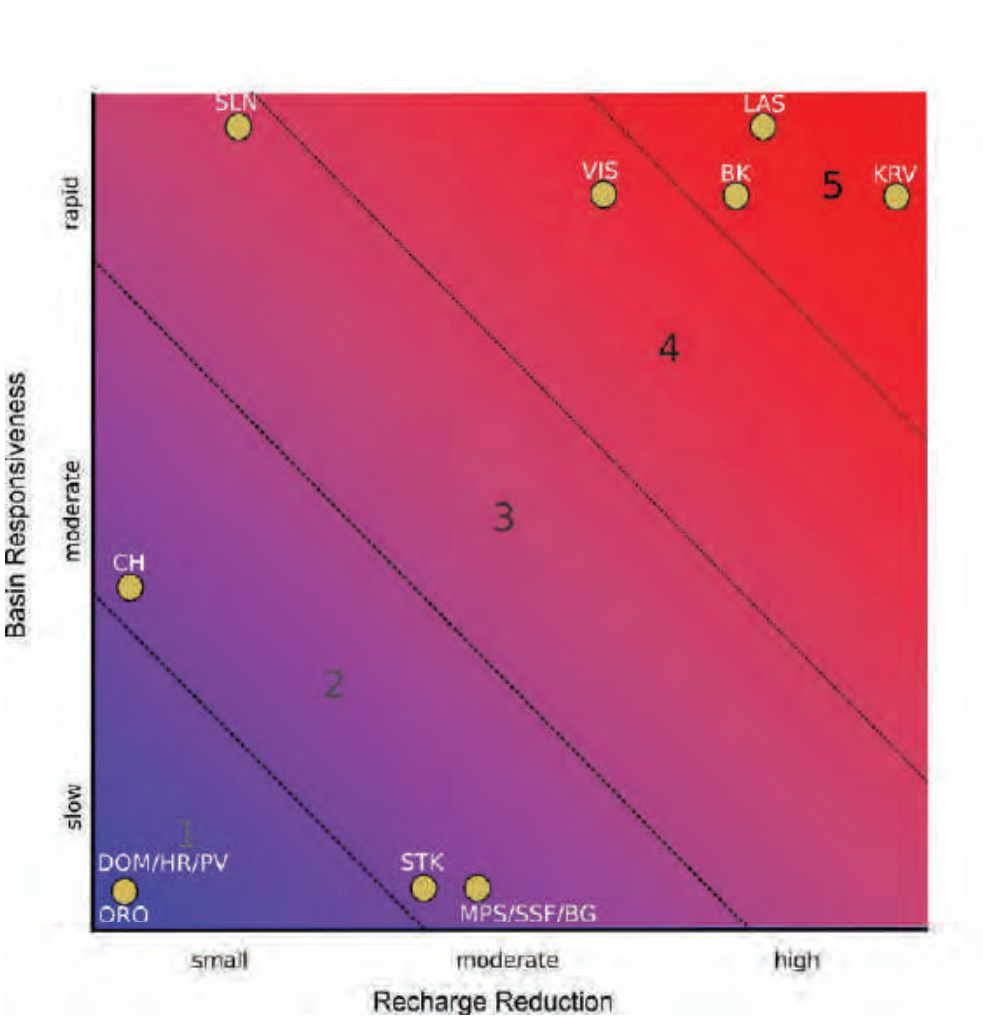
The overall risk to Cal Water's groundwater supplies for each district is based on the expected recharge reductions and the expected responsiveness of basin water level to those reductions. Table ES-5 rates each district's groundwater supply risk on a 1-5 scale, with 1 indicating little or no risk and 5 indicating high risk. Figure ES-4 is a visual depiction of these ratings.

Generally speaking, the groundwater supply impacts are large for the districts in the southern San Joaquin Valley. The Los Altos District also shows a high impact, largely because a significant portion of its recharge is from imported supplies, which are forecast to decrease significantly. Further north in the Central Valley, groundwater supplies are less affected. The Bay Area and Los Angeles Basin districts also show relatively smaller impacts.

Table ES- 5. District Groundwater Risk Ratings

District	Rating
BK	5
KRV	5
LAS	5
VIS	4
SLN	3
CH	2
MPS/SSF/BG	2
STK	2
ORO	1
DOM/HR/PV	1

Figure ES- 4. Groundwater Risk Ratings



LEGEND
KRV: Kern River Valley
LAS: Los Altos
BK: Bakersfield
VIS: Visalia
SLN: Salinas
CH: Chico
ORO: Oroville
STK: Stockton
MPS/SSF/BG:
Mid- Peninsula,
South San Francisco,
Bear Gulch
DOM/HR/PV:
Dominguez
Hermosa-Redondo
Palos Verdes

Impacts of Climate Change on Imported Water Supplies

About half of Cal Water's supply is imported water that is purchased from wholesale suppliers. The supply and delivery systems of these suppliers are generally very complex and it is impossible within the confines of this project to independently model the impacts of climate change on those systems. The analysis therefore relied on available data, including the results of any climate change modeling that these suppliers themselves have done and other indicators of climate change impacts.

As a result, the climate change scenarios on which the estimates of impacts on different wholesale supplies are based will differ from one another and from the approach described above for the analysis of local supply impacts. The time frames of the results also differ. However, despite those limitations, important information about potential future climate change impacts on wholesale water supply availability was developed. Table ES-6 compares summary measures of central tendency for the potential district-specific climate change impacts on the availability of imported supplies.

Table ES- 6. Projected Climate Change Impacts on Imported Supplies

District	Source	Mid-Century	Late-Century
BK	SWP	-7%	-17%
LAS	SWP, CVP	-9%	-21%
ORO	SWP	-1%	-3%
MPS/SSF/BG	SFPUC	-10%	-20%
DOM/HR/PV	MWD	-1% to -2%	-2% to -5%
STK	USBR	-5%	-10%

Conclusions and Next Steps

The study results indicate significant risks for some districts. This points to the need for Cal Water to account for these risks in its future water supply planning if it is to minimize the adverse effects on its customers. The sole focus of this effort was to assess the potential climate change impacts on Cal Water's supplies. That is an important first step in integrating climate change into supply planning, but this study was not designed to:

- Analyze the impacts of these future supply limitations on Cal Water's ability to serve future customer demands. This is a function of such factors as water rights and contractual arrangements, how future demands are forecast to grow, how water conservation programming will affect those demands, and how Cal Water might modify the manner in which it operates its system.

- Develop mitigation plan to evaluate how potential supply and infrastructure investments and/or acquisition of new supplies might address any adverse impacts on water supply reliability.

- Formally assess alternative approaches to incorporating climate change in Cal Water's supply planning.

Possible next steps for Cal Water include:

- Methodological enhancements to reduce some of the uncertainties in the results reported herein;

- Development and acquisition of better and more complete data;

- Extending this study to other Cal Water districts;

- Developing a plan to mitigate anticipated climate change impacts on supply; and

- Integrating climate change into the Company's ongoing water supply planning.

Despite the study's limitations and uncertainties, three critical messages emerge:

- Cal Water supplies in the 21st century are likely to be adversely affected by climate change.

- These impacts will vary considerably across districts, depending on geography and source mix. For some districts, the impacts can be significant; for others, little or no impacts are projected.

- The impacts will generally increase over time. Anticipated late-century impacts are forecast to be significantly higher in some districts than impacts at mid-century. Moreover, during the period that climate change is forecast to increasingly constrain supplies, demands are also generally forecast to increase, further exacerbating the adverse impacts on water supply reliability.

Appendix H: SFPUC and BAWSCA Common Language

- Draft Common Language for BAWSCA Member Agencies' 2020 UWMPs, dated February 3, 2021
- Common Language for BAWSCA Member Agencies' 2020 UWMP Updates, dated April 30, 2021
- Common Language for Wholesale Customers about Rate Impacts of Water Shortages, dated March 4, 2021
- Additional Language Requested by the Member Agencies, dated March 24, 2021

February 3, 2021

Draft Common Language for BAWSCA Member Agencies' 2020 UWMPs

Tier One Drought Allocations

In July 2009, San Francisco and its Wholesale Customers in Alameda County, Santa Clara County, and San Mateo County (Wholesale Customers) adopted the Water Supply Agreement (WSA), which includes a Water Shortage Allocation Plan (WSAP) that describes the method for allocating water from the Regional Water System (RWS) between Retail and Wholesale Customers during system-wide shortages of 20 percent or less. The WSAP, also known as the Tier One Plan, was amended in the 2018 Amended and Restated WSA.

The SFPUC allocates water under the Tier One Plan when it determines that the projected available water supply is up to 20 percent less than projected system-wide water purchases. The following table shows the SFPUC (i.e, Retail Customers) share and the Wholesale Customers' share of the annual water supply available during shortages depending on the level of system-wide reduction in water use that is required. The Wholesale Customers' share will be apportioned among the individual Wholesale Customers based on a separate methodology adopted by the Wholesale Customers, known as the Tier Two Plan, discussed further below.

Level of System-Wide Reduction in Water Use Required	Share of Available Water	
	SFPUC Share	Wholesale Customers Share
5% or less	35.5%	64.5%
6% through 10%	36.0%	64.0%
11% through 15%	37.0%	63.0%
16% through 20%	37.5%	62.5%

The Tier One Plan allows for voluntary transfers of shortage allocations between the SFPUC and any Wholesale Customer as well as between Wholesale Customers themselves. In addition, water "banked" by a Wholesale Customer, through reductions in usage greater than required, may also be transferred.

As amended in 2018, the Tier One Plan requires Retail Customers to conserve a minimum of 5% during droughts. If Retail Customer demands are lower than the Retail Customer allocation (resulting in a "positive allocation" to Retail[1]) then the excess percentage would be re-allocated to the Wholesale Customers' share. The additional water conserved by Retail Customers up to the minimum 5% level is deemed to remain in storage for allocation in future successive dry years.

The Tier One Plan will expire at the end of the term of the WSA in 2034, unless mutually extended by San Francisco and the Wholesale Customers.

The Tier One Plan applies only when the SFPUC determines that a system-wide water shortage exists and issues a declaration of a water shortage emergency under California Water Code

[1] See Water Supply Agreement, Water Shortage Allocation Plan (Attachment H), Section 2.1.

Section 350. Separate from a declaration of a water shortage emergency, the SFPUC may opt to request voluntary cutbacks from its Retail and Wholesale Customers to achieve necessary water use reductions during drought periods.

Tier Two Drought Allocations

The Wholesale Customers have negotiated and adopted the Tier Two Plan, referenced above, which allocates the collective Wholesale Customer share from the Tier One Plan among each of the 26 Wholesale Customers. These Tier Two allocations are based on a formula that takes into account multiple factors for each Wholesale Customer including:

- Individual Supply Guarantee;
- Seasonal use of all available water supplies; and
- Residential per capita use.

The water made available to the Wholesale Customers collectively will be allocated among them in proportion to each Wholesale Customer's Allocation Basis, expressed in millions of gallons per day (mgd), which in turn is the weighted average of two components. The first component is the Wholesale Customer's Individual Supply Guarantee, as stated in the WSA, and is fixed. The second component, the Base/Seasonal Component, is variable and is calculated using the monthly water use for three consecutive years prior to the onset of the drought for each of the Wholesale Customers for all available water supplies. The second component is accorded twice the weight of the first, fixed component in calculating the Allocation Basis. Minor adjustments to the Allocation Basis are then made to ensure a minimum cutback level, a maximum cutback level, and a sufficient supply for certain Wholesale Customers.

The Allocation Basis is used in a fraction, as numerator, over the sum of all Wholesale Customers' Allocation Bases to determine each wholesale customer's Allocation Factor. The final shortage allocation for each Wholesale Customer is determined by multiplying the amount of water available to the Wholesale Customers' collectively under the Tier One Plan, by the Wholesale Customer's Allocation Factor.

The Tier Two Plan requires that the Allocation Factors be calculated by BAWSCA each year in preparation for a potential water shortage emergency. As the Wholesale Customers change their water use characteristics (e.g., increases or decreases in SFPUC purchases and use of other water sources, changes in monthly water use patterns, or changes in residential per capita water use), the Allocation Factor for each Wholesale Customer will also change. However, for long-term planning purposes, each Wholesale Customer shall use as its Allocation Factor, the value identified in the Tier Two Plan when adopted.

The Tier Two Plan, which initially expired in 2018, has been extended by the BAWSCA Board of Directors every year since for one additional calendar year. In November 2020, the BAWSCA Board voted to extend the Tier Two Plan through the end of 2021.

Individual Supply Guarantee

San Francisco has a perpetual commitment (Supply Assurance) to deliver 184 mgd to the 24 permanent Wholesale Customers collectively. San Jose and Santa Clara are not included in the Supply Assurance commitment and each has temporary and interruptible water supply

contracts with San Francisco. The Supply Assurance is allocated among the 24 permanent Wholesale Customers through Individual Supply Guarantees (ISG), which represent each Wholesale Customer's allocation of the 184 mgd Supply Assurance.

[Name of Agency's] ISG is _____ mgd.

2028 SFPUC Decisions (formerly 2018 SFPUC Decisions)
[Note: This section is intended to be optional language that individual BAWSCA member agencies may use.]

In the 2009 WSA, the SFPUC committed to make three decisions before 2018 that affect water supply development:

- Whether or not to make the cities of San Jose and Santa Clara permanent customers,
- Whether or not to supply the additional unmet supply needs of the Wholesale Customers beyond 2018, and
- Whether or not to increase the wholesale customer Supply Assurance above 184 mgd.

Events since 2009 made it difficult for the SFPUC to conduct the necessary water supply planning and CEQA analysis required to make these three decisions before 2018. Therefore, in the 2018 Amended and Restated WSA, the decisions were deferred for 10 years to 2028.

Additionally, there have been recent changes to instream flow requirements and customer demand projections that have affected water supply planning beyond 2018. As a result, the SFPUC has established an Alternative Water Supply Planning program to evaluate several regional and local water supply options. Through this program, the SFPUC will conduct feasibility studies and develop an Alternative Water Supply Plan by July 2023 to support the continued development of water supplies to meet future needs.

Reliability of the Regional Water System

In 2008, the SFPUC adopted Level of Service (LOS) Goals and Objectives in conjunction with the adoption of WSIP. The SFPUC updated the LOS Goals and Objectives in February 2020.

The SFPUC's LOS Goals and Objectives related to water supply are:

Program Goal	System Performance Objective
Water Supply – *meet customer water needs in non-drought and drought periods*	• Meet all state and federal regulations to support the proper operation of the water system and related power facilities. • Meet average annual water demand of 265 mgd from the SFPUC watersheds for retail and Wholesale Customers during non–drought years for system demands consistent with the 2009 Water Supply Agreement. • Meet dry-year delivery needs while limiting rationing to a maximum 20 percent system-wide reduction in water service during extended droughts. • Diversify water supply options during non-drought and drought periods. • Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers.

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Factors Impacting Supply Reliability

Adoption of the 2018 Bay-Delta Plan Amendment

In December 2018, the State Water Resources Control Board (SWRCB) adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) to establish water quality objectives to maintain the health of the Bay-Delta ecosystem. The SWRCB is required by law to regularly review this plan. The adopted Bay-Delta Plan Amendment was developed with the stated goal of increasing salmonid populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay-Delta. The Bay-Delta Plan Amendment requires the release of 30-50% of the "unimpaired flow"[2] on the three tributaries from February through June in every year type. In SFPUC modeling of the new flow standard, it is assumed that the required release is 40% of unimpaired flow.

If the Bay-Delta Plan Amendment is implemented, the SFPUC will be able to meet the projected water demands presented in this UWMP in normal years but would experience supply shortages in single dry years or multiple dry years. Implementation of the Bay-Delta Plan Amendment will require rationing in all single dry years and multiple dry years. The SFPUC has initiated an Alternative Water Supply Planning Program to ensure that San Francisco can meet its Retail and Wholesale Customer water needs, address projected dry years shortages, and limit rationing to a maximum 20 percent system-wide in accordance with adopted SFPUC policies. This program is in early planning stages and is intended to meet future water supply challenges and vulnerabilities such as environmental flow needs and other regulatory changes; earthquakes, disasters, and emergencies; increases in population and employment; and climate

[2] "Unimpaired flow represents the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds." (Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Dec. 12, 2018) p.17, fn. 14, available at https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf.)

change. As the region faces future challenges – both known and unknown – the SFPUC is considering this suite of diverse non-traditional supplies and leveraging regional partnerships to meet Retail and Wholesale Customer needs through 2045.

The SWRCB has stated that it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, assuming all required approvals are obtained by that time. But implementation of the Plan Amendment is uncertain for multiple reasons.

First, since adoption of the Bay-Delta Plan Amendment, over a dozen lawsuits have been filed in both state and federal courts, challenging the SWRCB's adoption of the Bay-Delta Plan Amendment, including a legal challenge filed by the federal government, at the request of the U.S. Department of Interior, Bureau of Reclamation. This litigation is in the early stages and there have been no dispositive court rulings as of this date.

Second, the Bay-Delta Plan Amendment is not self-implementing and does not automatically allocate responsibility for meeting its new flow requirements to the SFPUC or any other water rights holders. Rather, the Bay-Delta Plan Amendment merely provides a regulatory framework for flow allocation, which must be accomplished by other regulatory and/or adjudicatory proceedings, such as a comprehensive water rights adjudication or, in the case of the Tuolumne River, may be implemented through the water quality certification process set forth in section 401 of the Clean Water Act as part of the Federal Energy Regulatory Commission's licensing proceedings for the Don Pedro and La Grange hydroelectric projects. It is currently unclear when the license amendment process is expected to be completed. This process and the other regulatory and/or adjudicatory proceedings would likely face legal challenges and have lengthy timelines, and quite possibly could result in a different assignment of flow responsibility (and therefore a different water supply impact on the SFPUC).

Third, in recognition of the obstacles to implementation of the Bay-Delta Plan Amendment, the SWRCB Resolution No. 2018-0059 adopting the Bay-Delta Plan Amendment directed staff to help complete a "Delta watershed-wide agreement, including potential flow measures for the Tuolumne River" by March 1, 2019, and to incorporate such agreements as an "alternative" for a future amendment to the Bay-Delta Plan to be presented to the SWRCB "as early as possible after December 1, 2019." In accordance with the SWRCB's instruction, on March 1, 2019, SFPUC, in partnership with other key stakeholders, submitted a proposed project description for the Tuolumne River that could be the basis for a voluntary substitute agreement with the SWRCB ("March 1st Proposed Voluntary Agreement"). On March 26, 2019, the Commission adopted Resolution No. 19-0057 to support the SFPUC's participation in the Voluntary Agreement negotiation process. To date, those negotiations are ongoing under the California Natural Resources Agency and the leadership of the Newsom administration.[3]

Water Supply – All Year Types

The SFPUC historically has met demand in its service area in all year types from its watersheds, which consist of:

- Tuolumne River watershed
- Alameda Creek watershed

[3] California Natural Resources Agency, "Voluntary Agreements to Improve Habitat and Flow in the Delta and its Watersheds," available at https://files.resources.ca.gov/voluntary-agreements/.

- San Mateo County watersheds

In general, 85 percent of the supply comes from the Tuolumne River through Hetch Hetchy Reservoir and the remaining 15 percent comes from the local watersheds through the San Antonio, Calaveras, Crystal Springs, Pilarcitos and San Andreas Reservoirs. The adopted WSIP retains this mix of water supply for all year types.

WSIP Dry Year Water Supply Projects

The WSIP authorized the SFPUC to undertake a number of water supply projects to meet dry-year demands with no greater than 20 percent system-wide rationing in any one year. Those projects include the following:

- **Calaveras Dam Replacement Project**

  Calaveras Dam is located near a seismically active fault zone and was determined to be seismically vulnerable. To address this vulnerability, the SFPUC constructed a new dam of equal height downstream of the existing dam. Construction on the project occurred between 2011 and July 2019. The SFPUC began impounding water behind the new dam in accordance with California Division of Safety of Dams (DSOD) guidance in the winter of 2018/2019.

- **Alameda Creek Recapture Project**

  As a part of the regulatory requirements for future operations of Calaveras Reservoir, the SFPUC must implement bypass and instream flow schedules for Alameda Creek. The Alameda Creek Recapture Project will recapture a portion of the water system yield lost due to the instream flow releases at Calaveras Reservoir or bypassed around the Alameda Creek Diversion Dam and return this yield to the RWS through facilities in the Sunol Valley. Water that naturally infiltrates from Alameda Creek will be recaptured into an existing quarry pond known as SMP (Surface Mining Permit)-24 Pond F2. The project will be designed to allow the recaptured water to be pumped to the Sunol Valley Water Treatment Plant or to San Antonio Reservoir. Construction of this project will occur from spring 2021 to fall 2022.

- **Lower Crystal Springs Dam Improvements**

  The Lower Crystal Springs Dam (LCSD) Improvements were substantially completed in November 2011. The joint San Mateo County/SFPUC Bridge Replacement Project to replace the bridge across the dam was completed in January 2019. A WSIP follow up project to modify the LCSD Stilling Basin for fish habitat and upgrade the fish water release and other valves started in April 2019. While the main improvements to the dam have been completed, environmental permitting issues for reservoir operation remain significant. While the reservoir elevation was lowered due to DSOD restrictions, the habitat for the Fountain Thistle, an endangered plant, followed the lowered reservoir elevation. Raising the reservoir elevation now requires that new plant populations be restored incrementally before the reservoir elevation is raised. The result is that it may be several years before pre-project water storage volumes can be restored.

- **Regional Groundwater Storage and Recovery Project**

  The Groundwater Storage and Recovery (GSR) Project is a strategic partnership between SFPUC and three San Mateo County agencies – the California Water Service Company (serving South San Francisco and Colma), the City of Daly City, and the City

of San Bruno – to conjunctively operate the south Westside Groundwater Basin. The project sustainably manages groundwater and surface water resources in a way that provides supplies during times of drought. During years of normal or heavy rainfall, the project would provide additional surface water to the partner agencies in San Mateo County in lieu of groundwater pumping. Over time, reduced pumping creates water storage through natural recharge of up to 20 billion gallons of new water supply available during dry years.

The project's Final Environmental Impact Report was certified in August 2014, and the project also received Commission approval that month. Phase 1 of this project consists of construction of thirteen well sites and is over 99 percent complete. Phase 2 of this project consists of completing construction of the well station at the South San Francisco Main site and some carryover work that has not been completed from Phase 1. Phase 2 design work began in December 2019.

- **2 mgd Dry-year Water Transfer**

  In 2012, the dry-year transfer was proposed between the Modesto Irrigation District and the SFPUC. Negotiations were terminated because an agreement could not be reached. Subsequently, the SFPUC had discussions with the Oakdale Irrigation District for a one-year transfer agreement with the SFPUC for 2 mgd (2,240 acre-feet). No progress towards agreement on a transfer was made in 2019, but the irrigation districts recognize SFPUC's continued interest and SFPUC will continue to pursue transfers.

In order to achieve its target of meeting at least 80 percent of its customer demand during droughts with a system demand of 265 mgd, the SFPUC must successfully implement the dry-year water supply projects included in the WSIP.

Furthermore, the permitting obligations for the Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements include a combined commitment of 12.8 mgd for instream flows on average. When this is reduced for an assumed Alameda Creek Recapture Project recovery of 9.3 mgd, the net loss of water supply is 3.5 mgd.

Alternative Water Supply Planning Program

The SFPUC is increasing and accelerating its efforts to acquire additional water supplies and explore other projects that would increase overall water supply resilience through the Alternative Water Supply Planning Program. The drivers for the program include: (1) the adoption of the Bay-Delta Plan Amendment and the resulting potential limitations to RWS supply during dry years, (2) the net supply shortfall following the implementation of WSIP, (3) San Francisco's perpetual obligation to supply 184 MGD to the Wholesale Customers, (4) adopted Level of Service Goals to limit rationing to no more than 20 percent system-wide during droughts, and (5) the potential need to identify water supplies that would be required to offer permanent status to interruptible customers. Developing additional supplies through this program would reduce water supply shortfalls and reduce rationing associated with such shortfalls. The planning priorities guiding the framework of the Alternative Water Supply Planning Program are as follows:

1. Offset instream flow needs and meet regulatory requirements
2. Meet existing obligations to existing permanent customers
3. Make interruptible customers permanent
4. Meet increased demands of existing and interruptible customers

In conjunction with these planning priorities, the SFPUC considers how the program fits within the LOS Goals and Objectives related to water supply and sustainability when considering new water supply opportunities. The key LOS Goals and Objectives relevant to this effort can be summarized as:

- Meet dry-year delivery needs while limiting rationing to a maximum of 20 percent system-wide reduction in water service during extended droughts;
- Diversify water supply options during non-drought and drought periods;
- Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers;
- Meet, at a minimum, all current and anticipated legal requirements for protection of fish and wildlife habitat;
- Maintain operational flexibility (although this LOS Goal was not intended explicitly for the addition of new supplies, it is applicate here).

Together, the planning priorities and LOS Goals and Objectives provide a lens through which the SFPUC considers water supply options and opportunities to meet all foreseeable water supply needs.

In addition to the Daly City Recycled Water Expansion project[4], which was a potential project identified in the 2015 UWMP and had committed funding at that time, the SFPUC has taken action to fund the study of potential additional water supply projects. Capital projects under consideration to develop additional water supplies include surface water storage expansion, recycled water expansion, water transfers, desalination, and potable reuse. A more detailed list and descriptions of these efforts are provided below.

The capital projects that are under consideration would be costly and are still in the early feasibility or conceptual planning stages. Because these water supply projects would take 10 to 30 years to implement, and because required environmental permitting negotiations may reduce the amount of water that can be developed, the yield from these projects are not currently incorporated into SFPUC's supply projections. State and federal grants and other financing opportunities would be pursued for eligible projects, to the extent feasible, to offset costs borne by ratepayers.

- **Daly City Recycled Water Expansion** (Regional, Normal- and Dry-Year Supply)

  This project can produce up to 3 mgd of tertiary recycled water during the irrigation season (~7 months). On an average annual basis, this is equivalent to 1.25 mgd or 1,400 acre-feet per year. The project is envisioned to provide recycled water to 13 cemeteries and other smaller irrigation customers, offsetting existing groundwater pumping from the South Westside Groundwater Basin; this will free up groundwater, enhancing the reliability of the Basin. The project is a regional partnership between the SFPUC and Daly City. The irrigation customers are located largely within California Water Service's (Cal Water's) service area. RWS customers will benefit from the increased reliability of the South Westside Basin for additional drinking water supply during droughts. In this way, this project supports the GSR Project, which is under construction.

[4] While this potential project was identified in the 2015 UWMP, it has since been approved by Daly City following environmental review and has a higher likelihood of being implemented.

- **ACWD-USD Purified Water Partnership** (Regional, Normal- and Dry-Year Supply)

  This project could provide a new purified water supply utilizing Union Sanitary District's (USD) treated wastewater. Purified water produced by advanced water treatment at USD could be transmitted to the Quarry Lakes Groundwater Recharge Area to supplement recharge into the Niles Cone Groundwater Basin or put to other uses in Alameda County Water District's (ACWD) service area. With the additional water supply to ACWD, an in-lieu exchange with the SFPUC would result in more water left in the RWS. Additional water supply could also be directly transmitted to the SFPUC through a new intertie between ACWD and the SFPUC.

- **Crystal Springs Purified Water** (Regional, Normal- and Dry-Year Supply)

  The Crystal Springs Purified Water (PREP) Project is a purified water project that could provide 6-12 mgd of water supply through reservoir water augmentation at Crystal Springs Reservoir, which is a facility of the RWS. Treated wastewater from Silicon Valley Clean Water (SVCW) and/or the City of San Mateo would go through an advanced water treatment plant to produce purified water that meets state and federal drinking water quality standards. The purified water would then be transmitted 10-20 miles (depending on the alignment) to Crystal Springs Reservoir, blended with regional surface water supplies and treated again at Harry Tracy Water Treatment Plant. Project partners include the SFPUC, BAWSCA, SVCW, CalWater, Redwood City, Foster City, and the City of San Mateo. Partner agencies are contributing financial and staff resources towards the work effort.

- **Los Vaqueros Reservoir Expansion** (Regional, Dry Year Supply)

  The Los Vaqueros Reservoir Expansion (LVE) Project is a storage project that will enlarge the existing reservoir located in northeastern Contra Costa County from 160,000 acre-feet to 275,000 acre-feet. While the existing reservoir is owned and operated by the Contra Costa Water District (CCWD), the expansion will have regional benefits and will be managed by a Joint Powers Authority (JPA) that will be set up prior to construction. Meanwhile, CCWD is leading the planning, design and environmental review efforts. CCWD's Board certified the EIS/EIR and approved the LVE Project on May 13, 2020. The additional storage capacity from the LVE Project would provide a dry year water supply benefit to the SFPUC. BAWSCA is working in concert with the SFPUC to support their work effort on the LVE project.
    - **Conveyance Alternatives:** The SFPUC is considering two main pathways to move water from storage in a prospective LVE Project to the SFPUC's service area, either directly to RWS facilities or indirectly via an exchange with partner agencies. The SFPUC is evaluating potential alignments for conveyance.
    - **Bay Area Regional Reliability Shared Water Access Program (BARR SWAP):** As part of the BARR Partnership, a consortium of 8 Bay Area water utilities (including ACWD, BAWSCA, CCWD, EBMUD, Marin Municipal Water District (MMWD), SFPUC, Valley Water, and Zone 7 Water Agency) are exploring opportunities to move water across the region as efficiently as possible, particularly during times of drought and emergencies. The BARR agencies are proposing two separate pilot projects in 2020-2021 through the Shared Water Access Program (SWAP) to test conveyance pathways and identify potential hurdles to better prepare for sharing water during a future drought or emergency. A strategy report identifying opportunities and considerations will accompany these pilot transfers and will be completed in 2021.

- **Bay Area Brackish Water Desalination** (Regional, Normal- and Dry-Year Supply)

  The Bay Area Brackish Water Desalination (Regional Desalination) Project is a partnership between CCWD, the SFPUC, Valley Water, and Zone 7 Water Agency. East Bay Municipal Utilities District (EBMUD) and ACWD may also participate in the project. The project could provide a new drinking water supply to the region by treating brackish water from CCWD's existing Mallard Slough intake in Contra Costa County. While this project has independent utility as a water supply project, for the current planning effort the SFPUC is considering it as a source of supply for storage in LVE. While the allocations remain to be determined among partners, the SFPUC is considering a water supply benefit of between 5 and 15 mgd during drought conditions when combined with storage at LVE.

- **Calaveras Reservoir Expansion** (Regional, Dry Year Supply)

  Calaveras Reservoir would be expanded to create 289,000 AF additional capacity to store excess Regional Water System supplies or other source water in wet and normal years. In addition to reservoir enlargement, the project would involve infrastructure to pump water to the reservoir, such as pump stations and transmission facilities.

- **Groundwater Banking**

  Groundwater banking in the Modesto Irrigation District (MID) and Turlock Irrigation District (TID) service areas could be used to provide some additional water supply to meet instream releases in dry years reducing water supply impacts to the SFPUC service area. For example, additional surface water could be provided to irrigators in wet years, which would offset the use of groundwater, thereby allowing the groundwater to remain in the basin rather than be consumptively used. The groundwater that remains in the basin can then be used in a subsequent dry year for irrigation, freeing up surface water that would have otherwise been delivered to irrigators to meet instream flow requirements.

  A feasibility study of this option is included in the proposed Tuolumne River Voluntary Agreement. Progress on this potential water supply option will depend on the negotiations of the Voluntary Agreement.

- **Inter-Basin Collaborations**

  Inter-Basin Collaborations could provide net water supply benefits in dry years by sharing responsibility for in-stream flows in the San Joaquin River and Delta more broadly among several tributary reservoir systems. One mechanism by which this could be accomplished would be to establish a partnership between interests on the Tuolumne River and those on the Stanislaus River, which would allow responsibility for streamflow to be assigned variably based on the annual hydrology.

  As is the case with Groundwater Banking, feasibility of this option is included in the proposed Tuolumne River Voluntary Agreement.

If all the projects identified through the current planning process can be implemented, there would still be a supply shortfall to meet projected needs. Furthermore, each of the supply options being considered has its own inherent challenges and uncertainties that may affect the SFPUC's ability to implement it.

Given the limited availability of water supply alternatives - unless the supply risks are significantly reduced or our needs change significantly - the SFPUC will continue to plan,

develop and implement all project opportunities that can help bridge the anticipated water supply gaps during droughts. In 2019, the SFPUC completed a survey among water and wastewater agencies within the service area to identify additional opportunities for purified water. Such opportunities remain limited, but the SFPUC continues to pursue all possibilities.

Projected SFPUC Regional Water System Supply Reliability

The SFPUC will provide tables presenting the projected RWS supply reliability under normal, single dry year, and multiple dry year scenarios.

Climate Change

The issue of climate change has become an important factor in water resources planning in the State, and is frequently considered in urban water management planning processes, though the extent and precise effects of climate change remain uncertain. There is convincing evidence that increasing concentrations of greenhouse gasses have caused and will continue to cause a rise in temperatures around the world, which will result in a wide range of changes in climate patterns. Moreover, observational data show that a warming trend occurred during the latter part of the 20th century and virtually all projections indicate this will continue through the 21st century. These changes will have a direct effect on water resources in California, and numerous studies have been conducted to determine the potential impacts to water resources. Based on these studies, climate change could result in the following types of water resource impacts, including impacts on the watersheds in the Bay Area:

- Reductions in the average annual snowpack due to a rise in the snowline and a shallower snowpack in the low and medium elevation zones, such as in the Tuolumne River basin, and a shift in snowmelt runoff to earlier in the year;
- Changes in the timing, annual average, intensity and variability of precipitation, and an increased amount of precipitation falling as rain rather than snow;
- Long-term changes in watershed vegetation and increased incidence of wildfires that could affect water quality and quantity;
- Sea level rise and an increase in saltwater intrusion;
- Increased water temperatures with accompanying potential adverse effects on some fisheries and water quality;
- Increases in evaporation and concomitant increased irrigation need; and
- Changes in urban and agricultural water demand.

Both the SFPUC and BAWSCA participated in the 2020 update of the Bay Area Integrated Regional Water Management Plan (BAIRWMP), which includes an assessment of the potential climate change vulnerabilities of the region's water resources and identifies climate change adaptation strategies. In addition, the SFPUC continues to study the effect of climate change on the Regional Water System (RWS). These works are summarized below.

Bay Area Integrated Regional Water Management Plan

Climate change adaptation continues to be an overarching theme for the 2019 BAIRWMP update. As stated in the BAIRWMP, identification of watershed characteristics that could

potentially be vulnerable to future climate change is the first step in assessing vulnerabilities of water resources in the Bay Area Region (Region). Vulnerability is defined as the degree to which a system is exposed to, susceptible to, and able to cope with or adjust to, the adverse effects of climate change. A vulnerability assessment was conducted in accordance with the Department of Water Resources' (DWR's) *Climate Change Handbook for Regional Water Planning* and using the most current science available for the Region. The vulnerability assessment, summarized in the table below, provides the main water planning categories applicable to the Region and a general overview of the qualitative assessment of each category with respect to anticipated climate change impacts.

Summary of BAIRWMP Climate Change Vulnerability Assessment

Vulnerability Areas	General Overview of Vulnerabilities
Water Demand	**Urban and Agricultural Water Demand** – Changes to hydrology in the Region as a result of climate change could lead to changes in total water demand and use patterns. Increased irrigation (outdoor landscape or agricultural) is anticipated to occur with temperature rise, increased evaporative losses due to warmer temperature, and a longer growing season. Water treatment and distribution systems are most vulnerable to increases in maximum day demand.
Water Supply	**Imported Water** – Imported water derived from the Sierra Nevada sources and Delta diversions provide 66 percent of the water resources available to the Region. Potential impacts on the availability of these sources resulting from climate change directly affect the amount of imported water supply delivered to the Region. **Regional Surface Water** – Although future projections suggest that small changes in total annual precipitation over the Region will not change much, there may be changes to when precipitation occurs with reductions in the spring and more intense rainfall in the winter. **Regional Groundwater** – Changes in local hydrology could affect natural recharge to the local groundwater aquifers and the quantity of groundwater that could be pumped sustainably over the long-term in some areas. Decreased inflow from more flashy or more intense runoff, increased evaporative losses and warmer and shorter winter seasons can alter natural recharge of groundwater. Salinity intrusion into coastal groundwater aquifers due to sea-level rise could interfere with local groundwater uses. Furthermore, additional reductions in imported water supplies would lead to less imported water available for managed recharge of local groundwater basins and potentially more groundwater pumping in lieu of imported water availability.
Water Quality	**Imported Water** – For sources derived from the Delta, sea-level rise could result in increases in chloride and bromide (a disinfection by-product (DBP) precursor that is also a component of sea water),

Vulnerability Areas	General Overview of Vulnerabilities
	potentially requiring changes in treatment for drinking water. Increased temperature could result in an increase in algal blooms, taste and odor events, and a general increase in DBP formation **Regional Surface Water** – Increased temperature could result in lower dissolved oxygen in streams and prolong thermocline stratification in lakes and reservoirs forming anoxic bottom conditions and algal blooms. Decrease in annual precipitation could result in higher concentrations of contaminants in streams during droughts or in association with flushing rain events. Increased wildfire risk and flashier or more intense storms could increase turbidity loads for water treatment. **Regional Groundwater** – Sea-level rise could result in increases in chlorides and bromide for some coastal groundwater basins in the Region. Water quality changes in imported water used for recharge could also impact groundwater quality.
Sea-Level Rise	Sea-level rise is additive to tidal range, storm surges, stream flows, and wind waves, which together will increase the potential for higher total water levels, overtopping, and erosion. Much of the bay shoreline is comprised of low-lying diked baylands which are already vulnerable to flooding. In addition to rising mean sea level, continued subsidence due to tectonic activity will increase the rate of relative sea-level rise. As sea-level rise increases, both the frequency and consequences of coastal storm events, and the cost of damage to the built and natural environment, will increase. Existing coastal armoring (including levees, breakwaters, and other structures) is likely to be insufficient to protect against projected sea-level rise. Crest elevations of structures will have to be raised or structures relocated to reduce hazards from higher total water levels and larger waves.
Flooding	Climate change projections are not sensitive enough to assess localized flooding, but the general expectation is that more intense storms would occur thereby leading to more frequent, longer and deeper flooding. Changes to precipitation regimes may increase flooding. Elevated Bay elevations due to sea-level rise will increase backwater effects exacerbating the effect of fluvial floods and storm drain backwater flooding.

Vulnerability Areas	General Overview of Vulnerabilities
Ecosystem and Habitat	Changes in the seasonal patterns of temperature, precipitation, and fire due to climate change can dramatically alter ecosystems that provide habitats for California's native species. These impacts can result in species loss, increased invasive species ranges, loss of ecosystem functions, and changes in vegetation growing ranges. Reduced rain and changes in the seasonal distribution of rainfall may alter timing of low flows in streams and rivers, which in turn would have consequences for aquatic ecosystems. Changes in rainfall patterns and air temperature may affect water temperatures, potentially affecting coldwater aquatic species. Bay Area ecosystems and habitat provide important ecosystem services, such as: carbon storage, enhanced water supply and quality, flood protection, food and fiber production. Climate change is expected to substantially change several of these services. The region provides substantial aquatic and habitat-related recreational opportunities, including: fishing, wildlife viewing, and wine industry tourism (a significant asset to the region) that may be at risk due to climate change effects.
Hydropower	Currently, several agencies in the Region produce or rely on hydropower produced outside of the Region for a portion of their power needs. As the hydropower is produced in the Sierra, there may be changes in the future in the timing and amount of energy produced due to changes in the timing and amount of runoff as a result of climate change. Some hydropower is also produced within the region and could also be affected by changes in the timing and amount of runoff.

Source: 2019 Bay Area Integrated Regional Water Management Plan (BAIRWMP), Table 16-3.

SFPUC Climate Change Studies

The SFPUC views assessment of the effects of climate change as an ongoing project requiring regular updating to reflect improvements in climate science, atmospheric/ocean modeling, and human response to the threat of greenhouse gas emissions. Climate change research by the SFPUC began in 2009 and continues to be refined. In its 2012 report "Sensitivity of Upper Tuolumne River Flow to Climate Change Scenarios," the SFPUC assessed the sensitivity of runoff into Hetch Hetchy Reservoir to a range of changes in temperature and precipitation due to climate change. Key conclusions from the report include the following:

- With differing increases in temperature alone, the median annual runoff at Hetch Hetchy would decrease by 0.7-2.1% from present-day conditions by 2040 and by 2.6-10.2% from

present-day by 2100. Adding differing decreases in precipitation on top of temperature increases, the median annual runoff at Hetch Hetchy would decrease by 7.6-8.6% from present-day conditions by 2040 and by 24.7-29.4% from present-day conditions by 2100.

- In critically dry years, these reductions in annual runoff at Hetch Hetchy would be significantly greater, with runoff decreasing up to 46.5% from present day conditions by 2100 utilizing the same climate change scenarios.
- In addition to the total change in runoff, there will be a shift in the annual distribution of runoff. Winter and early spring runoff would increase and late spring and summer runoff would decrease.
- Under all scenarios, snow accumulation would be reduced and snow would melt earlier in the spring, with significant reductions in maximum peak snow water equivalent under most scenarios.

Currently, the SFPUC is conducting a comprehensive assessment of the potential effects of climate change on water supply using a wide range of plausible increases in temperature and changes in precipitation to address the wide uncertainty in climate projections over the planning horizon 2020 to 2070. There are many uncertain factors such as climate change, changing regulations, water quality, growth and economic cycles that may create vulnerabilities for the Regional Water System's ability to meet levels of service. The uncertainties associated with the degree to which these factors will occur and how much risk they present to the water system is difficult to predict, but nonetheless they need to be considered in SFPUC planning. To address this planning challenge, the project uses a vulnerability-based planning approach to explore a range of future conditions to identify vulnerabilities, assess the risks associated with these vulnerabilities that could lead to developing an adaptation plan that is flexible and robust to a wide range of future outcomes.

Common Language for BAWSCA Member Agencies'

2020 UWMP Updates

BAWSCA

Description of BAWSCA

BAWSCA provides regional water reliability planning and conservation programming for the benefit of its 26 member agencies that purchase wholesale water supplies from the San Francisco Public Utilities Commission (SFPUC). Collectively, the BAWSCA member agencies deliver water to over 1.8 million residents and nearly 40,000 commercial, industrial and institutional accounts in Alameda, San Mateo and Santa Clara Counties.

BAWSCA also represents the collective interests of these wholesale water customers on all significant technical, financial, and policy matters related to the operation and improvement of the SFPUC's Regional Water System (RWS).

BAWSCA's role in the development of the 2020 Urban Water Management Plan (UWMP) updates is to work with its member agencies and the SFPUC to seek consistency among UWMP documents.

Regional Water Demand and Conservation Projections

In June 2020, BAWSCA completed the Regional Water Demand and Conservation Projections Report (Demand Study).[1] The goal of the Demand Study was to develop transparent, defensible, and uniform demand and conservation savings projections for each Wholesale Customer using a common methodology to support both regional and individual agency planning efforts and compliance with the new statewide water efficiency targets required by Assembly Bill (AB) 1668 and Senate Bill (SB) 606.

Through the Demand Study process, BAWSCA and the Wholesale Customers (1) quantified the total average-year water demand for each BAWSCA member agency through 2045, (2) quantified passive and active conservation water savings potential for each individual Wholesale Customer through 2045, and (3) identified 24 conservation programs with high water savings potential and/or member agency interest. Implementation of these conservation measures, along with passive conservation, is anticipated to yield an additional 37.3 MGD of water savings by 2045. Based on the revised water demand projections, the identified water conservation savings, increased development and use of other local supplies by the Wholesale Customers, and other actions, the collective purchases of the BAWSCA member agencies from the SFPUC are projected to stay below 184 MGD through 2045.

As part of the Demand Study, each Wholesale Customer was provided with a demand model that can be used to support ongoing demand and conservation planning efforts, including UWMP preparation.

[1] Phase III Final Report: http://bawsca.org/uploads/pdf/BAWSCA_Regional_Water_Demand_and_Conservation%20Projections%20Report_Final.pdf

Long-Term Reliable Water Supply Strategy

BAWSCA's Long-Term Reliable Water Supply Strategy (Strategy), completed in February 2015, quantified the water supply reliability needs of the BAWSCA member agencies through 2040, identified the water supply management projects and/or programs (projects) that could be developed to meet those needs, and prepared an implementation plan for the Strategy's recommendations.

When the 2015 Demand Study concluded it was determined that while there is no longer a regional normal year supply shortfall, there was a regional drought year supply shortfall of up to 43 MGD. In addition, key findings from the Strategy's project evaluation analysis included:

- Water transfers represent a high priority element of the Strategy.
- Desalination potentially provides substantial yield, but its high effective costs and intensive permitting requirements make it a less attractive drought year supply alternative.
- Other potential regional projects provide tangible, though limited, benefit in reducing dry-year shortfalls given the small average yields in drought years.

Since 2015, BAWSCA has completed a comprehensive update of demand projections and engaged in significant efforts to improve regional reliability and reduce the dry-year water supply shortfall.

Water Transfers. BAWSCA successfully facilitated two transfers of portions of Individual Supply Guarantee (ISG) between BAWSCA agencies in 2017 and 2018. Such transfers benefit all BAWSCA agencies by maximizing use of existing supplies. BAWSCA is currently working on an amendment to the Water Supply Agreement between the SFPUC and BAWSCA agencies to establish a mechanism by which member agencies that have an ISG may participate in expedited transfers of a portion of ISG and a portion of a Minimum Annual Purchase Requirement. In 2019, BAWSCA participated in a pilot water transfer that, while ultimately unsuccessful, surfaced important lessons learned and produced interagency agreements that will serve as a foundation for future transfers. BAWSCA is currently engaged in the Bay Area Regional Reliability Partnership[2] (BARR), a partnership among eight Bay Area water utilities (including the SFPUC, Alameda County Water District, BAWSCA, Contra Costa Water District, Santa Clara Valley Water District) to identify opportunities to move water across the region as efficiently as possible, particularly during times of drought and emergencies.

Regional Projects. Since 2015, BAWSCA has coordinated with local and State agencies on regional projects with potential dry-year water supply benefits for BAWSCA's agencies. These efforts include storage projects, indirect/direct water reuse projects, and studies to evaluate the capacity and potential for various conveyance systems to bring new supplies to the region.

BAWSCA continues to implement the Strategy recommendations in coordination with BAWSCA member agencies. Strategy implementation will be adaptively managed to account for changing conditions and to ensure that the goals of the Strategy are met in an efficient and cost-effective manner. On an annual basis, BAWSCA will reevaluate Strategy recommendations and results in conjunction with development of the BAWSCA's FY 2021-22 Work Plan. In this way, actions can be modified to accommodate changing conditions and new developments.

[2] https://www.bayareareliability.com/

Making Conservation a Way of Life Strategic Plan

Following the 2014-2016 drought, the State of California (State) developed the "Making Water Conservation a California Way of Life" framework to address the long-term water use efficiency requirements called for in executive orders issued by Governor Brown. In May of 2018, AB 1668 and SB 606 (collectively referred to as the efficiency legislation) went into effect, which built upon the executive orders implementing new urban water use objectives for urban retail water suppliers.

BAWSCA led its member agencies in a multi-year effort to develop and implement a strategy to meet these new legislative requirements. BAWSCA's Making Conservation a Way of Life Strategic Plan (Strategic Plan) provided a detailed roadmap for member agencies to improve water efficiency. BAWSCA implementing the following elements of the Strategic Plan:

- Conducted an assessment of the agencies' current practices and water industry best practices for three components of the efficiency legislation that, based on a preliminary review, present the greatest level of uncertainty and potential risk to the BAWSCA agencies. The three components were:
    1. Development of outdoor water use budgets in a manner that incorporates landscape area, local climate, and new satellite imagery data.
    2. Commercial, Industrial, and Institutional water use performance measures.
    3. Water loss requirements.
- Organized an Advanced Metering Infrastructure symposium to enable information exchange, including case studies, implementation strategies, and data analysis techniques.
- Initiated a regional CII audit pilot program, which BAWSCA aims to complete in 2021.[3]
- Implemented a regional program for water loss control to help BAWSCA agencies comply with regulatory requirements and implement cost-effective water loss interventions.
- Engaged with the SFPUC to audit meter testing and calibration practices for SFPUC's meters at BAWSCA agency turnouts.

Finally, BAWSCA's Demand Study developed water demand and conservation projections through 2045 for each BAWSCA agency. These projects are designed to provide valuable insights on long-term water demand patterns and conservation savings potential to support regional efforts, such as implementation of BAWSCA's Long-Term Reliable Water Supply Strategy.

[3] Efforts on the CII audit pilot program stalled in March 2020 due to the COVID 19 pandemic and related shelter-in-place orders.

Tier Two Drought Allocations

The Wholesale Customers have negotiated and adopted the Tier Two Plan, referenced above, which allocates the collective Wholesale Customer share from the Tier One Plan among each of the 26 Wholesale Customers. These Tier Two allocations are based on a formula that takes into account multiple factors for each Wholesale Customer including:

- Individual Supply Guarantee;
- Seasonal use of all available water supplies; and
- Residential per capita use.

The water made available to the Wholesale Customers collectively will be allocated among them in proportion to each Wholesale Customer's Allocation Basis, expressed in millions of gallons per day (mgd), which in turn is the weighted average of two components. The first component is the Wholesale Customer's Individual Supply Guarantee, as stated in the WSA, and is fixed. The second component, the Base/Seasonal Component, is variable and is calculated using the monthly water use for three consecutive years prior to the onset of the drought for each of the Wholesale Customers for all available water supplies. The second component is accorded twice the weight of the first, fixed component in calculating the Allocation Basis. Minor adjustments to the Allocation Basis are then made to ensure a minimum cutback level, a maximum cutback level, and a sufficient supply for certain Wholesale Customers.

The Allocation Basis is used in a fraction, as numerator, over the sum of all Wholesale Customers' Allocation Bases to determine each Wholesale Customer's Allocation Factor. The final shortage allocation for each Wholesale Customer is determined by multiplying the amount of water available to the Wholesale Customers' collectively under the Tier One Plan, by the Wholesale Customer's Allocation Factor.

The Tier Two Plan requires that the Allocation Factors be calculated by BAWSCA each year in preparation for a potential water shortage emergency. As the Wholesale Customers change their water use characteristics (e.g., increases or decreases in SFPUC purchases and use of other water sources, changes in monthly water use patterns, or changes in residential per capita water use), the Allocation Factor for each Wholesale Customer will also change. However, for long-term planning purposes, each Wholesale Customer shall use as its Allocation Factor, the value identified in the Tier Two Plan when adopted.

Per WSA Section 3.11, the Tier One and Tier Two Plans will be used to allocate water from the Regional Water System between Retail and Wholesale Customers during system-wide shortages of 20% or less. For Regional Water System shortages in excess of 20%, San Francisco shall (a) follow the Tier 1 Shortage Plan allocations up to the 20% reduction, (b) meet and discuss how to implement incremental reductions above 20% with the Wholesale Customers, and (c) make a final determination of allocations above the 20% reduction. After the SFPUC has made the final allocation decision, the Wholesale Customers shall be free to challenge the allocation on any applicable legal or equitable basis. For purposes of the 2020 UWMPs, for San Francisco Regional Water System (RWS) shortages in excess of 20%, the allocations among the Wholesale Customers is assumed to be equivalent among them and to equal the drought cutback to Wholesale Customer by the SFPUC.

The Tier Two Plan, which initially expired in 2018, has been extended by the BAWSCA Board of Directors every year since for one additional calendar year. In November 2020, the BAWSCA Board voted to extend the Tier Two Plan through the end of 2021.

SFPUC's Efforts to Develop of Alternative Water Supplies

With the adoption of the Bay-Delta Plan Phase 1 (Bay-Delta Plan) by the State Water Resources Control Board in December of 2018, coupled with the uncertainties associated with litigation and the development of Voluntary Agreements that, if successful, would provide an alternative to the 40% unimpaired flow requirement that is required by the Bay-Delta Plan, BAWSCA redoubled its efforts to ensure that the SFPUC took necessary action to develop alternative water supplies such that they would be in place to fill any potential gap in supply by implementation of the Bay-Delta Plan and that the SFPUC would be able to meet its legal and contractual obligations to its Wholesale Customers.

In 2019, BAWSCA held numerous meetings with the SFPUC encouraging them to develop a division within their organization whose chief mission was to spearhead alternative water supply development. On June 25, 2019, BAWSCA provided a written and oral statement to the Commissioners urging the SFPUC to focus on developing new sources of supply in a manner similar to how it addressed the implementation of the Water System Improvement Program (WSIP). BAWSCA urged that a new water supply program was called for, with clear objectives, persistent focus, a dedicated team, adequate funding, and a plan for successful execution. The SFPUC Commission supported BAWSCA's recommendation and directed staff to undertake such an approach.

In early 2020, the SFPUC began implementation of the Alternative Water Supply Planning Program (AWSP), a program designed to investigate and plan for new water supplies to address future long-term water supply reliability challenges and vulnerabilities on the RWS.

Included in the AWSP is a suite of diverse, non-traditional supply projects that, to a great degree, leverage regional partnerships and are designed to meet the water supply needs of the SFPUC Retail and Wholesale Customers through 2045. As of the most recent Alternative Water Supply Planning Quarterly Update, SFPUC has budgeted $264 million over the next ten years to fund water supply projects. BAWSCA is heavily engaged with the SFPUC on its AWSS efforts.

BAWSCA Conservation Programs

BAWSCA manages a Regional Water Conservation Program comprised of several programs and initiatives that support and augment member agencies' and customers' efforts to use water more efficiently. These efforts extend limited water supplies that are available to meet both current and future water needs; increase drought reliability of the existing water system; and save money for both the member agencies and their customers.

The implementation of the Regional Water Conservation Program builds upon both the Water Conservation Implementation Plan (WCIP, completed in September 2009) and the Regional Demand and Conservation Projections Project (Demand Study, completed in June of 2020). These efforts include both Core Programs (implemented regionally throughout the BAWSCA service area) and Subscription Programs (funded by individual member agencies that elect to participate and implement them within their respective service areas).

BAWSCA's Core Conservation Programs include organizing classes open to the public on topics such as water efficient landscape education and water-wise gardening, assistance related to automated metering infrastructure, and other associated programs that work to promote smart water use and practices. BAWSCA's Subscription Programs include numerous rebate programs, educational programs that can be offered to area schools, technical assistance to member agencies in evaluating water loss, and programs to train and certify contractors employed to install water efficient landscape. In total, BAWSCA offers 22 programs to its member agencies and that number continues to grow over time.

Each fiscal year, BAWSCA prepares an Annual Water Conservation Report that documents how all of BAWSCA's 26 member agencies have benefitted from the Core Conservation Programs. Additionally, the report highlights how all 26 member agencies participate in one or more of the Subscription Programs offered by BAWSCA, such as rebates, water loss management and large landscape audits. The Demand Study indicates that through a combination of active and passive conservation, 37.3 MGD will be conserved by BAWSCA's member agencies by 2045.
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Common Language for Wholesale Customers about Rate Impacts of Water Shortages

The SFPUC includes a variable component to water rates for most customer classes. As a result, as sales decrease, revenues are lost on a per unit basis. Because the marginal cost of water production is relatively small, as production is reduced, the cost of service remains the same. For both retail and wholesale customers, a reduction in water purchases – whether voluntary or mandated – would require the SFPUC to raise rates, cut costs, or use existing fund balance reserves to cover its expenses. The financial planning and rate-setting process is complex and iterative. While major impacts of a water shortage on rates are described below, the full process, especially for large water shortages, would incorporate significant stakeholder discussion about tradeoffs and financial impacts.

The SFPUC's current retail water rates have a provision for a "drought surcharge" that automatically increases adopted rates in the event of a declared water shortage. The drought surcharge is calculated so that, accounting for the expected reduction in retail water usage, total revenues are equal to what they would have been without the reduction. The drought surcharge protects the SFPUC's financial stability during water shortages, and provides customers an incentive to meet conservation targets.

For wholesale customers, the rate-setting process is governed by the terms of the WSA, which provides that, in the event of a water shortage emergency, the Commission may adjust wholesale rates in an expedited way concurrently with the imposition of drought surcharges on retail customers. Beyond drought rate setting and emergency rate setting, rates are set annually in coordination with the SFPUC annual budget process and are based on the forecasted wholesale share of regional water system expenditures and total purchases. If wholesale customer usage is expected to decrease – either voluntarily, or due to shortages – this would be incorporated into the wholesale rate forecast, and rates may increase.

7. Additional language requested by the Member Agencies

SFPUC's Decision to use With Bay-Delta Plan Scenario in UWMP Submittal Tables

The adoption of the Bay-Delta Plan Amendment may significantly impact the supply available from the RWS. SFPUC recognizes that the Bay-Delta Plan Amendment has been adopted and that, given that it is now state law, we must plan for a future in which it is fully implemented. SFPUC also acknowledges that the plan is not self-implementing and therefore does not automatically go into effect. SFPUC is currently pursuing a voluntary agreement as well as a lawsuit which would limit implementation of the Plan. With both of these processes occurring on an unknown timeline, SFPUC does not know at this time when the Bay-Delta Plan Amendment is likely to go into effect. As a result, it makes sense to conduct future supply modeling for a scenario that doesn't include implementation of the Bay-Delta Plan Amendment, as that represents a potential supply reliability scenario.

Because of the uncertainty surrounding implementation of the Bay-Delta Plan Amendment, the SFPUC conducted water service reliability assessment that includes: (1) a scenario in which the Bay-Delta Plan Amendment is fully implemented in 2023, and (2) a scenario that considers the SFPUC system's current situation without the Bay-Delta Plan Amendment. The two scenarios provide a bookend for the possible future scenarios regarding RWS supplies. The standardized tables associated with the SFPUC's UWMP contain the future scenario that assumes implementation of the Bay-Delta Plan Amendment starting in 2023.

Bay-Delta Plan Implementation Starting Year

Because of the uncertainty surrounding implementation of the Bay-Delta Plan Amendment, the water service reliability assessment presented in the SFPUC's draft UWMP looks at two future supply scenarios, both with and without implementation of the Bay-Delta Plan Amendment. Although the SWRCB has stated it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, given the current level of uncertainty, it is assumed for the purposes of the SFPUC's draft UWMP that the Bay-Delta Plan Amendment will be fully implemented starting in 2023.

SFPUC's Decision to Present Both Modeling Results in its UWMP

A key input for the HHLSM model is the anticipated level of demand on the RWS. Supply modeling results presented in the text of the SFPUC's UWMP reflect an input of projected demands on the RWS consisting of (1) projected retail demands on the RWS (total retail demands minus local groundwater and recycled water supplies), and (2) projected Wholesale Customer purchases. The SFPUC has a Level of Service objective of meeting average annual water demand of 265 mgd from the SFPUC watersheds for retail and Wholesale Customers during non-drought years, as well as a contractual obligation to supply 184 mgd to the Wholesale Customers. Therefore, the SFPUC has also conducted modeling based on a demand of 265 mgd in order to facilitate planning that supports meeting this Level of Service goal and their contractual obligations.

Appendix I: Regional Water Supply Reliability and BAWSCA Tier 2 Drought Implementation Scenarios

- UWMP 2020 Additional Modeling, dated March 30, 2021
- Updated Drought Allocations, dated April 1, 2021
- Memorandum on Updated Drought Cutbacks, dated February 18, 2021 with Attachment B, dated April 8, 2021
- Memorandum on Regional Water System Supply Reliability and UWMP 2020, dated June 2, 2021

San Francisco Water Power Sewer
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March 30, 2021

Danielle McPherson
Senior Water Resources Specialist
Bay Area Water Supply and Conservation Agency
155 Bovet Road, Suite 650
San Mateo, CA 94402

Dear Ms. McPherson,

Attached please find additional supply reliability modeling results conducted by the SFPUC. The SFPUC has conducted additional supply reliability modeling under the following planning scenarios:

- Projected supply reliability for years 2020 through 2045, assuming that demand is equivalent to the sum of the projected retail demands on the Regional Water System (RWS) and Wholesale Customer purchase request projections provided to SFPUC by BAWSCA on January 21st (see Table 1 below).
- Under the above demand conditions, projected supply reliability for scenarios both with and without implementation of the Bay-Delta Plan Amendment starting in 2023.

The SFPUC will be using this supply modeling in the text of its draft UWMP and moving the original modeling results into an appendix.

Table 1: Retail and Wholesale RWS Demand Assumptions Used for Additional Supply Reliability Modeling (mgd)

	2020	2025	2030	2035	2040	2045
Retail	66.5	67.2	67.5	68.6	70.5	73.7
Wholesale[1, 2]	132.1	146.0	147.9	151.9	156.3	162.8
Total	**198.6**	**213.2**	**215.4**	**220.5**	**226.8**	**236.5**

[1] Wholesale purchase request projections provided to the SFPUC by BAWSCA on January 21st, 2021
[2] Includes demands for Cities of San Jose and Santa Clara

Please note the following about the information presented in the attached tables:

London N. Breed
Mayor
Sophie Maxwell
President
Anson Moran
Vice President
Tim Paulson
Commissioner
Ed Harrington
Commissioner
Michael Carlin
Acting
General Manager

- Assumptions about infrastructure conditions remain the same as what was provided in our January 22nd letter.
- The Tier 1 allocations were applied to the RWS supplies to determine the wholesale supply, as was also described in the January 22nd letter; for any system-wide shortage above 20%, the Tier 1 split for a 20% shortage was applied.
- The SFPUC water supply planning methodology, including simulation of an 8.5-year design drought, is used to develop these estimates of water supply available from the RWS for five dry years. In each demand scenario for 2020 through 2045, the RWS deliveries are estimated using the standard SFPUC procedure, which includes adding increased levels of rationing as needed to balance the demands on the RWS system with available water supply. Some simulations may have increased levels of rationing in the final years of the design drought sequence, which can influence the comparison of results in the first five years of the sequence.
- Tables 7 and 8 in the attached document provide RWS and wholesale supply availability for the five-year drought risk assessment from 2021 to 2025. SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. Therefore, the supply projections for 2021 to 2025 are based on meeting 2020 levels of demand. However, in years when the Bay-Delta Plan Amendment is not in effect, sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests assuming that they are between the 2020 and 2025 projected levels. This is not reflected in Tables 7 and 8 because SFPUC did not want to make assumptions about the growth of purchase requests between 2020 and 2025.

In our draft UWMP, we acknowledge that we have a Level of Service objective of meeting average annual water demand of 265 mgd from the SFPUC watersheds for retail and Wholesale Customers during non-drought years, as well as a contractual obligation to supply 184 mgd to the Wholesale Customers. Therefore, we will still include the results of our modeling based on a demand of 265 mgd in order to facilitate planning that supports meeting this Level of Service objective and our contractual obligations. The results of this modeling will be in an appendix to the draft UWMP. As will be shown in this appendix, in a normal year the SFPUC can provide up to 265 mgd of supply from the RWS. The RWS supply projections shown in the attached tables are more accurately characterized as supplies that will be used to meet projected retail and Wholesale Customer demands.

It is our understanding that you will pass this information on to the Wholesale Customers. If you have any questions or need additional information, please do not hesitate to contact Sarah Triolo, at striolo@sfwater.org or (628) 230 0802.

Sincerely,

Paula Kehoe
Director of Water Resources

Table 2: Projected Total RWS Supply Utilized and Portion of RWS Supply Utilized by Wholesale Customers in Normal Years [For Table 6-9]:

Year	2020	2025	2030	2035	2040	2045
RWS Supply Utilized (mgd)	198.6	213.2	215.4	220.5	226.8	236.5
RWS Supply Utilized by Wholesale Customers[a] (mgd)	132.1	146.0	147.9	151.9	156.3	162.8

[a] RWS supply utilized by Wholesale Customers is equivalent to purchase request projections provided to SFPUC by BAWSCA on January 21, 2021, and includes Cities of San Jose and Santa Clara.

Basis of Water Supply Data: With Bay-Delta Plan Amendment

Table 3a: Basis of Water Supply Data [For Table 7-1], Base Year 2020, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2020	198.6	100%	132.1	
Single dry year		198.6	100%	132.1	
Consecutive 1st Dry year		198.6	100%	132.1	
Consecutive 2nd Dry year		198.6	100%	132.1	
Consecutive 3rd Dry year[1]		119.2	60%	74.5	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 4th Dry year		119.2	60%	74.5	• Same as above
Consecutive 5th Dry year		119.2	60%	74.5	• Same as above

[1] Assuming this year represents 2023, when Bay Delta Plan Amendment would come into effect.

Table 3b: Basis of Water Supply Data [For Table 7-1], Base Year 2025, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2025	213.2	100%	146.0	
Single dry year		149.2	70%	93.3	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		149.2	70%	93.3	• Same as above
Consecutive 2nd Dry year		127.9	60%	80.0	• Same as above
Consecutive 3rd Dry year		127.9	60%	80.0	• Same as above
Consecutive 4th Dry year		127.9	60%	80.0	• Same as above
Consecutive 5th Dry year		127.9	60%	80.0	• Same as above

Table 3c: Basis of Water Supply Data [For Table 7-1], Base Year 2030, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2030	215.4	100%	147.9	
Single dry year		150.8	70%	94.2	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		150.8	70%	94.2	• Same as above
Consecutive 2nd Dry year		129.2	60%	80.8	• Same as above
Consecutive 3rd Dry year		129.2	60%	80.8	• Same as above
Consecutive 4th Dry year		129.2	60%	80.8	• Same as above
Consecutive 5th Dry year		129.2	60%	80.8	• Same as above

Table 3d: Basis of Water Supply Data [For Table 7-1], Base Year 2035, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2035	220.5	100%	151.9	
Single dry year		154.4	70%	96.5	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		154.4	70%	96.5	• Same as above
Consecutive 2nd Dry year		132.3	60%	82.7	• Same as above
Consecutive 3rd Dry year		132.3	60%	82.7	• Same as above
Consecutive 4th Dry year		132.3	60%	82.7	• Same as above
Consecutive 5th Dry year		121.3	55%	75.8	• Same as above

Table 3e: Basis of Water Supply Data [For Table 7-1], Base Year 2040, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2040	226.8	100%	156.3	
Single dry year		158.8	70%	99.2	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		158.8	70%	99.2	• Same as above
Consecutive 2nd Dry year		136.1	60%	85.1	• Same as above
Consecutive 3rd Dry year		136.1	60%	85.1	• Same as above
Consecutive 4th Dry year		120.2	53%	75.1	• Same as above
Consecutive 5th Dry year		120.2	53%	75.1	• Same as above

Table 3f: Basis of Water Supply Data [For Table 7-1], Base Year 2045, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2045	236.5	100%	162.8	
Single dry year		141.9	60%	88.7	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		141.9	60%	88.7	• Same as above
Consecutive 2nd Dry year		141.9	60%	88.7	• Same as above
Consecutive 3rd Dry year		141.9	60%	88.7	• Same as above
Consecutive 4th Dry year		120.6	51%	75.4	• Same as above
Consecutive 5th Dry year		120.6	51%	75.4	• Same as above

Table 3g: Projected RWS Supply Availability [Alternative to Table 7-1], Years 2020-2045, With Bay-Delta Plan Amendment

Year	2020	2025	2030	2035	2040	2045
Average year	100%	100%	100%	100%	100%	100%
Single dry year	100%	70%	70%	70%	70%	60%
Consecutive 1st Dry year	100%	70%	70%	70%	70%	60%
Consecutive 2nd Dry year	100%	60%	60%	60%	60%	60%
Consecutive 3rd Dry year[1]	60%	60%	60%	60%	60%	60%
Consecutive 4th Dry year	60%	60%	60%	60%	53%	51%
Consecutive 5th Dry year	60%	60%	60%	55%	53%	51%

[1] Assuming that at base year 2020, this year represents 2023, when Bay Delta Plan Amendment would come into effect.

Basis of Water Supply Data: Without Bay-Delta Plan Amendment

Table 4a: Basis of Water Supply Data [For Table 7-1], Base Year 2020, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2020	198.6	100%	132.1	
Single dry year		198.6	100%	132.1	
Consecutive 1st Dry year		198.6	100%	132.1	
Consecutive 2nd Dry year		198.6	100%	132.1	
Consecutive 3rd Dry year		198.6	100%	132.1	
Consecutive 4th Dry year		198.6	100%	132.1	
Consecutive 5th Dry year		198.6	100%	132.1	

Table 4b: Basis of Water Supply Data [For Table 7-1], Base Year 2025, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2025	213.2	100%	146.0	
Single dry year		213.2	100%	146.0	
Consecutive 1st Dry year		213.2	100%	146.0	
Consecutive 2nd Dry year		213.2	100%	146.0	
Consecutive 3rd Dry year		213.2	100%	146.0	
Consecutive 4th Dry year		213.2	100%	146.0	
Consecutive 5th Dry year		213.2	100%	146.0	

Table 4c: Basis of Water Supply Data [For Table 7-1], Base Year 2030, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2030	215.4	100%	147.9	
Single dry year		215.4	100%	147.9	
Consecutive 1st Dry year		215.4	100%	147.9	
Consecutive 2nd Dry year		215.4	100%	147.9	
Consecutive 3rd Dry year		215.4	100%	147.9	
Consecutive 4th Dry year		215.4	100%	147.9	
Consecutive 5th Dry year		215.4	100%	147.9	

Table 4d: Basis of Water Supply Data [For Table 7-1], Base Year 2035, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2035	220.5	100%	151.9	
Single dry year		220.5	100%	151.9	
Consecutive 1st Dry year		220.5	100%	151.9	
Consecutive 2nd Dry year		220.5	100%	151.9	
Consecutive 3rd Dry year		220.5	100%	151.9	
Consecutive 4th Dry year		220.5	100%	151.9	
Consecutive 5th Dry year		220.5	100%	151.9	

Table 4e: Basis of Water Supply Data [For Table 7-1], Base Year 2040, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2040	226.8	100%	156.3	
Single dry year		226.8	100%	156.3	
Consecutive 1st Dry year		226.8	100%	156.3	
Consecutive 2nd Dry year		226.8	100%	156.3	
Consecutive 3rd Dry year		226.8	100%	156.3	
Consecutive 4th Dry year		226.8	100%	156.3	
Consecutive 5th Dry year		226.8	100%	156.3	

Table 4f: Basis of Water Supply Data [For Table 7-1], Base Year 2045, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2045	236.5	100%	162.8	
Single dry year		236.5	100%	162.8	
Consecutive 1st Dry year		236.5	100%	162.8	
Consecutive 2nd Dry year		236.5	100%	162.8	
Consecutive 3rd Dry year		236.5	100%	162.8	
Consecutive 4th Dry year		212.8	90%	139.1	• At a 10% shortage level, the wholesale allocation is 64% of available supply • The retail allocation is 36% of supply, which resulted in a positive allocation to retail of 2.9 mgd, which was re-allocated to the Wholesale Customers
Consecutive 5th Dry year		212.8	90%	139.1	• Same as above

Table 4g: Projected RWS Supply [Alternative to Table 7-1], Years 2020-2045, Without Bay-Delta Plan Amendment

Year	2020	2025	2030	2035	2040	2045
Average year	100%	100%	100%	100%	100%	100%
Single dry year	100%	100%	100%	100%	100%	100%
Consecutive 1st Dry year	100%	100%	100%	100%	100%	100%
Consecutive 2nd Dry year	100%	100%	100%	100%	100%	100%
Consecutive 3rd Dry year	100%	100%	100%	100%	100%	100%
Consecutive 4th Dry year	100%	100%	100%	100%	100%	90%
Consecutive 5th Dry year	100%	100%	100%	100%	100%	90%

Supply Projections for Consecutive Five Dry Year Sequences

Table 5: Projected Multiple Dry Years Wholesale Supply from RWS [For Table 7-4], With Bay-Delta Plan Amendment

	2025	2030	2035	2040	2045
First year	93.3	94.2	96.5	99.2	88.7
Second year	80.0	80.8	82.7	85.1	88.7
Third year	80.0	80.8	82.7	85.1	88.7
Fourth year	80.0	80.8	82.7	75.1	75.4
Fifth year	80.0	80.8	75.8	75.1	75.4

Table 6: Projected Multiple Dry Years Wholesale Supply from RWS [For Table 7-4], Without Bay-Delta Plan Amendment

	2025	2030	2035	2040	2045
First year	146.0	147.9	151.9	156.3	162.8
Second year	146.0	147.9	151.9	156.3	162.8
Third year	146.0	147.9	151.9	156.3	162.8
Fourth year	146.0	147.9	151.9	156.3	139.1
Fifth year	146.0	147.9	151.9	156.3	139.1

Table 7: Projected Regional Water System Supply for 5-Year Drought Risk Assessment [For Table 7-5], With Bay-Delta Plan Amendment. This table assumes Bay Delta Plan comes into effect in 2023.

Year	2021	2022	2023	2024	2025
RWS Supply (mgd)	198.6	198.6	119.2	119.2	119.2
Wholesale Supply (mgd)	132.1	132.1	74.5	74.5	74.5

Table 8: Projected Regional Water System Supply for 5-Year Drought Risk Assessment [For Table 7-5], Without Bay Delta Plan

Year	2021	2022	2023	2024	2025
RWS Supply (mgd)	198.6	198.6	198.6	198.6	198.6
Wholesale Supply (mgd)	132.1	132.1	132.1	132.1	132.1

Section 1: Basis for Calculations. Projected Wholesale RWS Purchases Through 2045

Table A: Wholesale RWS Actual Purchases in 2020 and Projected Purchases for 2025, 2030, 2035, 2040, and 2045 (mgd)[a]

Agency	2020 Actual	Projected Wholesale RWS Purchases 2025	2030	2035	2040	2045
ACWD	7.87	7.68	7.68	7.68	7.68	9.11
Brisbane/GVMID	0.64	0.89	0.89	0.88	0.89	0.89
Burlingame	3.48	4.33	4.40	4.47	4.58	4.69
Coastside	1.02	1.40	1.38	1.36	1.33	1.33
CalWater Total	29.00	29.99	29.74	29.81	30.27	30.70
Daly City	3.97	3.57	3.52	3.49	3.46	3.43
East Palo Alto	1.57	1.88	1.95	2.10	2.49	2.89
Estero	4.34	4.07	4.11	4.18	4.23	4.38
Hayward	13.92	17.86	18.68	19.75	20.82	22.14
Hillsborough	2.62	3.26	3.25	3.26	3.26	3.26
Menlo Park	2.96	3.55	3.68	3.87	4.06	4.29
Mid-Peninsula	2.66	2.86	2.84	2.88	2.89	2.93
Millbrae	1.90	2.29	2.50	2.45	2.82	3.20
Milpitas	5.92	6.59	6.75	7.03	7.27	7.53
Mountain View	7.67	8.60	8.90	9.20	9.51	9.93
North Coast	2.37	2.34	2.33	2.34	2.34	2.34
Palo Alto	9.75	10.06	10.15	10.28	10.51	10.79
Purissima Hills	1.75	2.09	2.09	2.12	2.13	2.15
Redwood City	8.76	8.46	8.49	8.64	8.74	8.90
San Bruno	0.95	3.24	3.22	3.20	3.20	3.21
San Jose	4.26	4.50	4.50	4.50	4.50	4.50
Santa Clara	3.27	4.50	4.50	4.50	4.50	4.50
Stanford	1.43	2.01	2.18	2.35	2.53	2.70
Sunnyvale	9.33	9.16	9.30	10.70	11.44	12.10
Westborough	0.82	0.86	0.85	0.85	0.84	0.84
Total	**132.22**	**146.01**	**147.87**	**151.90**	**156.31**	**162.76**

[a] Wholesale RWS purchase projections for 2025, 2030, 2035, 2040, and 2045 were provided to BAWSCA between July 2020 and January 2021 by the Member Agencies following the completion of the June 2020 Demand Study.

Table B: Basis for the 5-Year Drought Risk Assessment Wholesale RWS Actual Purchases in 2020 and 2021-2025 Projected Purchases (mgd)

Agency	2020 Actual	Projected and Estimated Wholesale RWS Purchases 2021[b]	2022[b]	2023[c]	2024[c]	2025[c]
ACWD	7.87	9.44	9.46	9.46	9.46	9.46
Brisbane/GVMID	0.64	0.62	0.65	0.65	0.65	0.65
Burlingame	3.48	3.34	3.35	3.35	3.35	3.35
Coastside	1.02	1.54	1.23	1.23	1.23	1.23
CalWater Total	29.00	29.66	29.81	29.81	29.81	29.81
Daly City	3.97	4.00	4.01	4.01	4.01	4.01
East Palo Alto	1.57	1.63	1.69	1.69	1.69	1.69
Estero	4.34	4.48	4.51	4.51	4.51	4.51
Hayward	13.92	14.47	15.12	15.12	15.12	15.12
Hillsborough	2.62	2.95	3.05	3.05	3.05	3.05
Menlo Park	2.96	2.92	2.93	2.93	2.93	2.93
Mid-Peninsula	2.66	2.65	2.80	2.80	2.80	2.80
Millbrae	1.90	1.95	2.15	2.15	2.15	2.15
Milpitas	5.92	5.88	5.34	5.34	5.34	5.34
Mountain View	7.67	7.80	8.05	8.05	8.05	8.05
North Coast	2.37	2.58	2.66	2.66	2.66	2.66
Palo Alto	9.75	9.44	9.66	9.66	9.66	9.66
Purissima Hills	1.75	1.97	2.02	2.02	2.02	2.02
Redwood City	8.76	8.72	9.07	9.07	9.07	9.07
San Bruno	0.95	3.39	3.40	3.40	3.40	3.40
San Jose	4.26	4.31	4.51	4.51	4.51	4.51
Santa Clara	3.27	3.29	3.50	3.50	3.50	3.50
Stanford	1.43	1.40	1.54	1.54	1.54	1.54
Sunnyvale	9.33	9.35	9.45	9.45	9.45	9.45
Westborough	0.82	0.84	0.81	0.81	0.81	0.81
Total	**132.22**	**138.61**	**140.77**	**140.77**	**140.77**	**140.77**

[b] Wholesale RWS purchase projections for 2021 and 2022 were provided to Christina Tang, BAWSCA's Finance Manager, by the Member Agencies in January 2021.

[c] The SFPUC's supply reliability tables assume the Bay-Delta Plan takes effect in 2023. In the event of a shortage, the Tier 2 Plan specifies that each agencies' Allocation Factor would be calculated once at the onset of a shortage based on the previous year's use and remains the same until the shortage condition is over. Therefore, for the purpose of drought allocations for the 5-year Drought Risk Assessment, wholesale RWS demand is assumed to remain static from 2022 through the drought sequence.

Section 2: Drought Allocations *With* Bay-Delta Plan

Table C: RWS Supply Available to the Wholesale Customers (Combined Tables 3a-3f from the SFPUC's March 30th letter) *With* Bay-Delta Plan (mgd)

	2020[e]	2025	2030	2035	2040	2045
Projected Purchases[d]	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 1st Dry Year	138.6	93.3	94.2	96.5	99.2	88.7
Consecutive 2nd Dry Year	140.8	80.0	80.8	82.7	85.1	88.7
Consecutive 3rd Dry Year	74.5	80.0	80.8	82.7	85.1	88.7
Consecutive 4th Dry Year	74.5	80.0	80.8	82.7	75.1	75.4
Consecutive 5th Dry Year	74.5	80.0	80.8	75.8	75.1	75.4

[d] Values for 2020 are actual purchases. This row aligns with what is labeled as an "Average Year" in Tables 3a-3f in the SFPUC's March 30th letter. However, these values do not represent an average year and instead are actual purchases for 2020 or projected purchases for 2025 through 2045.

[e] In years when the Bay-Delta Plan is not in effect, sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests assuming that they are between the 2020 and 2025 projected levels. As such, RWS supply available to the Wholesale Customers in the 1st and 2nd consecutive dry years under base year 2020 is equal to the cumulative projected wholesale RWS purchases for 2021 and 2022, respectively.

Table D: Wholesale RWS Demand (Combined Totals from Tables A and B) (mgd)[f]

	2020	2025	2030	2035	2040	2045
Projected Purchases[d]	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 1st Dry Year	138.6	146.0	147.9	151.9	156.3	162.8
Consecutive 2nd Dry Year	140.8	146.0	147.9	151.9	156.3	162.8
Consecutive 3rd Dry Year	140.8	146.0	147.9	151.9	156.3	162.8
Consecutive 4th Dry Year	140.8	146.0	147.9	151.9	156.3	162.8
Consecutive 5th Dry Year	140.8	146.0	147.9	151.9	156.3	162.8

[f] The SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. Additionally, the Tier 2 Plan calculates each agencies' Allocation Factor once at the onset of a drought and it remains the same until the shortage condition is over. When system-wide shortages are projected, wholesale RWS demand is assumed to be static for the remainder of the drought sequence.

Table E: Percent Cutback to the Wholesale Customers *With* Bay-Delta Plan[g]

	2020	2025	2030	2035	2040	2045
Projected Purchases[d]	0%	0%	0%	0%	0%	0%
Consecutive 1st Dry Year	0%	36%	36%	36%	37%	46%
Consecutive 2nd Dry Year	0%	45%	45%	46%	46%	46%
Consecutive 3rd Dry Year	47%	45%	45%	46%	46%	46%
Consecutive 4th Dry Year	47%	45%	45%	46%	52%	54%
Consecutive 5th Dry Year	47%	45%	45%	50%	52%	54%

[g] Agencies that wish to use new or different projected RWS purchases may use the percent cutbacks listed in this table to determine their drought allocation.

Table F1: Basis of Water Supply Data [For Tables 7-1 and 7-5], Base Year 2020, *With* Bay-Delta Plan (mgd)

Year Consecutive Dry Year	2020 Actual	2021 1st	2022 2nd	2023 3rd	2024 4th	2025 5th
Wholesale RWS Demand	132.2	138.6	140.8	140.8	140.8	140.8
Wholesale RWS Supply Available	132.2	138.6	140.8	74.5	74.5	74.5
Percent Cutback	0%	0%	0%	47%	47%	47%

Table F2: Individual Agency Drought Allocations [For Tables 7-1 and 7-5], Base Year 2020, *With* Bay-Delta Plan (mgd)

	2020	Wholesale RWS Drought Allocations				
Agency	Actual	2021	2022	2023	2024	2025
ACWD	7.87	9.44	9.46	5.01	5.01	5.01
Brisbane/GVMID	0.64	0.62	0.65	0.34	0.34	0.34
Burlingame	3.48	3.34	3.35	1.77	1.77	1.77
Coastside	1.02	1.54	1.23	0.65	0.65	0.65
CalWater Total	29.00	29.66	29.81	15.78	15.78	15.78
Daly City	3.97	4.00	4.01	2.12	2.12	2.12
East Palo Alto	1.57	1.63	1.69	0.89	0.89	0.89
Estero	4.34	4.48	4.51	2.39	2.39	2.39
Hayward	13.92	14.47	15.12	8.00	8.00	8.00
Hillsborough	2.62	2.95	3.05	1.61	1.61	1.61
Menlo Park	2.96	2.92	2.93	1.55	1.55	1.55
Mid-Peninsula	2.66	2.65	2.80	1.48	1.48	1.48
Millbrae	1.90	1.95	2.15	1.14	1.14	1.14
Milpitas	5.92	5.88	5.34	2.83	2.83	2.83
Mountain View	7.67	7.80	8.05	4.26	4.26	4.26
North Coast	2.37	2.58	2.66	1.41	1.41	1.41
Palo Alto	9.75	9.44	9.66	5.11	5.11	5.11
Purissima Hills	1.75	1.97	2.02	1.07	1.07	1.07
Redwood City	8.76	8.72	9.07	4.80	4.80	4.80
San Bruno	0.95	3.39	3.40	1.80	1.80	1.80
San Jose	4.26	4.31	4.51	2.39	2.39	2.39
Santa Clara	3.27	3.29	3.50	1.85	1.85	1.85
Stanford	1.43	1.40	1.54	0.82	0.82	0.82
Sunnyvale	9.33	9.35	9.45	5.00	5.00	5.00
Westborough	0.82	0.84	0.81	0.43	0.43	0.43
Total	**132.2**	**138.6**	**140.8**	**74.5**	**74.5**	**74.5**

Table G1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2025, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	146.0	146.0	146.0	146.0	146.0
Wholesale RWS Supply Available	93.3	80.0	80.0	80.0	80.0
Percent Cutback	36%	45%	45%	45%	45%

Table G2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2025, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.91	4.21	4.21	4.21	4.21
Brisbane/GVMID	0.57	0.49	0.49	0.49	0.49
Burlingame	2.76	2.37	2.37	2.37	2.37
Coastside	0.89	0.77	0.77	0.77	0.77
CalWater Total	19.16	16.43	16.43	16.43	16.43
Daly City	2.28	1.96	1.96	1.96	1.96
East Palo Alto	1.20	1.03	1.03	1.03	1.03
Estero	2.60	2.23	2.23	2.23	2.23
Hayward	11.41	9.78	9.78	9.78	9.78
Hillsborough	2.08	1.79	1.79	1.79	1.79
Menlo Park	2.27	1.95	1.95	1.95	1.95
Mid-Peninsula	1.83	1.57	1.57	1.57	1.57
Millbrae	1.46	1.25	1.25	1.25	1.25
Milpitas	4.21	3.61	3.61	3.61	3.61
Mountain View	5.49	4.71	4.71	4.71	4.71
North Coast	1.49	1.28	1.28	1.28	1.28
Palo Alto	6.43	5.51	5.51	5.51	5.51
Purissima Hills	1.33	1.14	1.14	1.14	1.14
Redwood City	5.40	4.63	4.63	4.63	4.63
San Bruno	2.07	1.77	1.77	1.77	1.77
San Jose	2.88	2.47	2.47	2.47	2.47
Santa Clara	2.88	2.47	2.47	2.47	2.47
Stanford	1.28	1.10	1.10	1.10	1.10
Sunnyvale	5.85	5.02	5.02	5.02	5.02
Westborough	0.55	0.47	0.47	0.47	0.47
Total	**93.3**	**80.0**	**80.0**	**80.0**	**80.0**

Table H1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2030, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	147.9	147.9	147.9	147.9	147.9
Wholesale RWS Supply Available	94.2	80.8	80.8	80.8	80.8
Percent Cutback	36%	45%	45%	45%	45%

Table H2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2030, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.89	4.20	4.20	4.20	4.20
Brisbane/GVMID	0.56	0.48	0.48	0.48	0.48
Burlingame	2.80	2.40	2.40	2.40	2.40
Coastside	0.88	0.75	0.75	0.75	0.75
CalWater Total	18.94	16.25	16.25	16.25	16.25
Daly City	2.24	1.92	1.92	1.92	1.92
East Palo Alto	1.24	1.07	1.07	1.07	1.07
Estero	2.62	2.24	2.24	2.24	2.24
Hayward	11.90	10.21	10.21	10.21	10.21
Hillsborough	2.07	1.78	1.78	1.78	1.78
Menlo Park	2.35	2.01	2.01	2.01	2.01
Mid-Peninsula	1.81	1.55	1.55	1.55	1.55
Millbrae	1.59	1.37	1.37	1.37	1.37
Milpitas	4.30	3.69	3.69	3.69	3.69
Mountain View	5.67	4.86	4.86	4.86	4.86
North Coast	1.48	1.27	1.27	1.27	1.27
Palo Alto	6.47	5.55	5.55	5.55	5.55
Purissima Hills	1.33	1.14	1.14	1.14	1.14
Redwood City	5.41	4.64	4.64	4.64	4.64
San Bruno	2.05	1.76	1.76	1.76	1.76
San Jose	2.87	2.46	2.46	2.46	2.46
Santa Clara	2.87	2.46	2.46	2.46	2.46
Stanford	1.39	1.19	1.19	1.19	1.19
Sunnyvale	5.92	5.08	5.08	5.08	5.08
Westborough	0.54	0.47	0.47	0.47	0.47
Total	**94.2**	**80.8**	**80.8**	**80.8**	**80.8**

Table I1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2035, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	151.9	151.9	151.9	151.9	151.9
Wholesale RWS Supply Available	96.5	82.7	82.7	82.7	75.8
Percent Cutback	36%	46%	46%	46%	50%

Table I2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2035, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.88	4.18	4.18	4.18	3.83
Brisbane/GVMID	0.56	0.48	0.48	0.48	0.44
Burlingame	2.84	2.44	2.44	2.44	2.23
Coastside	0.86	0.74	0.74	0.74	0.68
CalWater Total	18.94	16.23	16.23	16.23	14.88
Daly City	2.22	1.90	1.90	1.90	1.74
East Palo Alto	1.33	1.14	1.14	1.14	1.05
Estero	2.66	2.28	2.28	2.28	2.09
Hayward	12.55	10.75	10.75	10.75	9.86
Hillsborough	2.07	1.78	1.78	1.78	1.63
Menlo Park	2.46	2.10	2.10	2.10	1.93
Mid-Peninsula	1.83	1.57	1.57	1.57	1.44
Millbrae	1.56	1.34	1.34	1.34	1.22
Milpitas	4.47	3.83	3.83	3.83	3.51
Mountain View	5.84	5.01	5.01	5.01	4.59
North Coast	1.49	1.27	1.27	1.27	1.17
Palo Alto	6.53	5.60	5.60	5.60	5.13
Purissima Hills	1.34	1.15	1.15	1.15	1.06
Redwood City	5.49	4.70	4.70	4.70	4.31
San Bruno	2.03	1.74	1.74	1.74	1.60
San Jose	2.86	2.45	2.45	2.45	2.25
Santa Clara	2.86	2.45	2.45	2.45	2.25
Stanford	1.49	1.28	1.28	1.28	1.17
Sunnyvale	6.80	5.83	5.83	5.83	5.34
Westborough	0.54	0.46	0.46	0.46	0.42
Total	**96.5**	**82.7**	**82.7**	**82.7**	**75.8**

Table J1: Basis of Water Supply Data [For Table 7-1 and 7-4], Base Year 2040, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	156.3	156.3	156.3	156.3	156.3
Wholesale RWS Supply Available	99.2	85.1	85.1	75.1	75.1
Percent Cutback	37%	46%	46%	52%	52%

Table J2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2040, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.87	4.18	4.18	3.69	3.69
Brisbane/GVMID	0.56	0.48	0.48	0.43	0.43
Burlingame	2.91	2.49	2.49	2.20	2.20
Coastside	0.85	0.73	0.73	0.64	0.64
CalWater Total	19.21	16.48	16.48	14.54	14.54
Daly City	2.20	1.88	1.88	1.66	1.66
East Palo Alto	1.58	1.36	1.36	1.20	1.20
Estero	2.69	2.30	2.30	2.03	2.03
Hayward	13.21	11.34	11.34	10.00	10.00
Hillsborough	2.07	1.78	1.78	1.57	1.57
Menlo Park	2.58	2.21	2.21	1.95	1.95
Mid-Peninsula	1.84	1.58	1.58	1.39	1.39
Millbrae	1.79	1.53	1.53	1.35	1.35
Milpitas	4.62	3.96	3.96	3.49	3.49
Mountain View	6.03	5.18	5.18	4.57	4.57
North Coast	1.49	1.27	1.27	1.12	1.12
Palo Alto	6.67	5.72	5.72	5.05	5.05
Purissima Hills	1.35	1.16	1.16	1.03	1.03
Redwood City	5.55	4.76	4.76	4.20	4.20
San Bruno	2.03	1.74	1.74	1.54	1.54
San Jose	2.86	2.45	2.45	2.16	2.16
Santa Clara	2.86	2.45	2.45	2.16	2.16
Stanford	1.61	1.38	1.38	1.22	1.22
Sunnyvale	7.26	6.23	6.23	5.49	5.49
Westborough	0.54	0.46	0.46	0.41	0.41
Total	**99.2**	**85.1**	**85.1**	**75.1**	**75.1**

Table K1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2045, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	162.8	162.8	162.8	162.8	162.8
Wholesale RWS Supply Available	88.7	88.7	88.7	75.4	75.4
Percent Cutback	46%	46%	46%	54%	54%

Table K2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2045, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.97	4.97	4.97	4.22	4.22
Brisbane/GVMID	0.49	0.49	0.49	0.41	0.41
Burlingame	2.56	2.56	2.56	2.17	2.17
Coastside	0.72	0.72	0.72	0.61	0.61
CalWater Total	16.73	16.73	16.73	14.22	14.22
Daly City	1.87	1.87	1.87	1.59	1.59
East Palo Alto	1.58	1.58	1.58	1.34	1.34
Estero	2.39	2.39	2.39	2.03	2.03
Hayward	12.07	12.07	12.07	10.26	10.26
Hillsborough	1.78	1.78	1.78	1.51	1.51
Menlo Park	2.34	2.34	2.34	1.99	1.99
Mid-Peninsula	1.59	1.59	1.59	1.36	1.36
Millbrae	1.74	1.74	1.74	1.48	1.48
Milpitas	4.11	4.11	4.11	3.49	3.49
Mountain View	5.41	5.41	5.41	4.60	4.60
North Coast	1.28	1.28	1.28	1.09	1.09
Palo Alto	5.88	5.88	5.88	5.00	5.00
Purissima Hills	1.17	1.17	1.17	1.00	1.00
Redwood City	4.85	4.85	4.85	4.12	4.12
San Bruno	1.75	1.75	1.75	1.49	1.49
San Jose	2.45	2.45	2.45	2.08	2.08
Santa Clara	2.45	2.45	2.45	2.08	2.08
Stanford	1.47	1.47	1.47	1.25	1.25
Sunnyvale	6.59	6.59	6.59	5.61	5.61
Westborough	0.46	0.46	0.46	0.39	0.39
Total	**88.7**	**88.7**	**88.7**	**75.4**	**75.4**

Section 3: Drought Allocations *Without* Bay-Delta Plan

Table L: RWS Supply Available to the Wholesale Customers (Combined Tables 4a-4f from the SFPUC's March 30th letter) *Without* Bay-Delta Plan (mgd)[h]

	2020	2025	2030	2035	2040	2045
Projected Purchases[i]	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 1st Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 2nd Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 3rd Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 4th Dry Year	132.2	146.0	147.9	151.9	156.3	139.1
Consecutive 5th Dry Year	132.2	146.0	147.9	151.9	156.3	139.1

[h] The SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. However, the SFPUC has indicated that sufficient supplies are available to meet wholesale RWS demand so long as they reasonably stay within 2020 and 2040 levels. The SFPUC's modeling does not indicate cutbacks will be required till the 4th and 5th consecutive dry year at 2045 levels.

[i] Values for 2020 are actual purchases. This row aligns with what is labeled as an "Average Year" in Tables 4a-4f in the SFPUC's March 30th letter. However, these values do not represent an average year and instead are actual purchases for 2020 or projected purchases for 2025 through 2045.

Table M: Wholesale RWS Demand (Combined Totals from Tables A and B) (mgd)

	2020	2025	2030	2035	2040	2045
Projected Purchases[i]	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 1st Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 2nd Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 3rd Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 4th Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 5th Dry Year	132.2	146.0	147.9	151.9	156.3	162.8

Table N: Percent Cutback to the Wholesale Customers *Without* Bay-Delta Plan

	2020	2025	2030	2035	2040	2045
Projected Purchases[i]	0%	0%	0%	0%	0%	0%
Consecutive 1st Dry Year	0%	0%	0%	0%	0%	0%
Consecutive 2nd Dry Year	0%	0%	0%	0%	0%	0%
Consecutive 3rd Dry Year	0%	0%	0%	0%	0%	0%
Consecutive 4th Dry Year	0%	0%	0%	0%	0%	15%
Consecutive 5th Dry Year	0%	0%	0%	0%	0%	15%

Table O1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2045, *Without* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	162.8	162.8	162.8	162.8	162.8
Wholesale RWS Supply Available	162.8	162.8	162.8	139.1	139.1
Percent Cutback	0%	0%	0%	Tier 2 Plan	Tier 2 Plan

Table O2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2045, *Without* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations					Tier 2 Drought Cutback
Consecutive Dry Year	1st	2nd	3rd	4th	5th	
ACWD	9.11	9.11	9.11	8.20	8.20	10.0%
Brisbane/GVMID	0.89	0.89	0.89	0.74	0.74	16.8%
Burlingame	4.69	4.69	4.69	4.02	4.02	14.3%
Coastside	1.33	1.33	1.33	1.19	1.19	10.0%
CalWater Total	30.70	30.70	30.70	26.73	26.73	12.9%
Daly City	3.43	3.43	3.43	3.01	3.01	12.4%
East Palo Alto	2.89	2.89	2.89	2.68	2.68	7.3%
Estero	4.38	4.38	4.38	3.94	3.94	10.0%
Hayward	22.14	22.14	22.14	18.67	18.67	15.7%
Hillsborough	3.26	3.26	3.26	2.93	2.93	10.2%
Menlo Park	4.29	4.29	4.29	3.58	3.58	16.5%
Mid-Peninsula	2.93	2.93	2.93	2.63	2.63	10.0%
Millbrae	3.20	3.20	3.20	2.54	2.54	20.7%
Milpitas	7.53	7.53	7.53	6.55	6.55	13.1%
Mountain View	9.93	9.93	9.93	8.91	8.91	10.3%
North Coast	2.34	2.34	2.34	2.11	2.11	10.0%
Palo Alto	10.79	10.79	10.79	9.71	9.71	10.0%
Purissima Hills	2.15	2.15	2.15	1.41	1.41	34.5%
Redwood City	8.90	8.90	8.90	7.92	7.92	11.1%
San Bruno	3.21	3.21	3.21	2.60	2.60	19.1%
San Jose	4.50	4.50	4.50	2.95	2.95	34.5%
Santa Clara	4.50	4.50	4.50	2.95	2.95	34.5%
Stanford	2.70	2.70	2.70	2.27	2.27	16.0%
Sunnyvale	12.10	12.10	12.10	10.11	10.11	16.5%
Westborough	0.84	0.84	0.84	0.76	0.76	10.0%
Total	**162.8**	**162.8**	**162.8**	**139.1**	**139.1**	

February 18, 2021

TO: BAWSCA Member Agencies

FROM: Danielle McPherson, Senior Water Resources Specialist
Tom Francis, Water Resources Manager

SUBJECT: San Francisco Regional Water System Supply Reliability for 2020 Urban Water Management Plans

The purpose of this memorandum is to provide updated drought allocations among the Member Agencies under the various scenarios provided in the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS) Supply Reliability Letter dated January 22, 2021 and transmitted to the Member Agencies via email on January 25th ("Supply Reliability Letter", Attachment A). As presented and discussed at the February 12th BAWSCA Urban Water Management Plan (UWMP) Workshop, the Tier 2 Drought Allocation Plan was not designed for RWS shortages greater than 20 percent. As a result, the Tier 2 allocation tables shared with the Supply Reliability Letter showed unexpected and wide-ranging results between Member Agencies that should not be used for UWMP purposes.

As provided for in the 2018 Amended and Restated Water Supply Agreement (WSA), the SFPUC will honor new Tier 2 allocations agreed upon by all Member Agencies if an RWS shortage greater than 20 percent is declared. However, at this time, there is no method for allocating supplies under such significant cutbacks. Additionally, the time it would take to negotiate a modified Tier 2 plan to address those significant cutbacks would be extensive and greater than the timeline required for BAWSCA to provide your agency with numbers for input into your 2020 UWMP submittals.

For these reasons, BAWSCA is recommending that for the purpose of the 2020 UWMP updates, allocation of wholesale RWS supplies should be as follows:

1. When the average Wholesale Customers' RWS shortages are 10 percent or less, an equal percent reduction will be applied across all agencies. This is consistent with the existing Tier 2 requirement of a minimum 10 percent cutback in any Tier 2 application scenario.
2. When average Wholesale Customers' shortages are between 10 and 20 percent, the Tier 2 Drought Allocation Plan will be applied.
3. When the average Wholesale Customers' RWS shortages are greater than 20 percent, an equal percent reduction will be applied across all agencies.

Attachment B "Updated 2020 UWMP Drought Cutbacks" provides further detail, including recommended wholesale RWS allocation tables, for use in your agency's 2020 UWMP.

BAWSCA recognizes that this is not an ideal situation or method for allocation of available drought supplies. In the event of actual RWS shortages greater than 20 percent, the Member Agencies would have the opportunity to negotiate and agree upon a more nuanced and equitable approach. Such an approach would likely consider basic health and safety needs, the

water needs to support critical institutions such as hospitals, and minimizing economic impacts on individual communities and the region.

Enclosed: Attachment A: Supply Reliability Letter
Attachment B: Updated 2020 UWMP Drought Cutbacks

cc: Nicole Sandkulla
Allison Schutte

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Services of the San Francisco Public Utilities Commission

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January 22, 2021

Danielle McPherson
Senior Water Resources Specialist
Bay Area Water Supply and Conservation Agency
155 Bovet Road, Suite 650
San Mateo, CA 94402

Dear Ms. McPherson,

Attached please find the information you requested on the Regional Water System's supply reliability for use in the Wholesale Customer's 2020 Urban Water Management Plan (UWMP) updates. The SFPUC has assessed the water supply reliability under the following planning scenarios:

- Projected supply reliability for year 2020 through 2045
- Projected single dry year and multiple dry year reliability for base year 2020, both with and without implementation of the Bay-Delta Plan Amendment
- Projected single dry year and multiple dry year reliability for base year 2025, both with and without implementation of the Bay-Delta Plan Amendment

The tables presented below assume full implementation of the Bay-Delta Plan Amendment will begin in 2023. All tables assume that the wholesale customers will purchase 184 mgd from the RWS through 2045. Assumptions about the status of the dry-year water supply projects included in the Water Supply Improvement Program (WSIP) are provided below in the table 'WSIP Project Assumptions'. The tables reflect instream flow requirements at San Mateo and Alameda Creeks, as described in the common language provided to BAWSCA separately.

Concerning allocation of supply during dry years, the Water Shortage Allocation Plan (WSAP) was utilized to allocate shortages between the SFPUC and the Wholesale Customers collectively. The WSAP implements a method for allocating water between the SFPUC retail customers and wholesale customers collectively which has been adopted by the Wholesale Customers per the July 2009 Water Supply Agreement between the City and County of

London N. Breed
Mayor

Sophie Maxwell
President

Anson Moran
Vice President

Tim Paulson
Commissioner

Ed Harrington
Commissioner

Michael Carlin
Acting
General Manager

San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County. The WSAP, also known as the Tier One Plan, was amended in the 2018 Amended and Restated Water Supply Agreement. The wholesale customers have adopted the Tier Two Plan, the second component of the WSAP, which allocates the collective wholesale customer share among each of the 26 wholesale customers.

Compared to the reliability projections that were provided previously for the 2015 UWMP update, the biggest difference in projected future deliveries is caused by the implementation of the Bay-Delta Plan Amendment. Given the uncertainty about the implementation of the Amendment (described further in the common language provided to BAWSCA), tables are included to show future projected supplies both with and without the Bay-Delta Plan Amendment.

It is our understanding that you will pass this information on to the Wholesale Customers. If you have any questions or need additional information, please do not hesitate to contact Sarah Triolo, at striolo@sfwater.org or (628) 230 0802.

Sincerely,

Paula Kehoe
Director of Water Resources

Table 1: WSIP Project Assumptions

	2020	2025 and Beyond
Calaveras Dam Replacement Project	Calaveras Reservoir partially refilled at spring 2020 level of 63,900 AF	Calaveras Reservoir fully refilled
Lower Crystal Springs Dam Improvements	Crystal Springs storage not restored	
Regional Groundwater Storage and Recovery (GSR) Project	GSR account partially filled at spring 2020 level of 23,500 AF; GSR recovery rate of 6.2 mgd	GSR account fully filled; GSR recovery rate of 6.2 mgd
Alameda Creek Recapture Project	Project not built	Project built
Dry-year Transfers	Not in effect	

Table 2: Projected Wholesale Supply from Regional Water System [For Table 6-9]:

Year	2020	2025	2030	2035	2040	2045
RWS Supply (mgd)	265	265	265	265	265	265
Wholesale Supply (mgd)	184	184	184	184	184	184

Table 3: Basis of Water Supply Data [For Table 7-1], 2020 Infrastructure Conditions With Bay Delta Plan

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2020	265	100%	184	
Single dry year		238.5	90%	157.5	• At 10% shortage, wholesale allocation is 64%, or 152.6 mgd • Retail allocation is 36%, or 85.9 mgd • Retail allocations above 81 mgd are re-allocated to Wholesale Customers, per the 2018 WSA • 4.9 mgd added to wholesale allocation, bringing it to 157.5 mgd
Consecutive 1st Dry year		238.5	90%	157.5	• Same as above
Consecutive 2nd Dry year		212	80%	132.5	• At a 20% shortage, wholesale allocation is 62.5%, or 132.5 mgd • Retail allocation is 37.5%, or 79.5 mgd
Consecutive 3rd Dry year[1]		119.25	45%	74.5	• WSA does not define percentage split above a 20% shortage level • Assume same split as for a 20% shortage level, i.e. Wholesale Customers receive 62.5%
Consecutive 4th Dry year		119.25	45%	74.5	• Same as above
Consecutive 5th Dry year		119.25	45%	74.5	• Same as above

[1] Assuming this year represents 2023, when Bay Delta Plan Amendment would come into effect.

Table 4: Basis of Water Supply Data [For Table 7-1], 2020 Infrastructure Conditions Without Bay Delta Plan

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2020	265	100%	184	
Single dry year		238.5	90%	157.5	• At 10% shortage, wholesale allocation is 64%, or 152.6 mgd • Retail allocation is 36%, or 85.9 mgd • Retail allocations above 81 mgd are re-allocated to Wholesale Customers, per the 2018 WSA • 4.9 mgd added to wholesale allocation, bringing it to 157.5 mgd
Consecutive 1st Dry year		238.5	90%	157.5	• Same as above
Consecutive 2nd Dry year		212	80%	132.5	• At a 20% shortage, wholesale allocation is 62.5%, or 132.5 mgd • Retail allocation is 37.5%, or 79.5 mgd
Consecutive 3rd Dry year		212	80%	132.5	• Same as above
Consecutive 4th Dry year		212	80%	132.5	• Same as above
Consecutive 5th Dry year		212	80%	132.5	• Same as above

Table 5: Basis of Water Supply Data [For Table 7-1], 2025 Infrastructure With Bay Delta Plan

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2025	265	100%	184	
Single dry year		132.5	50%	82.8	• WSA does not define percentage split above a 20% shortage level • Assume same split as for a 20% shortage level, i.e. Wholesale Customers receive 62.5%
Consecutive 1st Dry year		132.5	50%	82.8	• Same as above
Consecutive 2nd Dry year		119.25	45%	74.5	• Same as above
Consecutive 3rd Dry year		119.25	45%	74.5	• Same as above
Consecutive 4th Dry year		119.25	45%	74.5	• Same as above
Consecutive 5th Dry year		119.25	45%	74.5	• Same as above

Table 6: Basis of Water Supply Data [For Table 7-1], 2025 Infrastructure Without Bay Delta Plan

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2025	265	100%	184	
Single dry year		238.5	90%	157.5	• At 10% shortage, wholesale allocation is 64% • Retail allocation is 36%, or 85.9 mgd; retail allocations above 81 mgd are re-allocated to Wholesaler Customers, per the 2018 WSA • 4.9 mgd added to wholesale allocation, bringing it to 157.5 mgd
Consecutive 1st Dry year		238.5	90%	157.5	• Same as above
Consecutive 2nd Dry year		238.5	90%	157.5	• Same as above
Consecutive 3rd Dry year		238.5	90%	157.5	• Same as above
Consecutive 4th Dry year		212	80%	132.5	• At a 20% shortage, wholesale allocation is 62.5%, or 132.5 mgd • Retail allocation is 37.5%, or 79.5 mgd
Consecutive 5th Dry year		212	80%	132.5	• Same as above

Table 7: Projected Multiple Dry Years Wholesale Supply from RWS [For Table 7-4], With Bay Delta Plan

	2025	2030	2035	2040	2045
First year	82.8	82.8	82.8	82.8	82.8
Second year	74.5	74.5	74.5	74.5	74.5
Third year	74.5	74.5	74.5	74.5	74.5
Fourth year	74.5	74.5	74.5	74.5	74.5
Fifth year	74.5	74.5	74.5	74.5	74.5

Table 8: Projected Multiple Dry Years Wholesale Supply from RWS [For Table 7-4], Without Bay Delta Plan

	2025	2030	2035	2040	2045
First year	157.5	157.5	157.5	157.5	157.5
Second year	157.5	157.5	157.5	157.5	157.5
Third year	157.5	157.5	157.5	157.5	157.5
Fourth year	132.5	132.5	132.5	132.5	132.5
Fifth year	132.5	132.5	132.5	132.5	132.5

Table 9: Projected Regional Water System Supply for 5-Year Drought Risk Assessment [For Table 7-5], With Bay Delta Plan. This table assumes Bay Delta Plan comes into effect in 2023.

Year	2021	2022	2023	2024	2025
RWS Supply (mgd)	238.5	212	119.25	119.25	119.25
Wholesale Supply (mgd)	157.5	132.5	74.5	74.5	74.5

Table 10: Projected Regional Water System Supply for 5-Year Drought Risk Assessment [For Table 7-5], Without Bay Delta Plan

Year	2021	2022	2023	2024	2025
RWS Supply (mgd)	238.5	212	212	212	212
Wholesale Supply (mgd)	157.5	132.5	132.5	132.5	132.5

Attachment B: Updated 2020 UWMP Drought Cutbacks

The January 22, 2021, SFPUC Regional Water System (RWS) Supply Reliability Letter (Supply Reliability Letter) provides RWS supplies available to the Wholesale Customers under two scenarios: (1) With Bay-Delta Plan, and (2) Without Bay-Delta Plan. Your agency must choose which scenario to use for your agency's 2020 UWMP submittal tables. However, you may discuss both scenarios in the body of your agency's UWMP. The purpose of this attachment is to provide further detail about your agency's allocation of total RWS supplies available to the Wholesale Customers under both scenarios.

Data Sources for Projected RWS Purchases

Supply allocations are based on projected RWS purchases provided to BAWSCA by the Member Agencies. Following the completion of the Demand Study in June 2020, BAWSCA used the results to develop a table for each Member Agency listing possible supplies and total demand for 2025, 2030, 2035, 2040, and 2045. BAWSCA populated the tables with total demand after passive conservation and entered active conservation, as calculated in the agencies' DSS Model, as a source of supply. Multi-source agencies were asked to complete the table with supply projections, including from the RWS, to meet total demand. Single-source agencies were offered the opportunity to review the tables upon request. Because active conservation was treated as a source of supply, projected RWS purchases are after passive and active conservation.

Water Management Representatives (WMRs) received a draft copy of all projected wholesale RWS purchase requests as part of the January 7, 2021 WMR meeting agenda packet and meeting slides. Agencies were asked to notify BAWSCA if changes were necessary regarding their purchase requests prior to BAWSCA sending those purchase requests to the SFPUC. Purchase requests were transmitted to the SFPUC via a letter dated January 15, 2021 for use in their 2020 UWMP efforts.

Note that the projected RWS purchases used by BAWSCA for fiscal years 2020-21 and for 2021-22 were provided to Christina Tang, BAWSCA's Finance Manager, by each Member Agency in January 2021. This annual reporting is part of the SFPUC's wholesale rate setting process. Member Agencies have provided BAWSCA with these projected purchases annually for the past 10 years.

UWMP Tables 7-1 and 7-5

UWMP Table 7-1 requests supply reliability for a normal year, a single dry year, and multiple (five) dry years. Tables 3, 4, 5, and 6 provided in the Supply Reliability Letter will help your agency complete UWMP Table 7-1. The Drought Risk Assessment (DRA) in UWMP Table 7-5 also requests a five-year drought sequence but specifies years 2021 through 2025. Supply Reliability Letter Tables 9 and 10 will help your agency complete UWMP Table 7-5.

The Supply Reliability Letter provides four tables for completing UWMP Table 7-1. The Supply Reliability Letter Tables 3 (with Bay-Delta Plan) and 4 (without Bay-Delta Plan) use 2020 as the base year. Depending on which scenario you choose, these will be the basis for your agency's five-year DRA (UWMP Table 7-5). The Supply Reliability Letter Tables 5 (with Bay-Delta Plan) and 6 (without Bay-Delta Plan) use 2025 as the base year. Depending on which scenario you choose, these will be the basis for UWMP Tables 7-2 through 7-4. Your agency may submit multiple UWMP Tables 7-1 with different base years (see Figure 1 below).

Attachment B: Updated 2020 UWMP Drought Cutbacks

Figure 1: Footnote from Draft UWMP Table 7-1

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a Supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.

Total RWS supplies available to the Wholesale Customers in the first through fifth consecutive dry years in Supply Reliability Letter Table 3 align with those in Table 9 of the same letter. Similarly, Supply Reliability Letter Table 4 aligns with Table 10 of the same letter.

Table A below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Tables 7-1and 7-5.

Table A: Wholesale Customer Drought Cutbacks Based on a Single Dry Year and Multiple Dry Years (Base Year 2020)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
(1)	Projected SF RWS Wholesale Purchases	132.2 MGD	138.6 MGD	140.8 MGD	140.8 MGD	140.8 MGD	140.8 MGD
(2)	Supply Available to the Wholesale Customers	Percent Cutback on Wholesale RWS Purchases					
		2020	**2021**	**2022**	**2023**	**2024**	**2025**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
(4)	132.5 MGD	0.0%	-4.4%	-5.9%	-5.9%	-5.9%	-5.9%
(5)	82.8 MGD	-37.4%	-40.3%	-41.2%	-41.2%	-41.2%	-41.2%
(6)	74.5 MGD	-43.7%	-46.3%	-47.1%	-47.1%	-47.1%	-47.1%

Table A, column (a), rows 3 through 6 lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative actual wholesale RWS purchases for 2020. In years when the Bay-Delta Plan is not in effect, sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests assuming that they are between the 2020 and 2025 projected levels. As such, RWS supply available to the Wholesale Customers in the 2021 and 2022 is equal to the cumulative projected wholesale RWS.. Projected RWS purchases for years 2021 and 2022 were provided to Christina Tang, BAWSCA's Finance Manager, by the Member Agencies in January 2021. The SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. Additionally, the Tier 2 Plan calculates each agencies' Allocation Factor once at the onset of a drought and it remains the same until the shortage condition is over. Therefore, wholesale RWS demand in 2023 through 2025 is assumed to be static based on the 2022 projected demand.

Table B below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Table 7-1.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table B: Wholesale Customer Drought Cutbacks Based on a Single Dry Year and Multiple Dry Years (Base Year 2025)

	(a)	(b)	(c)	(d)	(e)	(f)
(1)	Projected SF RWS Wholesale Purchases	146.0 MGD	146.0 MGD	146.0 MGD	146.0 MGD	146.0 MGD
(2)	Supply Available to the Wholesale Customers	Percent Cutback on Wholesale RWS Purchases				
		2025	**2026**	**2027**	**2028**	**2029**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	0.0%
(4)	132.5 MGD	-9.2%	-9.2%	-9.2%	-9.2%	-9.2%
(5)	82.8 MGD	-43.3%	-43.3%	-43.3%	-43.3%	-43.3%
(6)	74.5 MGD	-49.0%	-49.0%	-49.0%	-49.0%	-49.0%

Table B, column (a), rows 3 through 6 lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative projected wholesale RWS purchases for 2025 through 2029. The SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. Additionally, the Tier 2 Plan calculates each agencies' Allocation Factor once at the onset of a drought and it remains the same until the shortage condition is over. Therefore, wholesale RWS demand is assumed to be static between 2025 and 2029 based on the 2025 projected demand.

To complete UWMP Tables 7-1 and 7-5, reference tables in the Supply Reliability Letter to identify total RWS supplies available to the Wholesale Customers and apply the percent cutback in the corresponding year of the drought sequence using Tables A and B. For example, in Supply Reliability Letter Table 3, in the 5th consecutive year of a drought, the volume available to the Wholesale Customers is 74.5 MGD. To calculate RWS supplies available to your agency in 2025 using table A, locate the row with 74.5 MGD on the table – row 6 – and the column for 2025 – column (g). Then apply the percent cutback to your agency's RWS demand in 2025.

A list of purchase projections by agency are provided in Tables C, D, E, and F. The table also indicates the percent cutback that should be applied based on total RWS supplies available to the Wholesale Customers. Tables C and E use Scenario 1: With Bay-Delta Plan. Tables D and F use Scenario 2: Without Bay-Delta Plan. Tables C and D use 2020 as the base year and Tables E and F use 2025 as the base year.

BAWSCA understands that agencies are updating projected demands for their 2020 UWMPs and that projected RWS purchases may change from what was previously provided. Additionally, BAWSCA recognizes that not all Member Agencies will choose the same scenario for their UWMP supply reliability tables. For both reasons, projected RWS purchases in each Member Agency's 2020 UWMP may not add up to total Wholesale demands in the SFPUC's 2020 UWMP. This is consistent with direction given by the Department of Water Resources, which encourages suppliers use the UWMP tables to represent what they believe to be the most likely supply reliability scenario and to characterize the five-consecutive year drought in a manner that is best suited for understanding and managing their water service reliability and individual agency level of risk tolerance.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table C: Scenario 1: <u>With</u> Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2020)

	2020 (184 MGD)		**2021** (157.5 MGD)		**2022** (132.5 MGD)		**2023** (74.5 MGD)		**2024** (74.5 MGD)		**2025** (74.5 MGD)	
Agency	Actual Purchases	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.87	0.0%	9.44	0.0%	9.46	-5.9%	9.46	-47%	9.46	-47%	9.46	-47%
Brisbane/GVMID	0.64	0.0%	0.62	0.0%	0.65	-5.9%	0.65	-47%	0.65	-47%	0.65	-47%
Burlingame	3.48	0.0%	3.34	0.0%	3.35	-5.9%	3.35	-47%	3.35	-47%	3.35	-47%
Coastside	1.02	0.0%	1.54	0.0%	1.23	-5.9%	1.23	-47%	1.23	-47%	1.23	-47%
CalWater Total	29.00	0.0%	29.66	0.0%	29.81	-5.9%	29.81	-47%	29.81	-47%	29.81	-47%
Daly City	3.97	0.0%	4.00	0.0%	4.01	-5.9%	4.01	-47%	4.01	-47%	4.01	-47%
East Palo Alto	1.57	0.0%	1.63	0.0%	1.69	-5.9%	1.69	-47%	1.69	-47%	1.69	-47%
Estero	4.34	0.0%	4.48	0.0%	4.51	-5.9%	4.51	-47%	4.51	-47%	4.51	-47%
Hayward	13.92	0.0%	14.47	0.0%	15.12	-5.9%	15.12	-47%	15.12	-47%	15.12	-47%
Hillsborough	2.62	0.0%	2.95	0.0%	3.05	-5.9%	3.05	-47%	3.05	-47%	3.05	-47%
Menlo Park	2.96	0.0%	2.92	0.0%	2.93	-5.9%	2.93	-47%	2.93	-47%	2.93	-47%
Mid-Peninsula	2.66	0.0%	2.65	0.0%	2.80	-5.9%	2.80	-47%	2.80	-47%	2.80	-47%
Millbrae	1.90	0.0%	1.95	0.0%	2.15	-5.9%	2.15	-47%	2.15	-47%	2.15	-47%
Milpitas	5.92	0.0%	5.88	0.0%	5.34	-5.9%	5.34	-47%	5.34	-47%	5.34	-47%
Mountain View	7.67	0.0%	7.80	0.0%	8.05	-5.9%	8.05	-47%	8.05	-47%	8.05	-47%
North Coast	2.37	0.0%	2.58	0.0%	2.66	-5.9%	2.66	-47%	2.66	-47%	2.66	-47%
Palo Alto	9.75	0.0%	9.44	0.0%	9.66	-5.9%	9.66	-47%	9.66	-47%	9.66	-47%
Purissima Hills	1.75	0.0%	1.97	0.0%	2.02	-5.9%	2.02	-47%	2.02	-47%	2.02	-47%
Redwood City	8.76	0.0%	8.72	0.0%	9.07	-5.9%	9.07	-47%	9.07	-47%	9.07	-47%
San Bruno	0.95	0.0%	3.39	0.0%	3.40	-5.9%	3.40	-47%	3.40	-47%	3.40	-47%
San José	4.26	0.0%	4.31	0.0%	4.51	-5.9%	4.51	-47%	4.51	-47%	4.51	-47%
Santa Clara	3.27	0.0%	3.29	0.0%	3.50	-5.9%	3.50	-47%	3.50	-47%	3.50	-47%
Stanford	1.43	0.0%	1.40	0.0%	1.54	-5.9%	1.54	-47%	1.54	-47%	1.54	-47%
Sunnyvale	9.33	0.0%	9.35	0.0%	9.45	-5.9%	9.45	-47%	9.45	-47%	9.45	-47%
Westborough	0.82	0.0%	0.84	0.0%	0.81	-5.9%	0.81	-47%	0.81	-47%	0.81	-47%
Wholesale Total	**132.2**	**132.2†**	**138.6**	**138.6†**	**140.8**	**132.5†**	**140.8**	**74.5†**	**140.8**	**74.5†**	**140.8**	**74.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table D: Scenario 2: Without Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2020)

	2020 (184 MGD)		**2021** (157.5 MGD)		**2022** (132.5 MGD)		**2023** (132.5 MGD)		**2024** (132.5 MGD)		**2025** (132.5 MGD)	
Agency	Actual Purchases	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.87	0.0%	9.44	0.0%	9.46	-5.9%	9.46	-5.9%	9.46	-5.9%	9.46	-5.9%
Brisbane/GVMID	0.64	0.0%	0.62	0.0%	0.65	-5.9%	0.65	-5.9%	0.65	-5.9%	0.65	-5.9%
Burlingame	3.48	0.0%	3.34	0.0%	3.35	-5.9%	3.35	-5.9%	3.35	-5.9%	3.35	-5.9%
Coastside	1.02	0.0%	1.54	0.0%	1.23	-5.9%	1.23	-5.9%	1.23	-5.9%	1.23	-5.9%
CalWater Total	29.00	0.0%	29.66	0.0%	29.81	-5.9%	29.81	-5.9%	29.81	-5.9%	29.81	-5.9%
Daly City	3.97	0.0%	4.00	0.0%	4.01	-5.9%	4.01	-5.9%	4.01	-5.9%	4.01	-5.9%
East Palo Alto	1.57	0.0%	1.63	0.0%	1.69	-5.9%	1.69	-5.9%	1.69	-5.9%	1.69	-5.9%
Estero	4.34	0.0%	4.48	0.0%	4.51	-5.9%	4.51	-5.9%	4.51	-5.9%	4.51	-5.9%
Hayward	13.92	0.0%	14.47	0.0%	15.12	-5.9%	15.12	-5.9%	15.12	-5.9%	15.12	-5.9%
Hillsborough	2.62	0.0%	2.95	0.0%	3.05	-5.9%	3.05	-5.9%	3.05	-5.9%	3.05	-5.9%
Menlo Park	2.96	0.0%	2.92	0.0%	2.93	-5.9%	2.93	-5.9%	2.93	-5.9%	2.93	-5.9%
Mid-Peninsula	2.66	0.0%	2.65	0.0%	2.80	-5.9%	2.80	-5.9%	2.80	-5.9%	2.80	-5.9%
Millbrae	1.90	0.0%	1.95	0.0%	2.15	-5.9%	2.15	-5.9%	2.15	-5.9%	2.15	-5.9%
Milpitas	5.92	0.0%	5.88	0.0%	5.34	-5.9%	5.34	-5.9%	5.34	-5.9%	5.34	-5.9%
Mountain View	7.67	0.0%	7.80	0.0%	8.05	-5.9%	8.05	-5.9%	8.05	-5.9%	8.05	-5.9%
North Coast	2.37	0.0%	2.58	0.0%	2.66	-5.9%	2.66	-5.9%	2.66	-5.9%	2.66	-5.9%
Palo Alto	9.75	0.0%	9.44	0.0%	9.66	-5.9%	9.66	-5.9%	9.66	-5.9%	9.66	-5.9%
Purissima Hills	1.75	0.0%	1.97	0.0%	2.02	-5.9%	2.02	-5.9%	2.02	-5.9%	2.02	-5.9%
Redwood City	8.76	0.0%	8.72	0.0%	9.07	-5.9%	9.07	-5.9%	9.07	-5.9%	9.07	-5.9%
San Bruno	0.95	0.0%	3.39	0.0%	3.40	-5.9%	3.40	-5.9%	3.40	-5.9%	3.40	-5.9%
San José	4.26	0.0%	4.31	0.0%	4.51	-5.9%	4.51	-5.9%	4.51	-5.9%	4.51	-5.9%
Santa Clara	3.27	0.0%	3.29	0.0%	3.50	-5.9%	3.50	-5.9%	3.50	-5.9%	3.50	-5.9%
Stanford	1.43	0.0%	1.40	0.0%	1.54	-5.9%	1.54	-5.9%	1.54	-5.9%	1.54	-5.9%
Sunnyvale	9.33	0.0%	9.35	0.0%	9.45	-5.9%	9.45	-5.9%	9.45	-5.9%	9.45	-5.9%
Westborough	0.82	0.0%	0.84	0.0%	0.81	-5.9%	0.81	-5.9%	0.81	-5.9%	0.81	-5.9%
Wholesale Total	**132.2**	**132.2†**	**138.6**	**138.6†**	**140.8**	**132.5†**	**140.8**	**132.5†**	**140.8**	**132.5†**	**140.8**	**132.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table E: Scenario 1: With Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2025)

	2025 (184 MGD)		**2026** (82.8 MGD)		**2027** (74.5 MGD)		**2028** (74.5 MGD)		**2029** (74.5 MGD)	
Agency	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.68	0%	7.68	-43.3%	7.68	-49%	7.68	-49%	7.68	-49%
Brisbane/GVMID	0.89	0%	0.89	-43.3%	0.89	-49%	0.89	-49%	0.89	-49%
Burlingame	4.33	0%	4.33	-43.3%	4.33	-49%	4.33	-49%	4.33	-49%
Coastside	1.40	0%	1.40	-43.3%	1.40	-49%	1.40	-49%	1.40	-49%
CalWater Total	29.99	0%	29.99	-43.3%	29.99	-49%	29.99	-49%	29.99	-49%
Daly City	3.57	0%	3.57	-43.3%	3.57	-49%	3.57	-49%	3.57	-49%
East Palo Alto	1.88	0%	1.88	-43.3%	1.88	-49%	1.88	-49%	1.88	-49%
Estero	4.07	0%	4.07	-43.3%	4.07	-49%	4.07	-49%	4.07	-49%
Hayward	17.86	0%	17.86	-43.3%	17.86	-49%	17.86	-49%	17.86	-49%
Hillsborough	3.26	0%	3.26	-43.3%	3.26	-49%	3.26	-49%	3.26	-49%
Menlo Park	3.55	0%	3.55	-43.3%	3.55	-49%	3.55	-49%	3.55	-49%
Mid-Peninsula	2.86	0%	2.86	-43.3%	2.86	-49%	2.86	-49%	2.86	-49%
Millbrae	2.29	0%	2.29	-43.3%	2.29	-49%	2.29	-49%	2.29	-49%
Milpitas	6.59	0%	6.59	-43.3%	6.59	-49%	6.59	-49%	6.59	-49%
Mountain View	8.60	0%	8.60	-43.3%	8.60	-49%	8.60	-49%	8.60	-49%
North Coast	2.34	0%	2.34	-43.3%	2.34	-49%	2.34	-49%	2.34	-49%
Palo Alto	10.06	0%	10.06	-43.3%	10.06	-49%	10.06	-49%	10.06	-49%
Purissima Hills	2.09	0%	2.09	-43.3%	2.09	-49%	2.09	-49%	2.09	-49%
Redwood City	8.46	0%	8.46	-43.3%	8.46	-49%	8.46	-49%	8.46	-49%
San Bruno	3.24	0%	3.24	-43.3%	3.24	-49%	3.24	-49%	3.24	-49%
San José	4.50	0%	4.50	-43.3%	4.50	-49%	4.50	-49%	4.50	-49%
Santa Clara	4.50	0%	4.50	-43.3%	4.50	-49%	4.50	-49%	4.50	-49%
Stanford	2.01	0%	2.01	-43.3%	2.01	-49%	2.01	-49%	2.01	-49%
Sunnyvale	9.16	0%	9.16	-43.3%	9.16	-49%	9.16	-49%	9.16	-49%
Westborough	0.86	0%	0.86	-43.3%	0.86	-49%	0.86	-49%	0.86	-49%
Wholesale Total	**146.0**	**146.0†**	**146.0**	**82.8†**	**146.0**	**74.5†**	**146.0**	**74.5†**	**146.0**	**74.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table F: Scenario 2: Without Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2025)

	2025 (184 MGD)		**2026** (157.5 MGD)		**2027** (157.5 MGD)		**2028** (157.5 MGD)		**2029** (132.5 MGD)	
Agency	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.68	0.0%	7.68	0.0%	7.68	0.0%	7.68	0.0%	7.68	-9.2%
Brisbane/GVMID	0.89	0.0%	0.89	0.0%	0.89	0.0%	0.89	0.0%	0.89	-9.2%
Burlingame	4.33	0.0%	4.33	0.0%	4.33	0.0%	4.33	0.0%	4.33	-9.2%
Coastside	1.40	0.0%	1.40	0.0%	1.40	0.0%	1.40	0.0%	1.40	-9.2%
CalWater Total	29.99	0.0%	29.99	0.0%	29.99	0.0%	29.99	0.0%	29.99	-9.2%
Daly City	3.57	0.0%	3.57	0.0%	3.57	0.0%	3.57	0.0%	3.57	-9.2%
East Palo Alto	1.88	0.0%	1.88	0.0%	1.88	0.0%	1.88	0.0%	1.88	-9.2%
Estero	4.07	0.0%	4.07	0.0%	4.07	0.0%	4.07	0.0%	4.07	-9.2%
Hayward	17.86	0.0%	17.86	0.0%	17.86	0.0%	17.86	0.0%	17.86	-9.2%
Hillsborough	3.26	0.0%	3.26	0.0%	3.26	0.0%	3.26	0.0%	3.26	-9.2%
Menlo Park	3.55	0.0%	3.55	0.0%	3.55	0.0%	3.55	0.0%	3.55	-9.2%
Mid-Peninsula	2.86	0.0%	2.86	0.0%	2.86	0.0%	2.86	0.0%	2.86	-9.2%
Millbrae	2.29	0.0%	2.29	0.0%	2.29	0.0%	2.29	0.0%	2.29	-9.2%
Milpitas	6.59	0.0%	6.59	0.0%	6.59	0.0%	6.59	0.0%	6.59	-9.2%
Mountain View	8.60	0.0%	8.60	0.0%	8.60	0.0%	8.60	0.0%	8.60	-9.2%
North Coast	2.34	0.0%	2.34	0.0%	2.34	0.0%	2.34	0.0%	2.34	-9.2%
Palo Alto	10.06	0.0%	10.06	0.0%	10.06	0.0%	10.06	0.0%	10.06	-9.2%
Purissima Hills	2.09	0.0%	2.09	0.0%	2.09	0.0%	2.09	0.0%	2.09	-9.2%
Redwood City	8.46	0.0%	8.46	0.0%	8.46	0.0%	8.46	0.0%	8.46	-9.2%
San Bruno	3.24	0.0%	3.24	0.0%	3.24	0.0%	3.24	0.0%	3.24	-9.2%
San José	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	-9.2%
Santa Clara	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	-9.2%
Stanford	2.01	0.0%	2.01	0.0%	2.01	0.0%	2.01	0.0%	2.01	-9.2%
Sunnyvale	9.16	0.0%	9.16	0.0%	9.16	0.0%	9.16	0.0%	9.16	-9.2%
Westborough	0.86	0.0%	0.86	0.0%	0.86	0.0%	0.86	0.0%	0.86	-9.2%
Wholesale Total	**146.0**	**146.0†**	**146.0**	**146.4†**	**146.0**	**146.8†**	**146.0**	**147.1†**	**146.0**	**132.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

UWMP Table 7-4

Supply Reliability Letter Tables 7 and 8 will help your agency complete UWMP Table 7-4. Table G below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Table 7-4. The table assumes (1) the Tier 2 Plan will be used to allocate supplies available to the Wholesale Customers when average Wholesale Customers' RWS shortages are greater than 10 and up to 20 percent, and (2) an equal percent reduction will be shared across all Wholesale Customers when average Wholesale Customers' RWS shortages are 10 percent or less or greater than 20 percent.

Table G: Drought Cutbacks Based on Projected Demands Under All Water Supply Availability Conditions

	(a)	(b)	(c)	(d)	(e)	(f)
(1)	Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
(2)	Supply Available to the Wholesale Customers	% Cutback on Wholesale RWS Purchases				
		2025	**2030**	**2035**	**2040**	**2045**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	-3.2%
(4)	132.5 MGD	-9.3%	-10.4%	Tier 2 Avg. -14%*	Tier 2 Avg. -16%*	Tier 2 Avg. -19%*
(5)	82.8 MGD	-43.3%	-44.0%	-45.5%	-47.0%	-49.1%
(6)	74.5 MGD	-49.0%	-49.6%	-51.0%	-52.3%	-54.2%

* Calculated average. Individual agency cutbacks are calculated in Table H.

Table G, column (a) lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative projected wholesale RWS purchases for 2025, 2030, 2035, 2040, and 2045.

Tables H, I, J and K provide additional detail by agency for each of the four supply availability conditions listed in Table G. To complete UWMP Table 7-4, reference Table 7 or 8 (depending on which Bay-Delta Plan scenario you choose) in the Supply Reliability Letter to identify total RWS supplies available to the Wholesale Customers and apply the percent cutback in the corresponding year using Table G or input the volumetric drought allocation using Tables H, I, J and K below.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table H: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 157.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2035**	**2040**	**2045**
ACWD	7.68	7.68	7.68	7.68	8.82
Brisbane/GVMID	0.89	0.89	0.88	0.89	0.87
Burlingame	4.33	4.40	4.47	4.58	4.54
Coastside	1.40	1.38	1.36	1.33	1.28
CalWater Total	29.99	29.74	29.81	30.27	29.71
Daly City	3.57	3.52	3.49	3.46	3.32
East Palo Alto	1.88	1.95	2.10	2.49	2.80
Estero	4.07	4.11	4.18	4.23	4.24
Hayward	17.86	18.68	19.75	20.82	21.43
Hillsborough	3.26	3.25	3.26	3.26	3.15
Menlo Park	3.55	3.68	3.87	4.06	4.15
Mid-Peninsula	2.86	2.84	2.88	2.89	2.83
Millbrae	2.29	2.50	2.45	2.82	3.10
Milpitas	6.59	6.75	7.03	7.27	7.29
Mountain View	8.60	8.90	9.20	9.51	9.61
North Coast	2.34	2.33	2.34	2.34	2.27
Palo Alto	10.06	10.15	10.28	10.51	10.44
Purissima Hills	2.09	2.09	2.12	2.13	2.08
Redwood City	8.46	8.49	8.64	8.74	8.62
San Bruno	3.24	3.22	3.20	3.20	3.11
San José	4.50	4.50	4.50	4.50	4.35
Santa Clara	4.50	4.50	4.50	4.50	4.35
Stanford	2.01	2.18	2.35	2.53	2.61
Sunnyvale	9.16	9.30	10.70	11.44	11.71
Westborough	0.86	0.85	0.85	0.84	0.82
Wholesale Total	**146.0**	**147.9**	**151.9**	**156.3**	**157.5**

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table I: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 132.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2035**	**2040**	**2045**
ACWD	6.97	6.88	6.91	6.91	8.20
Brisbane/GVMID	0.81	0.79	0.73	0.73	0.72
Burlingame	3.93	3.94	3.96	3.89	3.80
Coastside	1.27	1.24	1.22	1.20	1.19
CalWater Total	27.21	26.65	26.46	25.69	24.69
Daly City	3.24	3.15	3.04	3.01	2.98
East Palo Alto	1.70	1.75	1.97	2.30	2.62
Estero	3.69	3.68	3.76	3.87	3.77
Hayward	16.20	16.74	17.32	17.69	18.07
Hillsborough	2.96	2.92	2.90	2.75	2.56
Menlo Park	3.22	3.30	3.37	3.33	3.26
Mid-Peninsula	2.59	2.54	2.59	2.62	2.54
Millbrae	2.07	2.24	2.16	2.32	2.45
Milpitas	5.98	6.05	6.25	6.31	6.35
Mountain View	7.80	7.97	8.28	8.49	8.34
North Coast	2.12	2.09	2.11	2.11	2.11
Palo Alto	9.13	9.09	9.26	9.46	9.71
Purissima Hills	1.89	1.87	1.42	1.38	1.32
Redwood City	7.67	7.61	7.89	7.70	7.49
San Bruno	2.94	2.88	2.56	2.51	2.45
San José	4.08	4.03	3.03	2.91	2.76
Santa Clara	4.08	4.03	3.03	2.91	2.76
Stanford	1.82	1.95	2.06	2.13	2.16
Sunnyvale	8.31	8.33	9.46	9.51	9.43
Westborough	0.78	0.76	0.76	0.76	0.76
Wholesale Total	**132.5**	**132.5**	**132.5**	**132.5**	**132.5**

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table J: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 82.8 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2035**	**2040**	**2045**
ACWD	4.36	4.30	4.19	4.07	4.64
Brisbane/GVMID	0.51	0.50	0.48	0.47	0.45
Burlingame	2.45	2.46	2.44	2.43	2.39
Coastside	0.79	0.77	0.74	0.71	0.68
CalWater Total	17.00	16.65	16.25	16.03	15.62
Daly City	2.02	1.97	1.90	1.83	1.75
East Palo Alto	1.06	1.09	1.14	1.32	1.47
Estero	2.31	2.30	2.28	2.24	2.23
Hayward	10.13	10.46	10.77	11.03	11.26
Hillsborough	1.85	1.82	1.78	1.73	1.66
Menlo Park	2.01	2.06	2.11	2.15	2.18
Mid-Peninsula	1.62	1.59	1.57	1.53	1.49
Millbrae	1.30	1.40	1.34	1.49	1.63
Milpitas	3.74	3.78	3.83	3.85	3.83
Mountain View	4.88	4.98	5.01	5.04	5.05
North Coast	1.33	1.30	1.28	1.24	1.19
Palo Alto	5.71	5.68	5.61	5.57	5.49
Purissima Hills	1.18	1.17	1.15	1.13	1.10
Redwood City	4.80	4.76	4.71	4.63	4.53
San Bruno	1.83	1.80	1.75	1.70	1.63
San José	2.55	2.52	2.45	2.38	2.29
Santa Clara	2.55	2.52	2.45	2.38	2.29
Stanford	1.14	1.22	1.28	1.34	1.37
Sunnyvale	5.19	5.21	5.83	6.06	6.16
Westborough	0.49	0.48	0.46	0.45	0.43
Wholesale Total	**82.8**	**82.8**	**82.8**	**82.8**	**82.8**

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table K: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 74.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2035**	**2040**	**2045**
ACWD	3.92	3.87	3.77	3.66	4.17
Brisbane/GVMID	0.46	0.45	0.43	0.42	0.41
Burlingame	2.21	2.21	2.19	2.18	2.15
Coastside	0.71	0.70	0.67	0.64	0.61
CalWater Total	15.30	14.98	14.62	14.43	14.05
Daly City	1.82	1.77	1.71	1.65	1.57
East Palo Alto	0.96	0.98	1.03	1.19	1.32
Estero	2.08	2.07	2.05	2.02	2.00
Hayward	9.11	9.41	9.69	9.92	10.14
Hillsborough	1.66	1.64	1.60	1.55	1.49
Menlo Park	1.81	1.86	1.90	1.94	1.96
Mid-Peninsula	1.46	1.43	1.41	1.38	1.34
Millbrae	1.17	1.26	1.20	1.34	1.47
Milpitas	3.36	3.40	3.45	3.47	3.45
Mountain View	4.39	4.48	4.51	4.53	4.54
North Coast	1.19	1.17	1.15	1.12	1.07
Palo Alto	5.14	5.11	5.04	5.01	4.94
Purissima Hills	1.06	1.05	1.04	1.02	0.99
Redwood City	4.31	4.28	4.24	4.17	4.08
San Bruno	1.65	1.62	1.57	1.53	1.47
San José	2.30	2.27	2.21	2.14	2.06
Santa Clara	2.30	2.27	2.21	2.14	2.06
Stanford	1.03	1.10	1.15	1.21	1.24
Sunnyvale	4.67	4.69	5.25	5.45	5.54
Westborough	0.44	0.43	0.41	0.40	0.39
Wholesale Total	**74.5**	**74.5**	**74.5**	**74.5**	**74.5**

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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TO: SFPUC Wholesale Customers

FROM: Steven R. Ritchie, Assistant General Manager, Water

DATE: June 2, 2021

RE: Regional Water System Supply Reliability and UWMP 2020

This memo is in response to various comments from Wholesale Customers we have received regarding the reliability of the Regional Water System supply and San Francisco's 2020 Urban Water Management Plan (UWMP).

As you are all aware, the UWMP makes clear the potential effect of the amendments to the Bay-Delta Water Quality Control Plan adopted by the State Water Resources Control Board on December 12, 2018 should it be implemented. Regional Water System-wide water supply shortages of 40-50% could occur until alternative water supplies are developed to replace those shortfalls. Those shortages could increase dramatically if the State Water Board's proposed Water Quality Certification of the Don Pedro Federal Energy Regulatory Commission (FERC) relicensing were implemented.

We are pursuing several courses of action to remedy this situation as detailed below.

Pursuing a Tuolumne River Voluntary Agreement

The State Water Board included in its action of December 12, 2018 a provision allowing for the development of Voluntary Agreements as an alternative to the adopted Plan. Together with the Modesto and Turlock Irrigation Districts, we have been actively pursuing a Tuolumne River Voluntary Agreement (TRVA) since January 2017. We believe the TRVA is a superior approach to producing benefits for fish with a much more modest effect on our water supply. Unfortunately, it has been a challenge to work with the State on this, but we continue to persist, and of course we are still interested in early implementation of the TRVA.

Evaluating our Drought Planning Scenario in light of climate change

Ever since the drought of 1987-92, we have been using a Drought Planning Scenario with a duration of 8.5 years as a stress test of our Regional Water System supplies. Some stakeholders have criticized this methodology as being too conservative. This fall we anticipate our Commission convening a workshop

London N. Breed
Mayor

Sophie Maxwell
President

Anson Moran
Vice President

Tim Paulson
Commissioner

Ed Harrington
Commissioner

Newsha Ajami
Commissioner

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Acting
General Manager

regarding our use of the 8.5-year Drought Planning Scenario, particularly in light of climate change resilience assessment work that we have funded through the Water Research Foundation. We look forward to a valuable discussion with our various stakeholders and the Commission.

Pursuing Alternative Water Supplies

The SFPUC continues to aggressively pursue Alternative Water Supplies to address whatever shortfall may ultimately occur pending the outcome of negotiation and/or litigation. The most extreme degree of Regional Water System supply shortfall is modeled to be 93 million gallons per day under implementation of the Bay-Delta Plan amendments. We are actively pursuing more than a dozen projects, including recycled water for irrigation, purified water for potable use, increased reservoir storage and conveyance, brackish water desalination, and partnerships with other agencies, particularly the Turlock and Modesto Irrigation Districts. Our goal is to have a suite of alternative water supply projects ready for CEQA review by July 1, 2023.

In litigation with the State over the Bay-Delta Plan Amendments

On January 10, 2019, we joined in litigation against the State over the adoption of the Bay-Delta Water Quality Control Plan Amendments on substantive and procedural grounds. The lawsuit was necessary because there is a statute of limitations on CEQA cases of 30 days, and we needed to preserve our legal options in the event that we are unsuccessful in reaching a voluntary agreement for the Tuolumne River. Even then, potential settlement of this litigation is a possibility in the future.

In litigation with the State over the proposed Don Pedro FERC Water Quality Certification

The State Water Board staff raised the stakes on these matters by issuing a Water Quality Certification for the Don Pedro FERC relicensing on January 15, 2021 that goes well beyond the Bay-Delta Plan amendments. The potential impact of the conditions included in the Certification appear to virtually double the water supply impact on our Regional Water System of the Bay-Delta Plan amendments. We requested that the State Water Board reconsider the Certification, including conducting hearings on it, but the State Water Board took no action. As a result, we were left with no choice but to once again file suit against the State. Again, the Certification includes a clause that it could be replaced by a Voluntary Agreement, but that is far from a certainty.

I hope this makes it clear that we are actively pursuing all options to resolve this difficult situation. We remain committed to creating benefits for the Tuolumne River while meeting our Water Supply Level of Service Goals and Objectives for our retail and wholesale customers.

cc.: SFPUC Commissioners
Nicole Sandkulla, CEO/General Manager, BAWSCA

Appendix J: 26 March 2021 SFPUC Commission Special Meeting – Water Workshop Number 3 Water Supply Planning Scenarios SFPUC Staff Presentation Material

Hetch Hetchy Regional Water System

Operated by the San Francisco Public Utilities Commission

Water Workshop Number 3
Water Supply Planning Scenarios

March 26, 2021

Introduction

- Ten water supply planning scenarios were run using our HHLSM system modeling tool and the Regional Water System Supply and Demand Worksheet.
- For each scenario the ultimate result is either a surplus or deficit of supply, and each scenario produces different results, demonstrating the effect of the choices that are made.
- The assumptions and results for each scenario will be displayed in this presentation.
- The presentation concludes with a summary table of the bottom-line results for all the scenarios.

The Ten Scenarios

I. Previous Demand Estimates
II. Current Conditions
III. Tuolumne River Voluntary Agreement
IV. Bay-Delta Plan
V. Bay-Delta Plan with Alternative Water Supply Projects
VI. Bay-Delta Plan with Alternative Water Supply Projects and Modified Rationing Policy
VII. Bay-Delta Plan with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought
VIII. Water Quality Certification (401) with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought
IX. NGO scenario 1: Current system, 198 mgd constant demand, Bay-Delta Plan flows
X. NGO Scenario 2: Current system, 223 mgd constant demand, 7 ½ year design drought, Bay-Delta Plan flows

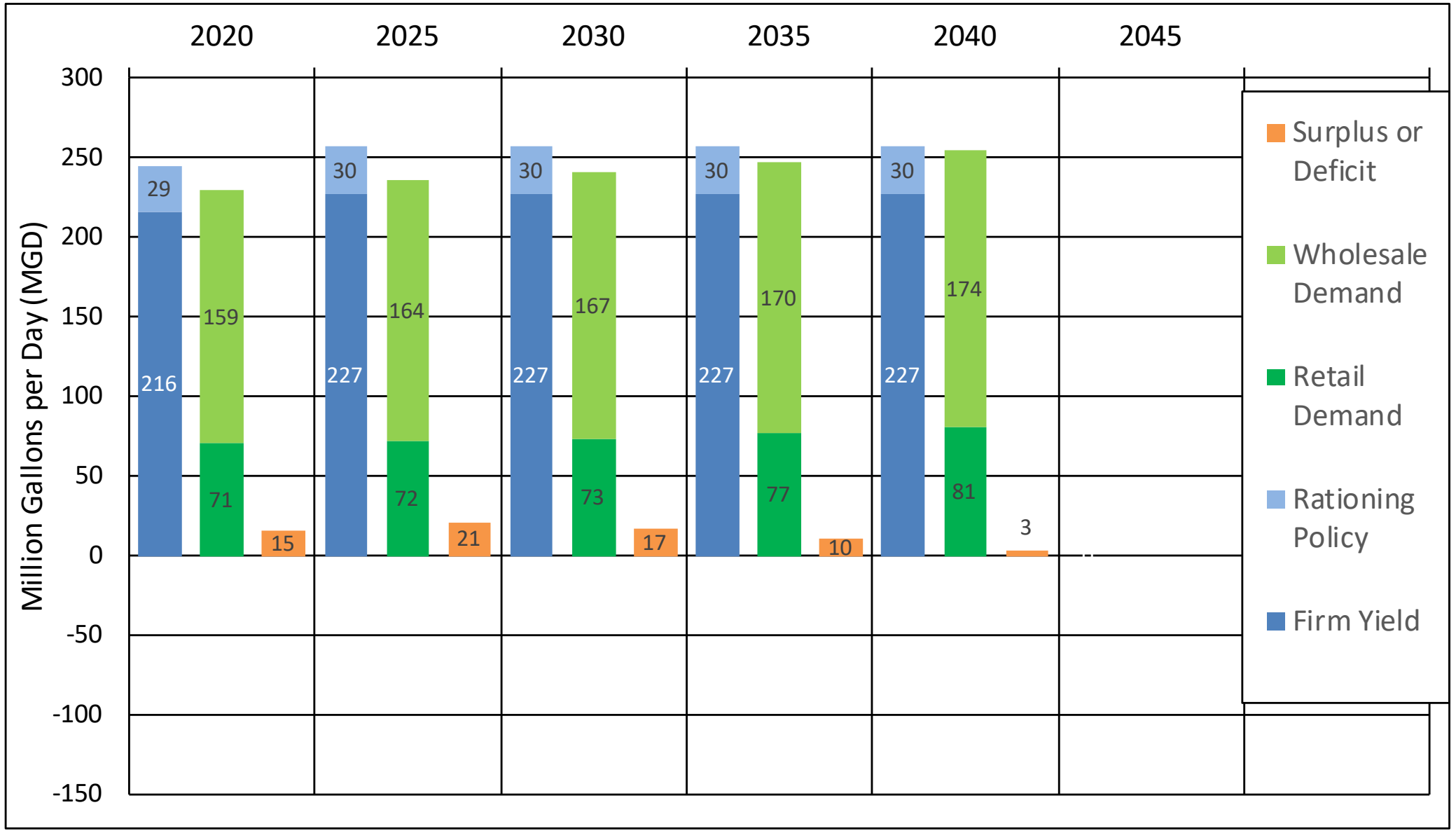
I. Prior Demand Estimates

- Includes retail demand projections from the 2015 Urban Water Management Plan
- Includes 2015 purchase projections from wholesale customers
- Includes current side agreement on flows in the lower Tuolumne River
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	2020	2025	2030	2035	2040	2045
Total Yield:	245	257	257	257	257	NA
RWS Demand:	230	236	241	247	255	NA
Lower Tuolumne Contribution:	NA	NA	NA	NA	NA	NA
Surplus or Deficit:	15	21	17	10	3	NA

I. Prior Demand Estimates



II. Current Conditions

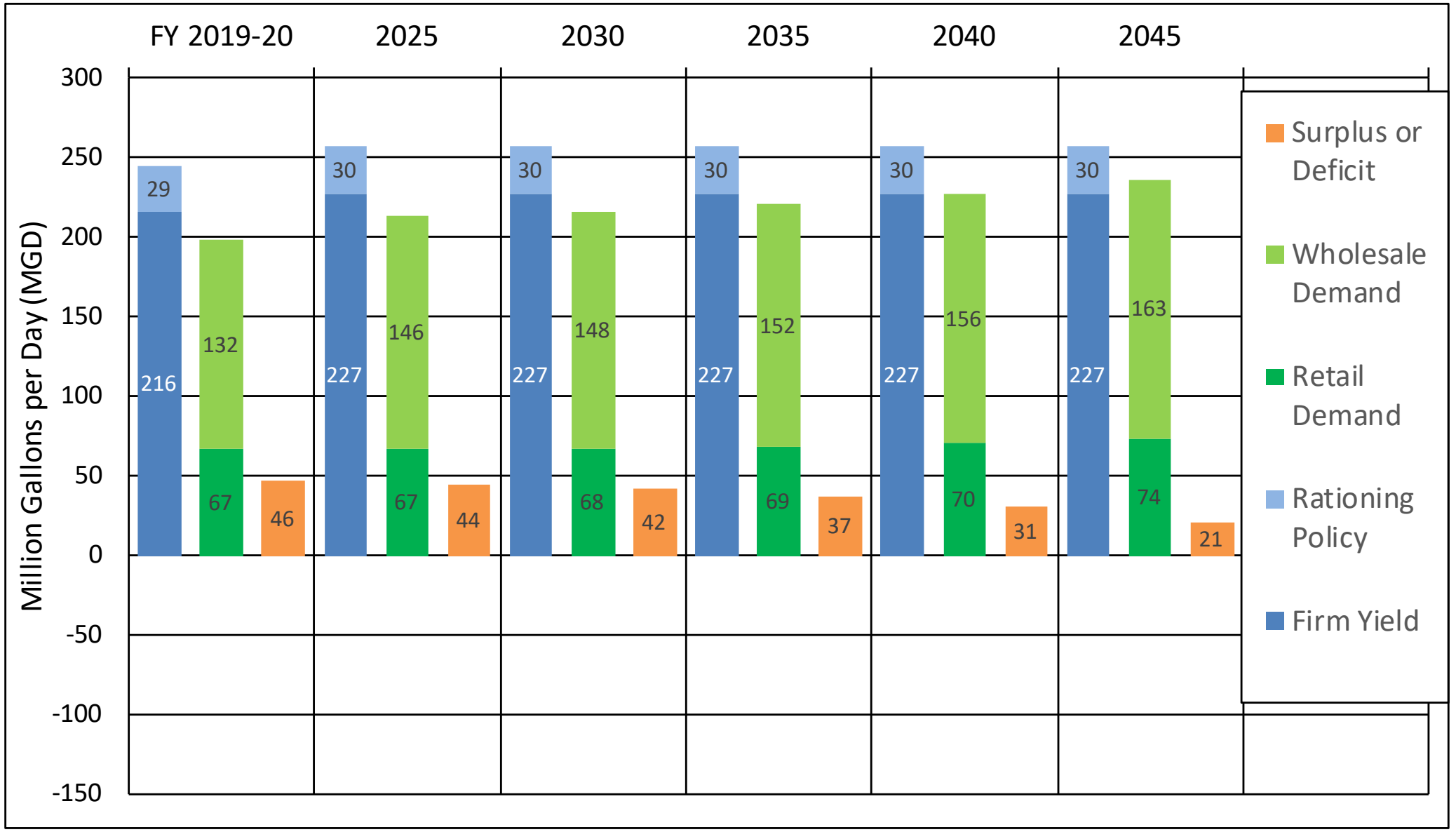
- Includes updated demand projections for anticipated development in retail service area*
- Includes most recent purchase projections from wholesale customers*
- Includes a total of 9 MGD for San Jose and Santa Clara*
- Includes the 1995 side agreement on flows in the lower Tuolumne River
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	245	257	257	257	257	257
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	NA	NA	NA	NA	NA
Surplus or Deficit:	46	44	42	37	31	21

* Base Conditions in later slides

II. Current Conditions



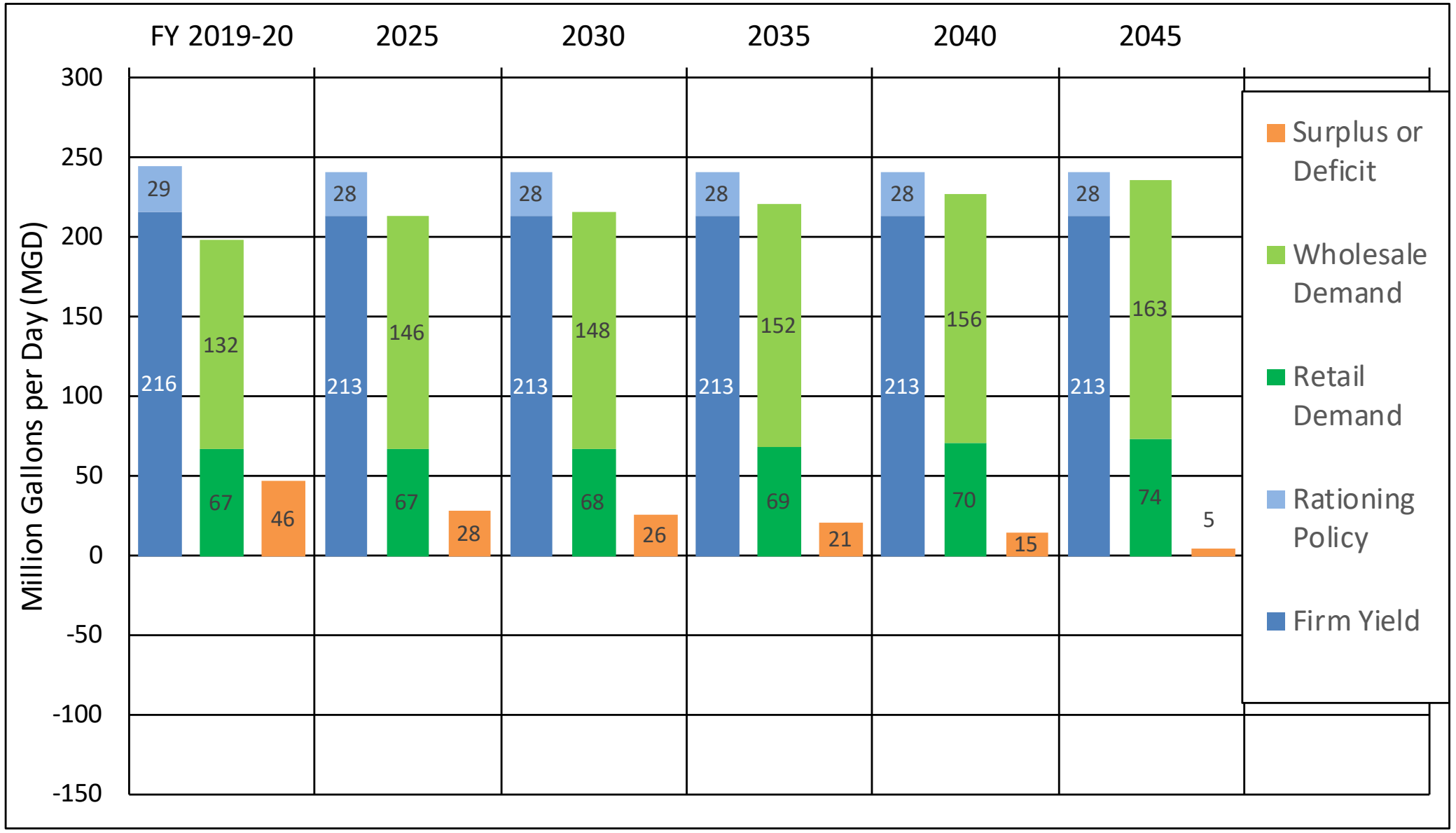
III. Tuolumne River Voluntary Agreement

- Base Conditions
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy
- Includes SFPUC contribution to the TRVA, displayed in the graph as a reduction in Firm Yield
- SFPUC contributions are calculated according to the 4th Agreement and assumes continuation of the 1995 side agreement.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	245	241	241	241	241	241
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	14	14	14	14	14
Surplus or Deficit:	46	28	26	21	15	5

III. Tuolumne River Voluntary Agreement



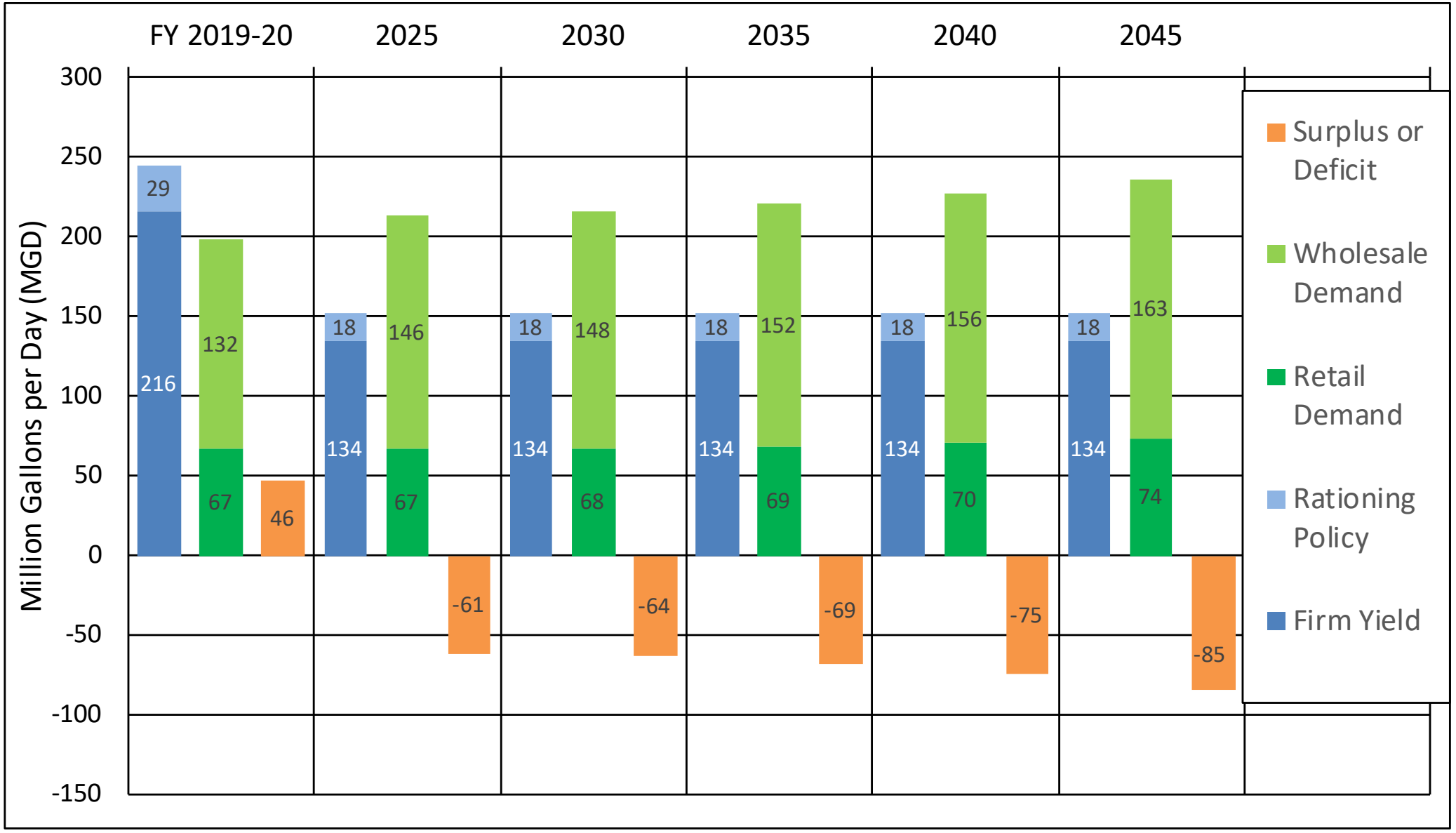
IV. Bay-Delta Plan

- Base Conditions
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy
- Includes SFPUC contribution to the Bay-Delta Plan displayed in the graph as a reduction in Firm Yield, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	245	152	152	152	152	152
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	93	93	93	93	93
Surplus or Deficit:	46	-61	-64	-69	-75	-85

IV. Bay-Delta Plan



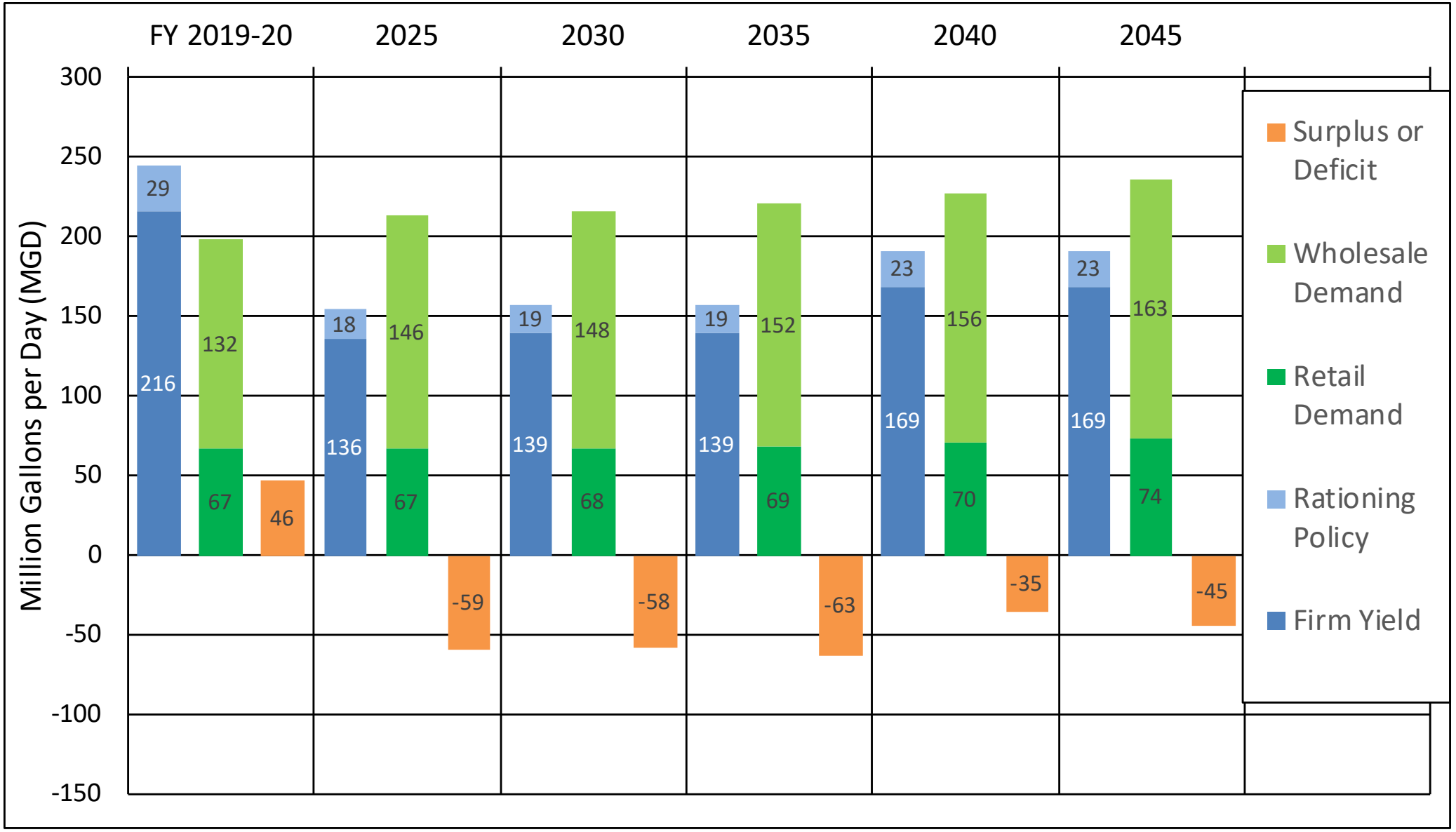
V. Bay-Delta Plan with Alternative Water Supply Projects

- Base Conditions
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy
- Includes SFPUC contribution to the Bay-Delta Plan displayed in the graph as a reduction in Firm Yield, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and continuation of the 1995 side agreement.
- Includes a total of 35 MGD of new water supply projects, which are assumed to be added between 2025 and 2040. The firm yield from the new projects is shown separately in the table to demonstrate the estimated development of the projects over time. The new project yield is also included in the Total Yield shown in the table.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	245	154	158	158	192	192
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	93	93	93	93	93
Alternative Water Supply Projects:	NA	2	5	5	35	35
Surplus or Deficit:	46	-59	-58	-63	-35	-45

V. Bay-Delta Plan with Alternative Water Supply Projects



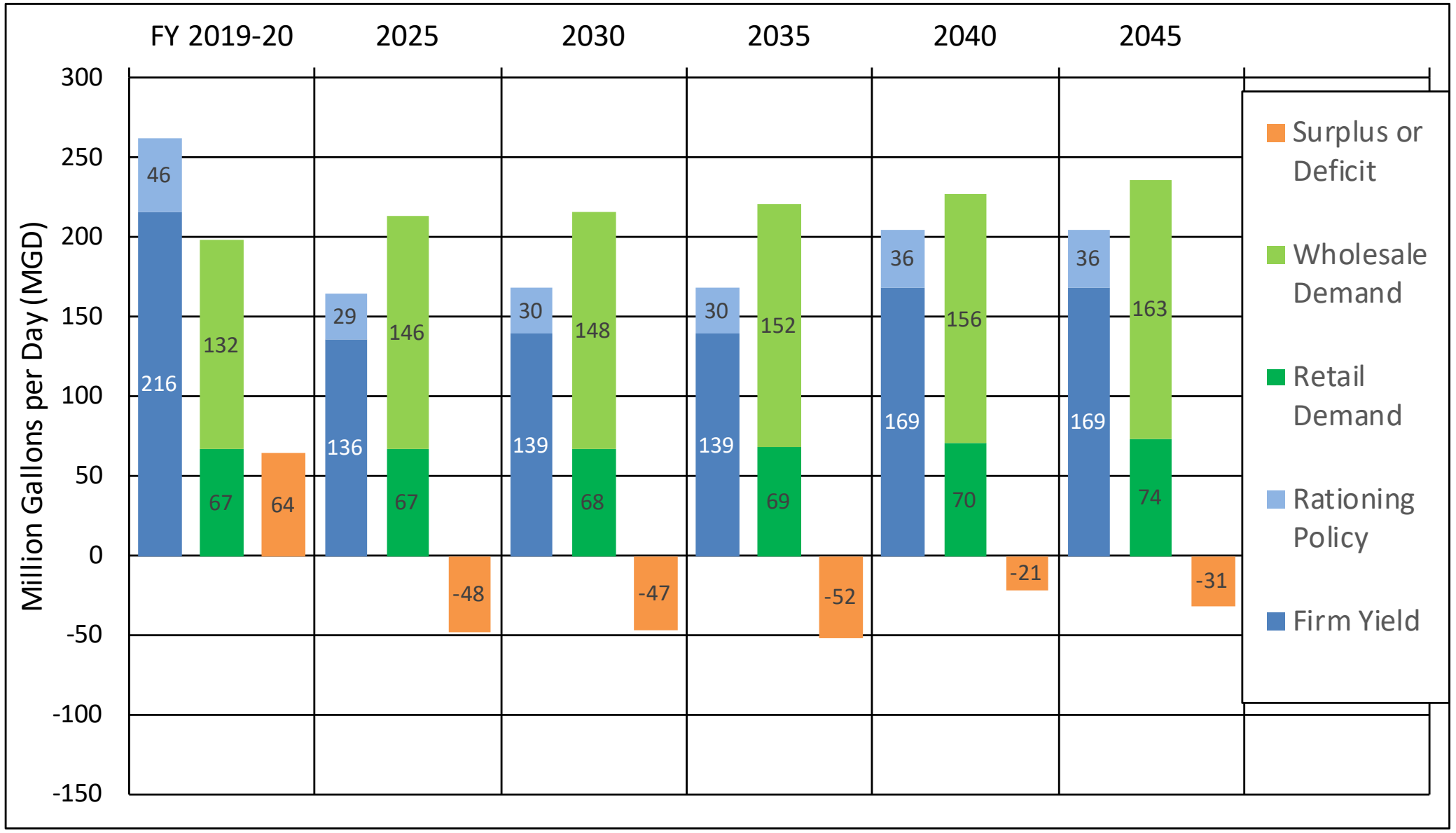
VI. Bay-Delta Plan with Alternative Water Supply Projects and Modified Rationing Policy

- Base Conditions
- Yield values are based on the 8.5-year design drought
- Includes SFPUC contribution to the Bay-Delta Plan displayed in the graph as a reduction in Firm Yield, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.
- Includes a total of 35 MGD of new water supply projects, as described on slide 12 for scenario V
- Includes 7.5 years of rationing at 20% in the 8.5-year design drought sequence

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	262	165	169	169	205	205
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	93	93	93	93	93
Surplus or Deficit:	64	-48	-47	-52	-21	-31

VI. Bay-Delta Plan with Alternative Water Supply Projects and Modified Rationing Policy



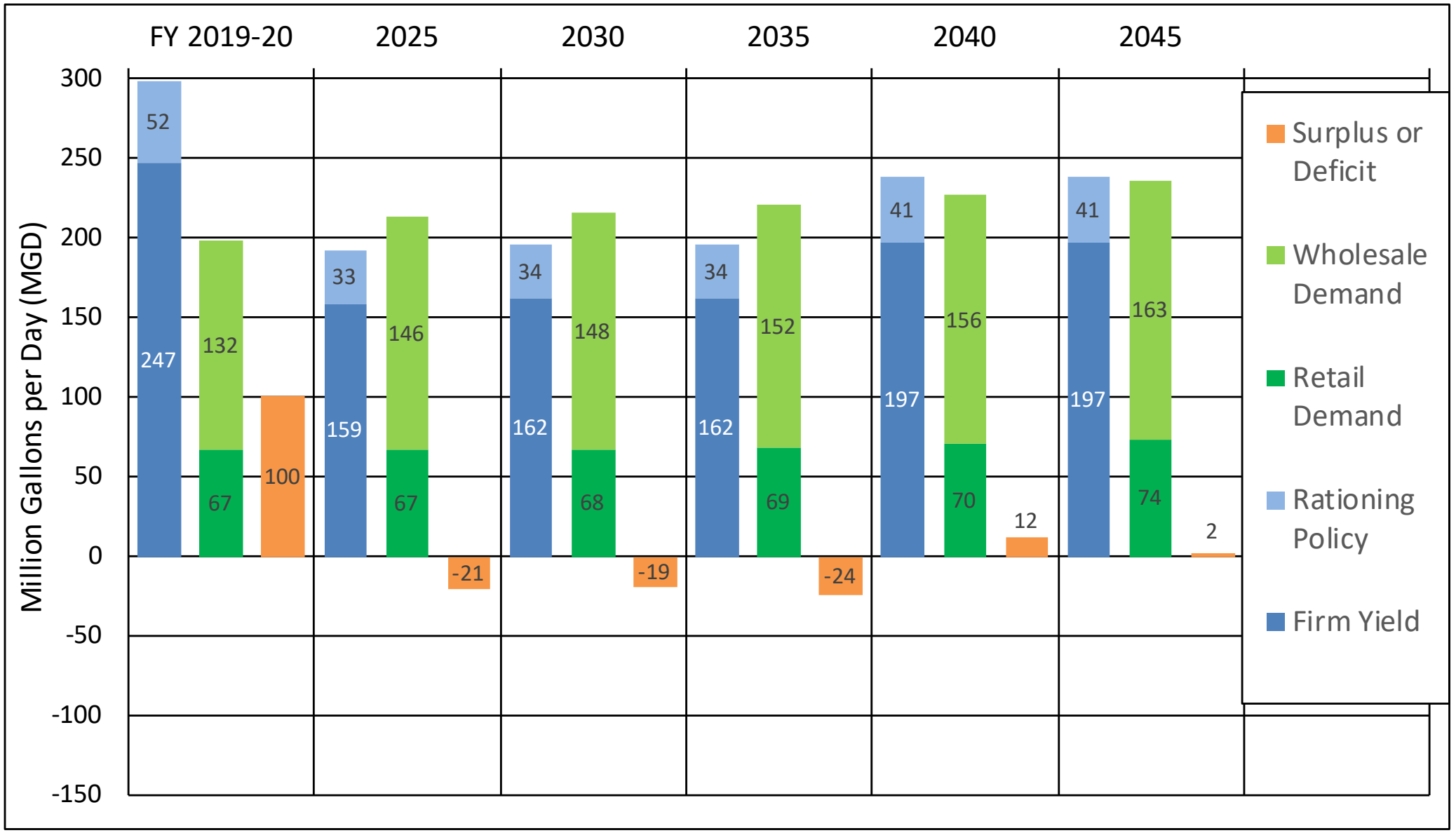
VII. Bay-Delta Plan with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought

- Base Conditions
- Includes SFPUC contribution to the Bay-Delta Plan displayed in the graph as a reduction in Firm Yield, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.
- Includes a total of 35 MGD of new water supply projects, as described on slide 12 for scenario V
- Yield values are estimated using a 7.5-year design drought
- Includes 6.5 years of rationing at 20% in the 7.5-year design drought sequence.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	299	192	196	196	238	238
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	101	101	101	101	101
Surplus or Deficit:	100	-21	-19	-24	12	2

VII. Bay-Delta Plan with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought



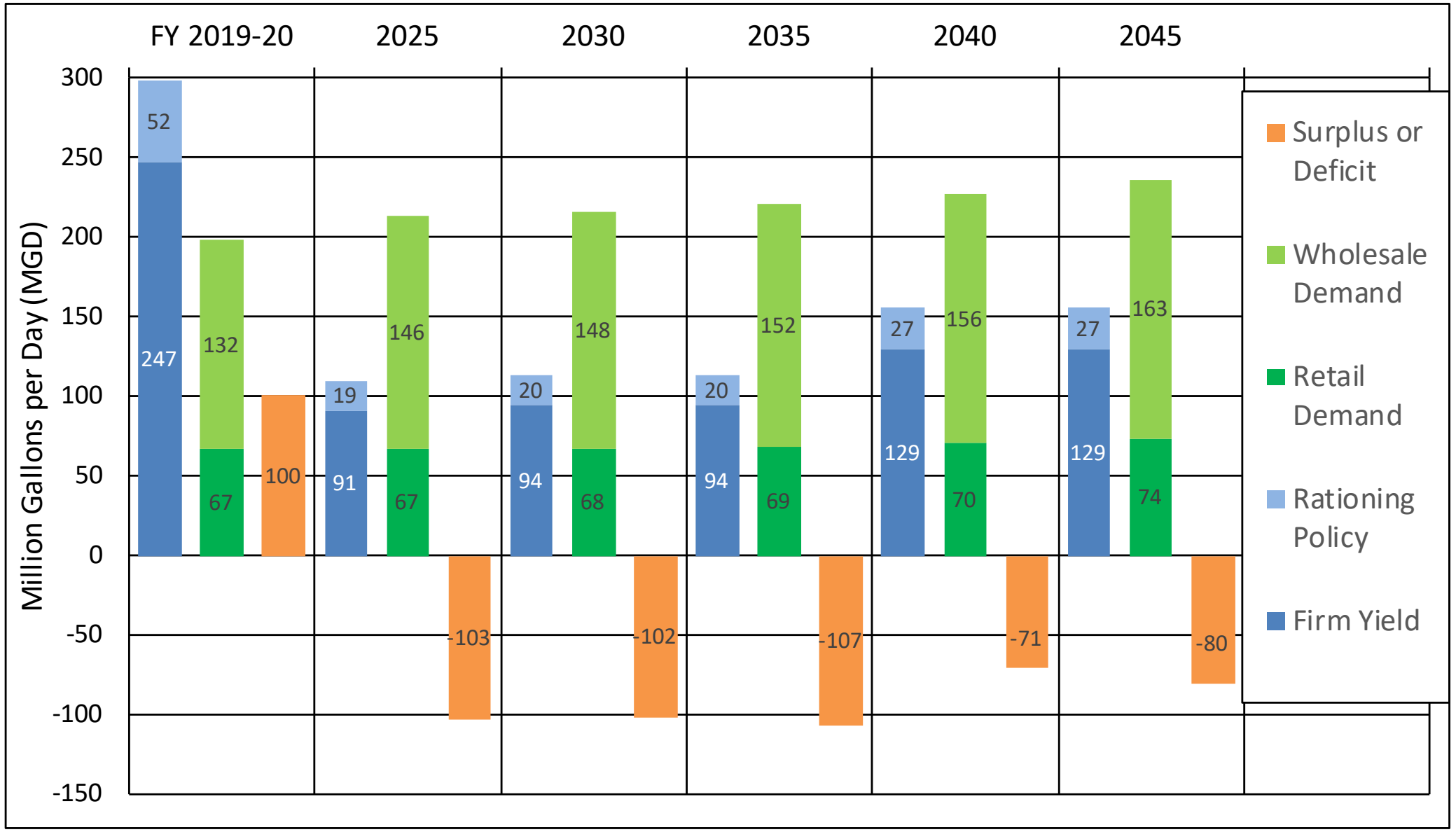
VIII. Water Quality Certification (401) with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought

- Base Conditions
- Includes SFPUC contribution to the Section 401 water quality certification on the FERC license displayed in the graph as a reduction in Firm Yield.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.
- Includes a total of 35 MGD of new water supply projects, as described on slide 12 for scenario V
- Yield values are estimated using a 7.5-year design drought
- Includes 6.5 years of rationing at 20% in the 7.5-year design drought sequence.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	299	110	114	114	156	156
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	169	169	169	169	169
Surplus or Deficit:	100	-103	-102	-107	-71	-80

VIII. Water Quality Certification (401) with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought



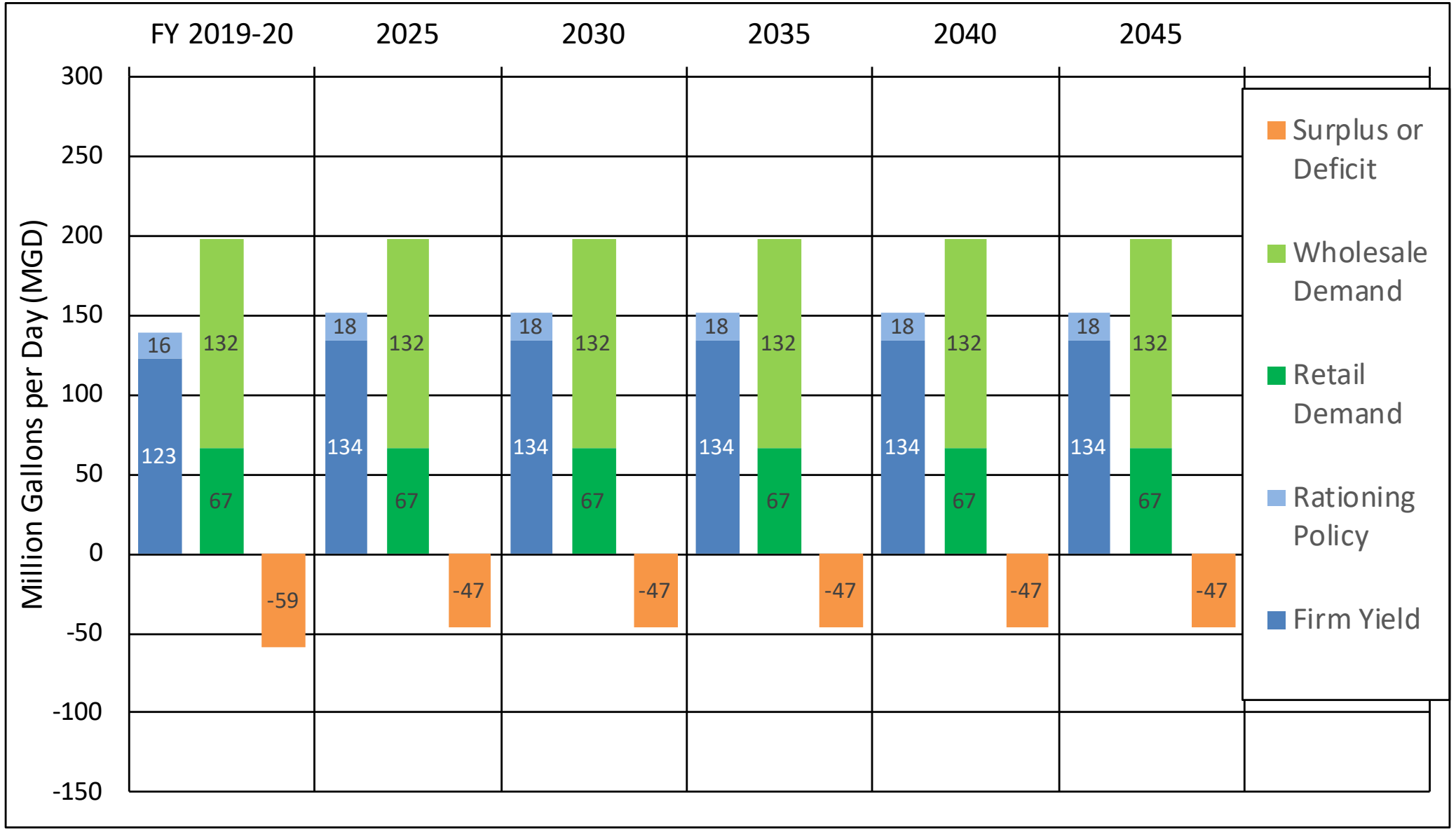
IX. NGO scenario 1: Current system, 198 mgd constant demand, Bay-Delta Plan flows

- Assumes that retail and wholesale demand on the RWS remain at the current level of approximately 198 MGD, and that SFPUC contributions to the Bay-Delta Plan are being made now
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy
- Includes SFPUC contribution to the Bay-Delta Plan, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	139	152	152	152	152	152
RWS Demand:	198	198	198	198	198	198
Lower Tuolumne Contribution:	93	93	93	93	93	93
Surplus or Deficit:	-59	-47	-47	-47	-47	-47

IX. NGO scenario 1: Current system, 198 mgd constant demand, Bay-Delta Plan flows



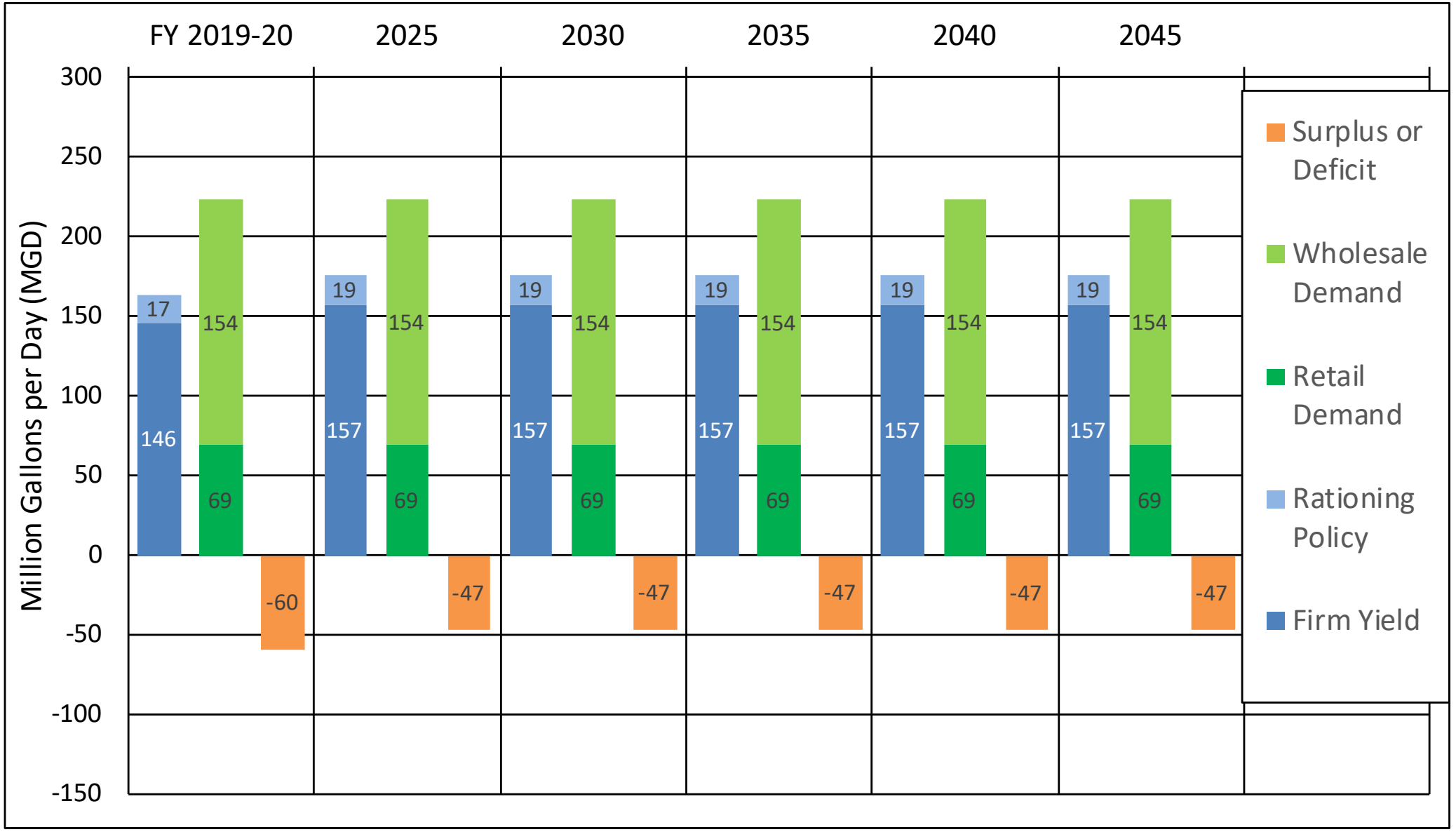
X. NGO scenario 2: Current system, 223 mgd constant demand, 7½ year design drought, Bay-Delta Plan flows

- Includes an assumed demand of 223 MGD for the SFPUC service area in all years
- Includes a total of 9 MGD for San Jose and Santa Clara
- Includes SFPUC contribution to the Bay-Delta Plan, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year. Assumes this contribution begins now.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.
- Yield values are estimated using a 7.5-year design drought and a truncated version of the adopted WSIP rationing policy

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	163	176	176	176	176	176
RWS Demand:	223	223	223	223	223	223
Lower Tuolumne Contribution:	101	101	101	101	101	101
Surplus or Deficit:	-59	-47	-47	-47	-47	-47

X. NGO scenario 2: Current system, 223 mgd constant demand, 7½ year design drought, Bay-Delta Plan flows



SCENARIO SURPLUSES OR DEFICITS						
SCENARIOS	**FY19-20**	**2025**	**2030**	**2035**	**2040**	**2045**
I. Previous Demand Estimates	15	21	17	10	3	NA
II. Current Conditions	46	44	42	37	31	21
III. Tuolumne River Voluntary Agreement	46	28	26	21	15	5
IV. Bay-Delta Plan	46	-61	-64	-69	-75	-85
V. Bay-Delta Plan with Alternative Water Supply Projects	46	-59	-58	-63	-35	-45
VI. Bay-Delta Plan with Alternative Water Supply Projects and Modified Rationing Policy	64	-48	-47	-52	-21	-31
VII. Bay-Delta Plan with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design	100	-21	-19	-24	12	2
VIII. Water Quality Certification (401) with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought	100	-103	-102	-107	-71	-80
IX. NGO scenario 1: Current system and 198 mgd constant demand and Bay-Delta Plan flows	-59	-47	-47	-47	-47	-47
X. NGO Scenario 2: Current system, 223 mgd constant demand, 7 ½ year design drought and Bay-Delta Plan	-60	-47	-47	-47	-47	-47

Appendix K: Bay-Delta Plan Correspondence

- Tier 2 Shortage Allocation Methodology, dated June 7, 2021
- Comments on the 2018 Final Draft of the Proposed Amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary and Final Substitute Environmental Document, dated July 27, 2018
- Comments on the Substitute Environmental Document Concerning the Sacramento-San Joaquin Bay Delta Water Quality Control Plan, dated March 17, 2017

CALIFORNIA WATER SERVICE
Water Resource Sustainability Department 1720 North First Street
San Jose, CA 95112

June 7, 2021

Nicole Sandkulla, Chief Executive Officer
Bay Area Water Supply Conservation Agency
155 Bovet Road, Suite 650
San Mateo, CA 94402

Re: Tier 2 Shortage Allocation Methodology

Dear Ms. Sandkulla:

As you know, the State Water Resources Control Board's (SWRCB) 2018 adoption of amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) could significantly affect the future reliability of the SFPUC's water supplies to its wholesale customers. This action, together with the subsequent failure to achieve a Voluntary Agreement between the SWRCB and the impacted parties, has certainly complicated the process of preparing our 2020 updates to the urban water management plans (UWMP) for our three districts receiving supplies from the SFPUC's Regional Water System.

Cal Water appreciates the assistance that the Bay Area Water Supply and Conservation Agency (BAWSCA) has provided to its member agencies by coordinating with the SFPUC on the development and communication of the projected impacts of these potential cutbacks. Given the lack of time to develop an alternative shortage allocation method for distributing limited SFPUC supplies among the wholesale customers, Cal Water plans to adopt supply projections for its 2020 UWMPs based on the equal allocation cutback methodology discussed during the recent UWMP workshops and provided by BAWSCA. However, this letter serves as a formal notice that Cal Water does not agree to the methodology and our actions should not be considered as acceptance of this approach should an actual allocation of limited supplies be necessary in the future.

As you will recall, Cal Water shared an allocation methodology and accompanying tool that we feel could be easily transferable to the BAWSCA service area to create a more equitable allocation of available SFPUC supplies. This methodology is a "needs based" approach that considers factors such as basic health and safety needs, a wholesale customers reliance on SFPUC supplies, and overall efficiency to avoid drastic differences in retail level reliability. This seeks to minimize economic impacts on individual communities and the region.

We believe BAWSCA understands the problematic inequities that would occur if the equal allocation cutback methodology were employed, and we look forward to the discussion of alternative shortage allocation approaches among the Member Agencies to ensure that cutbacks are allocated equitably in the event of a severe drought.

Sincerely,

Michael Hurley
Water Resources Manager

CALIFORNIA WATER SERVICE

July 27, 2018

The Honorable Felicia Marcus, Chair
The Honorable Tam Doduc, Hearing Officer
Ms. Jeanine Townsend, Clerk of the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814

Re: Comments on the 2018 Final Draft of the Proposed Amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary and Final Substitute Environmental Document

Dear Chair Marcus & Board Member Doduc:

California Water Service (Cal Water) is the largest water utility regulated by the California Public Utilities Commission and a proud steward of the environment that strongly supports sustainability efforts to ensure a safe and adequate supply of drinking water. Since 1926, we have provided millions of Californians with safe, reliable, and high-quality water utility service. Today, we serve about two million residents in service areas across the state that covers a vast array of California's footprint from Chico in the north to the Palos Verdes Peninsula in the south.

Our comments today are in addition to the comments Cal Water submitted on March 17, 2017. Cal Water sincerely appreciates the time and effort the State Water Resources Control Board (Board) has put into not only preparing the Supplemental Environmental Document in Support of Potential Changes to the Water Quality Control Plan for the Bay-Delta (SED), but also undertaking an extensive public outreach effort related to the SED. Further, Cal Water understands the need to protect the water quality of the Sacramento-San Joaquin Bay Delta, and we recognize the importance of reliable, high-quality water to our state's health and continued economic growth.

Cal Water is proud to be at the forefront of a number of the state's efforts to ensure that all Californians continue to have safe and dependable potable water supplies. For example, during California's historic drought, Cal Water built upon its industry-leading water conservation

program, and developed a customer first drought response effort that provided customers with the information and tools they needed to meet the aggressive water use targets established by the Governor and State Water Resources Control Board.

Additionally, Cal Water is one of the only water utilities in California that has supported the establishment of a Safe and Affordable Drinking Water Fund, as championed by Senator Bill Monning in his Senate Bill 623. In our view, efforts like these will do much to protect the health and safety of millions of Californians and to help those who have been under-served or without access to safe drinking water.

We take our responsibility for providing reliable, affordable water supply to our customers and communities very seriously. In light of this responsibility, we must communicate our concerns with the SED. Across our service areas, we rely on a combination of surface water and groundwater. As both a purchaser of wholesale water from various suppliers and a water rights holder, Cal Water has interests in "areas of origin," exports from the Delta, and locally derived supplies. For example, Cal Water relies on locally derived supplies to provide water to approximately 257,000 people in our Bayshore and Bear Gulch service areas, which are in the San Francisco Bay Area. Because of certain restrictions under federal law, a reduction in water supply to the Hetch Hetchy Regional Water System could significantly impact our ability to serve these customers.

As is the case with many water utilities, Cal Water is reliant in many of our service areas on the supplies made available by local wholesale agencies. For example, we utilize significant imported water from our wholesale partners to serve approximately 171,000 people who live in and around the City of Stockton. In those areas where we are unable to rely on groundwater to supplement the water we receive from local wholesalers, any water supply shortages will directly impact us and our ability to serve our customers. This is also true in service areas where the future use of local groundwater supplies may be limited by rules and regulations established pursuant to the Sustainable Groundwater Management Act. Further, as a retail agency within the service area of the Metropolitan Water District of Southern California, we are well aware of the needs for maintaining drinking water quality and reliability that sources from the Bay-Delta system.

We respectfully ask that the Board give due consideration to the very limited flexibility of urban water suppliers to meet their responsibilities in providing safe and reliable service at a reasonable cost. The Board appears to attribute more flexibility and opportunity for enhancing water supplies from other sources and arrangements than are realistically achievable.

We would like to commend the Board's flexibility through its allowance for a range of potential flows rather than rigid, real-time adherence to a specific percent of unimpaired flow. We urge the Board to consider proposals that focus on functional flows combined with habitat

improvements that meet clearly defined objectives regarding timing, temperature and other specified criteria to improve fish production and the overall environment.

Finally, Cal Water believes that a negotiated solution is in the best interests of all parties. Water agencies have proven on many occasions that they are capable of reaching agreement with regulators and other interested parties concerning far-reaching regulatory programs, including the Bay-Delta. We urge the Water Board to continue to provide the water users the opportunity to work with the regulatory agencies to develop long lasting plans to improve the sustainability of our water system ecosystem and address the needs of all interests.

Cal Water stands committed and ready to work with the Board, parties to the negotiations, and others to reach such a solution that meets the long-term needs of our state. If there is anything we can do to assist you or if you have any questions, please do not hesitate to call on us for support.

Sincerely,

Robert Kuta

Vice President, Engineering

Cc: Marty Kropelnicki, President and Chief Executive Officer, Cal Water

Tim Treloar, VP Water Quality & Chief Utility Operations Officer, Cal Water

Michael Hurley, Water Resource Manager, Cal Water

Nicole Sandkulla, Chief Executive Officer/General Manager, BAWSCA

Scott Moody, District Manager, Stockton East Water District

CALIFORNIA WATER SERVICE
1720 North First Street
San Jose, CA 95112-4598 *Tel:* (408) 367-8200

March 17, 2017

The Honorable Felicia Marcus, Chair
The Honorable Tam Doduc, Hearing Officer
Ms. Jeanine Townsend, Clerk of the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814

Re: Comments on the Substitute Environmental Document Concerning the Sacramento-San Joaquin Bay Delta Water Quality Control Plan

Dear Chair Marcus & Board Member Doduc:

As you know, California Water Service (Cal Water) is the largest water utility regulated by the California Public Utilities Commission (Commission). We serve approximately 2 million Californians through 500,000 individual service connections. Our service areas span the state, from Chico in the north to the Palos Verdes Peninsula in the south.

Cal Water sincerely appreciates the time and effort the State Water Resources Control Board (Board) has put into not only preparing the Substitute Environmental Document in Support of Potential Changes to the Water Quality Control Plan for the Bay-Delta (SED), but also undertaking an extensive public outreach effort related to the SED. Further, Cal Water understands the need to protect the water quality of the Sacramento-San Joaquin Bay Delta, and we recognize the importance of reliable, high-quality water to the state's health and economy.

Across our service areas, we rely on a combination of surface water and groundwater to provide safe, reliable, and high-quality service to our customers. As both a purchaser of wholesale water from various suppliers and a water rights holder, Cal Water has interests in areas of origin, exports from the Delta, and locally derived supplies. For example, Cal Water relies on locally derived supplies to provide water to about 250,000 residents of the San Francisco Bay area, and because of certain restrictions under federal law, a reduction in water supply to the Hetch Hetchy water system could significantly impact our ability to serve our customers.

As is the case with many water utilities, Cal Water is reliant, in many of its service areas, on the supplies made available by local wholesale agencies. For example, we utilize significant amounts of what from our wholesale partners to serve approximately 170,500 people who live

in or around the City of Stockton. In those areas where we are unable to rely on groundwater to supplement the water we receive from local wholesalers, any water supply shortages will directly impact our customers. This is also true in those service areas where the future use of local groundwater supplies may be limited by rules and regulations established pursuant to the Sustainable Groundwater Management Act.

You are aware of the concerns addressed by many wholesalers that the proposed changes to the Bay-Delta Water Quality Control Plan would have devastating effects on their ability to meet customer demands and that the SED has some scientific infirmities. Our wholesale partners share these concerns. Given our reliance on wholesale supplies, we urge you to continue to work toward a solution that will not ultimately harm the customers we are committed to serving.

We truly appreciate the Board making the decision to provide a two-month extension to the 120-day public comment period on the SED. With negotiations regarding a potential solution ongoing and in light of the seriousness of the potential negative consequences of the proposal laid out in the SED, Cal Water respectfully requests that the Board consider further extending the comment period. It is our hope that this additional time will increase the likelihood of negotiating parties reaching a sustainable and equitable solution.

Cal Water stands ready to work with the Board, parties to the negotiations, and others to reach such a solution. If there is anything we can do to assist you or if you have any questions, please do not hesitate to get in touch with us.

Sincerely,

Robert Kuta
Vice President, Engineering

Cc: Mr. Scott Moody, General Manager, Stockton East Water District
Mr. Harlan Kelly, General Manager, San Francisco Public Utilities District
Ms. Nicole Sandkulla, CEO, Bay Area Water Supply & Conservation Agency
Mr. Rami Kahlon, Director, Water Division, California Public Utilities Commission

Appendix L: Water Shortage Contingency Plan

Water Shortage Contingency Plan 2020 Update

Bear Gulch District

June 2021

Chapter 1
Introduction

☑ ***CWC § 10640***

(a) Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

(b) Every urban water supplier required to prepare a water shortage contingency plan shall prepare a water shortage contingency plan pursuant to Section 10632. The supplier shall likewise periodically review the water shortage contingency plan as required by paragraph (10) of subdivision (a) of Section 10632 and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

☑ ***CWC § 10632.3***

It is the intent of the Legislature that, upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the board defer to implementation of locally adopted water shortage contingency plans to the extent practicable.

This document describes the water shortage contingency plan (WSCP) for the Bear Gulch District (also referred to herein as the "District"). The WSCP includes the stages of response to a water shortage caused by drought or by supply interruptions caused by infrastructure failure, regulatory mandate, or catastrophic human-caused or natural events. The primary objective of the WSCP is to ensure that the District has in place the necessary resources and management responses needed to protect health and human safety, minimize economic disruption, and preserve environmental and community assets during water supply shortages and interruptions.

Specifically, this Plan includes the following chapters:

Chapter 1 - Introduction

Chapter 2 - Water Supply Reliability Analysis

Chapter 3 - Annual Water Supply and Demand Assessment Procedures

Chapter 4 - Water Shortage Levels

Chapter 5 - Shortage Response Actions

Chapter 6 - Communication Protocols

Chapter 7 - Compliance and Enforcement

Chapter 8 - Legal Authorities

Chapter 9 - Financial Consequences of WSCP

Chapter 10 - Monitoring and Reporting

Chapter 11 - WSCP Refinement Procedures

Chapter 12 - Plan Adoption, Submittal, and Availability

Chapter 2
Water Supply Reliability Analysis

☑ ***CWC § 10632 (a) (1)*** *The analysis of water supply reliability conducted pursuant to Section 10635.*

As described in Chapter 6 of the District Urban Water Management Plan (UWMP), the District relies on purchases from the San Francisco Public Utilities Commission (SFPUC) and surface water from Bear Gulch Reservoir.

Chapter 7 of the District UWMP indicates the potential of future water supply shortages in single-dry and multiple-dry years. This WSCP addresses potential water shortage conditions resulting from such future droughts as well as other causes (e.g., impacted distribution system infrastructure, regulatory-imposed shortage restrictions, catastrophic events, etc.).

Chapter 3
Annual Water Supply and Demand Assessment Procedures

☑ ***CWC § 10632 (a) (2)***

The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:

(A) The written decision-making process that an urban water supplier will use each year to determine its water supply reliability.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

(iii) Existing infrastructure capabilities and plausible constraints.

(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of water supply.

☑ ***CWC § 10632.1***

An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.

☑ ***CWC § 10632.2***

An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan, as identified in subdivision (a) of Section 10632, or reasonable alternative actions, provided that descriptions of the alternative actions are submitted with the annual water shortage assessment report pursuant to Section 10632.1. Nothing in this section prohibits an urban water supplier from taking actions not specified in its water shortage contingency plan, if needed, without having to formally amend its urban water management plan or water shortage contingency plan.

On an annual basis, the District will conduct a Supply-Demand Assessment (SDA) to identify whether there is likely to be a water shortage condition in the coming year. This assessment will be based largely on the water supply assessment provided by the SFPUC. Each element of the annual SDA is described below.

1. Evaluation Criteria

The evaluation criteria that will be used to identify whether the District is likely to experience a water shortage in the coming year include:

a. Purchased Water Availability - Because the District's primary source of potable water supply is from the SFPUC, the evaluation of District supplies for a particular year will be based largely on information provided by the SFPUC or the Bay Area Water Supply and Conservation Agency (BAWSCA). Cal Water will conduct its Annual Assessment as part of a coordinated effort led by BAWSCA. The SFPUC Annual Water Supply and Demand Assessment Procedures are included as Attachment A of this WSCP.

b. Treatment and Distribution System Constraints - An assessment of the probabilities of facility and infrastructure outages and the degree to which they could limit Cal Water's ability to access, convey, or treat adequate supplies, including any planned maintenance or capital improvements over the next year that could affect its ability to provide sufficient supply to meet demands.

c. State Regulatory Conditions - Evaluation of any state-mandated drought or water use restrictions.

These criteria will be assessed by Cal Water staff, including District staff with detailed knowledge of District operations. The data used to support these assessments may include, but is not limited to, supply capacity, supply and pump capacity, firm capacities, tank storage capacity, system demand, and zone demand.

2. Water Supply

As described above, the District obtains its potable supplies from the SFPUC and local surface water. As noted in Chapter 2, the supplies purchased from the SFPUC may be constrained in single-dry year or multiple-dry-year hydrologic conditions. The potential constraints on water supply therefore include these purchased supply limitations and the operational limitations and potential local regulatory conditions identified as evaluation criteria above.

3. Unconstrained Customer Demand

The demand forecast described in Chapter 4 of the District UWMP yields the anticipated unconstrained water demand, i.e. the expected water use in the absence of shortage-caused reductions in water use. During a drought cycle, unconstrained demand typically increases due to higher than normal air temperatures and lower than normal precipitation. The supply reliability analysis and Drought Risk Assessment presented in

Chapter 7 of the District UWMP accounts for this anticipated shift in unconstrained water demand.

The model underlying the demand forecast described in Chapter 4 of the District UWMP has an annual time step. Cal Water has begun developing a short-term demand model with a monthly time step that will be more appropriate for the annual supply-demand assessments.

4. Planned Water Use for Current Year Considering Dry Subsequent Year

Cal Water will evaluate the anticipated supplies for the current year, based in large part on SFPUC's assessment of available supplies. Cal Water will evaluate local surface water supplies assuming that the following year will be dry, as defined above, using the Evaluation Criteria identified above.

5. Infrastructure Considerations

As part of its triennial General Rate Case applications to the California Public Utilities Commission (CPUC), Cal Water prepares a Supply-Demand Analysis (CPUC SD Analysis) for each of its Districts. The CPUC SD Analysis is an inventory of water production and pump assets that provide direct and indirect sources of supply to meet customer demands in accordance with CPUC General Order 103-A and California Code of Regulations (CCR) Title 22 Waterworks Standards. This CPUC SD Analysis is based on a combination of regulatory requirements, professional consultant recommendations, and industry standard practices, including those from the American Water Works Association (AWWA) and American Society of Civil Engineers (ASCE). It identifies specific vulnerabilities in different pressure zones within the system and evaluates the system against performance criteria that meet regulatory requirements and ensure operationally adequate levels of service.

Cal Water plans to extend the District CPUC SD Analysis to perform this analysis on an annual basis. This analysis will guide Cal Water's annual evaluation of operational treatment/distribution constraints that could potentially limit the availability of supplies. This evaluation of supply well operational constraints and treatment and distribution constraints will be completed by March 31 of each year and will assess potential impacts on supply availability. If such constraints are identified, Cal Water will develop a plan to address these constraints, mitigate potential effects, and implement the appropriate water shortage stage of action per Chapter 5, below.

6. Other Factors

As identified under the Evaluation Criteria above, local regulatory conditions could potentially limit the availability of supplies. Therefore, Cal Water will evaluate the development of new regulatory constraints by March 31 of each year and assess their potential impacts on supply availability. If such constraints are identified, Cal Water will develop a plan to address these constraints and mitigate potential effects and implement the appropriate water shortage stage of action per Chapter 5 below.

Consistent with California Water Code (CWC) § 10632.1, Cal Water will perform and submit an SDA to DWR by July 1st of each year beginning in 2022.

Chapter 4
Water Shortage Levels

☑ ***CWC § 10632 (a) (3)***

(A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.

(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross-reference relating its existing categories to the six standard water shortage levels.

Consistent with the requirements of CWC § 10632(a)(3), this WSCP is based on the six water shortage levels (also referred to as "stages") shown in Table 4-1. These shortage stages are intended to address shortage caused by any condition, including the catastrophic interruption of water supplies.

Table 4-1. Water Shortage Contingency Plan Levels (DWR Table 8-1)

Shortage Level	Percent Shortage Range	Shortage Response Actions
1	Up to 10%	Demand reduction (See Table 5-1)
2	Up to 20%	Demand reduction (See Table 5-1)
3	Up to 30%	Demand reduction (See Table 5-1)
4	Up to 40%	Demand reduction (See Table 5-1)
5	Up to 50%	Demand reduction (See Table 5-1)
6	>50%	Demand reduction (See Table 5-1)
NOTES:		

Shortage response actions for each of these stages are identified and discussed in Chapter 5.

Chapter 5
Shortage Response Actions

☑ ***CWC § 10632 (a) (4)***

Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

☑ ***CWC § 10632 (b)***

For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

This chapter describes the response actions Cal Water will take to deal with the shortages associated with each of the six stages enumerated in Chapter 4.

5.1 Demand Reduction

The combinations of demand-reduction actions required to resolve the shortages associated with each of the six drought stages are based on Cal Water's experiences in dealing with past drought-related shortages and also include other actions deemed appropriate to achieve the required demand reductions. In order to evaluate and ensure that the right actions would be implemented with the proper level of intensity, Cal Water employed the Drought Response Tool (DRT), an Excel spreadsheet model developed by EKI Environment and Water, Inc.

The DRT provides a quantitative framework that allows Cal Water to systematically estimate the monthly and cumulative annual demand reductions expected to result from particular combinations of drought response actions and associated implementation rates. Data inputs to the DRT include total production, class-specific water use, population, and assumptions regarding the split between indoor and outdoor water use for each customer class.

For each drought response action, the user specifies:

- The customer class(es) and end use(s) that are affected;

- The percent savings for those end use(s) for each account that implements the action. These are based on evaluations reported in the literature, or where such studies are not available, on best estimates based on Cal Water experience; and
- The percentage of accounts assumed to implement the action, which is presumed to be the result of the intensity level of Cal Water program implementation, including but not limited to marketing and enforcement activities.

Based on the foregoing inputs, the DRT model calculates the resulting monthly savings. Cal Water adjusted the combination of actions and implementation levels to achieve the targeted savings levels at each of the six shortage stages.

In order to evaluate the robustness of the DRT model, Cal Water modeled the actions implemented during the height of the last drought for a subset of its Districts, and found that the modeled water shortage reductions were generally consistent with the responses observed in its Districts. In short, the DRT is a robust, transparent tool to tie a particular set of shortage-response actions to an expected reduction in demand.

For each of the six water shortage stages, the modeling targeted the mid-range of the required demand reduction range, ergo:

- 5% for Stage 1,
- 15% for Stage 2,
- 25% for Stage 3,
- 35% for Stage 4,
- 45% for Stage 5, and
- 55% for Stage 6

The key DRT inputs and outputs for each of the six water shortage stages are reproduced in Attachment B.

Table 5-1 shows the water shortage reduction actions, savings assumptions, and implementation rates that are required for the District to achieve the targeted annual demand reductions for each of the six shortage stages. At each stage, there are two types of demand-reduction actions identified:

- Restrictions on customer water usage; and
- Consumption reduction actions by Cal Water to encourage decreased water usage.

The total demand reductions are governed by a set of user-specified constraints to ensure that usage levels do not endanger health and safety or result in unacceptable economic impacts. The DRT will not permit estimated usage reductions to violate these constraints, regardless of the demand reduction actions selected. For most Cal Water districts, including Bear Gulch, the following default constraints are used:

- A minimum residential indoor per capita daily usage of 25 gallons,
- A maximum residential outdoor usage reduction of 100%,

- A maximum Commercial, industrial, and institutional (CII) indoor usage reduction of 30%, and
- A maximum CII outdoor usage reduction of 100%.

Many actions are implemented across a number of stages, some at increasing implementation levels. Therefore the actions are listed as a row under the first stage at which they are implemented, and the implementation rate is shown under each stage column heading at the right. The unit savings represent a percentage savings of the end uses indicated in the table.

Because of the DRT logic described above, the format of Table 5-1 differs from that of the default DWR table.

Table 5-1. Demand Reduction Actions to Achieve Required Savings (DWR Table 8-2)

Water Shortage Response Action	End Use(s)	End Use Savings	IMPLEMENTATION RATES BY STAGE						Penalty, Charge, or Other Enforcement?
			1	2	3	4	5	6	
Stage 1: Minimal Shortage									
Restrictions									
Landscape - Limit landscape irrigation to specific times	Irrigation	**10%**	50%	N/A	N/A	N/A	N/A	N/A	Yes
Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Leaks	**100%**	10%	20%	25%	50%	50%	75%	Yes
Landscape - Restrict or prohibit runoff from landscape irrigation	Irrigation	**3%**	15%	40%	50%	50%	50%	50%	Yes
Landscape - Prohibit application of potable water to outdoor landscapes within 48 hours of measurable rainfall	Irrigation	**20%**	15%	40%	50%	50%	50%	N/A	Yes
Other - Prohibit use of potable water for washing hard surfaces	Misc. Outdoor	**17%**	15%	40%	50%	50%	50%	50%	Yes
Other - Require shut-off nozzles on hoses for vehicle washing with potable water	Misc. Outdoor	**17%**	50%	50%	50%	50%	50%	50%	
CII - Lodging establishments must offer opt out of linen service	Fixtures & Appliances	**1%**	50%	50%	50%	50%	50%	50%	Yes
CII - Restaurants may only serve water upon request	Fixtures & Appliances	**1%**	50%	50%	50%	50%	50%	50%	Yes

Water Shortage Response Action	End Use(s)	End Use Savings	IMPLEMENTATION RATES BY STAGE						Penalty, Charge, or Other Enforcement?
			1	2	3	4	5	6	
No watering of landscape of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission, the Department of Housing and Community Development, or other state agency	Irrigation	**50%**	0.07%	0.07%	0.07%	0.07%	0.07%	N/A	Yes
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	**50%**	50%	50%	50%	50%	50%	50%	Yes
Consumption Reduction									
Expand Public Information/Media Campaign	All	**0.5%**	50%	50%	50%	50%	50%	75%	No
Water Bill Inserts	All	**1%**	100%	100%	100%	100%	100%	100%	No
Promote online water waste reporting	All	**10%**	0.1%	0.2%	0.2%	0.3%	0.5%	0.5%	No
Expand Rebates or Giveaways of Plumbing Fixtures and Devices	All	**10%**	1%	1%	2%	4%	5%	5%	No
Expand Rebates for Landscape Irrigation Efficiency	All	**10%**	1%	1%	2%	4%	5%	5%	No
Expand CII Water Use Surveys	All CII uses	**5%**	1%	1%	1%	2%	2%	3%	No
Expand Res Water Use Surveys	All Residential Uses	**5%**	1%	1%	1%	2%	2%	3%	No
Stage 2: Moderate Shortage									
Restrictions									

Water Shortage Response Action	End Use(s)	End Use Savings	IMPLEMENTATION RATES BY STAGE						Penalty, Charge, or Other Enforcement?
			1	2	3	4	5	6	
Landscape - Limit landscape irrigation to 1-3 days/week	Irrigation	**15%-79%** [1]		75%	25%	25%	75%	N/A	Yes
Prohibit the use of non-recirculating systems in all new conveyer car wash and commercial laundry systems	Fixtures & Appliances	**50%**		0%	0%	0%	0%	0%	Yes
Prohibit the use of single pass cooling systems in new connections	Cooling	**50%**		0%	0%	0%	20%	20%	Yes
Consumption Reduction									
Water Efficiency Workshops, Public Events	All Residential Uses	**5%**		25%	25%	25%	50%	75%	No
Offer Water Use Surveys	All	**1%**		1%	1%	2%	2%	3%	No
Provide Rebates or Giveaways of Plumbing Fixtures and Devices	All	**10%**		1%	2%	4%	5%	5%	No
Provide Rebates for Landscape Irrigation Efficiency	All	**10%**		1%	2%	4%	5%	5%	No
Stage 3: Severe Shortage									
Restrictions									
Other - Prohibit use of potable water for construction and dust control	Misc. Outdoor	**100%**			100%	1%	1%	1%	Yes
Prohibit use of potable water for street washing	Misc. Outdoor	**100%**			1%	1%	1%	1%	Yes

Water Shortage Response Action	End Use(s)	End Use Savings	IMPLEMENTATION RATES BY STAGE						Penalty, Charge, or Other Enforcement?
			1	2	3	4	5	6	
Landscape - Prohibit irrigation of ornamental turf on public street medians with potable water	Irrigation	**100%**			10%	20%	25%	N/A	Yes
Prohibit Filling Ornamental Lakes or Ponds	Misc. Outdoor	**100%**			1%	1%	1%	1%	Yes
Consumption Reduction									
Home or Mobile Water Use Reports	All	**5%**			10%	25%	25%	50%	No
Decrease Frequency and Length of Line Flushing	Non Revenue Water	**25%**			50%	50%	50%	50%	No
Reduce System Water Loss	Non Revenue Water	**100%**			10%	10%	10%	10%	No
Increase Water Waste Patrols/Enforcement	All	**10%**			1%	3%	5%	5%	No
Implement Drought Rate Structure and Customer Water Budgets (Res)	All Residential Uses	**30%-60%** [2]			40%	30%	30%	30%	Yes
Implement Drought Rate Structure and Customer Water Budgets (CII)	All CII uses	**10%-30%** [3]			40%	30%	30%	50%	Yes
Stage 4: Critical Shortage									
Water Use Restrictions									
Prohibit vehicle washing except with recirculated water or low-volume systems	Misc. Outdoor	**10%**				50%	50%	50%	Yes
Prohibit use of water for recreational purposes such as water parks and the filling of pools	Misc. Outdoor	**100%**				1%	1%	1%	Yes
Consumption Reduction Actions									
Promote / Expand Use of Recycled Water	Irrigation	**100%**				0%	0%	0%	No

Water Shortage Response Action	End Use(s)	End Use Savings	IMPLEMENTATION RATES BY STAGE						Penalty, Charge, or Other Enforcement?
			1	2	3	4	5	6	
Stage 5: Emergency Shortage									
Water Use Restrictions									
Require net zero demand Increase on new water service connections	All	**100%**					0.07%	0.07%	Yes
Prohibit single-pass cooling systems	Cooling	**50%**					20%	20%	Yes
Consumption Reduction Actions									
Require Pool Covers	Misc. Outdoor	**28%**					10%	10%	Yes
Stage 6: Extreme Shortage									
Water Use Restrictions									
Moratorium on new water service connections	All	**100%**						0.07%	Yes
Landscape - Prohibit all landscape irrigation	Irrigation	**100%**						50%	Yes
		Cumulative Annual Savings	**8%**	**16%**	**26%**	**35%**	**43%**	**57%**	

NOTES:
1. Watering restricted to no more than 3 days/wk in Stage 2 and Stage 3; no more than 2 days/wk in Stage 4; no more than 1 day/wk in Stage 5.
2. Residential water budgets of up to 30% for Stage 3, up to 40% for Stage 4; 50% for Stage 5, up to 60% for Stage 6.
3. CII water budgets of up to 10% for Stage 3, up to 20% for Stage 4, up to 30% for Stages 5 and 6.

5.2 Supply Augmentation

As indicated in Table 5-2, Cal Water has not identified any supply augmentation actions to assist in resolving future District water shortages.

Table 5-2. Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*
NOTES:			

5.3 Operational Changes

As identified in Table 5-1, the District will decrease the frequency and length of line flushing under Stage 3 and beyond. The District will also evaluate the potential benefits of altering other maintenance cycles and expediting infrastructure repairs to improve system efficiency, to the extent feasible.

5.4 Mandatory Restrictions

The water shortage response actions included in Table 5-1 include a variety of mandatory customer water use restrictions that will be necessary to achieve the targeted demand reductions for the different shortage stages. The types of restrictions and the manner and degree of enforcement for these restrictions vary by stage, and are discussed in Chapter 7.

5.5 Emergency Response Plan

Cal Water has an Emergency Response Plan (ERP) in place that coordinates the overall response to a disaster.

The ERP addresses the Company's responsibilities in emergencies associated with natural disaster, human-caused emergencies, and technological incidents. It provides a framework for coordination of response and recovery efforts within the Company in cooperation with local, State, and Federal agencies, as well as other public and private organizations. The ERP establishes an emergency organization to direct and control operations during a period of emergency by assigning responsibilities to specific personnel.

The ERP does the following:

- It conforms to the State mandated Standardized Emergency Management System (SEMS) and the National Incident Management System (NIMS), and it effectively structures emergency response at all levels in compliance with the Incident Command System (ICS).
- It establishes response policies and procedures, while providing the Company clear guidance related to emergency planning.
- It describes and details procedural steps necessary to protect lives and property.
- It outlines coordination requirements.
- It provides a basis for unified training and response exercises to ensure compliance.

The Bear Gulch District has installed backup power generators at some of its well sites, booster sites, and pump storage sites that can be operated in the event of a system wide power outage. A complete loss of power has never been experienced, but the generators have been used in the past to overcome localized outages.

The District has emergency interties with the City of Redwood City and the City of Menlo Park.

5.6 Seismic Risk Assessment and Mitigation Plan

☑ ***CWC § 10632.5***

(a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

Cal Water's ERP includes information on various hazards and a related fault map overlying the District. The San Mateo County Multi-Jurisdictional Local Hazard Mitigation Plan, which includes additional discussion of area earthquake risk and mitigation, can be found at https://cmo.smcgov.org/multijurisdictional-local-hazard-mitigation-plan.

5.7 Shortage Response Action Effectiveness

Table 5-1 above shows the effectiveness of the specific demand-reduction actions and implementation levels necessary for the District to achieve the targeted savings for each water shortage stage. The bottom row indicates the total annual cumulative savings expected to be reached at each water shortage stage level. Additional details, including anticipated savings on

a month-by-month basis are provided in the DRT model inputs and outputs included in Attachment B.

Chapter 6
Communication Protocols

☑ ***CWC § 10632 (a) (5)***

Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications.

Cal Water intends to escalate communication to customers and stakeholders, as needed, throughout any water shortage situation to help ensure they are aware of current conditions, any water use restrictions that are in effect, and the many ways Cal Water can help them reduce their water use. Cal Water's outreach efforts include multiple channels, including bill messages, bill inserts, direct mail, email, letters, social media, print, radio, music streaming services, TV, over-the-top media, movie theatre advertising, and group presentations.

These efforts will expand on current Cal Water outreach efforts and will be customized to the needs at the time of the shortage to ensure a proper channel mix so that the maximum audience is reached as efficiently as possible.

Chapter 7
Compliance and Enforcement

☑ ***CWC § 10632 (a) (6)*** *For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.*

7.1 Water Use Restrictions

In accordance with Rule 14.1, Cal Water is currently authorized to take the following actions to enforce the water use restrictions:

First Violation: Cal Water shall provide the customer with a written notice of violation.

Second Violation: If Cal Water verifies that the customer has used potable water for non- essential, wasteful uses after having been notified of the first violation, Cal Water shall provide the customer with a second written notice of violation and is authorized to install a flow-restricting device on the customer's service line.

Cal Water has submitted to the California Public Utilities Commission (CPUC) an update to Rule 14.1 and Schedule 14.1, for approval, to align with the restrictions identified in this WSCP. Rule14.1 and Schedule 14.1 are discussed in more detail in Chapter 8. The current versions of Rule 14.1 and Schedule 14.1 can be found on the Cal Water website.

7.2 Non-Essential, Wasteful Uses

In the event that more stringent measures are needed, implementation of Schedule 14.1 would be requested from the CPUC. If implemented, Cal Water is currently authorized to take the following actions when its personnel verify a customer is using potable water for non-essential, wasteful uses.

First Violation: Cal Water shall provide the customer with a written notice of violation. In addition, Cal Water is authorized to take the following actions:

A. If the customer currently receives service through a metered connection, install a real- time water measurement device on the customer's service line and provide the customer with access to information from the device. The cost of the device, including installation and ongoing operating costs, may be billed to the customer, and nonpayment may result in discontinuance of service.

B. If the customer does not currently receive service through a metered connection, install a water meter on the customer's service line, charge the

customer for water use pursuant to Cal Water's metered service tariffs and rules, and install a real-time water measurement device on the customer's service line and provide the customer with access to information from the device. The cost of the device, including installation and ongoing operating costs, may be billed to the customer, and nonpayment may result in discontinuance of service.

Second Violation: If Cal Water verifies that the customer has used potable water for non- essential, wasteful uses after having been notified of the first violation, Cal Water shall provide the customer with a second written notice of violation. In addition to the actions prescribed under the first violation above, Cal Water is authorized to take the following actions:

A. Apply the following waste of water penalties, which are in addition to any other charges authorized by this Schedule or other Cal Water tariffs.
   i. If Stage 1 is in effect, $25
   ii. If Stage 2 is in effect, $50
   iii. If Stage 3 is in effect, $100
   iv. If Stage 4 is in effect, $200
B. At its sole discretion, waive the waste of water penalty if the customer participates in a water use evaluation provided by Cal Water and/or provides documentation to Cal Water proving that a drip irrigation system, micro spray irrigation system, high-efficiency sprinkler system, or properly programmed smart irrigation controller has been installed, after a notice of violation was delivered, and is in use at the customer's service address.

Third Violation: If Cal Water verifies that the customer has used potable water for non-essential, wasteful uses after having been notified of the second violation, Cal Water shall provide the first and second violations above, Cal Water is authorized to take the following actions:

A. A. Apply the following waste of water penalties, which are in addition to any other charges authorized by this Schedule or other Cal Water tariffs.
   i. If Stage 1 is in effect, $50
   ii. If Stage 2 is in effect, $100
   iii. If Stage 3 is in effect, $200
   iv. If Stage 4 is in effect, $400

B. At its sole discretion, waive the waste of water surcharge if the customer participates in a water use evaluation provided by Cal Water and/or provides documentation to Cal Water proving that a drip irrigation system, micro spray irrigation system, high- efficiency sprinkler system, or properly programmed smart irrigation controller has been installed, after notice of violations have been delivered, and is in use at the customer's service address.

Fourth Violation: If Cal Water verifies that the customer has used potable water for non- essential, wasteful uses after having been notified of the third violation, Cal Water shall provide the customer with a fourth written notice of violation. In addition to actions set forth in previous violations prescribed above, Cal Water is authorized to install a flow- restricting device on the customer's service line.

Egregious Violations: Notwithstanding the foregoing framework for penalties, customers who Cal Water has verified are egregiously using potable water for non-essential, wasteful uses are subject to having a flow- restricting device installed on their service line. After providing the customer with one notice of egregious violation, either by direct mail or door hanger, which documents the egregious use of potable water for non-essential, wasteful uses and explains that failure to correct the violation may result in the installation of a flow-restricting device on the customer's service line, Cal Water is authorized to install a flow-restricting device on the customer's service line.

Cal Water plans to submit to the CPUC an update to Schedule 14.1 to align with this WSCP including, but not limited to, consistency with the new six stage shortage level structure.

7.3 Drought Surcharges

Water budgets and associated drought surcharges are included as actions in Table 5-1. Cal Water will implement such actions through the implementation of Schedule 14.1.

Chapter 8
Legal Authorities

☑ ***CWC § 10632 (a) (7)***

(A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

Cal Water is an investor-owned water utility that is regulated by the CPUC. As such, it does not have the authority to adopt resolutions or ordinances. Rule 14.1, as filed with the CPUC, serves as Cal Water's restrictions on non-essential, wasteful uses of potable water. In the event that more stringent measures are required, Cal Water may request the addition of Schedule 14.1 which serves as Cal Water's WSCP and includes staged mandatory reductions and drought surcharges. Cal Water shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency as defined in Section 8558 of the Government Code and to ensure consistency with local resolutions and ordinances.

On April 1, 2016, Cal Water filed its current Schedule 14.1 with the CPUC.[1] The Schedule lays out the staged mandatory reductions and drought surcharges associated with Cal Water's WSCP. This filing is consistent with Resolution W-5034, adopted by the Commission on April 9, 2015, ordering compliance with requirements of the State Water Resources Control Board (SWRCB).

Schedule 14.1 is an extension of Rule 14.1. The compliance and enforcement information presented in Chapter 7 is based on the current versions of both Rule 14.1 and Schedule 14.1, which are based, in part, on the specific SWRCB requirements associated with the Governor's Executive Order B-29-15, which required statewide cutbacks to address the unprecedented 2011-2017 drought, as well as the additional information required pursuant to the CWC.

Cal Water has submitted an update to Rule 14.1 and Schedule 14.1 to the CPUC, for approval, to align with this WSCP.

[1] For reference, the current versions of Rule 14.1 and Schedule 14.1 are included as Attachment C.

In the event of a determination of a water shortage Cal Water shall declare a water shortage emergency in accordance with the Water Code Chapter 3 (commencing with Section 350) of Division 1 and implement the Water Shortage Contingency Plan at the appropriate Stage.

Chapter 9
Financial Consequences of WSCP

☑ ***CWC § 10632 (a) (8)***

A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

In 2008, the CPUC approved the creation of a Water Revenue Adjustment Mechanism (WRAM) and Modified Cost Balancing Accounts (MCBA). The goals of the WRAM and MCBA are to sever the relationship between sales and revenue to remove the disincentive to reduce water use. The WRAM and MCBA are designed to be revenue neutral in order to ensure that both the utility and ratepayers are neither harmed nor benefitted.

In 2020, the CPUC ordered that regulated water utilities may not include the continuation of the WRAM and MCBA in their next general rate case filing but may propose the use of a Monterey-Style Revenue Adjustment Mechanism and Incremental Cost Balancing Account. As such, the WRAM and MCBA will no longer be in place for Cal Water beginning in 2023.

During a water shortage, Cal Water will file for a Drought Memorandum Account, or similar, to track incremental shortage-related expenses to be reviewed by the CPUC for future recovery in rates. Cal Water will also file for a Drought Lost Revenue Memorandum Account, or similar, to track reduced sales to be reviewed by the CPUC for future recovery in rates.

Both the Drought Memorandum Account and Drought Lost Revenue Memorandum Account are mechanisms that have been approved by the CPUC in previous droughts.

Chapter 10
Monitoring and Reporting

☑ ***CWC § 10632 (a) (9)*** *For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.*

During the period 2014-16, in order to effectively respond to the drought, Cal Water realigned its organizational structure to ensure sufficient resources were available to implement its WSCP. The day-to-day implementation was overseen by the Director of Drought Management & Conservation, with the assistance of the Drought Response Project Manager. The Director of Drought Management & Conservation reported to a team of Cal Water's Officers (Steering Committee), including the President & CEO, the Vice President of Corporate Communications & Community Affairs, the Vice President of Customer Service & Information Technology, the Vice President of Operations, and the Vice President of Continuous Improvement.

Reporting to the Director of Drought Management & Conservation was a team of functional leads, each responsible for managing individual portions of Cal Water's Plan. This team included the Director of Customer Service, the Water Conservation Manager, the Manager of Corporate Communications, the Water Supply Manager, and the Government & Community Relations Manager.

Cal Water would implement a similar structure to effectively manage future water shortages.

This structure includes regular meetings with reporting on items such as:

- Aggregate customer demands,
- Customer compliance with water use restrictions,
- Current and projected water supply conditions,
- Customer outreach activities,
- Customer service inquiries, and
- Operations activities (e.g., water flushing activities, leak repairs, etc.).

Chapter 11
WSCP Refinement Procedures

☑ ***CWC § 10632 (a) (10)*** *Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.*

Cal Water's Drought Steering Committee utilizes an adaptive management process to regularly assess and determine adjustments and changes to the implementation of the WSCP. These refinements are implemented by the Director of Drought Management & Conservation (or equivalent) through the team of functional leads.

Chapter 12
Plan Adoption, Submittal, and Availability

☑ ***CWC § 10632 (c)*** *The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.*

The deadline for public comments on the WSCP was June 11, 2021. The final WSCP was formally adopted by Cal Water's Vice President of Customer Service & Chief Citizenship Officer on June 20, 2021. The District UWMP includes a copy of the signed Resolution of Plan Adoption and contains the following:

- Letters sent to and received from various agencies regarding the UWMP and WSCP, and
- Correspondence between Cal Water and participating agencies.

This UWMP and WSCP were submitted to DWR within 30 days of adoption and by the July 1, 2021 deadline. The submittal was done electronically through Water Use Efficiency Data Portal, an online submittal tool. The adopted WSCP was also sent to the California State Library and to the cities and counties listed in Table 10-1 of the District UWMP.

On or about May 10, 2021, an electronic version of the draft 2020 UWMP and WSCP was made available for review on Cal Water's website: https://www.calwater.com/conservation/uwmp.

Attachment A
SFPUC Annual Water Supply and Demand Assessment Procedures

ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

Each year the SFPUC evaluates the amount of total water storage expected to occur throughout the RWS and compares it to expected demands. This annual Water Supply and Demand Assessment (WSDA) is described in the subsections below, which are organized by the sequential steps the SFPUC takes to conduct the assessment each year and reference the relevant California Water Code requirements for a WSDA.[1]

The SFPUC's annual WSDA is a robust planning system that considers a range of input factors unique to the SFPUC's water supplies and system configuration while also providing the flexibility to consider new factors. Traditional surface water supplies from the SFPUC's up country, East Bay, and Peninsula reservoirs are the backbone of the water supply, but the SFPUC extends and protects those supplies in many additional ways by: (1) partnering with the community to help save water through robust conservation programs; (2) minimizing the need for additional water to serve new developments through an onsite water reuse program; (3) recycling wastewater resources to deliver water for large non-potable uses; (4) utilizing local groundwater supplies to supplement surface water supplies; (5) investigating new, alternative water supply options such as purified water and desalination; and (6) investing in innovations that allow for creative solutions to meet diverse needs. These efforts help the SFPUC conserve water and diversify supplies to reduce likelihood of a water shortage condition.

1.1 DEMAND ASSESSMENT [WATER CODE SECTION 10632(A)(2)(B)(I)]

To calculate unconstrained customer demand for the purpose of an annual WSDA, the SFPUC collects information on both the retail and wholesale system demands. Retail customer demand is estimated based on the best available information to date, and typically includes the previous year's demands as well as consideration of current demand use patterns or other conditions impacting demands, such as weather and growth. Each year, in February, the SFPUC receives from BAWSCA a report of estimated Wholesale Customer demand for the upcoming year. BAWSCA typically estimates unconstrained demands for the Wholesale Customers by using total water purchased by those customers in the prior year along with other relevant information. Relatively small demands from the two additional wholesale customers not part of the WSA are estimated based on the best available information to date, and typically includes the previous year's demands as well as consideration of current demand use patterns or other conditions impacting demands, such as weather and growth.

1.2 SUPPLY ASSESSMENT [WATER CODE SECTIONS 10632(A)(2)(B)(II) AND 10632(A)(2)(B)(V)]

The RWS collects water from the Tuolumne River watershed in the Sierra Nevada and from local reservoirs in the Alameda and Peninsula watersheds. The RWS draws an average of 85 percent of its supply from the Tuolumne River watershed. This water feeds into an aqueduct system delivering water 167 miles by gravity to Bay Area reservoirs and customers. The remaining RWS supply is drawn from local surface waters in the Alameda and Peninsula watersheds. The split between these resources varies from year to year depending on the water year hydrology and operational circumstances.

To project and evaluate water supply conditions, the SFPUC uses measurements of precipitation and snowpack in the watersheds above Hetch Hetchy, Cherry, and Eleanor Reservoirs. Snowpack conditions are evaluated regularly by the Cooperative Snow Survey (conducted by the SFPUC in partnership with state and federal agencies) beginning in late January of each year. The SFPUC also estimates snowpack conditions using information from airborne snow observatory (ASO) and other sources. The SFPUC maintains a hydrologic model

[1] California Water Code section 10632(a)(1) requires "*the analysis of water supply reliability conducted pursuant to Section 10635."* Additional information about the SFPUC's water supply reliability analysis can be found in Chapter 7 of the SFPUC's 2020 UWMP.

of the watersheds that uses this information to project expected runoff for the coming year. This process also includes a statistical analysis of additional expected precipitation. In addition to projected runoff, the determination of projected available water supply also takes into account stored water throughout the RWS, water acquired by the SFPUC from non-SFPUC sources, inactive storage, reservoir losses, and allowances for carryover storage.

Additionally, the SFPUC accounts for groundwater provided by the San Francisco Groundwater Supply Project for the in-City retail system and recycled water provided for irrigation at Harding Park, Fleming and Sharp Park Golf Courses.

The RWS relies on precipitation and snowmelt captured and stored in its reservoirs. During droughts, water supply deliveries can exceed inflows, such that water stored in previous years is relied upon to meet demands. Because of the importance of carry-over storage, the SFPUC constantly monitors and evaluates water supply conditions in the RWS. Look-ahead forecasts are updated as a year's hydrology and operations change. Generally, in early winter of any year, SFPUC staff can begin providing a forecast of water supply conditions for the upcoming year based on known and anticipated winter and spring precipitation and snowpack. The predictive power of this forecast improves greatly through the spring. The annual precipitation, snowmelt, and carry-over storage together constitute the SFPUC's reservoir storage condition. Using data for each of these factors, the SFPUC can determine whether the reservoir system will be capable of serving full deliveries to its customers. Section 1.3 describes the system modeling SFPUC conducts

Table 0-1 shows the availability of RWS supplies for retail customers and Wholesale Customers in normal years. Table 0-2 shows the current and projected RWS supply needs to meet retail and wholesale demands based on information and projections presented in the SFPUC's 2020 UWMP.

The SFPUC sells water to 26 of its 28 wholesale customers under the terms of the 25-year contract known as the Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County (WSA) and associated individual water sales contracts with each Wholesale Customer. The WSA carries forward the SFPUC's "Supply Assurance" of 184 million gallons per day (mgd) to the Wholesale Customers. The SFPUC has agreed to deliver water to the Wholesale Customers up to the amount of the Supply Assurance, and this agreement is perpetual and survives the expiration of the WSA. The Supply Assurance is, however, subject to reduction due to water shortage, drought, scheduled RWS maintenance activities, and emergencies. The WSA also describes the temporary limitation on water sales established by the Phased Water System Improvement Plan (WSIP) in 2008. This "Interim Supply Limitation" (ISL) limits water sales from the RWS to an average annual amount of 265 mgd. The WSA allocations the ISL between the SFPUC's retail customers and Wholesale Customers as follows:

- Wholesale supply allocation: 184 mgd
- Retail supply allocation: 81 mgd[2]

Table 0-1. Regional Water System Supply Availability in Normal Years (mgd)

RWS Supply Allocation	Actual	Projected				
	2020	2025	2030	2035	2040	2045
Retail Customers[a, b]	81	81	81	81	81	81
Wholesale Customers[c, d]	184	184	184	184	184	184

[2] Groveland CSD is considered a retail customer of the SFPUC. Thus, RWS supplies to Groveland CSD are accounted for in the retail supply allocation of 81 mgd.

Total RWS Supplies	265	265	265	265	265	265

a Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if these alternative supplies are not available, up to 81 mgd of RWS supply could be used in normal years.

b Groveland CSD is reported as a wholesale customer for the purposes of this 2020 UWMP, but it is considered a retail customer of the SFPUC solely for purposes of allocating RWS supplies between retail and Wholesale Customers. Its demands would be met by the retail supply allocation of 81 mgd.

c Projected Wholesale Customer deliveries are limited to 184 mgd, including the demands of the Cities of San Jose and Santa Clara, which are supplied on a temporary and interruptible basis, with their total supply not exceeding 9 mgd assuming supply is available (decision to be made by end of 2028).

d Cordilleras MWC is not a party to the WSA, and it is not included in the wholesale supply allocation of 184 mgd. The demands of Cordilleras MWC are minor (projected to be less than 0.01 mgd) and are anticipated to be met with RWS supplies through 2045.

Table 0-2. Regional Water System Supply Utilized in Normal Years (mgd)

RWS Supply Allocation	Actual	Projected				
	2020	2025	2030	2035	2040	2045
Retail Customers[a, b]	66.5	67.2	67.5	68.6	70.5	73.7
Wholesale Customers[c, d]	132.1	146.0	147.9	151.9	156.3	162.8
Total RWS Supplies	198.6	213.2	215.4	220.5	226.8	236.5

a Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if these alternative supplies are not available, up to 81 mgd of RWS supply could be used in normal years.

b Groveland CSD is reported as a wholesale customer for the purposes of this 2020 UWMP, but it is considered a retail customer of the SFPUC solely for purposes of allocating RWS supplies between retail and Wholesale Customers. Its demands would be met by the retail supply allocation of 81 mgd.

c Projected Wholesale Customer deliveries are limited to 184 mgd, including the demands of the Cities of San Jose and Santa Clara, which are supplied on a temporary and interruptible basis, with their total supply not exceeding 9 mgd assuming supply is available (decision to be made by end of 2028).

d Cordilleras MWC is not a party to the WSA, and it is not included in the wholesale supply allocation of 184 mgd. The demands of Cordilleras MWC are minor (projected to be less than 0.01 mgd) and are anticipated to be met with RWS supplies through 2045.

1.3 INFRASTRUCTURE CONSIDERATIONS [WATER CODE SECTION 10632(A)(2)(B)(III)]

On an ongoing basis, the SFPUC's Hetch Hetchy Water and Power, Water Supply and Treatment Division, and Hydrology and Water Systems group conduct analyses of the RWS that incorporate planned facility outages and multiple levels of projected system demands to evaluate and plan for potential water delivery constraints. These groups meet quarterly to share plans and coordinate how facility outages, changes in service area demand, wet or dry weather, and other variables shape the operating plans each year. Facility outages due to maintenance or upgrades are coordinated in an adaptive manner to respond to changes as they occur. For new water supplies or new capital projects related to supply distribution, impacts on the system are evaluated extensively prior to initiation of any changes. Results from these modeling efforts are considered in the annual WSDA.

1.4 SYSTEM MODELING [WATER CODE SECTION 10632(A)(2)(B)(IV)]

To proactively plan for conditions that would result in a shortage of water supplies, the SFPUC models conditions using a hypothetical drought that is more severe than what the RWS has historically experienced. This drought sequence is referred to as the "design drought" and serves as the basis for planning and modeling of future scenarios. The design drought consists of an 8.5-year sequence of dry conditions.

In applying its water supply planning methodology, the SFPUC performs an initial model simulation of the system for the design drought sequence and then reviews the ability of the system to deliver water to the service area through the entire design drought sequence. If the projected water supply runs out before the end of the design drought sequence in the initial model run, system-wide water supply rationing is added and the scenario is re-run. This process continues iteratively until a model simulation of the system is achieved in which the water supply in storage at the end of the design drought sequence is brought to the system "dead pool," where no additional storage is available for delivery (currently simulated as 96,775 acre-feet). Drawing system storage down to the dead pool without going below it indicates that water supply delivery, including the adjusted amount of rationing, is maintained through the design drought sequence.

Estimated rationing levels and corresponding storage threshold values can then be used to simulate the operation of the system through the historical record of hydrology, or to evaluate system water supply conditions during an ongoing drought. While the design drought sequence does not occur in the historical hydrology, the rationing and storage threshold values that are adjusted to allow a system configuration to maintain water delivery through the design drought sequence can be used to evaluate system performance in the historical record, or as a comparison for real-time system conditions. Through use of this planning method, the SFPUC can simulate a response to declining water supply in storage that is appropriate for the system conditions being evaluated.

The SFPUC plans its water deliveries using indicators for water supply rationing that are developed through analysis with the design drought sequence. As a result, the SFPUC system operations are designed to provide sufficient carry-over water in SFPUC reservoirs to continue delivering water, although at reduced levels, during multiple-year droughts.

1.5 DECISION-MAKING PROCESS [WATER CODE SECTION 10632(A)(2)(A)]

Regardless of the expectation of shortage conditions, as part of the normal course of business, the SFPUC provides a water supply condition update to its executive team every two weeks throughout the year. The SFPUC also provides water supply estimates to its Wholesale Customers on a monthly basis beginning February 1. A Wholesale Customer Annual Meeting is held in the last week of February at which the SFPUC makes a presentation on current water supply conditions and forecasts. The last snow survey of the season typically occurs within the first week of April, followed by a runoff forecast to determine total system storage expected as of July 1. By the middle of April, the SFPUC sends a formal letter to the Wholesale Customers summarizing the water supply availability for the coming year.

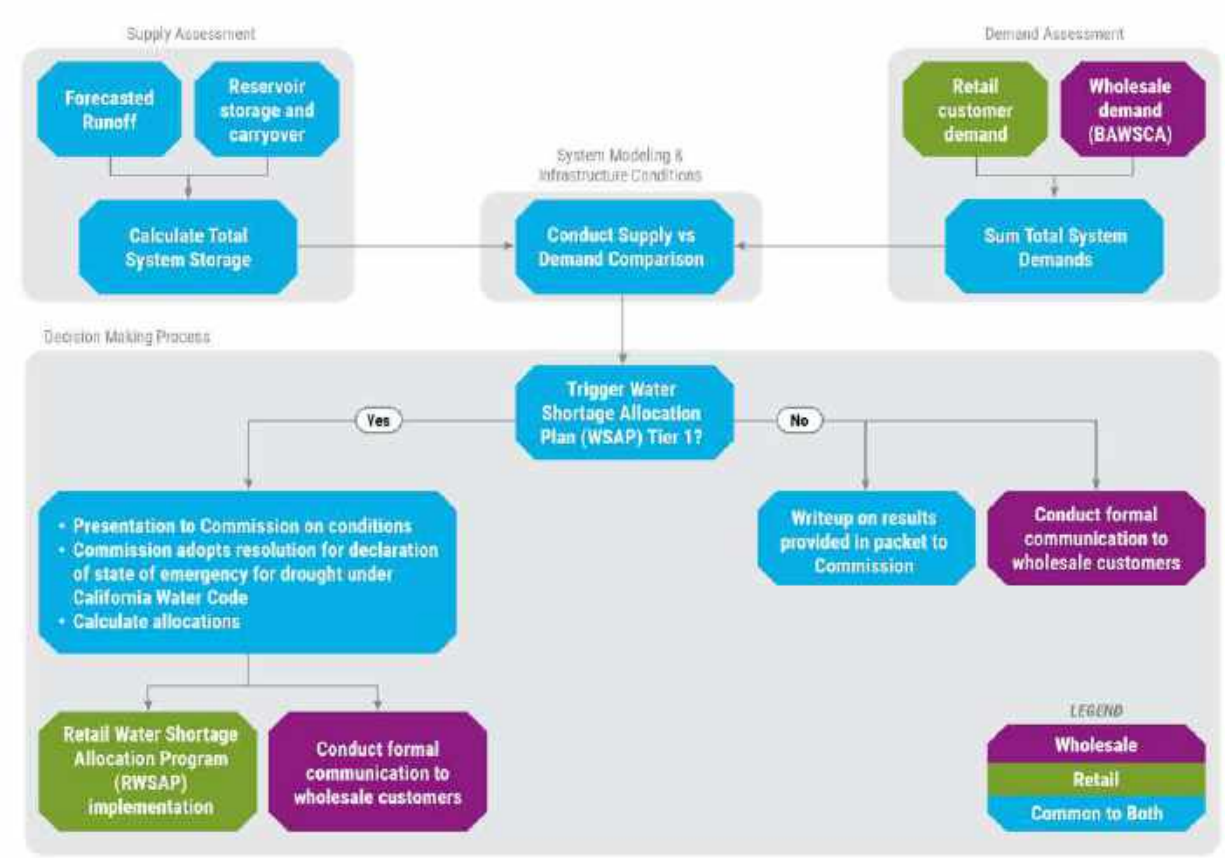
If the RWS appears incapable of meeting system-wide demand due to drought, the SFPUC is expected to declare a water shortage by March 31 of that drought year. The General Manager, or designee, is responsible for declaring such a shortage. A presentation would be made to the Commission as part of the General Manager's report, showing conditions of precipitation to date, snowpack, and storage levels with more information as necessary depending on the particulars of the supply forecast. Depending on the level of shortage, the Commission may adopt a resolution declaring a water shortage emergency under the California Water Code, or lesser actions such as a call for voluntary conservation efforts.

Prior to the initiation of any water delivery reductions to its retail customers, whether it be initial implementation of delivery reductions or implementing a different water shortage level, the SFPUC will outline a drought response plan to address the following: the water supply situation; proposed water use reduction objectives; alternatives to water use reductions; methods to calculate water use allocations and adjustments; compliance methodology and enforcement measures; and budget considerations. Details on the expected allocation program are described further in Section 4.1. This drought response plan will be presented

at a regularly scheduled SFPUC Commission meeting and advertised in accordance with the requirements of Section 6066 of the California Government Code.

The overall WSDA process is described visually in the flowchart presented in Figure 0-1.

Figure 0-1: Water Supply and Demand Assessment Process



Attachment B
Key Drought Response Tool Tables and Charts

Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Bear Gulch

Enter Agency Information	
Agency Name	Bear Gulch
Total Population Served	61,480
Conservation Goal (%)	5%
Drought Stage	Stage 1
Number of Residential Accounts	17,134
Number of Commercial, Industrial, and Institutional (CII) Accounts	1,429
Number of Dedicated Irrigation Accounts	0
Baseline Year(s)	2020
Percentage of Residential Indoor Use During Minimum Month (%)	100%
Percentage of Comm-Gov Indoor Use During Minimum Month (%)	81%
Comments	BG

Drought Response Tool
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Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Bear Gulch

Navigation	
USER'S GUIDE	Download and read the guide before using this Tool
1 - HOME	Enter agency information
2 - INPUT BASELINE YEAR WATER USE	Enter Baseline Year production and use
3 - BASELINE YEAR WATER USE PROFILE	Review and confirm entered information
4 - DROUGHT RESPONSE ACTIONS	Select Drought Response Actions and input estimated water savings and implementation rates.
5 - ESTIMATED WATER SAVINGS	Review estimated water production and compare estimated savings to conservation target.
6 - DROUGHT RESPONSE TRACKING	Track production and water savings against the conservation target.

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Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Bear Gulch

For questions about this tool or for additional information, contact:

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2 - Input Baseline Year (2020) Water Use

Bear Gulch

Input Baseline Year (2020) Production and Water Use

Units: (mg)

Select the units to input monthly production and use data. Enter the total monthly potable water production for the Baseline Year. Next, enter monthly water use data by sector for the Baseline Year. If you bill on a bi-monthly basis, divide your billing data between the months that the billing cycle includes. If your single-family and multi-family accounts are tracked separately, enter the combined water use for both sectors in the Residential Water Use column. If your commercial, industrial, and institutional (CII) accounts are tracked separately, enter the combined water use for each sector in the CII Water Use column. Your non-revenue water use is calculated by subtracting your monthly residential, CII, and dedicated irrigation water uses from your monthly production. Your monthly residential gallons per capita per day (R-GPCD) is calculated by dividing your monthly residential water use by your population entered in Worksheet 1 - Home.

Date	Total Production (mg)	Residential Water Use (mg)	COM-GOV Water Use (mg)	Industrial Water Use (mg)	Non-Revenue Water Use (mg)	Total R-GPCD	Comments
October	433	381	47	1	4	200	
November	339	311	42	1	-15	168	
December	189	240	37	1	-89	126	
January	150	114	28	0	9	60	
February	182	115	30	0	37	67	
March	259	198	35	0	26	104	
April	260	194	28	0	38	105	
May	425	246	29	0	149	129	
June	468	376	41	1	51	204	
July	494	457	50	1	-13	240	
August	549	460	48	1	40	242	
September	468	414	43	1	10	225	

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Drought Response Tool

Home | Input Baseline Year Water Use | **Baseline Year Water Use Profile** | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

3 - Baseline Year (2020) Water Use Profile

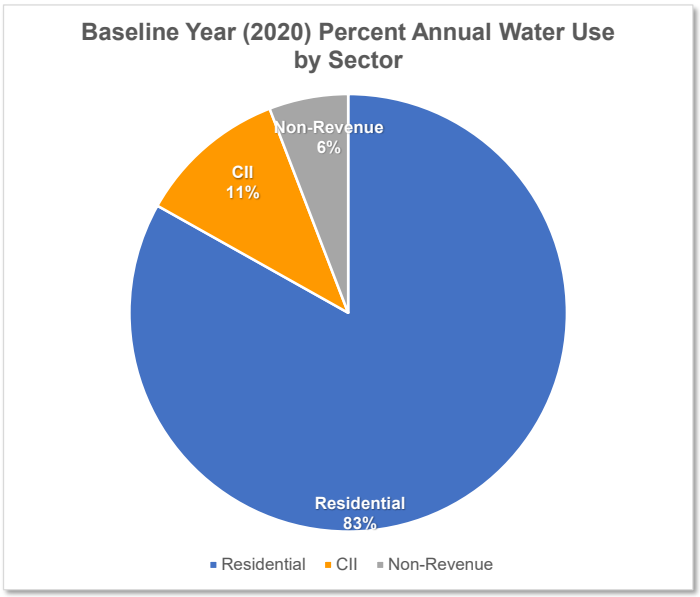
Bear Gulch

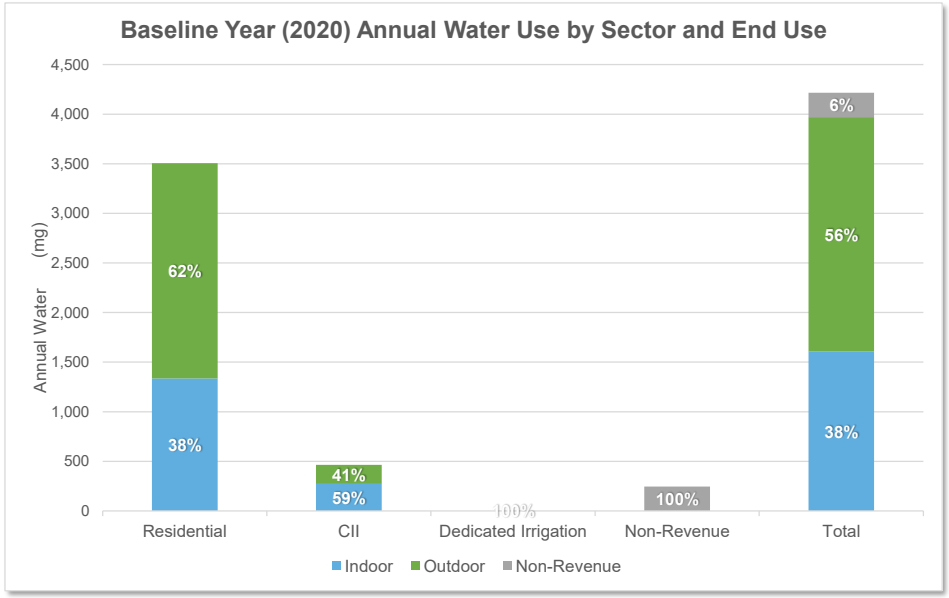
Baseline Year (2020) Annual Water Use Summary

Units: (mg)

A summary of your Baseline Year water use by sector and major end use category is shown below. Select the units in which your production and use data are displayed.

Water Use	Total Production (mg)	Water Use (mg)				Comments
		Residential	CII	Dedicated Irrigation	Non-Revenue	
Total	4,217	3,506	464	0	247	
Total Indoor	1,607	1,335	272	--	--	
Total Outdoor	2,363	2,171	193	0	--	
Total Non-Revenue	247	--	--	--	247	
Total Indoor %	38%	38%	59%	0%	--	
Total Outdoor %	56%	62%	41%	100%	--	
Total Non-Revenue %	6%	--	--	--	100%	





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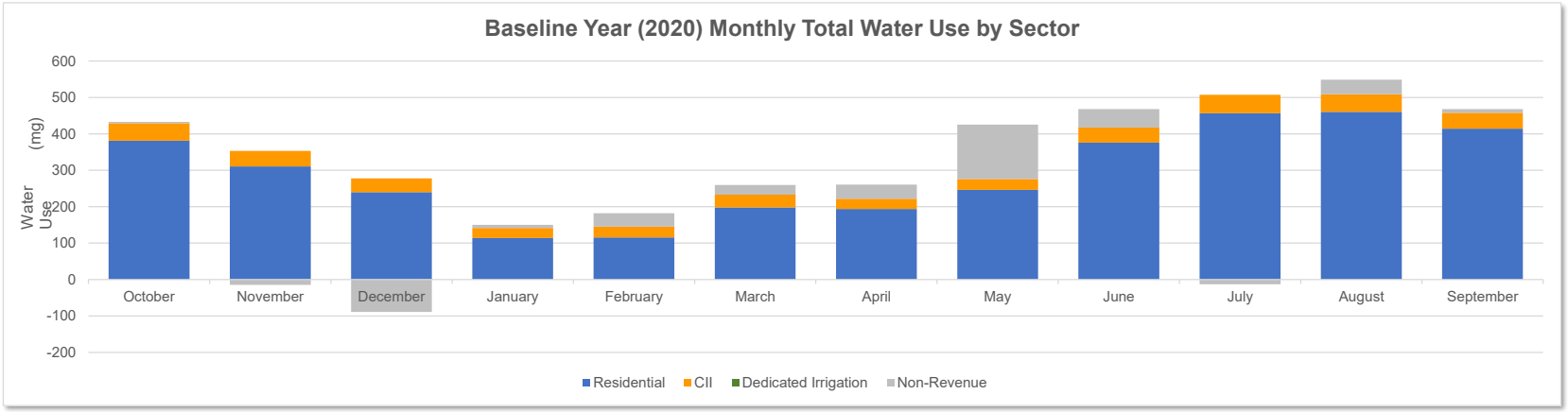
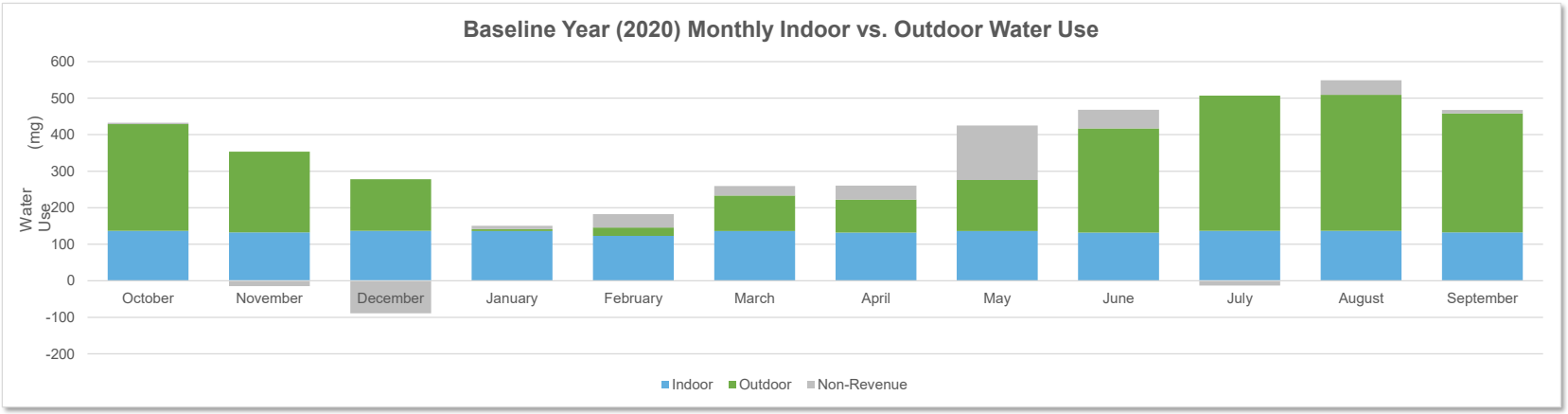
3 - Baseline Year (2020) Water Use Profile

Bear Gulch





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5 - Estimated Water Savings - Stage 1

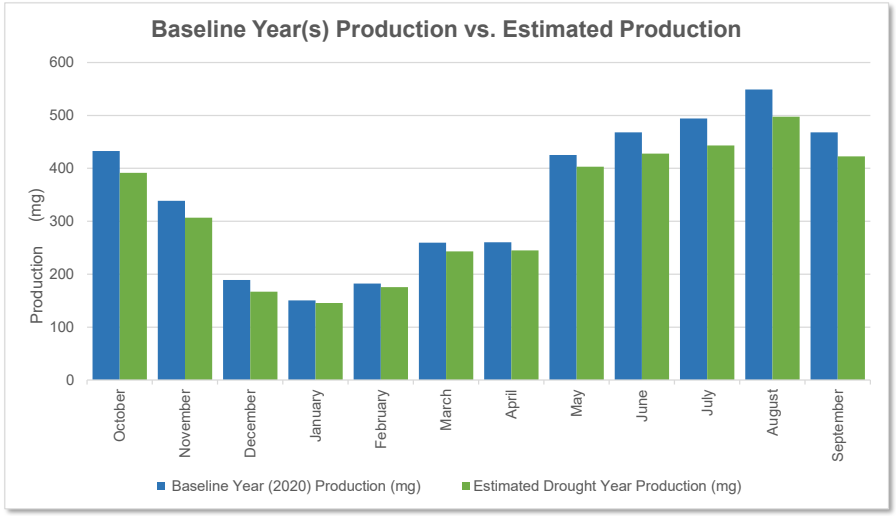
Bear Gulch

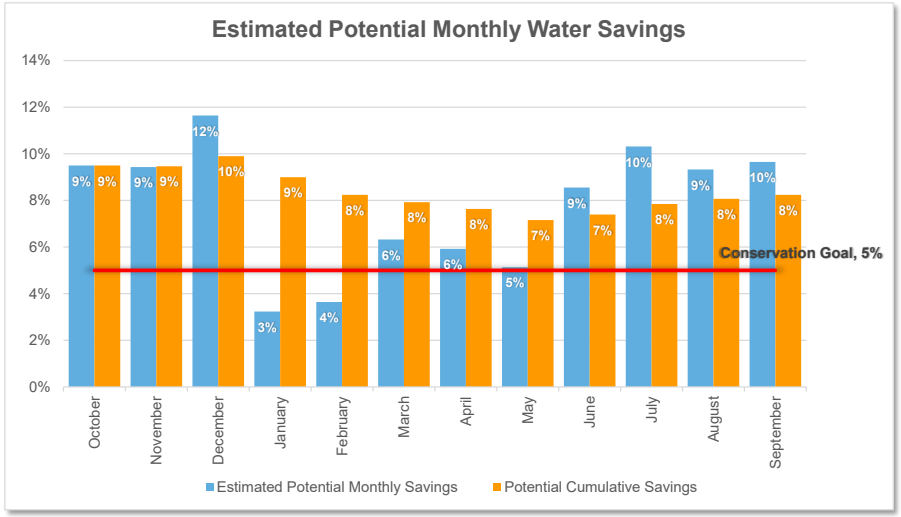
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2020) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
October	433	391	9%	9%	5%	
November	339	307	9%	9%	5%	
December	189	167	12%	10%	5%	
January	150	145	3%	9%	5%	
February	182	176	4%	8%	5%	
March	259	243	6%	8%	5%	
April	260	245	6%	8%	5%	
May	425	403	5%	7%	5%	
June	468	428	9%	7%	5%	
July	494	443	10%	8%	5%	
August	549	498	9%	8%	5%	
September	468	423	10%	8%	5%	





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Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Bear Gulch

Enter Agency Information	
Agency Name	Bear Gulch
Total Population Served	61,480
Conservation Goal (%)	15%
Drought Stage	Stage 2
Number of Residential Accounts	17,134
Number of Commercial, Industrial, and Institutional (CII) Accounts	1,429
Number of Dedicated Irrigation Accounts	0
Baseline Year(s)	2020
Percentage of Residential Indoor Use During Minimum Month (%)	100%
Percentage of Comm-Gov Indoor Use During Minimum Month (%)	81%
Comments	BG

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5 - Estimated Water Savings - Stage 2

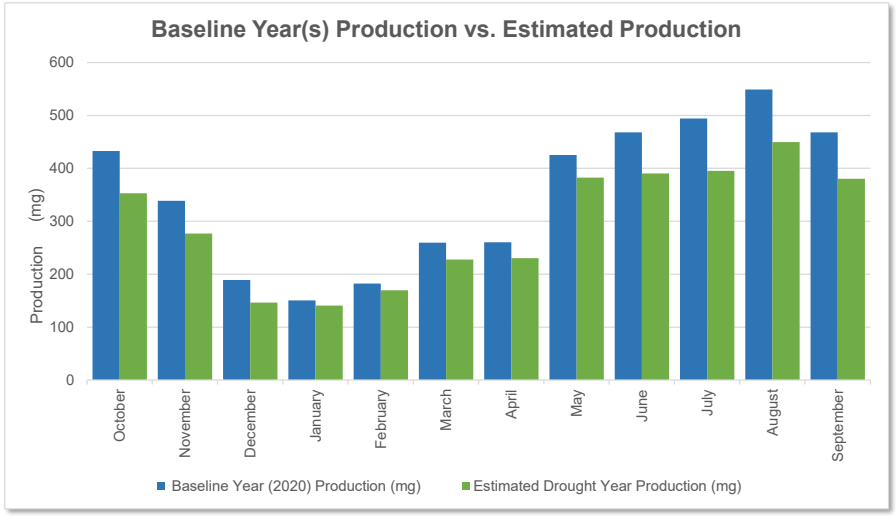
Bear Gulch

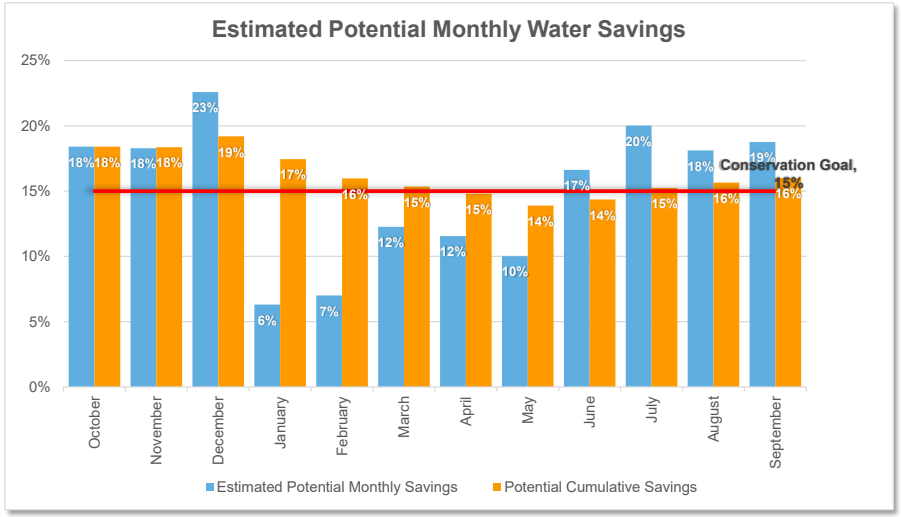
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2020) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
October	433	353	18%	18%	15%	
November	339	277	18%	18%	15%	
December	189	146	23%	19%	15%	
January	150	141	6%	17%	15%	
February	182	169	7%	16%	15%	
March	259	228	12%	15%	15%	
April	260	230	12%	15%	15%	
May	425	383	10%	14%	15%	
June	468	390	17%	14%	15%	
July	494	395	20%	15%	15%	
August	549	449	18%	16%	15%	
September	468	380	19%	16%	15%	





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Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Bear Gulch

Enter Agency Information	
Agency Name	Bear Gulch
Total Population Served	61,480
Conservation Goal (%)	25%
Drought Stage	Stage 3
Number of Residential Accounts	17,134
Number of Commercial, Industrial, and Institutional (CII) Accounts	1,429
Number of Dedicated Irrigation Accounts	0
Baseline Year(s)	2020
Percentage of Residential Indoor Use During Minimum Month (%)	100%
Percentage of Comm-Gov Indoor Use During Minimum Month (%)	81%
Comments	BG

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5 - Estimated Water Savings - Stage 3

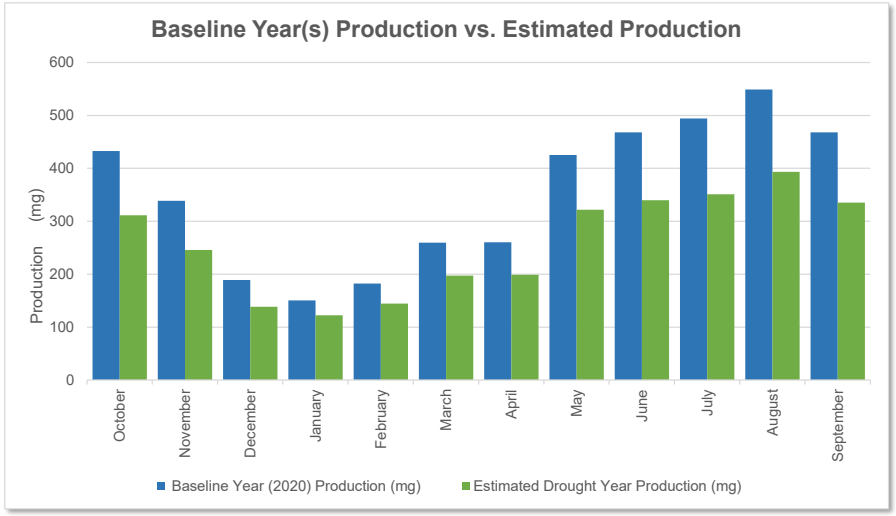
Bear Gulch

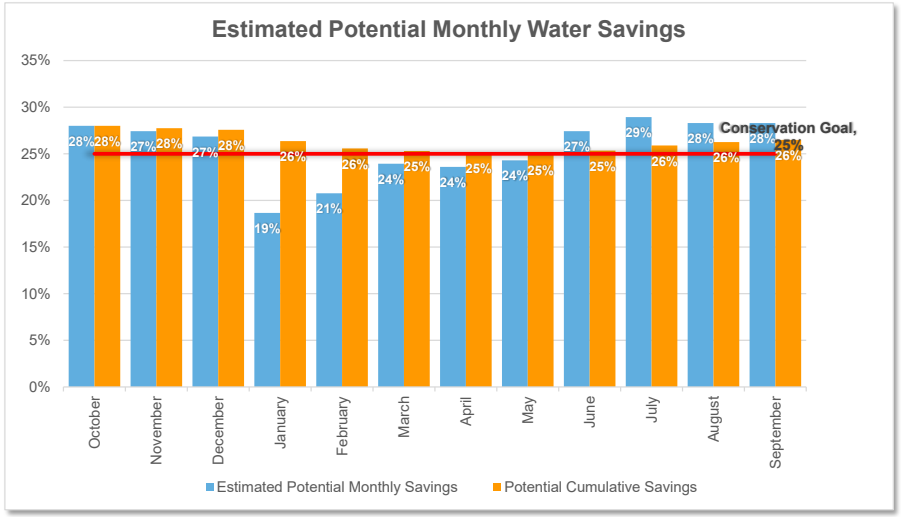
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2020) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
October	433	311	28%	28%	25%	
November	339	246	27%	28%	25%	
December	189	138	27%	28%	25%	
January	150	122	19%	26%	25%	
February	182	144	21%	26%	25%	
March	259	197	24%	25%	25%	
April	260	199	24%	25%	25%	
May	425	322	24%	25%	25%	
June	468	340	27%	25%	25%	
July	494	351	29%	26%	25%	
August	549	393	28%	26%	25%	
September	468	335	28%	26%	25%	





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Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Bear Gulch

Enter Agency Information	
Agency Name	Bear Gulch
Total Population Served	61,480
Conservation Goal (%)	35%
Drought Stage	Stage 4
Number of Residential Accounts	17,134
Number of Commercial, Industrial, and Institutional (CII) Accounts	1,429
Number of Dedicated Irrigation Accounts	0
Baseline Year(s)	2020
Percentage of Residential Indoor Use During Minimum Month (%)	100%
Percentage of Comm-Gov Indoor Use During Minimum Month (%)	81%
Comments	BG

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5 - Estimated Water Savings - Stage 4

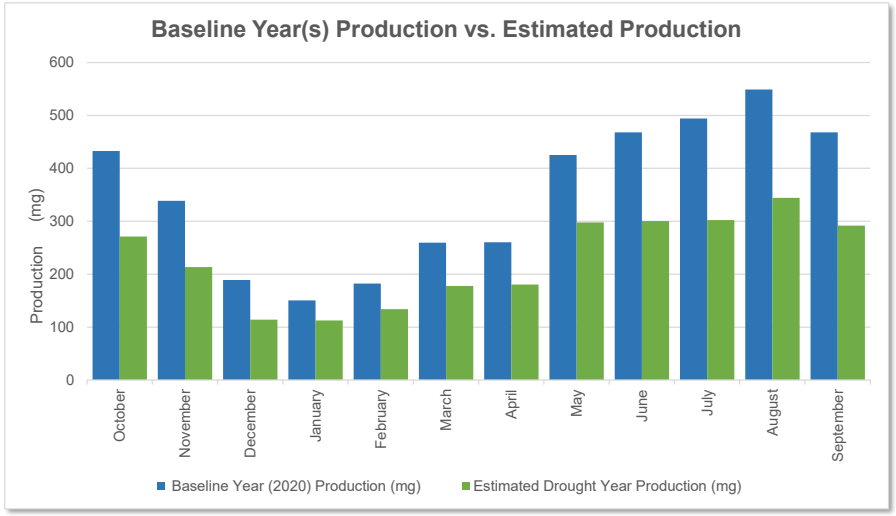
Bear Gulch

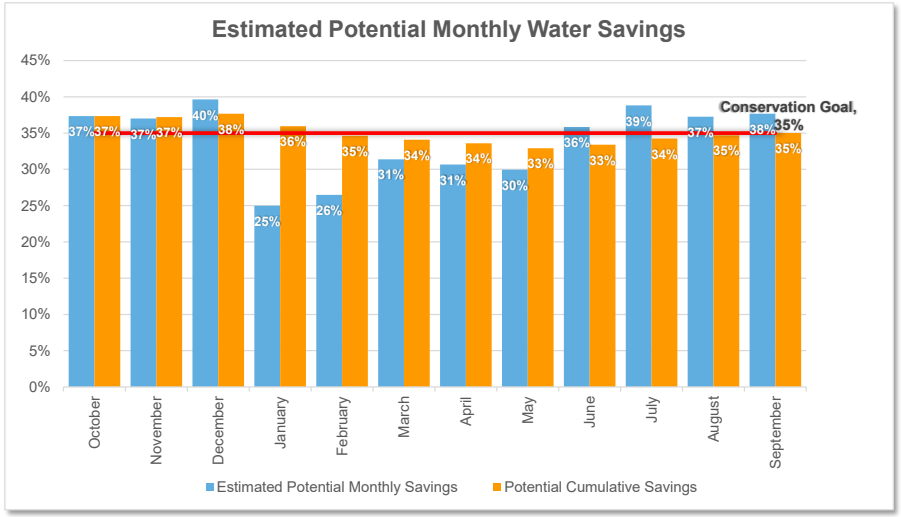
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2020) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
October	433	271	37%	37%	35%	
November	339	213	37%	37%	35%	
December	189	114	40%	38%	35%	
January	150	113	25%	36%	35%	
February	182	134	26%	35%	35%	
March	259	178	31%	34%	35%	
April	260	181	31%	34%	35%	
May	425	298	30%	33%	35%	
June	468	300	36%	33%	35%	
July	494	302	39%	34%	35%	
August	549	344	37%	35%	35%	
September	468	292	38%	35%	35%	





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Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Bear Gulch

Enter Agency Information	
Agency Name	Bear Gulch
Total Population Served	61,480
Conservation Goal (%)	45%
Drought Stage	Stage 5
Number of Residential Accounts	17,134
Number of Commercial, Industrial, and Institutional (CII) Accounts	1,429
Number of Dedicated Irrigation Accounts	0
Baseline Year(s)	2020
Percentage of Residential Indoor Use During Minimum Month (%)	100%
Percentage of Comm-Gov Indoor Use During Minimum Month (%)	81%
Comments	BG

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5 - Estimated Water Savings - Stage 5

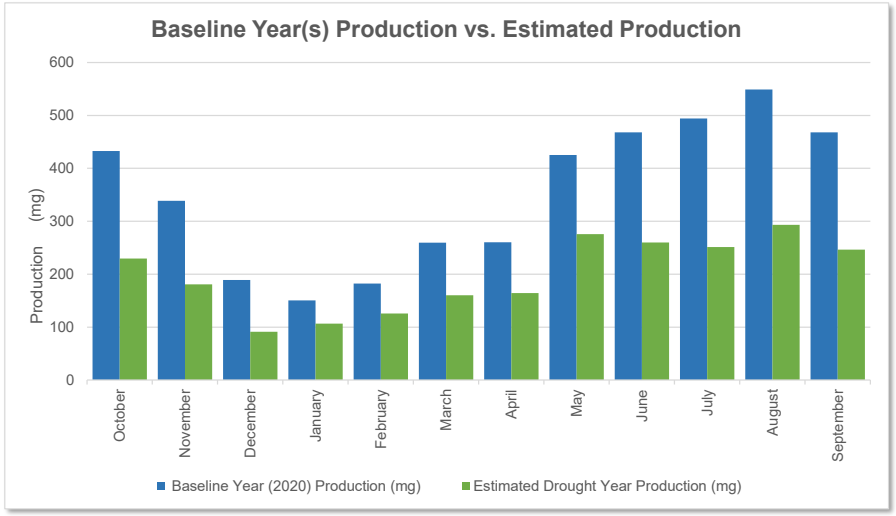
Bear Gulch

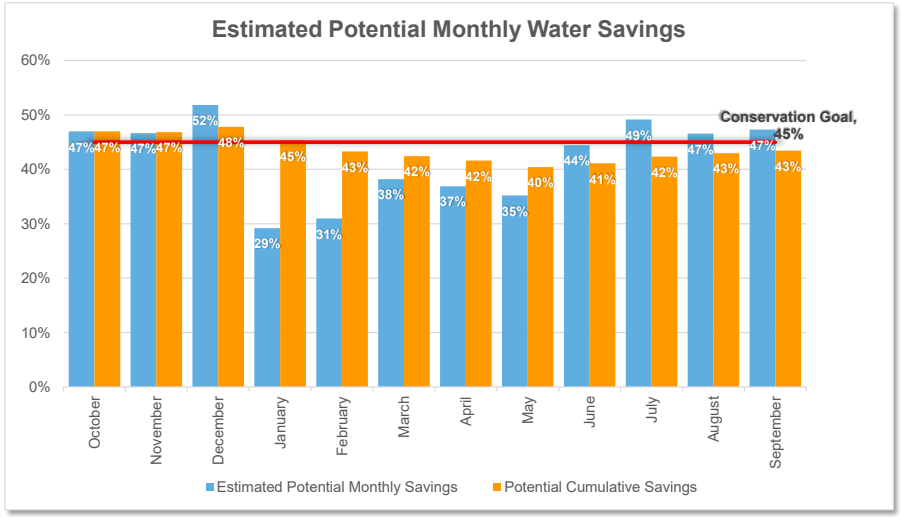
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2020) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
October	433	229	47%	47%	45%	
November	339	181	47%	47%	45%	
December	189	91	52%	48%	45%	
January	150	106	29%	45%	45%	
February	182	126	31%	43%	45%	
March	259	160	38%	42%	45%	
April	260	164	37%	42%	45%	
May	425	275	35%	40%	45%	
June	468	260	44%	41%	45%	
July	494	251	49%	42%	45%	
August	549	293	47%	43%	45%	
September	468	247	47%	43%	45%	





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Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Bear Gulch

Enter Agency Information	
Agency Name	Bear Gulch
Total Population Served	61,480
Conservation Goal (%)	55%
Drought Stage	Stage 6
Number of Residential Accounts	17,134
Number of Commercial, Industrial, and Institutional (CII) Accounts	1,429
Number of Dedicated Irrigation Accounts	0
Baseline Year(s)	2020
Percentage of Residential Indoor Use During Minimum Month (%)	100%
Percentage of Comm-Gov Indoor Use During Minimum Month (%)	81%
Comments	BG

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5 - Estimated Water Savings - Stage 6

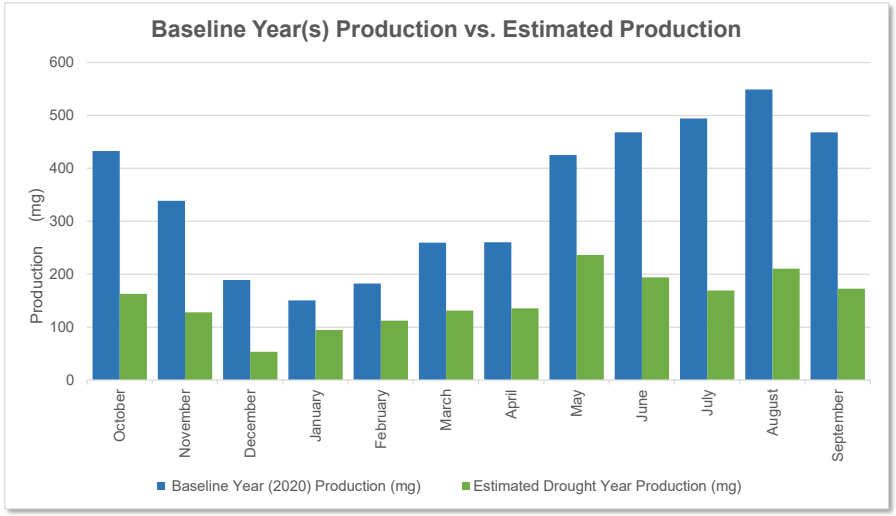
Bear Gulch

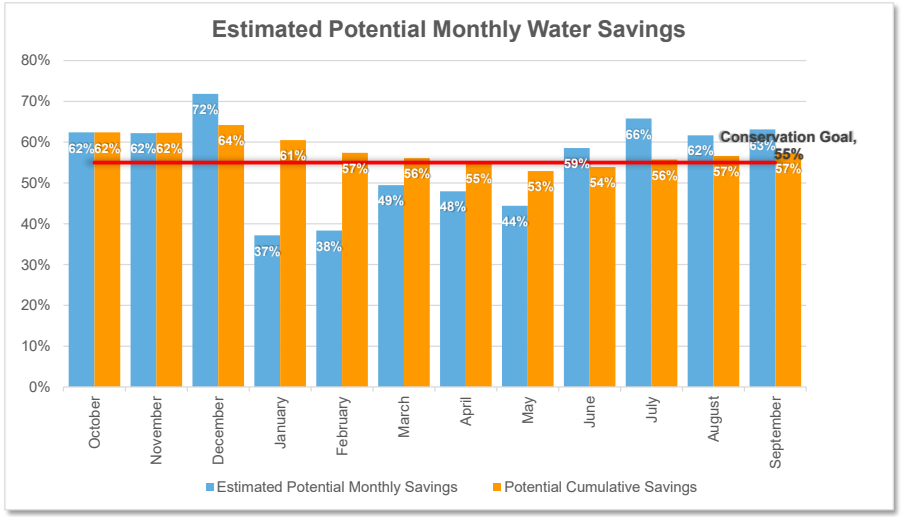
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2020) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
October	433	163	62%	62%	55%	
November	339	128	62%	62%	55%	
December	189	53	72%	64%	55%	
January	150	94	37%	61%	55%	
February	182	112	38%	57%	55%	
March	259	131	49%	56%	55%	
April	260	136	48%	55%	55%	
May	425	236	44%	53%	55%	
June	468	194	59%	54%	55%	
July	494	169	66%	56%	55%	
August	549	210	62%	57%	55%	
September	468	173	63%	57%	55%	





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Attachment C
CPUC Rule and Schedule 14.1

Rule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 1) (T)

A. APPLICABILITY (N)

1. This schedule applies to all of California Water Service's regulated ratemaking areas in California, as well as Grand Oaks Water.

B. GENERAL INFORMATION

1. All expenses incurred by utility to implement Rule 14.1, and Schedule 14.1, and requirements of the California State Water Resources Control Board ("Water Board") that have not been considered in a General Rate Case or other proceeding shall be accumulated by Cal Water in a separate memorandum account, authorized in Resolution W-4976, for disposition as directed or authorized from time to time by the Commission.
2. To the extent that a Stage of Mandatory Water Use Restrictions in Schedule 14.1 has been activated, and a provision in this Rule is inconsistent with the activated Stage in Schedule 14.1, the provisions of Schedule 14.1 apply.

C. DEFINITIONS

For the purposes of this Rule, the following terms have the meanings set forth in this section.

1. "Commercial nursery" means the use of land, buildings or structures for the growing and/or storing of flowers, fruit trees, ornamental trees, vegetable plants, shrubs, trees and similar vegetation for the purpose of transplanting, for use as stock or grafting, and includes the retail sale or wholesale distribution of such items directly from the premises/lot.
2. "Drip irrigation system" means a non-spray, low-pressure, and low volume irrigation system utilizing emission devices with a precipitation or flow rate measured in gallons per hour (GPH), designed to slowly apply small volumes of water at or near the root zone of plants or other landscaping.
3. "Flow rate" means the rate at which water flows through pipes, valves, and emission devices, measured in gallons per minute (GPM), gallons per hour (GPH), inches per hour (IPH), hundred cubic feet (Ccf), or cubic feet per second (CFS).
4. "Flow-restricting device" means valves, orifices, or other devices that reduce the flow of potable water through a service line, which are capable of passing a minimum of 3 Ccf per person, per month, based upon the U.S. Census calculation of the average number of people in a household in the area.
5. "High-efficiency sprinkler systems" means an irrigation system with emission devices, such as sprinkler heads or nozzles, with a precipitation or flow rate no greater than one IPH.
6. "Irrigation" means the application of potable water by artificial means to landscape.
7. "Irrigation system" means the components of a system meant to apply water to an area for the purpose of irrigation, including, but not limited to, piping, fittings, sprinkler heads or nozzles, drip tubing, valves, and control wiring.
8. "Landscape" means all of the outdoor planting areas, turf areas, and water features at a particular location.
9. "Measureable rainfall" means any amount of precipitation of more than one-tenth of an inch (0.1").
10. "Micro spray irrigation system" means a low-pressure, low-volume irrigation system utilizing emission devices that spray, mist, sprinkle, or drip with a precipitation or flow rate measured in GPH, designed to slowly apply small volumes of water to a specific area. (N)

(continued)

Rule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN (continued)

(T)

C. DEFINITIONS (Continued) (N)

11. "Ornamental landscape" means shrubs, bushes, flowers, ground cover, turf, lawns, and grass planted for the purpose of improving the aesthetic appearance of property, but does not include crops or other agricultural products or special landscape areas.

12. "Ornamental turf" means a ground cover surface of grass that can be mowed and is planted for the purpose of improving the aesthetic appearance of the property, but does not include crops or other agricultural products or special landscape areas.

13. "Plumbing fixture" means a receptacle or device that is connected to a water supply system, including, but not limited to, pipes, toilets, urinals, showerheads, faucets, washing machines, water heaters, tubs, and dishwashers.

14. "Potable water" means water supplied by Cal Water which conforms to the federal and state standards for human consumption.

15. "Properly programmed" means a smart irrigation controller that has been programmed according to the manufacturer's instructions and site-specific conditions.

16. "Real-time water measurement device" means a device or system that provides regularly updated electronic information regarding the customer's water use.

17. "Runoff" means water which is not absorbed by the soil or landscape to which it is applied and flows from the landscape onto other areas.

18. "Smart irrigation controller" means an automatic device used to remotely control valves that operate an irrigation system that has been tested by an American National Standards Institute accredited third-party certifying body or laboratory in accordance with the Environmental Protection Agency's WaterSense program (or an analogous successor program), and certified by such body or laboratory as meeting the performance and efficiency requirements of such program, or the more stringent performance and efficiency requirements of another similar program.

19. "Special landscape area" means an area of the landscape dedicated solely to edible plants and areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing surface.

20. "Turf" means a ground cover surface of grass that can be mowed.

21. "Water feature" means a design element where open, artificially supplied water performs an aesthetic or recreation feature, including, but not limited to, ponds, lakes, waterfalls, fountains, and streams.

22. "Water use evaluation" means an evaluation of the efficiency of indoor water-using devices, including, but not limited to, measurement of flow rates for all existing showerheads, faucets, and toilets, inspection for leaks, and providing written recommendations to improve the efficiency of the indoor water-using fixtures and devices and/or an evaluation of the performance of an irrigation system, including, but not limited to, inspection for leaks, reporting of overspray or runoff, and providing written recommendations to improve the performance of the irrigation system. (N)

(continued)

Rule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 3) (T)

D. ENFORCEMENT (N)

Each Stage of this Rule establishes certain restrictions on the use of potable water. Violating the restrictions set forth in a particular Stage while it is in effect is declared a non-essential, wasteful use of potable water. Subject to the schedule and conditions outlined below, Cal Water is authorized to install a flow-restricting device on the service line of any customer when its personnel verify a customer is using potable water for non-essential, wasteful uses. No person shall have any right or claim in law or in equity, against Cal Water because of, or as a result of, any matter or thing done or threatened to be done pursuant to the restrictions on using potable water for non-essential, wasteful uses.

1. FIRST VIOLATION: Cal Water shall provide the customer with a written notice of violation.

2. SECOND VIOLATION: If Cal Water verifies that the customer has used potable water for non-essential, wasteful uses after having been notified of the first violation, Cal Water shall provide the customer with a second written notice of violation and is authorized to install a flow-restricting device on the customer's service line. Cal Water shall not be held liable for any injuries, damages, and/or consequences arising from the installation of a flow restricting device.

3. NOTICES OF VIOLATION:

   A. Written notices of violation provided to customers pursuant to this Rule shall document the verified violation and alert the customer to the fact that future violations of the restricted uses of potable water may result in the installation of a flow-restricting device on the customer's service line or the discontinuation of the customer's service.

   B. If Cal Water elects to install a flow-restricting device on a customer's service line, the written notice of violation shall explain that a flow-restricting device has or will be installed on the customer's service line, document the steps the customer must take in order for the flow-restricting device to be removed, and explain that after the flow-restricting device is removed, it may be reinstalled, without further notice, if the customer is again verified by Cal Water's personnel to be using potable water for non-essential, wasteful uses.

4. FLOW RESTRICTING DEVICE CONDITIONS: The installation of a flow-restricting devide on a customer's service line is subject to the following conditions:

   a. The device shall be capable of providing the premise with a minimum of 3 Ccf per person, per month, based upon the U.S. Census calculation of the average number of people in a household in the area.

   b. The device may only be removed by Cal Water, and only after a minimum three-day period has elapsed.

   c. Any tampering with the device may result in the discontinuation of the customer's water service and the customer being charged for any damage to Cal Water's equipment or facilities and any required service visits. (N)

(continued)

Rule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 4) (T)

D. ENFORCEMENT (Continued) (N)

d. After the removal of the device, if Cal Water verifies that the customer is using potable water for non-essential, wasteful uses, Cal Water may install another flow-restricting device without prior notice. This device may remain in place until water supply conditions warrant its removal. If, despite the installation of the device, Cal Water verifies that the customer is using potable water for non-essential and, unauthorized wasteful uses, then Cal Water may discontinue the customer's water service, as provided in its Rule No. 11.

5. FLOW-RESTRICTING DEVICE REMOVAL CHARGES: The charge to customers for removal of a flow-restricting device installed pursuant to this Rule is $100 during normal business hours, and $150 for the device to be removed outside of normal business hours.

E. WASTEFUL USES OF WATER

Except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency, customers are prohibited, at all times, from using potable water for the following actions, as each is declared a non-essential, wasteful use of water:

1. Use of potable water through a broken or defective plumbing fixture or irrigation system when Cal Water has notified the customer in writing to repair the broken or defective plumbing fixture or irrigation system, and the customer has failed to effect such repairs within seven (7) business days of receipt of such notice;
2. The application of potable water to landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures;
3. The use of a hose that dispenses potable water to wash vehicles, including cars, trucks, buses, boats, aircraft, and trailers, whether motorized or not, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use.

F. MANDATORY STAGED RESTRICTIONS OF WATER USE

1. ADOPTION OF STAGED MANDATORY RESTRICTIONS: Cal Water may implement the following staged mandatory restrictions of water use, after notifying the Director of the Commission's Division of Water and Audits (DWA), by a Tier 1 advice letter in both hard-copy and emailed formats, of Cal Water's intent to implement a particular stage, if:
   a. Water supplies are projected to be insufficient to meet normal customer demand by Cal Water; or
   b. A water supply shortage or threatened shortage exists; or
   c. Water supplies are curtailed by a wholesale water supplier; or
   d. Directed to do so under a duly adopted emergency regulation by the Commission or other authorized government agencies. (N)

(continued)

Rule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 5)

F. MANDATORY STAGED RESTRICTIONS OF WATER USE (Continued)

2. PUBLIC NOTICE: Thirty (30) days prior to implementing a mandatory staged reduction in water use in this Rule, Cal Water shall notify its customer of the requirements of the particular stage implemented by Cal Water by bill insert, direct mailing, email, or bill message directing the customer to additional information on Cal Water's website.

3. STAGE 1 WATER SHORTAGE: A Stage 1 Water Shortage occurs when Cal Water, the Commission, a wholesale water supplier, or other authorized government agency determines that measures are needed to reduce water consumption by customers served by public water suppliers. In addition to the prohibitions outlined in **Section E**, the following restrictions may be imposed by Cal Water, except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency:

   a. Outdoor Irrigation Restrictions (Stage 1)

      i. Irrigating ornamental landscapes with potable water is limited to no more than **three (3) days** per week, on a schedule established and posted by Cal Water on its website or otherwise provided to customers by bill message, bill insert, direct mail, or email, or as follows:

         1. Customers with even-numbered addresses may irrigate on Saturdays, Tuesdays, and Thursdays.
         2. Customers with odd-numbered addresses may irrigate on Sundays, Wednesdays, and Fridays.
         3. Customers without a street address may irrigate on Saturdays, Tuesdays, and Thursdays.
         4. Notwithstanding the foregoing restrictions, irrigation of special landscape areas or commercial nurseries may occur as needed, provided that the customer who wishes to irrigate a special landscape area or commercial nursery presents Cal Water with a plan to achieve water use reductions commensurate with those that would be achieved by complying with foregoing restrictions.
         5. Notwithstanding the foregoing restrictions, when a city, county, or other local public agency in one of Cal Water's service areas duly adopts restrictions on the number of days or hours of the day that customers may irrigate which are different than those adopted by Cal Water, Cal Water may enforce the city, county, or other local public agency's restrictions.

      ii. Irrigating ornamental landscape with potable water is prohibited during the hours between **8:00 a.m. and 6:00 p.m**.

      iii. The foregoing restrictions do **not** apply to:

         1. Landscape irrigation zones that exclusively use drip irrigation systems and/or micro spray irrigation system; (N)

(continued)

Rule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN (continued)

F. MANDATORY STAGED RESTRICTIONS OF WATER USE (Continued)

[Stage 1 (cont.)]

2. Irrigating ornamental landscapes with the use of a hand-held bucket or similar container, with a continuously monitored hose which is fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored, or for the express purpose of adjusting or repairing an irrigation system.

b. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing fixture(s) or irrigation system(s) must be repaired within **five (5) business days** of written notification by Cal Water, unless other arrangements are made with Cal Water.

c. **Prohibited** Uses of Water: Customers are prohibited from using potable water for the following actions:

i. The application of potable water to driveways and sidewalks;

ii. The use of potable water in a water feature, except where the water is part of a recirculating system;

iii. The application of potable water to outdoor landscapes during and within forty-eight (48) hours after measurable rainfall.

d. Other duly adopted restrictions on the use potable water as prescribed from time to time by the Commission or other authorized government agencies are incorporated herein by reference.

4. STAGE 2 WATER SHORTAGE: A Stage 2 Water Shortage occurs when the Stage 1 Water Shortage restrictions are deemed insufficient to achieve identified water use goals established by Cal Water, the Commission, a wholesale water supplier, or other authorized government agency. In addition to the prohibited wasteful water use practices listed in Section D, the following restrictions may be imposed by Cal Water, except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency. Differences from or additions to the previous Stage are underlined.

a. Outdoor Irrigation Restrictions (Stage 2)

i. Irrigating ornamental landscapes with potable water is limited to no more than **three (3) days** per week, on a schedule established and posted by Cal Water on its website or otherwise provided to customers by bill message, bill insert, direct mail, or email, or as follows:

1. Customers with even-numbered addresses may irrigate on Saturdays, Tuesdays, and Thursdays.

2. Customers with odd-numbered addresses may irrigate on Sundays, Wednesdays, and Fridays. (N)

(continued)

Rule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 7)

F. MANDATORY STAGED RESTRICTIONS OF WATER USE (Continued)

[Stage 2 (cont.)]

3. Customers without a street address may irrigate on Saturdays, Tuesdays, and Thursdays.

4. Notwithstanding the foregoing restrictions, irrigation of special landscape areas or commercial nurseries may occur as needed, provided that the customer who wishes to irrigate a special landscape area or commercial nursery presents Cal Water with a plan to achieve water use reductions commensurate with those that would be achieved by complying with foregoing restrictions.

5. Notwithstanding the foregoing restrictions, when a city, county, or other public agency in one of Cal Water's service areas duly adopts restrictions on the number of days or hours of the day that customers may irrigate which are different than those adopted by Cal Water, Cal Water may enforce the city, county, or other local public agency's restrictions.

ii. Irrigating ornamental landscape with potable water is prohibited during the hours between **8:00 a.m. and 6:00 p.m**.

iii. The foregoing restrictions do **not** apply to:

1. Landscape irrigation zones that exclusively use drip irrigation systems and/or micro spray irrigation system;

2. Irrigating ornamental landscapes with the use of a hand-held bucket or similar container, a continuously monitored hose which is fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored, or for the express purpose of adjusting or repairing an irrigation system.

b. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing fixture(s) or irrigation system(s) must be repaired within **three (3) business days** of written notification by Cal Water, unless other arrangements are made with Cal Water.

c. **Prohibited** Uses of Water: Customers are prohibited from using potable water for the following actions:

i. The application of potable water to driveways and sidewalks;

ii. The use of potable water in a water feature, except where the water is part of a recirculating system;

iii. The application of potable water to outdoor landscapes during and within forty-eight (48) hours after measurable rainfall;

iv. The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased; (N)

(continued)

Rule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN (continued)

F. MANDATORY STAGED RESTRICTIONS OF WATER USE (Continued)

[Stage 2 (cont.)]

v. Irrigation of ornamental landscape on public street medians;

vi. Irrigation outside of newly constructed homes and buildings with potable water in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.

d. Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guest room using clear and easily understood language.

e. Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds with potable water is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to the implementation of any staged mandatory restrictions of water use as described in this Rule.

f. Other duly adopted restrictions on the use of potable water as prescribed from time to time by the Commission or other authorized government agencies are incorporated herein by reference.

5. STAGE 3 WATER SHORTAGE: A Stage 3 Water Shortage occurs when the Stage 2 Water Shortage restrictions are deemed insufficient to achieve identified water use goals established by Cal Water, the Commission, a wholesale water supplier, or other authorized government agency. In addition to the prohibited wasteful water use practices listed in Section D, the following restrictions may be imposed by Cal Water, except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency. Differences from or additions to the previous Stages are underlined.

a. Outdoor Irrigation Restrictions

i. Irrigating ornamental landscapes with potable water is limited to no more than **two (2) days** per week, on a schedule established and posted by Cal Water on its website or otherwise provided to customers by bill message, bill insert, direct mail, or email, or as follows:

1. Customers with even-numbered addresses may irrigate on Saturdays and Tuesdays (previous Stages allowed Thursdays as well).

2. Customers with odd-numbered addresses may irrigate on Sundays and Wednesdays (previous Stages allowed Fridays as well).

3. Customers without a street address may irrigate on Saturdays and Tuesdays (previous Stages allowed Thursdays as well). (N)

(continued)

Rule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 9)

F. MANDATORY STAGED RESTRICTIONS OF WATER USE (Continued)

[Stage 3 (cont.)]

4. Notwithstanding the foregoing restrictions, irrigation of special landscape areas or commercial nurseries may occur as needed, provided that the customer who wishes to irrigate a special landscape area or commercial nursery presents Cal Water with a plan to achieve water use reductions commensurate with those that would be achieved by complying with foregoing restrictions.

5. Notwithstanding the foregoing restrictions, when a city, county, or other local public agency in one of Cal Water's service areas duly adopts restrictions on the number of days or hours of the day that customers may irrigate which are different than those adopted by Cal Water, Cal Water may enforce the city, county, or other local public agency's restrictions.

ii. Irrigating ornamental landscape with potable water is prohibited during the hours between **8:00 a.m. and 6:00 p.m.**

iii. The foregoing restrictions do **not** apply to:

1. Landscape irrigation zones that exclusively use drip irrigation systems and/or micro spray irrigation system;

2. Irrigating ornamental landscapes with the use of a hand-held bucket or similar container, a continuously monitored hose which is fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored, or for the express purpose of adjusting or repairing an irrigation system.

b. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing fixtures and/or irrigation system must be repaired within **two (2) business days** of written notification by Cal Water, unless other arrangements are made with Cal Water.

c. **Prohibited** Uses of Water: Customers are prohibited from using potable water for the following actions:

i. The application of potable water to driveways and sidewalks;

ii. The use of potable water in a water feature, except where the water is part of a recirculating system;

iii. The application of potable water to outdoor landscapes during and within forty-eight (48) hours after measurable rainfall;

iv. The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased;

v. Irrigation of ornamental turf on public street medians;

vi. Irrigation outside of newly constructed homes and buildings with potable water in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.

vii. Use of potable water for street cleaning with trucks, except for initial wash-down for construction purposes (if street sweeping is not feasible); (N)

(continued)

Rule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN (continued)

F. MANDATORY STAGED RESTRICTIONS OF WATER USE (Continued)

[Stage 3 (cont.)]

viii. Use of potable water for construction purposes, such as consolidation of backfill, dust control, or other uses unless no other source of water or other method can be used.

d. Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guest room using clear and easily understood language.

e. Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds with potable water is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to the implementation of any staged mandatory restrictions of water use as described in this Rule.

f. Other duly adopted restrictions on the use of potable water as prescribed from time to time by the Commission or other authorized government agencies are incorporated herein by reference.

6. STAGE 4 WATER SHORTAGE: A Stage 4 Water Shortage occurs when the Stage 3 Water Shortage restrictions are deemed insufficient to achieve identified water use goals established by Cal Water, the Commission, a wholesale water supplier, or other authorized government agency. In addition to the prohibited wasteful water use practices listed in Section D, the following restrictions may be imposed by Cal Water, except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency. Differences from or additions to the previous Stage are underlined.

a. Irrigating ornamental landscape with potable water is prohibited, except when a hand-held bucket or a similar container, or a continuously monitored hose which is fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored is used to maintain vegetation, including trees and shrubs.

b. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing fixtures or irrigation system must be repaired within **one (1) business day** of written notification by Cal Water, unless other arrangements are made with Cal Water.

Prohibited Uses of Water: Customers are prohibited from using potable water for the following actions:

i. The application of potable water to driveways and sidewalks;

ii. The use of potable water in a water feature, except where the water is part of a recirculating system;

iii. The application of potable water to outdoor landscapes during and within forty-eight (48) hours after measurable rainfall; (N)

(continued)

Rule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN (continued)

F. MANDATORY STAGED RESTRICTIONS OF WATER USE (Continued)

[Stage 4 (cont.)]

iv. The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased;

[Note that items previously identified as (v) and (vi) in Stage 3 have been eliminated.]

v. Use of potable water for street cleaning with trucks (the previous Stage allowed certain exceptions);

vi. Use of potable water for construction purposes, such as consolidation of backfill, dust control, or other uses (the previous Stage allowed certain exceptions).

c. Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guest room using clear and easily understood language.

d. Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds with potable water is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to the implementation of any staged mandatory restrictions of water use as described in this Rule.

f. Other duly adopted restrictions on the use of utility-supplied potable water as prescribed from time to time by the Commission or other authorized government agencies, commissions, or officials are incorporated herein by reference.

G. ADOPTION OF STAGED MANDATORY WATER USE REDUCTIONS (for Schedule 14.1)

1. ADDITION OF SCHEDULE 14.1: If, in the opinion of Cal Water, more stringent water conservation measures are required due to supply conditions or government directive, Cal Water may request the addition of a Schedule No. 14.1 – Staged Mandatory Water Use Reductions, via a Tier 2 advice letter.

   A. Cal Water may not activate Schedule No. 14.1 until it has been authorized to do so by the California Public Utilities Commission, as delegated to its Division of Water and Audits.

   B. A Schedule No. 14.1 that has been authorized by the California Public Utilities Commission shall remain dormant until triggered by specific conditions detailed in the Schedule 14.1 tariff and Cal Water has requested and received authorization for activating a stage by the California Public Utilities Commission. (N)

(continued)

Rule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN (continued)

G. ADOPTION OF STAGED MANDATORY WATER USE REDUCTIONS (for Schedule 14.1) (continued)

c. Notice of the Tier 2 advice letter and associated public participation hearing, if required, shall be provided to customers through a bill insert or a direct mailing, as set forth in Subsection 5 (Public Notice) below.

d. Cal Water shall comply with all requirements of Sections 350-358 of the California Water Code.

e. The Tier 2 advice letter requesting the addition of a Schedule No. 14.1 shall include, but not be limited to:

i. A proposed Schedule No. 14.1 tariff, which shall include but not be limited to:

1. Applicability,
2. Territory applicable to,
3. A detailed description of each stage of water budgets (the number of stages requested for a ratemaking area may vary depending on the specifics of the water shortage event),
4. A detailed description of the trigger(s) that activates each stage of water budgets,
5. A detailed description of each water use restriction for each stage of water budgets,
6. Water use violation levels, written warning levels, associated fines, if applicable, and exception procedures,
7. Conditions for installation of a flow restrictor,
8. Charges for removal of flow restrictors, and
9. Special conditions

ii. Justification for, and documentation and calculations in support of the water budgets.

2. Conditions for Activating Schedule No. 14.1: Cal Water may file a Tier 1 advice letter to request activation of a particular stage of its Schedule No. 14.1 tariff if:

a. Cal Water, the California Public Utilities Commission, wholesale water supplier, or other government agency declares an emergency requiring mandatory water budgets, mandatory water rationing, or mandatory water allocations; or

b. A government agency declares a state of emergency in response to severe drought conditions, earthquake or other catastrophic event that severely reduces Cal Water's water supply; or

c. Cal Water is unable to achieve water conservation targets set by itself; or

d. Water conservation targets set by itself or a governing agency are insufficient; or

e. Cal Water chooses to subsequently activate a different stage of its Schedule No. 14.1 tariff.

(continued)

Rule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN (continued)

(Page 13)

G. ADOPTION OF STAGED MANDATORY WATER USE REDUCTIONS (for Schedule 14.1) (continued)

a. Include, but not be limited to, a justification for activating the particular stage of mandatory water use reductions, as well as the period during which the particular stage will be in effect.

b. Be accompanied by the customer notification measures detailed in sub-section 5 (Public Notice) below.

4. De-Activating Schedule No. 14.1: When Schedule No. 14.1 is activated and Cal Water determines that water supplies are again sufficient to meet normal demands, and mandatory water use reductions are no longer necessary, Cal Water shall seek the approval of the California Public Utilities Commission, via a Tier 1 advice letter, to de-activate the particular stage of mandatory water use reductions that had been authorized.

5. Public Notice

a. When Cal Water requests the addition of a Schedule 14.1 – Staged Mandatory Water Use Reductions Tariff, via a Tier 2 advice letter, it shall provide notice of the Tier 2 advice letter and associated public hearing provided to customers through bill inserts or direct mailing, and it shall comply with all requirements of Sections 350-358 of the California Water Code (CWC), including but not limited to the following:

i. In order to be in compliance with both the General Order 96-B and CWC, notice shall be provided via both newspaper and bill insert/direct mailing.

ii. One notice shall be provided for each advice letter filed, that includes both notice of the filing of the Tier 2 advice letter as well as the details of the public hearing (date, time, place, etc.).

iii. The public meeting shall be held after the Tier 2 advice letter is filed, and before the Commission authorizes the addition of Schedule 14.1 to the tariff except in cases of emergency water shortages approved by DWA.

iv. Cal Water shall consult with Division of Water and Audits staff prior to filing advice letter, in order to determine details of public meeting.

b. In the event that Schedule No. 14.1- Staged Mandatory Water Use Reductions Tariff is triggered, and Cal Water requests activation through the filing of a Tier 1 advice letter, Cal Water shall notify its customers and provide each customer with a summary of Schedule No. 14.1 by means of bill insert or direct mailing. Notification shall take place prior to imposing any penalties associated with this plan. If activation of Schedule No. 14.1 occurs one year or more since the public hearing associated with adding Schedule 14.1 to its tariffs, then Cal Water shall conduct a public hearing pursuant to California Water Code Section 351 prior to activating a stage of its Mandatory Water Use Reduction Tariff.

c. During the period that a stage of Schedule No. 14.1 is activated, Cal Water shall provide customers with updates in at least every other bill, regarding its water supply status and the results of customers' conservation efforts. (N)

[end]

Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES

A. APPLICABILITY

1. This schedule applies to all of California Water Service's regulated ratemaking areas in California, as well as Grand Oaks Water.

B. GENERAL INFORMATION

1. All expenses incurred by California Water Service to implement Rule 14.1, and Schedule 14.1, and requirements of the California State Water Resources Control Board ("Water Board") that have not been considered in a General Rate Case or other proceeding shall be accumulated by Cal Water in a separate memorandum account, authorized in Resolution W-4976, for disposition as directed or authorized from time to time by the Commission.
2. All monies collected by Cal Water through waste of water penalties established in this schedule shall be recorded in the appropriate memorandum account and used to offset the expenses described in Section 1 above.
3. Except in the case of Grand Oaks, all monies collected by Cal Water through drought surcharges, as established by the Mandatory Water Budgets found in Schedule 14.1, shall be recorded in the appropriate Water Revenue Adjustment Mechanism ("WRAM") account and used to offset under-collected revenues.
4. To the extent that any provision in this Schedule is inconsistent with Rule 14.1, the provisions of this Schedule apply. (D)
5. On April 1, 2015, the Governor of the State of California issued Executive Order B-29-15 due to severe drought conditions. The Executive Order, among other requirements, directs the State Water Resources Control Board ("Water Board") to impose restrictions on urban water suppliers like Cal Water to achieve a statewide 25% reduction in potable urban usage, as compared with the amount used in 2013, through February 2016. (L) (D)

   Urban water suppliers must develop rate structures and other pricing mechanisms, such as surcharges and penalties, to achieve 25% water conservation. (L)
6. On May 5, 2015, the Water Board issued an Emergency Regulation by Resolution No. 2015-0032 due to continuing drought conditions with specific water use reductions, by service area, and prohibitions on how end-use customers can use potable water. On May 7, 2015, the California Public Utilities Commission ("Commission") issued Resolution W-5041 ordering compliance with the mandates of the Governor and the Water Board. (L)
7. On November 13, 2015, the Governor of the State of California issued Executive Order B-36-15 that directed the Water Board to, if drought conditions persist through January 2016, extend until October 31, 2016 restrictions to achieve a statewide reduction in potable usage. (N)
8. On February 2, 2016, the Water Board adopted an extended and revised Emergency Regulation due to continuing drought conditions. On February 11, 2016, the Commission issued Resolution W-5082 ordering compliance with the mandates of the Governor and the Water Board. (N)

C. DEFINITIONS

For the purposes of this Schedule, the following terms have the meanings set forth in this section.
(These are the same as in Rule 14.1, unless otherwise specified.)

1. "Commercial nursery" means the use of land, buildings or structures for the growing and/or storing of flowers, fruit trees, ornamental trees, vegetable plants, shrubs, trees and similar vegetation for the purpose of transplanting, for use as stock or grafting, and includes the retail sale or wholesale distribution of such items directly from the premises/lot.

(continued)

Schedule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES

C. DEFINITIONS (Continued)

2. "Drip irrigation system" means a non-spray, low-pressure, and low volume irrigation system utilizing emission devices with a precipitation or flow rate measured in gallons per hour (GPH), designed to slowly apply small volumes of water at or near the root zone of plants or other landscaping.
3. "Flow rate" means the rate at which water flows through pipes, valves, and emission devices, measured in gallons per minute (GPM), gallons per hour (GPH), inches per hour (IPH), hundred cubic feet (Ccf), or cubic feet per second (CFS).
4. "Flow-restricting device" means valves, orifices, or other devices that reduce the flow of potable water through a service line, which are capable of passing a minimum of 3 Ccf per person, per month, based upon the U.S. Census calculation of the average number of people in a household in the area.
5. "High-efficiency sprinkler systems" means an irrigation system with emission devices, such as sprinkler heads or nozzles, with a precipitation or flow rate no greater than one IPH.
6. "Irrigation" means the application of potable water by artificial means to landscape.
7. "Irrigation system" means the components of a system meant to apply water to an area for the purpose of irrigation, including, but not limited to, piping, fittings, sprinkler heads or nozzles, drip tubing, valves, and control wiring.
8. "Landscape" means all of the outdoor planting areas, turf areas, and water features at a particular location.
9. "Measureable rainfall" means any amount of precipitation of more than one-tenth of an inch (0.1").
10. "Micro spray irrigation system" means a low-pressure, low-volume irrigation system utilizing emission devices that spray, mist, sprinkle, or drip with a precipitation or flow rate measured in GPH, designed to slowly apply small volumes of water to a specific area.
11. "Ornamental landscape" means shrubs, bushes, flowers, ground cover, turf, lawns, and grass planted for the purpose of improving the aesthetic appearance of property, but does not include crops or other agricultural products or special landscape areas.
12. "Ornamental turf" means a ground cover surface of grass that can be mowed and is planted for the purpose of improving the aesthetic appearance of the property, but does not include crops or other agricultural products or special landscape areas.
13. "Plumbing fixture" means a receptacle or device that is connected to a water supply system, including, but not limited to, pipes, toilets, urinals, showerheads, faucets, washing machines, water heaters, tubs, and dishwashers.
14. "Potable water" means water supplied by Cal Water which conforms to the federal and state standards for human consumption.
15. "Properly programmed" means a smart irrigation controller that has been programmed according to the manufacturer's instructions and site-specific conditions.
16. "Real-time water measurement device" means a device or system that provides regularly updated electronic information regarding the customer's water use.
17. "Runoff" means water which is not absorbed by the soil or landscape to which it is applied and flows from the landscape onto other areas.
18. "Smart irrigation controller" means an automatic device used to remotely control valves that operate an irrigation system that has been tested by an American National Standards Institute accredited third-party certifying body or (N)

(continued)

Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

C. DEFINITIONS (Continued)

laboratory in accordance with the Environmental Protection Agency's WaterSense program (or an analogous successor program), and certified by such body or laboratory as meeting the performance and efficiency requirements of such program, or the more stringent performance and efficiency requirements of another similar program.

19. "Special landscape area" means an area of the landscape dedicated solely to edible plants and areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing surface.
20. "Turf" means a ground cover surface of grass that can be mowed.
21. "Water feature" means a design element where open, artificially supplied water performs an aesthetic or recreation feature, including, but not limited to, ponds, lakes, waterfalls, fountains, and streams.
22. "Water use evaluation" means an evaluation of the efficiency of indoor water-using devices, including, but not limited to, measurement of flow rates for all existing showerheads, faucets, and toilets, inspection for leaks, and providing written recommendations to improve the efficiency of the indoor water-using fixtures and devices and/or an evaluation of the performance of an irrigation system, including, but not limited to, inspection for leaks, reporting of overspray or runoff, and providing written recommendations to improve the performance of the irrigation system.

D. WASTE OF WATER PENALTIES

Each Stage of this Schedule establishes certain restrictions on the use of potable water. Violating the restrictions set forth in a particular Stage while it is in effect is declared a non-essential, wasteful use of potable water. Cal Water is authorized to take the following actions when its personnel verify a customer is using potable water for non-essential, wasteful uses. No person shall have any right or claim in law or in equity, against Cal Water because of, or as a result of, any matter or thing done or threatened to be done pursuant to the restrictions on using potable water for non-essential, wasteful uses.

Note: When a Stage in this Schedule has been activated, Section D in this Schedule supersedes Section D (Enforcement) in Rule 14.1.

1. **FIRST VIOLATION:** Cal Water shall provide the customer with a written notice of violation. In addition, Cal Water is authorized to take the following actions:
   a. If the customer currently receives service through a metered connection, install a real-time water measurement device on the customer's service line and provide the customer with access to information from the device. The cost of the device, including installation and ongoing operating costs, may be billed to the customer, and nonpayment may result in discontinuance of service. (C)
   b. If the customer does not currently receive service through a metered connection, install a water meter on the customer's service line, charge the customer for water use pursuant to Cal Water's metered service tariffs and rules, and install a real-time water measurement device on the customer's service line and provide the customer with access to information from the device. The cost of the device, including installation and ongoing operating costs, may be billed to the customer, and nonpayment may result in discontinuance of service. (C)
2. **SECOND VIOLATION:** If Cal Water verifies that the customer has used potable water for non-essential, wasteful uses after having been notified of the first violation, Cal Water shall provide the customer with a second written notice of violation. In addition to the actions prescribed under the first violation above, Cal Water is authorized to take the following actions:
   a. Apply the following waste of water penalties, which are in addition to any other charges authorized by this Schedule or other Cal Water tariffs.
      i. If Stage 1 is in effect, $25 (Stage 1 is detailed below in Section E).
      ii. If Stage 2 is in effect, $50 (Stage 2 is detailed below in Section F).

(continued)

Schedule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

D. WASTE OF WATER PENALTIES (Continued)

iii. If Stage 3 is in effect, $100 (Stage 3 is detailed below in Section G).
iv. If Stage 4 is in effect, $200 (Stage 4 is detailed below in Section H).

b. At its sole discretion, waive the waste of water penalty if the customer participates in a water use evaluation provided by Cal Water and/or provides documentation to Cal Water proving that a drip irrigation system, micro spray irrigation system, high-efficiency sprinkler system, or properly programmed smart irrigation controller has been installed, after a notice of violation was delivered, and is in use at the customer's service address.

3. THIRD VIOLATION: If Cal Water verifies that the customer has used potable water for non-essential, wasteful uses after having been notified of the second violation, Cal Water shall provide the customer with a third written notice of violation. In addition to the actions prescribed under the first and second violation above, Cal Water is authorized to take the following actions:

a. Apply the following waste of water penalties, which are in addition to any other charges authorized by this Schedule or other Cal Water tariffs.
i. If Stage 1 is in effect, $50 (Stage 1 is detailed below in Section E).
ii. If Stage 2 is in effect, $100 (Stage 2 is detailed below in Section F).
iii. If Stage 3 is in effect, $200 (Stage 3 is detailed below in Section G).
iv. If Stage 4 is in effect, $400 (Stage 4 is detailed below in Section H).

b. At its sole discretion, waive the waste of water surcharge if the customer participates in a water use evaluation provided by Cal Water and/or provides documentation to Cal Water proving that a drip irrigation system, micro spray irrigation system, high-efficiency sprinkler system, or properly programmed smart irrigation controller has been installed, after notice of violations have been delivered, and is in use at the customer's service address.

4. FOURTH VIOLATION: If Cal Water verifies that the customer has used potable water for non-essential, wasteful uses after having been notified of the third violation, Cal Water shall provide the customer with a fourth written notice of violation. In addition to actions set forth in previous violations prescribed above, Cal Water is authorized to install a flow-restricting device on the customer's service line. Cal Water shall not be held liable for any injuries, damages, and/or consequences arising from the installation of a flow restricting device.

5. EGREGIOUS VIOLATIONS: Notwithstanding the foregoing framework for penalties, customers who Cal Water has verified are egregiously using potable water for non-essential, wasteful uses are subject to having a flow-restricting device installed on their service line. After providing the customer with one notice of egregious violation, either by direct mail or door hanger, which documents the egregious use of potable water for non-essential, wasteful uses and explains that failure to correct the violation may result in the installation of a flow-restricting device on the customer's service line, Cal Water is authorized to install a flow-restricting device on the customer's service line. Cal Water shall not be held liable for any injuries, damages, and/or consequences arising from the installation of a flow restricting device.

6. NOTICES OF VIOLATION:

a. Unless otherwise specified, written notices of violation provided to customers pursuant to this Schedule shall document the verified violation and alert the customer to the fact that future violations of the restricted uses of potable water may result in a real-time water measurement device being installed on the customer's service line at the customers expense, waste of water surcharges being applied to the customer's bill, the installation of a flow-restricting device on the customer's service line, or the discontinuation of the customer's service. (N)

(continued)

Schedule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

D. WASTE OF WATER PENALTIES (Continued)

b. If Cal Water elects to install a flow-restricting device on a customer's service line, the written notice shall document the steps the customer must take in order for the flow-restricting device to be removed, and shall explain that after the flow-restricting device is removed, it may be reinstalled, without further notice, if the customer is again verified by Cal Water to be using potable water for non-essential, wasteful uses.

7. FLOW RESTRICTING DEVICE CONDITIONS: The installation of a flow-restricting device on a customer's service line is subject to the following conditions:

a. The device shall be capable of providing the premise with a minimum of 3 Ccf per person, per month, based upon the U.S. Census calculation of the average number of people in a household in the area.

b. The device may only be removed by Cal Water, and only after a minimum three-day period has elapsed.

c. Any tampering with the device may result in the discontinuation of the customer's water service and the customer being charged for any damage to Cal Water's equipment or facilities and any required service visits.

d. After the removal of the device, if Cal Water's personnel verify that the customer is using potable water for non-essential, wasteful uses, Cal Water may install another flow-restricting device without prior notice. This device shall remain in place until water supply conditions warrant its removal. If, despite the installation of the device, Cal Water's personnel verifies that the customer is using potable water for non-essential, wasteful uses, then Cal Water may discontinue the customer's water service, as provided in its Rule No. 11.

8. FLOW-RESTRICTING DEVICE REMOVAL CHARGES: The charge to customers for removal of a flow-restricting device installed pursuant to this Schedule is $100 during normal business hours, and $150 for the device to be removed outside of normal business hours.

E. STAGE ONE WATER USE RESTRICTIONS

1. WASTEFUL USES OF WATER (STAGE 1)

The following restrictions may be imposed by Cal Water, except where necessary to address an immediate health or safety need, or to comply with a term or condition in a permit issued by a state or federal agency:

a. Outdoor Irrigation Restrictions (Stage 1)

i. Irrigating ornamental landscapes with potable water is limited to no more than **three (3) days per week,** on a schedule established and posted by Cal Water on its website or otherwise provided to customers by bill message, bill insert, direct mail, or email, or as follows:

1. Customers with even-numbered addresses may irrigate on Saturdays, Tuesdays, and Thursdays.
2. Customers with odd-numbered addresses may irrigate on Sundays, Wednesdays, and Fridays.
3. Customers without a street address may irrigate on Saturdays, Tuesdays, and Thursdays. (N)

(continued)

Schedule No. 14.1 (N)

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

E. STAGE ONE WATER USE RESTRICTIONS (Continued)

4. Notwithstanding the foregoing restrictions, irrigation of special landscape areas or commercial nurseries may occur as needed, provided that the customer who wishes to irrigate a special landscape area or commercial nursery presents Cal Water with a plan to achieve water use reductions commensurate with those that would be achieved by complying with foregoing restrictions.
5. Notwithstanding the foregoing restrictions, when a city, county, or other local public agency in one of Cal Water's service areas duly adopts restrictions on the number of days or hours of the day that customers may irrigate that are different than those adopted by Cal Water, Cal Water may enforce the city, county, or other local public agency's restrictions.

ii. Irrigating ornamental landscape with potable water is prohibited during the hours between **8:00 a.m. and 6:00 p.m.**

iii. The foregoing restrictions do **not** apply to:
1. Landscape irrigation zones that exclusively use drip irrigation systems and/or micro spray irrigation system;
2. Irrigating ornamental landscapes with the use of a hand-held bucket or similar container, with a continuously monitored hose which is fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored, or for the express purpose of adjusting or repairing an irrigation system.

b. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing fixtures and/or irrigation system must be repaired within **five (5) business days** of written notification by Cal Water, unless other arrangements are made with Cal Water.

c. Prohibited Uses of Water: Customers are prohibited from using potable water for the following actions:
i. The application of potable water to landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures;
ii. The use of a hose that dispenses potable water to wash vehicles, including cars, trucks, buses, boats, aircraft, and trailers, whether motorized or not, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use.
iii. The application of potable water to driveways and sidewalks;
iv. The use of potable water in a water feature, except where the water is part of a recirculating system;
v. The application of potable water to outdoor landscapes during and within forty-eight (48) hours after measurable rainfall (see Definitions);
vi. The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased;
vii. Irrigation of ornamental turf on public street medians with potable water;
viii. Irrigation outside of newly constructed homes and buildings with potable water in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.

d. Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guest room using clear and easily understood language. (N)

(continued)

Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

E. STAGE ONE WATER USE RESTRICTIONS (Continued)

[Stage 1 (cont.)]

e. Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds with potable water is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to the implementation of any staged mandatory restrictions of water use as described in this Schedule.

f. Other duly adopted restrictions on the use of potable water as prescribed from time to time by the Commission or other authorized government agencies are incorporated herein by reference.

F. STAGE TWO WATER USE RESTRICTIONS

1. MANDATORY WATER BUDGETS AND BANKING (STAGE 2)

As described in greater detail below, the Water Board has mandated reductions in potable urban usage, as compared with the amount used in 2013, in each of Cal Water's service areas. Water suppliers must develop rate structures and other pricing mechanisms, such as surcharges and penalties, to achieve these mandated reductions (T)

a. **Mandatory Reduction Percentages**: The Water Board has established increasing levels of required water reduction for each service areas based upon the residential per capita per day use (R-GPCD) in that service area for the three summer months of July through September 2014. The Water Board's approach considers the relative per capita water usage in each service area and requires that those areas with high per-capita use achieve proportionally greater reductions than those with low use. The Water Board has also allowed for adjustments to these required water reductions based on specific criteria.

Each month, the Water Board determines whether a service area has met its mandatory reduction percentage by calculating cumulative savings in the service area since June 2015, and comparing those with the amount of water used during the same months in 2013. (T)

b. **Customer Water Budgets:** Each customer with metered potable water service (residential and non-residential customers) will receive an individualized "Water Budget" for each billing period. (T)

i. The Water Budget will be based on the units of water (CCF) that customer used in the same billing period in 2013, minus the Mandatory Reduction Percentage established by the Water Board for that customer's service area. (T) A customer's Water Budget will vary according to their monthly water usage in 2013. (C) Cal Water shall notify its customers of any changes to the Mandatory Reduction Percentage by the Water Board through bill inserts or direct mailings prior to applying the changed percentage in the requirements in this Schedule, consistent with the "Update" process described in Section F.1.d.(iv) of this Schedule. Cal Water shall also include the current Mandatory Reduction Percentage in effect for each service area on its website. (C)

ii. If a customer was not in his or her current location in 2013, the average monthly consumption will be used as a starting budget. If customers have a unique situation and the average budget is not appropriate, they can file an appeal to have their Water Budget increased. Cal Water may also modify the starting budget to reflect suitable use. (T)

iii. The Water Budget for the following billing period will appear on each customer's water bill. (T) Customers will also be able to find their Water Budgets, and their individual water use history dating back to 2013, by going to usage.calwater.com (do not include "www"), and entering their account number, street (or house) number, and ZIP code. (T)

(D)

(continued)

Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

F. STAGE TWO WATER USE RESTRICTIONS (continued) (T)

1. MANDATORY WATER BUDGETS AND BANKING (STAGE 2) (continued) (T)

c. **Minimum Water Budgets**: A minimum monthly amount of water that protects the health and safety of customers will be established for each service area as a Minimum Water Budget for single-family residential customers.

i. No single-family residential customer will have a water budget that is below the threshold of the monthly Minimum Water Budget, even if applying the Mandatory Reduction Percentage to that customer's 2013 usage would result in a lower amount.

ii. The Minimum Water Budget for each service area is identified in **Appendix A**. (For areas with bi-monthly billing and bi-monthly water budgets, the Minimum Water Budget in Appendix A should be doubled for the billing period.)

d. **Drought Surcharges**: If a customer uses more units of potable water (CCF) than their Water Budget in a billing period, that customer's water bill may reflect an additional "Drought Surcharge" for each unit of water over the Water Budget, depending on the amount of excess usage (according to usage tiers described below). (T) (C)

i. **Tier A and Tier B Excess Water Usage:** Excess water usage above a customer's Water Budget may fall into one or both of two tiers – Tier A and Tier B. The amount of usage in Tiers A and B varies by service area, and depends upon whether an area has met its Mandatory Reduction Percentage on a cumulative basis.

For the purposes of Drought Surcharges, each service area will fall into one of two categories – those in compliance with the Mandatory Reduction Percentage, and those not in compliance. There are two sample tables in the last section of this Schedule (**Section I**). The first sample table identifies the Tier A and B usage amounts for those service areas that are in compliance with their Mandatory Reduction Percentage, as of the date specified in **Appendix A**. The second sample table identifies the Tier A and B usage amounts for those service areas that are not in compliance with their Mandatory Reduction Percentage, as of the date specified in **Appendix A**. (C)

ii. **Current Surcharges and Tiers: Appendix A** to this schedule provides the Drought Surcharge rate per unit of water and the excess water usage in Tiers A and B that are currently in effect for each service area. (T) (C)

At this time, Drought Surcharges only apply to excess water usage that falls within "Tier B." Excess water usage in Tier A constitutes a "courtesy" tier to which Drought Surcharges are not applied. As stated below under Water Banking, however, all excess water usage will be applied against a customer's "banked" water amounts, regardless of whether the usage falls within Tier A or Tier B. (C)

Customers will continue to pay the normal tariffed rates for potable water, in addition to any applicable Drought Surcharges. Cal Water retains the right to increase the surcharges if there are changes to the rates in the future. (T) (T)

iii. **Current Compliance Status of Service Area**: **Appendix B** to this schedule provides the Mandatory Reduction Percentage adopted by the Water Board for each area, and the actual cumulative savings for each area, **as of the date specified in Appendix A.** ***Drought Surcharges will be applied based on Tier A and B excess water usage beginning with the first day of each billing period that starts on or after March 31, 2016.*** (C)

iv. **Updates**: An increase in the excess usage designated in Tier A, an increase in Customer Water Budgets, or a decrease in Drought Surcharge rates, are "less restrictive" tariff changes that may be implemented via a Tier 1 advice letter.

A decrease in the excess usage designated in Tier A, a decrease in Customer Water Budgets, or an increase in Drought Surcharge rates are "more restrictive" tariff changes that shall be implemented by filing a Tier 2 advice letter. Cal Water shall notify its customers, and provide each customer with a summary of the changes by means of a bill insert or direct mailing, prior to the effective date of a more restrictive tariff change.

A service area's compliance status, which determines the amount of excess usage designated for Tiers A and B, shall be updated no more than once every 90 days, or to implement different requirements of the Water Board as needed. (C)

(continued)

Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

 (T)

F. STAGE TWO WATER USE RESTRICTIONS (continued)

1. MANDATORY WATER BUDGETS AND BANKING (STAGE 2) (continued) (T)

e. **Water Banking**: Customers will be able to "bank" unused units of water from their water budget for use in future billing periods. (L)

i. Should a customer exceed his or her monthly budget, any banked units of water will be applied to the overage before drought surcharges are imposed.

ii. Banked water units can only offset future usage that exceeds a water budget.

f. **Water Budget Appeals:** If specified criteria are met, a customer can file an appeal to have his or her water budget increased.

i. The reasons appeals may be considered include: water use necessary for health and safety; business or economic needs, including process-water requirements; significant long-term savings achieved since 2011; average monthly water use in 2014 that is at least 50% lower than district average; and large animal care (e.g. horse).

ii. All appeals must be submitted online at **www.calwater.com/appeal** or via a written application form (available at **www.calwater.com/appeal** or from our local Customer Center).

iii. Surcharges incurred during the appeal review period may be waived if the review takes an extended period of time.

2. WASTEFUL USES OF WATER (STAGE 2)

Cal Water may continue to impose the restrictions on the wasteful use of water as outlined in Stage One, except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency.

G. STAGE THREE WATER USE RESTRICTIONS

1. MANDATORY WATER BUDGETS AND BANKING (STAGE 3)

Water budgets will be based on a customer's consumption during a historical base period and will include a percentage reduction designed to meet necessary water-use reductions. Cal Water may include provisions such as minimum water budgets to protect the health and safety of customers, and water banking allowing customers additional flexibility with regard to their required reductions.

In addition to the normal rate paid for the unit of water, a drought surcharge will be charged to a customer for each unit of water used over the established water budget for the billing period. Cal Water may implement surcharges up to three (3) times those charged in Stage 2. Cal Water will establish an appeals process for customers that will allow for requests for increased water budgets. (L)

(continued)

Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

(T)

G. STAGE THREE WATER USE RESTRICTIONS (Continued)

[Stage 3 (cont.)]

2. WASTEFUL USES OF WATER (STAGE 3)

The following restrictions may be imposed by Cal Water, except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency. Differences from or additions to previous Stages are underlined. (The following restrictions are the same as those provided in Stage 3 of Rule 14.1.)

a. Outdoor Irrigation Restrictions (Stage 3)

i. Irrigating ornamental landscapes with potable water is limited to no more than **two (2) days per week,** on a schedule established and posted by Cal Water on its website or otherwise provided to customers by bill message, bill insert, direct mail, or email, or as follows:

1. Customers with even-numbered addresses may irrigate on Saturdays and Tuesdays (previous Stages allowed Thursdays as well).
2. Customers with odd-numbered addresses may irrigate on Sundays and Wednesdays (previous Stages allowed Fridays as well).
3. Customers without a street address may irrigate on Saturdays and Tuesdays (previous Stages allowed Thursdays as well).
4. Notwithstanding the foregoing restrictions, irrigation of special landscape areas or commercial nurseries may occur as needed, provided that the customer who wishes to irrigate a special landscape area or commercial nursery presents Cal Water with a plan to achieve water use reductions commensurate with those that would be achieved by complying with foregoing restrictions.
5. Notwithstanding the foregoing restrictions, when a city, county, or other local public agency in one of Cal Water's service areas duly adopts restrictions on the number of days or hours of the day that customers may irrigate which are different than those adopted by Cal Water, Cal Water may enforce the city, county, or other local public agency's restrictions.

ii. Irrigating ornamental landscape with potable water is prohibited during the hours between **8:00 a.m. and 6:00 p.m.**

iii. The foregoing restrictions do **not** apply to:

1. Landscape irrigation zones that exclusively use drip irrigation systems and/or micro spray irrigation system;
2. Irrigating ornamental landscapes with the use of a hand-held bucket or similar container, a continuously monitored hose which is fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored, or for the express purpose of adjusting or repairing an irrigation system.

b. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing fixtures and/or irrigation system must be repaired within **two (2) business days** of written notification by Cal Water, unless other arrangements are made with Cal Water.

c. **Prohibited** Uses of Water: Customers are prohibited from using potable water for the following actions:

i. The application of potable water to landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures (note: this provision appears under Section E in Rule 14.1);

(continued)

Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

(T)

G. STAGE THREE WATER USE RESTRICTIONS (Continued)

[Stage 3 (cont.)]

ii. The use of a hose that dispenses potable water to wash vehicles, including cars, trucks, buses, boats, aircraft, and trailers, whether motorized or not, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use (note: this provision appears under Section E in Rule 14.1).

iii. The application of potable water to driveways and sidewalks;

iv. The use of potable water in a water feature, except where the water is part of a recirculating system;

v. The application of potable water to outdoor landscapes during and within forty-eight (48) hours after measurable rainfall;

vi. The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased;

vii. Irrigation of ornamental turf on public street medians with potable water;

viii. Irrigation outside of newly constructed homes and buildings with potable water in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.

ix. Use of potable water for street cleaning with trucks, except for initial wash-down for construction purposes (if street sweeping is not feasible);

x. Use of potable water for construction purposes, such as consolidation of backfill, dust control, or other uses unless no other source of water or other method can be used.

d. Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guest room using clear and easily understood language.

e. Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds with potable water is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to the implementation of any staged mandatory restrictions of water use as described in this Schedule.

f. Other duly adopted restrictions on the use of potable water as prescribed from time to time by the Commission or other authorized government agencies are incorporated herein by reference.

H. STAGE FOUR WATER USE RESTRICTIONS

1. MANDATORY WATER BUDGETS AND BANKING (STAGE 4)

Water budgets will be based on a customer's consumption during a historical base period and will include a percentage reduction designed to meet necessary water-use reductions. Cal Water may include provisions such as minimum water budgets to protect the health and safety of customers, and water banking allowing customers additional flexibility with regard to their required reductions.

In addition to the normal rate paid for the unit of water, a drought surcharge will be charged to a customer for each unit of water used over the established water budget for the billing period. For Stage 4, Cal Water may implement surcharges up to three (3) times those charged in Stage 2. Cal Water may require customer consumption reductions of up to 50%.

Cal Water will establish an appeals process for customers that will allow for requests for increased water budgets.

(continued)

Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

(T)

H. STAGE FOUR WATER USE RESTRICTIONS (Continued)

[Stage 4 (cont.)]

2. WASTEFUL USES OF WATER (STAGE 4)

The following restrictions may be imposed by Cal Water, except where necessary to address an immediate health or safety need or to comply with a term or condition in a permit issued by a state or federal agency. Differences from or additions to previous Stages are underlined. (The following restrictions are the same as those provided in Stage 4 of Rule 14.1.)

a. Irrigating ornamental landscape with potable water is prohibited, except when a hand-held bucket or a similar container, or a continuously monitored hose which is fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored is used to maintain vegetation, including trees and shrubs.

b. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the customer's plumbing fixtures or irrigation system must be repaired within **one (1) business day** of written notification by Cal Water, unless other arrangements are made with Cal Water.

c. Prohibited Uses of Water: Customers are prohibited from using potable water for the following actions:

i. The application of potable water to landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures;

ii. The use of a hose that dispenses potable water to wash vehicles, including cars, trucks, buses, boats, aircraft, and trailers, whether motorized or not, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use.

iii. The application of potable water to driveways and sidewalks;

iv. The use of potable water in a water feature, except where the water is part of a recirculating system;

v. The application of potable water to outdoor landscapes during and within forty-eight (48) hours after measurable rainfall;

vi. The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased;

[Note that items previously identified as (ix) and (x) in Stage 3 have been eliminated.]

vii. Use of potable water for street cleaning with trucks (previous Stage allowed certain exceptions);

viii. Use of potable water for construction purposes, such as consolidation of backfill, dust control, or other uses (previous Stages allowed certain exceptions).

d. Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guest room using clear and easily understood language.

e. Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds with potable water is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to the implementation of any staged mandatory restrictions of water use as described in this Schedule.

f. Other duly adopted restrictions on the use of potable water as prescribed from time to time by the Commission or other authorized government agencies are incorporated herein by reference.

(continued)

Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

(T)

I. SAMPLE TABLES WITH TIER A AND TIER B EXCESS USAGE AMOUNTS

(N)

1. FOR DISTRICTS IN COMPLIANCE WITH MANDATORY REDUCTIONS

For the purposes of applying Drought Surcharges, the sample table below identifies the number of units over a customer's Water Budget (the excess usage) that falls within Tiers A and B in a district whose cumulative savings meet the Water Board's Mandatory Reduction Percentage as of the date identified in **Appendix A**.

For Districts in Compliance with Mandatory Water Reduction Targets

District	Service Area	Tier A - No Surcharges	Tier B - Drought Surcharges Applied			Minimum Water Budget	Rate Support Fund Area
		Units Over Water Budget	Units Over Water Budget	Surcharge per unit (Non-LIRA Customers)	Surcharge per unit (LIRA Customers)	(Ccf per month)	(RSF)
Antelope Valley	Fremont Valley & Lake Hughes	1-6	7+	$4.5200	$2.2600	5	RSF Area
	Lancaster	1-5	6+	$7.1180	$3.5590	5	
	Leona Valley	1-4	5+	$4.5200	$2.2600	5	RSF Area
Bakersfield		1-6	7+	$4.1868	$2.0934	7	
Bayshore	Mid-Peninsula	1-3	4+	$10.0000	$5.0000	6	
	South San Francisco	1-3	4+	$5.6492	$2.8246	6	
Bear Gulch		1-5	6+	$10.0000	$5.0000	6	
Chico		1-6	7+	$3.1314	$1.5657	6	
Dixon		1-3	4+	$7.9402	$3.9701	7	
Dominguez		1-3	4+	$6.9934	$3.4967	7	
East Los Angeles		1-4	5+	$3.7605	$1.8803	9	
Grand Oaks		1-6	7+	$2.1236	$1.0618	5	
Hermosa Redondo		1-3	4+	$9.1586	$4.5793	5	
Kern River Valley		1-3	4+	$4.5200	$2.2600	4	RSF Area
King City		1-4	5+	$6.7536	$3.3768	9	
Livermore		1-4	5+	$7.6194	$3.8097	6	
Los Altos		1-5	6+	$8.1608	$4.0804	6	
Marysville		1-4	5+	$5.1470	$2.5735	6	
Oroville		1-5	6+	$6.1840	$3.0920	6	
Palos Verdes		1-6	7+	$9.5358	$4.7679	6	
Redwood Valley		1-4	5+	$4.5200	$2.2600	4	RSF Area
Salinas		1-3	4+	$5.7776	$2.8888	7	
Selma		1-5	6+	$3.0122	$1.5061	8	
Stockton		1-4	5+	$5.5506	$2.7753	7	
Visalia		1-5	6+	$2.9796	$1.4898	7	
Westlake		1-6	7+	$9.2378	$4.6189	6	
Willows		1-5	6+	$4.1356	$2.0678	6	

(N)

(continued)

Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

(T)

I. SAMPLE TABLES WITH TIER A AND TIER B EXCESS USAGE AMOUNTS

(N)

2. FOR DISTRICTS NOT IN COMPLIANCE WITH MANDATORY REDUCTIONS

For the purposes of applying Drought Surcharges, the sample table below identifies the number of units over a customer's Water Budget (the excess usage) that falls within Tiers A and B in a district whose cumulative savings do NOT meet the Water Board's Mandatory Reduction Percentage as of the date identified in **Appendix A**.

For Districts not in Compliance with Mandatory Water Reduction Targets

District	Service Area	Tier A - No Surcharges	Tier B - Drought Surcharges Applied			Minimum Water Budget	Rate Support Fund Area
		Units Over Water Budget	Units Over Water Budget	Surcharge per unit (Non-LIRA Customers)	Surcharge per unit (LIRA Customers)	(CCF per month)	(RSF)
Antelope Valley	Fremont Valley & Lake Hughes	1	2+	$4.5200	$2.2600	5	RSF Area
	Lancaster	1	2+	$7.1180	$3.5590	5	
	Leona Valley	1	2+	$4.5200	$2.2600	5	RSF Area
Bakersfield		1	2+	$4.1868	$2.0934	7	
Bayshore	Mid-Peninsula	1	2+	$10.0000	$5.0000	6	
	South San Francisco	1	2+	$5.6492	$2.8246	6	
Bear Gulch		1	2+	$10.0000	$5.0000	6	
Chico		1	2+	$3.1314	$1.5657	6	
Dixon		1	2+	$7.9402	$3.9701	7	
Dominguez		1	2+	$6.9934	$3.4967	7	
East Los Angeles		1	2+	$3.7605	$1.8803	9	
Grand Oaks		1	2+	$2.1236	$1.0618	5	
Hermosa Redondo		1	2+	$9.1586	$4.5793	5	
Kern River Valley		1	2+	$4.5200	$2.2600	4	RSF Area
King City		1	2+	$6.7536	$3.3768	9	
Livermore		1	2+	$7.6194	$3.8097	6	
Los Altos		1	2+	$8.1608	$4.0804	6	
Marysville		1	2+	$5.1470	$2.5735	6	
Oroville		1	2+	$6.1840	$3.0920	6	
Palos Verdes		1	2+	$9.5358	$4.7679	6	
Redwood Valley		1	2+	$4.5200	$2.2600	4	RSF Area
Salinas		1	2+	$5.7776	$2.8888	7	
Selma		1	2+	$3.0122	$1.5061	8	
Stockton		1	2+	$5.5506	$2.7753	7	
Visalia		1	2+	$2.9796	$1.4898	7	
Westlake		1	2+	$9.2378	$4.6189	6	
Willows		1	2+	$4.1356	$2.0678	6	

(N)

(continued)

Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

APPENDIX A to Schedule 14.1 - *NOT IN EFFECT* (C)

Drought Surcharge Tiers (applies to all metered customers of potable water) (C)

District	Service Area	In Compliance with Mandatory Reduction? As of 2/1/16	Tier A - No Surcharges	Tier B - Drought Surcharges Applied			Minimum Water Budget	Rate Support Fund Area
			Units Over Water Budget	Units Over Water Budget	Surcharge per unit (Non-LIRA Customers)	Surcharge per unit (LIRA Customers)	(CCF per month)	(RSF)
Antelope Valley	Fremont Val. /Lake Hughes		1-6	7+	$4.5200	$2.2600	5	RSF Area
	Lancaster		1-5	6+	$7.1180	$3.5590	5	
	Leona Valley		1-4	5+	$4.5200	$2.2600	5	RSF Area
Bakersfield			1-6	7+	$4.1868	$2.0934	7	
Bayshore	Mid-Peninsula		1-3	4+	$10.0000	$5.0000	6	
	South San Francisco		1-3	4+	$5.6492	$2.8246	6	
Bear Gulch			1-5	6+	$10.0000	$5.0000	6	
Chico			1-6	7+	$3.1314	$1.5657	6	
Dixon			1-3	4+	$7.9402	$3.9701	7	
Dominguez			1-3	4+	$6.9934	$3.4967	7	
East Los Angeles			1-4	5+	$3.7605	$1.8803	9	
Grand Oaks			1-6	7+	$2.1236	$1.0618	5	
Hermosa Redondo		**No**	1	2+	$9.1586	$4.5793	5	
Kern River Valley		**No**	1	2+	$4.5200	$2.2600	4	RSF Area
King City			1-4	5+	$6.7536	$3.3768	9	
Livermore			1-4	5+	$7.6194	$3.8097	6	
Los Altos			1-5	6+	$8.1608	$4.0804	6	
Marysville			1-4	5+	$5.1470	$2.5735	6	
Oroville			1-5	6+	$6.1840	$3.0920	6	
Palos Verdes		**No**	1	2+	$9.5358	$4.7679	6	
Redwood Valley (all)			1-4	5+	$4.5200	$2.2600	4	RSF Area
Salinas			1-3	4+	$5.7776	$2.8888	7	
Selma			1-5	6+	$3.0122	$1.5061	8	
Stockton			1-4	5+	$5.5506	$2.7753	7	
Visalia		**No**	1	2+	$2.9796	$1.4898	7	
Westlake		**No**	1	2+	$9.2378	$4.6189	6	
Willows			1-5	6+	$4.1356	$2.0678	6	

(a) The Drought Surcharge is equal to two (2) times the highest residential tier rate with a $10.00 maximum EXCEPT:
The Drought Surcharge in Rate Support Fund (RSF) areas is equal to $4.52.
The Drought Surcharge for districts with a 10% or less water reduction requirement is equal to the highest residential tier rate.

(b) The Drought Surcharge for LIRA customers is 50% of the Drought Surcharge for Non-LIRA customers.

(c) The Minimum Water Budget is set at 55 gpcd (gallons per capita per day) multiplied by the number of people per household for the area according to the U.S. Census.

(d) A district is determined to be in compliance if it has met or is within one percent of its Mandatory Reduction requirement.

(continued)

This tariff was approved by the CPUC.
An original stamped version is
available upon request.

Schedule No. 14.1

WATER SHORTAGE CONTINGENCY PLAN
WITH STAGED MANDATORY REDUCTIONS AND DROUGHT SURCHARGES (continued)

 (T)

APPENDIX B to Schedule 14.1 (T)

CUMULATIVE WATER SAVED COMPARED TO MANDATORY REDUCTIONS (C)

Urban Water Supplier	Cumulative Percentage Saved	Water Board's Target Percentage	In Compliance?
	Jun. 2015 to Jan. 2016 (as compared to 2013) *	Mandatory Reduction *	As of Feb. 1, 2016 **
California Water Service Company Antelope Valley	47.8%	36%	
California Water Service Company Bakersfield	31.1%	32%	
California Water Service Company Bear Gulch	35.0%	36%	
California Water Service Company Chico District	38.3%	32%	
California Water Service Company Dixon, City of	30.2%	28%	
California Water Service Company Dominguez	16.8%	16%	
California Water Service Company East Los Angeles	15.5%	8%	
California Water Service Company Hermosa Redondo	18.3%	20%	No
California Water Service Company Kern River Valley	20.1%	28%	No
California Water Service Company King City	21.8%	12%	
California Water Service Company Livermore	39.9%	24%	
California Water Service Company Los Altos/Suburban	38.1%	32%	
California Water Service Company Marysville	26.2%	24%	
California Water Service Company Mid Penninsula	26.6%	16%	
California Water Service Company Oroville	28.5%	28%	
California Water Service Company Palos Verdes	28.9%	36%	No
California Water Service Company Redwood Valley	31.7%	16%	
California Water Service Company Salinas District	24.9%	16%	
California Water Service Company Selma	39.0%	32%	
California Water Service Company South San Francisco	20.8%	8%	
California Water Service Company Stockton	22.6%	20%	
California Water Service Company Visalia	25.6%	32%	No
California Water Service Company Westlake	33.5%	36%	No
California Water Service Company Willows	30.1%	28%	

(C)

* The figures in Appendix B are from the State Water Resources Control Board's website at:
http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/docs/2016feb/suppliercompliance_022516.pdf (C)

(D)

** A district is determined to be in compliance if it has met or is within one percent of its Mandatory Reduction requirement. (N)

[end]

Appendix M: Conservation Master Plan

CONSERVATION MASTER PLAN 2021 – 2025

April 2021

Bear Gulch District

California Water Service

Prepared by M.Cubed

Table of Contents

List of Acronyms iii

1 Introduction 1

1.1 Master Plan Scope and Objectives 1

1.2 Relationship to GRC and UWMP 1

1.3 Relationship to Water Shortage Contingency Plan 2

1.4 Report Organization 2

2 District Overview 3

3 Conservation Goals and Progress 6

3.1 Conservation Program Activity and Water Savings 6

3.2 Plumbing Codes and Water Use Efficiency Standards 6

3.3 Compliance with State Urban Water Use Target 8

3.4 Compliance with CPUC Conservation Goals 9

3.5 Making Water Conservation a California Way of Life 10

4 Water Conservation Program 13

4.1 Conservation Program Drivers 13

4.2 Customer Conservation Programs 14

4.2.1 Plumbing Fixture Replacement 14

4.2.2 Irrigation Equipment/Landscape Upgrades 15

4.2.3 Customer Assistance 15

4.2.4 Summary of Customer Programs 16

4.3 School Education and Public Information Programs 16

4.4 Water System Efficiency 17

4.4.1 System Water Loss Management 17

4.4.2 Metering and Pricing 17

4.5 Conservation Partnerships 18

5 Conservation Budget 18

6 Performance Metrics 22

7 Program Monitoring and Reporting 22

List of Acronyms

AB	Assembly Bill
AF	Acre-feet (one AF equals 325,851 gallons)
AMI	Advanced metering infrastructure
AMR	Automatic meter reading
AWE	Alliance for Water Efficiency
BCR	Benefit Cost Ratio
BMP	Best Management Practice
CalWEP	California Water Efficiency Partnership
CII	Commercial, industrial, and institutional
CPUC	California Public Utilities Commission
CUWCC	California Urban Water Conservation Council
EO	Executive Order
GPCD	Gallons per capita per day
GPF	Gallons per flush
GPM	Gallons per minute
GRC	General Rate Case
HET	High efficiency toilet
HEU	High efficiency urinal
HEW	High efficiency clothes washer
IOU	Investor-owned utility
MaP	Maximum performance toilet testing program
MGD	Million gallons per day
MOU	Memorandum of Understanding Regarding Urban Water Conservation in California
SB	Senate Bill
SB X7-7	Senate Bill X7-7 Water Conservation Act of 2009
ULFT	Ultra low flow toilet
UWMP	Urban Water Management Plan
WF	Water Factor
WSCP	Water Shortage Contingency Plan

1 Introduction

1.1 Master Plan Scope and Objectives

Cal Water is committed to helping its customers use water efficiently and has developed a range of water conservation programs to support this goal. To ensure that it is providing the right mix of programs in a cost-effective manner, Cal Water routinely conducts comprehensive conservation program analysis and planning. This is done on a five-year cycle in tandem with the Urban Water Management Plan (UWMP). The results of this planning for the Bear Gulch District are summarized in this report, which covers the period 2021 to 2025.

The main purposes of this Conservation Master Plan are to:

- Serve as a broad guidance document that helps inform annual conservation activities, such as program levels, staffing, and budget needs both internally and for stakeholders.
- Summarize the mix of conservation measures that Cal Water plans to implement going forward, including the estimated water savings, costs, and effects on water demand.
- Explain the evaluation process and factors considered in selecting conservation measures.
- Provide an update to the 2016-20 Conservation Master Plan as part of a five-year review cycle to assess program performance and identify the need for any adjustments; and
- Ensure Cal Water districts are positioned to comply with the state's Making Water Conservation a California Way of Life regulations.

1.2 Relationship to GRC and UWMP

Cal Water's operations are regulated by the California Public Utilities Commission (CPUC), which approves the budgets and rates for each Cal Water district every three years in a General Rate Case (GRC) proceeding. The district's conservation programs and expenditures are part of the GRC proceeding. The last GRC covered the three-year period 2020-22 and a new GRC covering the period 2023-25 is presently underway. The conservation programs and budgets for 2021 in this plan reflect those authorized in the last GRC while those recommended for 2023-25 reflect programs and budgets being proposed by Cal Water in the current GRC.

This plan is an update to the Conservation Master Plan Cal Water completed in 2016 covering the period 2016-20. It constitutes the primary source of information on historical and proposed implementation of conservation programs reported in the Bear Gulch District's 2020 UWMP. A copy of this plan is provided as an appendix to the UWMP.

1.3 Relationship to Water Shortage Contingency Plan

The Water Conservation Master Plan is distinct from Cal Water's Water Shortage Contingency Plan (WSCP), which is also part of each district's UWMP. While the main purpose of the WSCP is to provide a blue-print for responding to water shortage emergencies caused by drought or other events resulting in temporary disruption to water supplies, the goal of the Water Conservation Master Plan is to provide a blue-print for providing education, assistance, and incentives to help customers use water efficiently all the time. Regardless of drought, water in California is an increasingly scarce resource. Investing in water use efficiency has repeatedly been shown to be a cost-effective way to ensure adequate supply of water for the future. While the conservation programs Cal Water implements are critically important during periods of water shortage, their primary purpose is to help make sure Cal Water can reliably serve customer water needs far into the future.

1.4 Report Organization

The remainder of this report is organized as follows:

- Section 2 provides a brief overview of the District, including the communities it serves, its sources of water supply, and its customer water demands.
- Section 3 discusses Cal Water's conservation goals and accomplishments, in particular with respect to the Water Conservation Act of 2009, CPUC conservation requirements, and the state's pending Making Water Conservation a California Way of Life regulations.
- Section 4 describes the conservation programs Cal Water currently offers to its customers and discusses new programs Cal Water intends to offer.
- Section 5 presents the water savings, costs, and benefits expected from the recommended conservation programs.
- Section 6 discusses metrics used to assess program performance.
- Section 7 addresses program monitoring and future updates to the Conservation Master Plan.

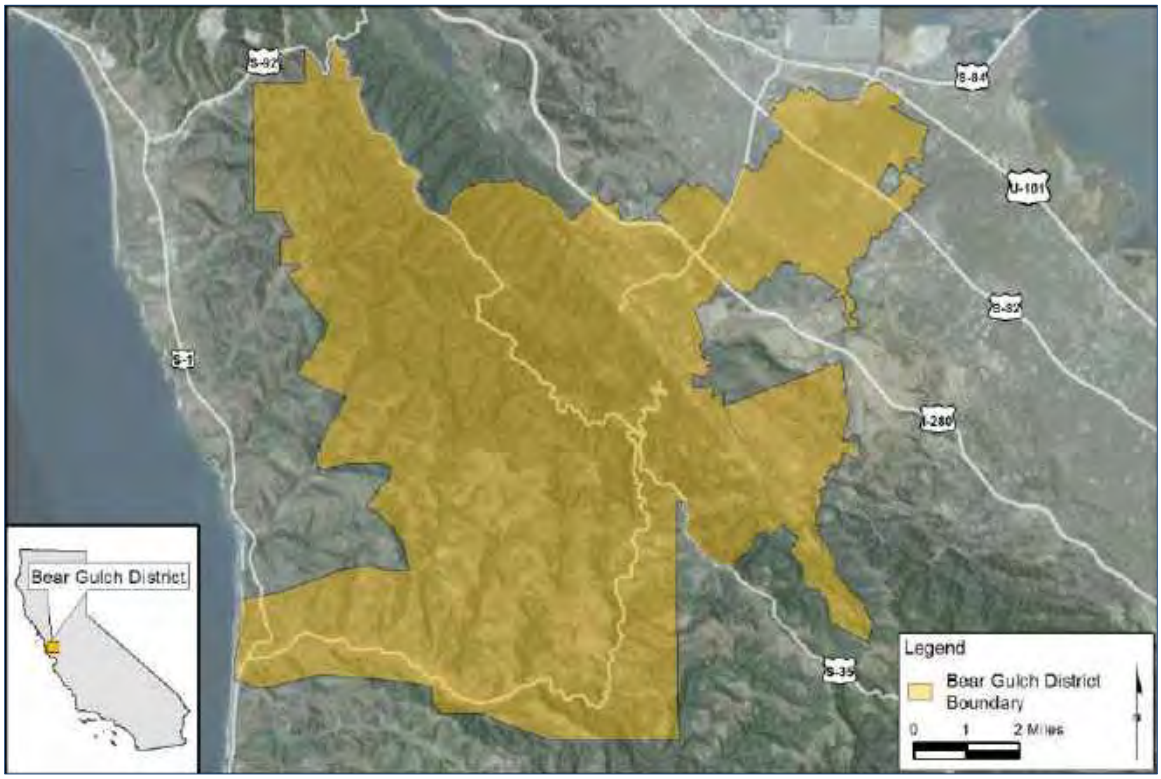
2 District Overview

District Quick Facts:

- Communities Served: Atherton, Portola Valley, Woodside, parts of Menlo Park, unincorporated portions of San Mateo County
- Population served in 2020: 60,814
- Residential Customers: 92% of total services and 89% of total use
- Sources of Supply: 95% imported, 5% local surface water
- Average Annual Water Deliveries Last Five Years: 12,000 AF
- Average Per Capita Water Use Last Five Years: 171 GPCD

The Bear Gulch District serves the communities of Atherton, Portola Valley, Woodside, portions of Menlo Park, and adjacent unincorporated portions of San Mateo County including: West Menlo Park, Ladera, North Fair Oaks, and Menlo Oaks. The system is bordered on the north by Redwood City; on the east by Palo Alto, Stanford University, and unincorporated Santa Clara County; and on the south and west by unincorporated San Mateo County. A map of the service area boundaries is shown in Figure 1.

Figure 1. Bear Gulch District Service Area Boundaries



Cal Water estimates the service area population was 60,814 in 2020. Service area population has been growing at an annual rate of less than one percent for the past 15 years. Between 2016 and 2020, the District's population increased at an average rate of 0.3 percent per year.

The District delivers a combination of local surface water and imported water purchased from the City and County of San Francisco (SFPUC). Approximately 95 percent is purchased from SFPUC and 5 percent is produced from the District's reservoir and treatment plant in Atherton.

The District delivers water to residential, commercial, industrial, and governmental customers. Residential customers account for 92 percent of water services in the District. The share of services in 2020 by customer category is shown in Figure 2. The share of total water sales by customer category over the period 2016-2020 is shown in Figure 3. Residential customers accounted for 87 percent of water use over this period.

Annual demand has averaged 12,000 acre-feet (AF) over the five-year period 2016-2020. Total annual demands and sources of water supply since 1980 are shown in Figure 4.

Figure 2. Share of Services in 2020 by Customer Category

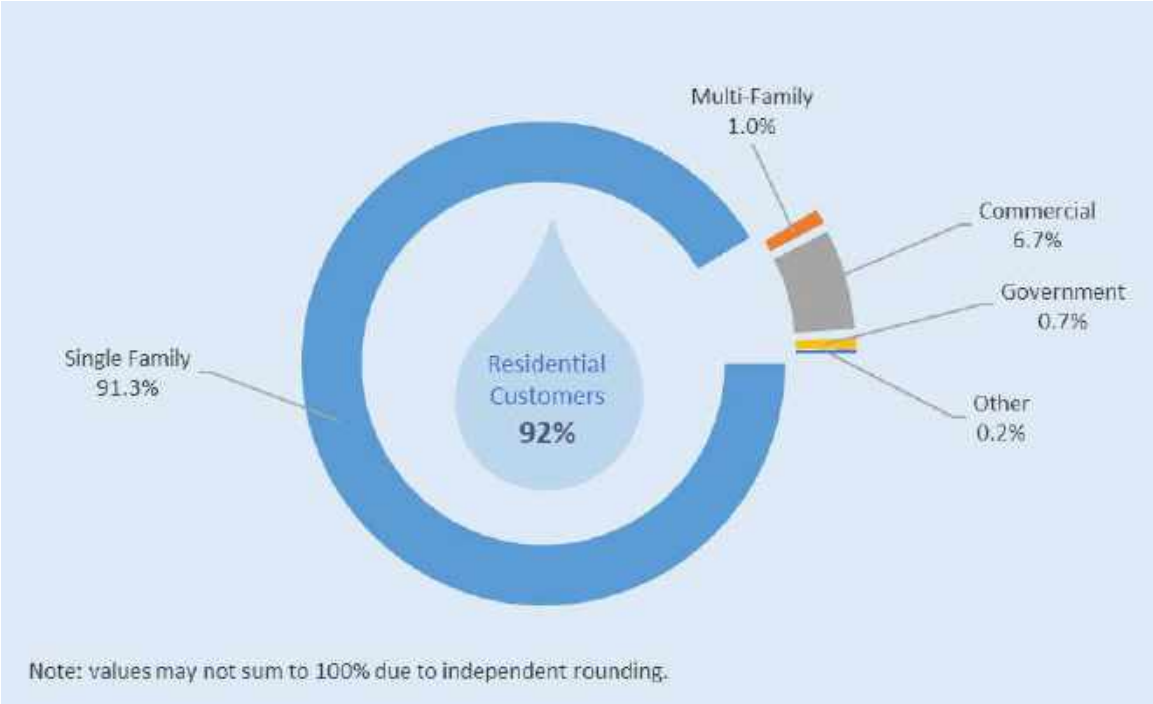


Figure 3. Share of Water Sales by Customer Category: 2016-2020

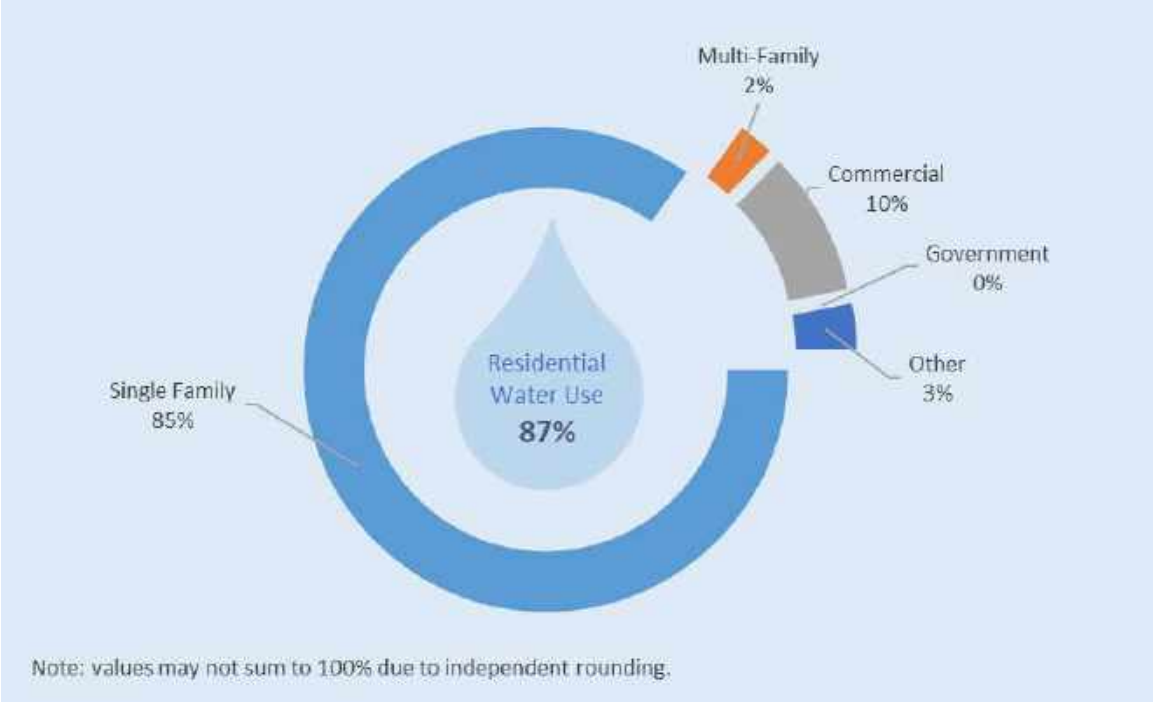
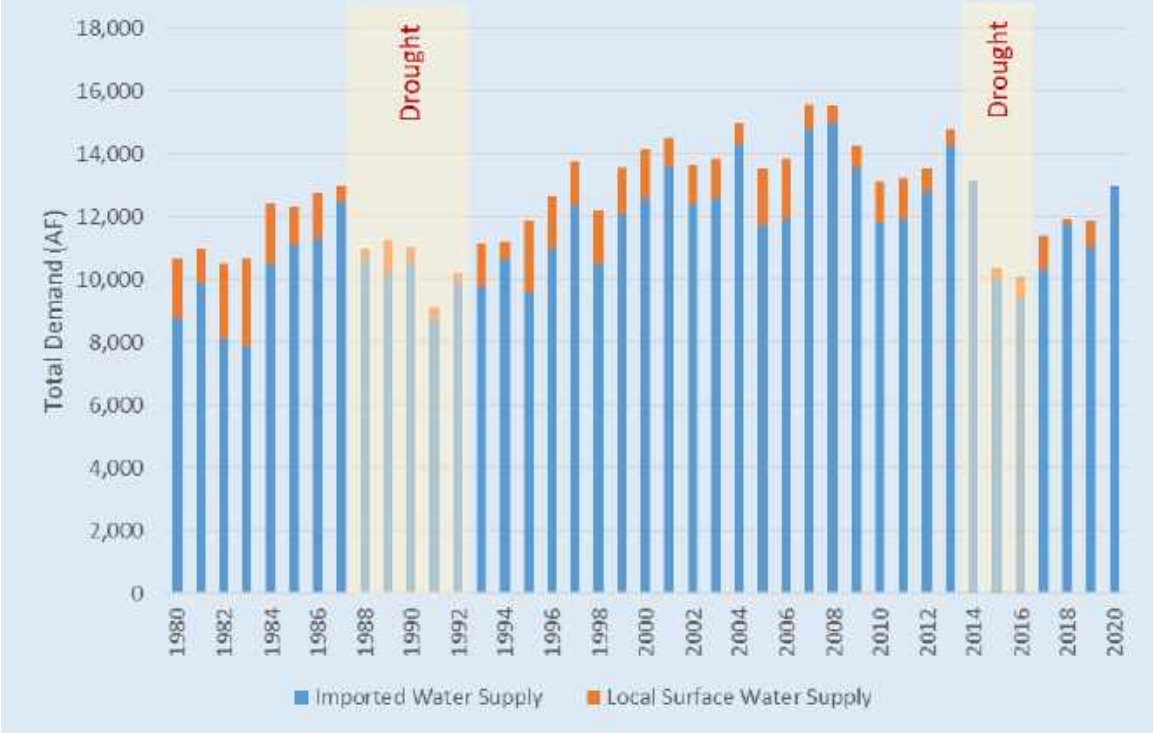


Figure 4. Total Demand and Sources of Supply: 1980 - 2020



3 Conservation Goals and Progress

In this section, conservation goals and progress for the Bear Gulch District are presented.

3.1 Conservation Program Activity and Water Savings

Cal Water uses the Alliance for Water Efficiency's Water Conservation Tracking Tool to track program activity and estimate water savings. Conservation program activity for 2016-20 is shown in Table 1. This activity is expected to generate water savings of 96 AF/year and cumulative lifetime savings of 1,440 AF.

Table 1. Conservation Program Activity and Water Savings: 2016-20

1. Plumbing Fixture Replacement	2016 – 2020 Total Activity
Toilets & Urinals (number distributed)	1,933
Clothes Washers (number distributed)	325
Consv. Kits (number distributed)	238
2. Irrigation Equip./Landscape Upgrades	
Smart Controllers (number distributed)	422
Nozzles & Spray Bodies (number distributed)	1,206
Turf Replacement (sq ft removed)	52,850
3. Residential Customer Assistance	
Surveys/Audits (homes receiving)	60
4. Non-Residential Customer Assistance	
Surveys/Audits (sites receiving)	5
Large Landscape Reports (sites receiving)	78
Average Annual Water Savings (AF)	**96**
Cumulative Lifetime Water Savings (AF)	**1,440**

3.2 Plumbing Codes and Water Use Efficiency Standards

Cal Water's conservation programs are operated within the context of existing plumbing codes and water use efficiency standards that are designed to improve the future water use efficiency of major water using appliances and fixtures, such as toilets and clothes washers, as well as water used outdoor for landscaping. Cal Water estimates that plumbing codes and water use efficiency standards will cumulatively save more than 7,800 AF in the District over the next 25 years. The primary drivers for the expected water savings are as follows:

- AB 715, enacted in 2007, requires that any toilet or urinal sold or installed in California on or after January 1, 2014 cannot have a flush rating exceeding 1.28 and 0.5 gallons per flush, respectively. AB 715 superseded the state's previous standards for toilet and urinal water use set in 1991 of 1.6 and 1.0 gallons per flush, respectively. On April 8, 2015, in response to the Governor's Emergency Drought Response Executive Order (EO B-29-15), the California Energy Commission approved new standards for urinals requiring that they not use more than 0.125 gallons per flush, 75% less than the standard set by AB 715.

- Water use standards for residential and commercial clothes washers and dishwashers are established by the U.S. Department of Energy through its authority under the federal Energy Policy and Conservation Act. Water use efficiency is summarized by the water factor for the appliance which measures the gallons of water used per cycle per cubic foot of capacity. A typical top-loading residential clothes washer manufactured in the 1990s had a water factor of around 12. In 2015, the allowable water factor for top- and front-loading residential clothes was reduced to 8.4 and 4.7, respectively. In 2018, the water factor standard for top-loading residential clothes washers was reduced to 6.5. In 2010 the allowable water factor for top- and front-loading commercial clothes washers was reduced to 8.5 and 5.5, respectively. The maximum water factor for Energy Star compliant top- and front-loading washers is 3.7 and 4.3, respectively. An Energy Star compliant washer uses about two-thirds less water per cycle than washers manufactured in the 1990s. There also are federal dishwasher efficiency standards. The maximum water use for standard and compact sized dishwashers is 5.0 and 3.5 gallons per cycle, respectively.

- New construction and renovations in California are subject to CalGreen Code requirements. CalGreen includes prescriptive indoor provisions for maximum water consumption of plumbing fixtures and fittings in new and renovated properties. CalGreen also allows for an optional performance path to compliance, which requires an overall aggregate 20% reduction in indoor water use from a calculated baseline using a set of worksheets provided with the CalGreen guidelines.

- SB 407, enacted in 2009, mandates that existing buildings in California come up to current state plumbing fixture standards. This law establishes requirements that residential and commercial property built and available for use on or before January 1, 1994 replace plumbing fixtures that are not water conserving, defined as "noncompliant plumbing fixtures" as follows:

    - any toilet manufactured to use more than 1.6 gallons of water per flush;

    - any urinal manufactured to use more than one gallon of water per flush;

  - any showerhead manufactured to have a flow capacity of more than 2.5 gallons of water per minute; and

  - any interior faucet that emits more than 2.2 gallons of water per minute.

- For single-family residential property, the SB 407 compliance date was January 1, 2017. For multi-family and commercial property, it was January 1, 2019.

- The law does not include enforcement mechanisms ensuring conversion by these dates. However, it does require retrofit upon resale of property. SB 837, passed in 2011, reinforced this requirement by requiring the transfer disclosure statement include disclosure of compliance with SB 407.

California also has adopted regulations governing future use of water for landscape.

- The California Water Commission approved the State's updated Model Water Efficient Landscape Ordinance (MWELO) in 2015. MWELO or a locally adopted equivalent ordinance limits how much water new and rehabilitated residential and commercial landscapes can use. For residential landscapes, the maximum allowed water allowance (MAWA) is 55% of the amount of water that healthy cool season turf grass would require given the local climate. For commercial landscapes, it is 45%. Variances are allowed for special landscaping, such as play fields and parks, or landscaping irrigated with recycled water.

- CalGreen requires that automatic irrigation controllers for new landscaping installed by a builder be weather- or soil moisture-based controllers that automatically adjust irrigation in response to changes in plant water needs as weather or soil conditions change.

- Starting October 1, 2020, spray sprinkler bodies sold or offered for sale in California are required to use the WaterSense test procedure (Version 1.0, September 21, 2017) and must meet state standards (California Code of Regulations, Title 20, section 1605.3(x)(1)(A)). The new standards establish limits on maximum and average flow rate and minimum outlet pressure. Statewide, the new standards are estimated to save 15 billion gallons of water in the first year the standard is in effect and 152 billion gallons per year at full stock turnover. Consumers are expected to save about $22 per spray sprinkler body over the life of the device through reduced water use.

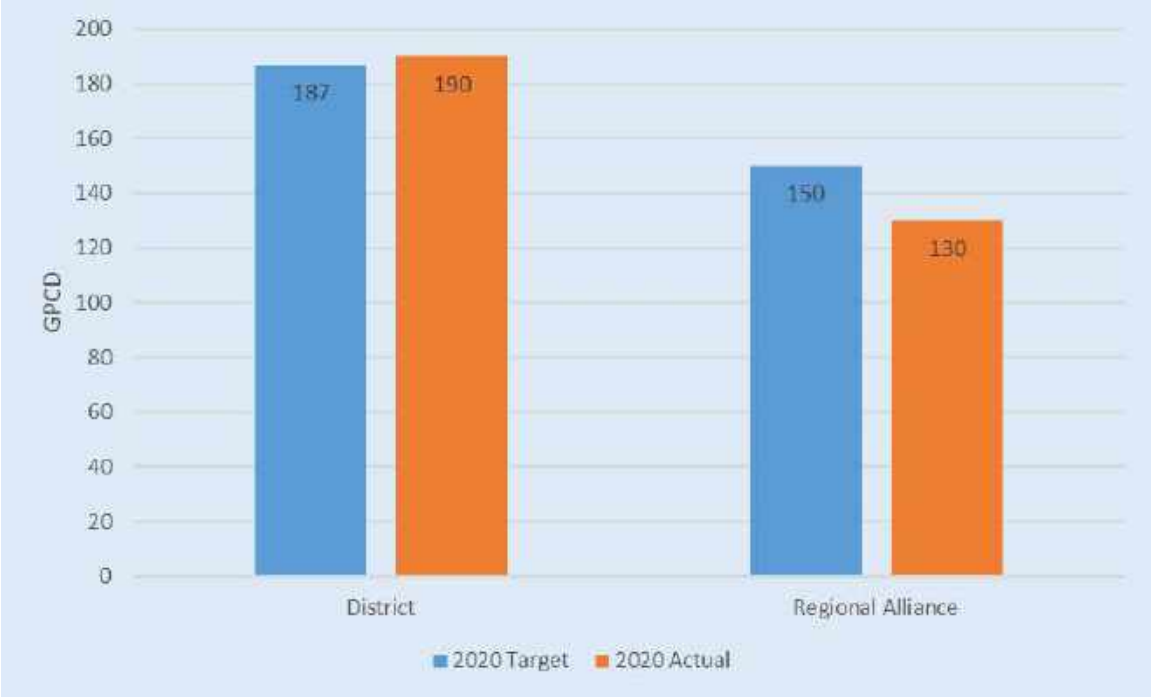
3.3 Compliance with State Urban Water Use Target

The Water Conservation Act of 2009, also known as SB X7-7, mandated a 20% reduction in per capita water use by 2020. Every urban retail water supplier was

required to establish a 2020 per capita water use target based on their historical water use. Water suppliers could also form a Regional Alliance with other retail water suppliers and meet the requirement jointly. The District formed a Regional Alliance with other Cal Water districts in the San Francisco Bay Hydrologic Region. As long as either the District's or the Regional Alliance's 2020 per capita water use is below target, the District will have met the act's requirements.

Figure 5 demonstrates the District's compliance with the Water Conservation Act of 2009. Although 2020 per capita water use was slightly above the District target, water use by the Regional Alliance was well below it. Through the concerted efforts of Cal Water and its customers, District per capita water use is now 24% below its peak reached in the mid-2000s (see Figure 6).

Figure 5. 2020 Target and Actual Per Capita Water Use



3.4 Compliance with CPUC Conservation Goals

In 2008, the California Public Utilities Commission (CPUC) established water conservation goals of 1-2% per year for Class A utilities, which includes California Water Service Company.[1] As shown in Figure 6, the District has met or exceeded these goals every year since they were adopted.

[1] CPUC Decision 08-02-036, dated February 29, 2008.

Figure 6. District Per Capita Water Use Relative to CPUC Conservation Goals

3.5 Making Water Conservation a California Way of Life

The state adopted legislation in 2018 establishing a new framework for setting urban water conservation standards and objectives.[2] This legislation built upon the April 2017 report entitled *Making Water Conservation a California Way of Life, Implementing Executive Order B-37-16*, prepared by state agencies, including the CPUC. The legislation directs the state to establish water use efficiency standards for:

- Residential Indoor Water Use
- Residential Outdoor Water Use
- Dedicated Landscape Meter Water Use
- Utility Distribution System Water Losses

Once adopted, these standards will provide the basis for a new urban water use target, or in the vernacular of the legislation, an aggregate urban water use objective. In one way, the Making Water Conservation a California Way of Life legislation carries on where the Water Conservation Act of 2009 left off – it will establish a new set of water use objectives for retail urban water suppliers. However, there are important

[2] Senate Bill 606 (Hertzberg) and Assembly Bill 1668 (Friedman).

differences. First, whereas the 2009 legislation established a long-term reduction target, under the new regulations, urban water suppliers will report water use relative to the new target annually starting in 2023 and will need to achieve the new target by January 1, 2027. Second, while the 2009 legislation applied to all urban water uses, the new legislation excludes non-residential uses other than water served by dedicated landscape meters from the target setting process. Instead, it requires DWR and the State Water Board to propose best management practices, including water audits and water management plans for non-residential customers above a certain size or volume of use, by October 1, 2021. Third, whereas the 2009 legislation set the same objective for all urban water suppliers (reduce water use by 20%), the new legislation varies the objective based on local conditions and existing levels of water use.[3]

Figure 7 shows the components of an urban water supplier's water use objective. The first four components will be based on the efficiency standards the state sets for indoor and outdoor residential water use, dedicated landscape meter water use, and utility distribution system losses. The fifth component allows for special circumstances, such as a large seasonal population or significant water use for fire protection, while the sixth component provides credit for water recycling. Added together, the six components establish the water suppliers water use objective.

For water suppliers failing to meet their water use objective, the legislation specifies progressive enforcement, as follows:

- Starting November 1, 2023, the State Water Board may issue information orders to obtain information to determine technical assistance needs for compliance (CWC 10609.26(a))

- Starting November 1, 2024, the State Water Board may issue written notices to warn suppliers of violation and request corrective actions by the next annual reporting (CWC 10609.26(b))

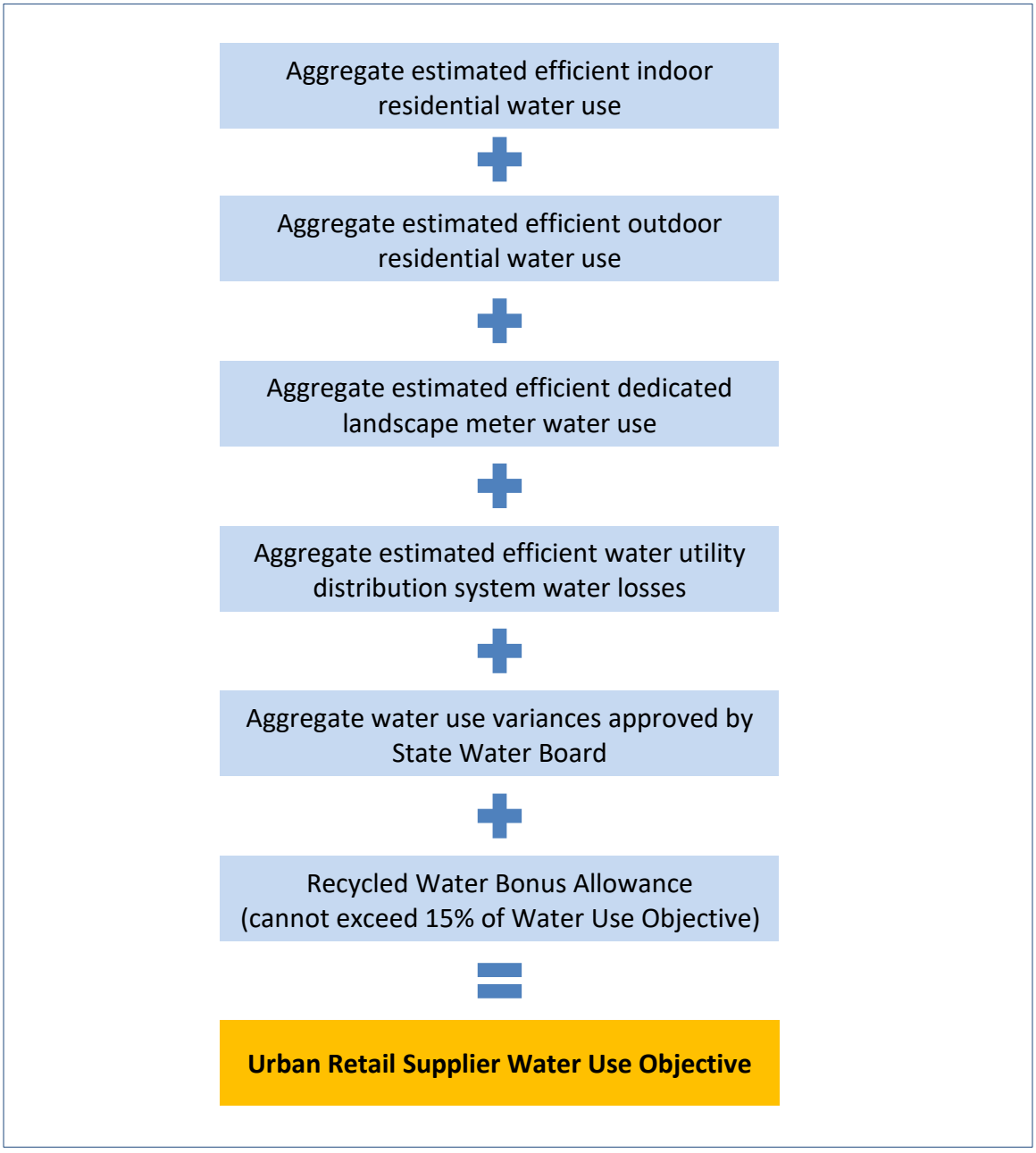
- Starting November 1, 2025, the State Water Board may issue conservation orders that may include referral to DWR for technical assistance and other local enforcement actions, including imposition of civil liability (CWC 10609.26(c)

Cal Water conducted a risk assessment to determine which of its districts may require additional resources to meet the new conservation regulations. The risk assessment considered current and projected level of overall water use, level of indoor residential water use, extent of residential and non-residential landscape area and water use, and

[3] For additional information, see Making Water Conservation a California Way of Life: Primer of 2018 Legislation on Water Conservation and Drought Planning Senate Bill 606 (Hertzberg) and Assembly Bill 1668 (Friedman).

condition of distribution system and level of water loss. Using a scoring system, the assessment ranked each district in terms of its risk of non-compliance with the individual components of the water use objective as well as the aggregate objective. The results of this assessment provided the basis for the conservation program budgets put forward in Cal Water's 2018 and 2021 general rate cases.

Figure 7. Making Water Conservation a California Way of Life Water Use Objective



4 Water Conservation Program

Cal Water centrally administers the conservation programs for its service districts. This creates both constraints and opportunities in terms of program design and implementation. The key constraint is the need to have consistent program offerings across districts. Except under unique circumstances, it is generally not logistically feasible or cost-effective to customize programs for individual districts. Also, if Cal Water offers a program in one district, customers in other districts generally expect it to also be available in their district. This puts a premium on offering a relatively small set of programs that can benefit all Cal Water customers. The advantage of central administration, however, is that it gives Cal Water scale economies and purchasing power that helps it keep program costs down, thereby improving cost-effectiveness.

4.1 Conservation Program Drivers

While Cal Water strives to develop programs that can be deployed in any of its districts, it tailors marketing, customer targeting, and implementation focus based on the needs of each district. In the Bear Gulch District, the main drivers shaping the conservation program are summarized in Table 2.

Table 2. Main Conservation Program Drivers in Bear Gulch District

Driver	Explanation
Supply Reliability	The District depends primarily on imported surface water which may be substantially curtailed during drought periods. Conservation is an important option available to the District for reducing dependence on imported water supply.
Water Supply Cost	The District's dependence on imported surface water results in high water supply cost. Acquiring additional water through conservation in most cases is less costly than purchasing additional imported water.
Residential Water Use	The state's Making Conservation a California Way of Life water use regulations are focused on reducing indoor and outdoor residential water use.
Landscape Water Use	The state's Making Conservation a California Way of Life water use efficiency regulations may require the District to start serving some non-residential landscapes through dedicated landscape meters and annually report water use relative to new landscape water use efficiency standards.

4.2 Customer Conservation Programs

Cal Water's conservation programs are grouped into four categories:

- Plumbing Fixture Replacement
- Irrigation Equipment/Landscape Upgrades
- Residential Customer Assistance
- Non-Residential Customer Assistance

A description of current programs in each of these categories follows. Where rebate amounts are listed, these are current rebate levels. Readers should note that rebate amounts may be adjusted in the future in response to CPUC requirements or changes to program design.

4.2.1 Plumbing Fixture Replacement

High-Efficiency Toilet Replacement – This program replaces old toilets with MaP certified high-efficiency toilets via financial rebates, direct installation, or direct distribution.[4] Current rebate amounts are up to $50/toilet for residential toilet replacement and up to $100/toilet for commercial toilet replacement.

High-Efficiency Urinal Replacement – This program replaces old urinals with high-efficiency urinals meeting the state's 0.125 gallon per flush water use standard via financial rebates and direct installation. While available to all non-residential customers, the program targets sites with higher-than-average bathroom utilization, such as restaurants and office buildings. The current rebate amount is up to $150/urinal.

Clothes Washer Replacement – This program provides a financial rebate to replace an old inefficient clothes washer with a new high-efficiency washer. The program is available to all residential and multi-family customers. The current rebate amount is up to $150/washer.

Residential Conservation Kit Distribution – This program offers residential customers conservation kits featuring a range of water-saving plumbing retrofit devices. The kits are available at no charge and include two high-efficiency showerheads (1.5 gpm), two bathroom faucet aerators (1.0 gpm), one kitchen faucet aerator (1.5 gpd), toilet leak tablets, and an outside multi-function, full-stop hose nozzle.

[4] For information on MaP certified toilets, see: https://www.map-testing.com/

4.2.2 Irrigation Equipment/Landscape Upgrades

Smart Irrigation Controller Installation – This program provides a financial rebate for the installation of a smart irrigation controller that automatically adjusts watering schedule in response to changing weather conditions. The current rebate amount is $125/controller for residential customers and $25/station for commercial customers.

High-Efficiency Sprinkler Nozzle Rebate – This program provides a financial rebate for the installation of high-efficiency sprinkler nozzles. This program is available to all Cal Water customers. The current rebate amount is $5/nozzle.

Large Rotary Nozzle Rebate – This program provides a financial rebate for the installation of high-efficiency large rotary nozzles. This program is available to all Cal Water customers. The current rebate amount is up to $30/nozzle toward the nozzle purchase cost and up to $8/spray body toward installation cost, if installed by a C-27 licensed landscape contractor.

Spray Body with Integrated Pressure Regulation and Check Valve Rebate – This program provides a financial rebate for the installation of high-efficiency spray bodies with integrated pressure regulation. This program is available to all Cal Water customers. The current rebate amount is up to $10/body toward the spray body purchase cost and up to $8/spray body toward installation cost, if installed by a C-27 licensed landscape contractor.

Turf Replacement Rebate – This program provides a financial rebate for replacement of turf with approved drought-tolerant landscaping. Cal Water operated this program in 2015/16 as a drought response measure. The program will be re-started as part of Cal Water's irrigation equipment/landscape upgrade program offerings.

4.2.3 Customer Assistance

Smart Landscape Tune-Up Program – This program provides customers with an irrigation system evaluation and installation of approved efficient irrigation system equipment, such as a smart irrigation controller and high-efficiency sprinkler nozzles. The program also includes irrigation system adjustments and detection and repair of irrigation system leaks. This program is available to all Cal Water customers at no charge.

Residential Customer Portal – Through its residential customer portal, Cal Water provides tailored assistance to each residential customer via customized water-efficiency targets, water savings calculators, and customer-specific recommendations for programs and water-saving tips.

Non-Residential Customer Assistance – Cal Water provides tailored assistance to commercial customers through customized incentives, commercial water surveys, and large landscape water use surveys. The non-residential assistance program helps commercial customers efficiently use water for sanitation/cleaning, heating/cooling, process, and landscape purposes.

4.2.4 Summary of Customer Programs

The customer conservation programs offered to customers in Bear Gulch District are summarized in Table 3 by customer class.

Table 3. Cal Water Conservation Programs Available to Bear Gulch District Customers

Programs (Rebate, Direct Install, and Free Distribution Programs)	Customer Eligibility		
	Single-Family	Multi-Family	Commercial
Plumbing Fixture Replacement			
High-Efficiency Toilet Replacement	✓	✓	✓
High-Efficiency Urinal Replacement			✓
High-Efficiency Clothes Washer Rebate	✓	✓	
Conservation Kits	✓	✓	
Irrigation Equipment/Landscape Upgrades			
Smart Irrigation Controller Rebate	✓	✓	✓
High-Efficiency Sprinkler Nozzle Rebate	✓	✓	✓
Large Rotary Nozzle Rebate		✓	✓
Spray Body Rebate		✓	✓
Turf Replacement Rebate	✓	✓	✓
Customer Assistance			
Smart Landscape Tune-Up Program	✓	✓	✓
Residential Customer Portal	✓		
Non-Residential Customer Assistance		✓	✓

4.3 School Education and Public Information Programs

Public Information Program – Cal Water operates an extensive public information program to provide information to customers on ways to use water efficiently and to market its conservation programs through multiple media outlets, including the Cal Water website, direct mail and bills, digital media, social media, and email.

School Education Program - Cal Water's school education program includes the Cal Water H2O Challenge, a project-based learning competition for grades 4-6, individual student competitions for grades K-12 and general information and learning materials

for students and teachers. Cal Water deploys its school education program in all its districts. Cal Water H2O Challenge is a project-based competition for classrooms, grades 4-6. The program is offered in partnership with DoGoodery, the California Association of Science Educators (CASE), and the WestEd K-12 Alliance. The program aligns with the Common Core State Standards and the Next Generation Science Standards. The Cal Water H2O Challenge offers a unique opportunity for upper elementary teachers to facilitate their students' learning of standards-based content, while developing the core understanding of environmental principles necessary to becoming science-literate citizens.

4.4 Water System Efficiency

4.4.1 System Water Loss Management

As discussed above, reducing distribution system losses is one of the main focuses of the new Making Water Conservation a California Way of Life regulations. In preparation for these new requirements, Cal Water took part in the California Water Loss Technical Assistance Program (TAP) in both 2016 and 2017. Cal Water annually conducts distribution system audits using the American Water Works Association (AWWA) Free Water Audit Software. It has also developed a Water Loss Control Plan and Water Loss Control Policy to guide future water loss management with respect to:

- Meeting CPUC and state water loss standards and regulations
- Improving audit data and validity scores
- Implementing cost-effective water loss control actions

To coordinate and oversee water loss management actions across its multiple districts, Cal Water has added a Water Loss Program Analyst position to its conservation staff.

4.4.2 Metering and Pricing

Cal Water has deployed conservation-oriented rate designs in all its districts since 2008. The CPUC reviews these rate designs every three years as part of a general rate case. Cal Water is continuously seeking ways to improve the efficiency and equity of the rates and charges paid by customers. One example is Cal Water's Customer Assistance Program (CAP), which provides bill discounts to qualifying lower income households.

All service connections in the District are metered. In addition to its use for billing, Cal Water uses meter data in the management of its conservation programs, including using it to analyze water use trends and identify customers that may benefit from Cal Water conservation programs. Cal Water is also piloting automatic meter reading

(AMR) and advanced metering infrastructure (AMI) in several of its districts. Broad adoption of AMI would allow Cal Water in the future to detect and alert households of leaks and other possible problems as well as provide customers with tailored water use information to help them use water more efficiently.

4.5 Conservation Partnerships

Cal Water collaborates with organizations at the local, state, and national level to promote and advance water use efficiency, including as a member of the following organizations and initiatives.

California Water Efficiency Partnership (CalWEP) – CalWEP's mission is to maximize urban water efficiency and conservation throughout California by supporting and integrating innovative technologies and practices; encouraging effective public policies; advancing research, training, and public education; and building collaborative approaches and partnerships. In addition to being a CalWEP member, Cal Water serves on the organization's board of directors.

Alliance for Water Efficiency - The Alliance for Water Efficiency (AWE) is a national non-profit organization dedicated to efficient and sustainable use of water. In addition to being an AWE member, Cal Water uses the AWE Water Conservation Tracking Tool to evaluate conservation programs and track water savings.

EPA WaterSense - As an EPA WaterSense partner, Cal Water has committed to educating its customers about the value of water, water efficiency, and the WaterSense brand. Products and services earning the WaterSense label have been certified to be at least 20 percent more efficient without sacrificing performance.

5 Conservation Budget

The District's recommended conservation budget for the period 2021-2025 is presented in Figure 8.[5] Cal Water used the three-step process shown in Figure 9 to develop the conservation budget. In the first step, a wide range of possible conservation programs are qualitatively screened in terms of their potential savings, implementation feasibility, customer receptivity, and cost. The program screening filters used in this step are listed in Table 4. In the second step, the programs passing through the screen are quantitatively analyzed using the AWE's Water Conservation Tracking Tool. In the third step, a portfolio of programs is developed based on the

[5] This is a composite of the conservation budget the CPUC approved in Cal Water's 2018 general rate case, which covers the period 2020-2022, and the budget Cal Water is proposing in its 2021 general rate case, which covers the period 2023-2025. Depending on the outcome of the general rate case, the adopted 2023-2025 budget may differ from Cal Water's recommended budget.

results of the second step. As discussed earlier, in its two most recent general rate cases Cal Water has further refined the conservation budget based on the results of a risk assessment used to determine which districts may require additional resources to meet the state's new conservation regulations.

Figure 8. Recommend Conservation Budget and Allocation: 2021-2025

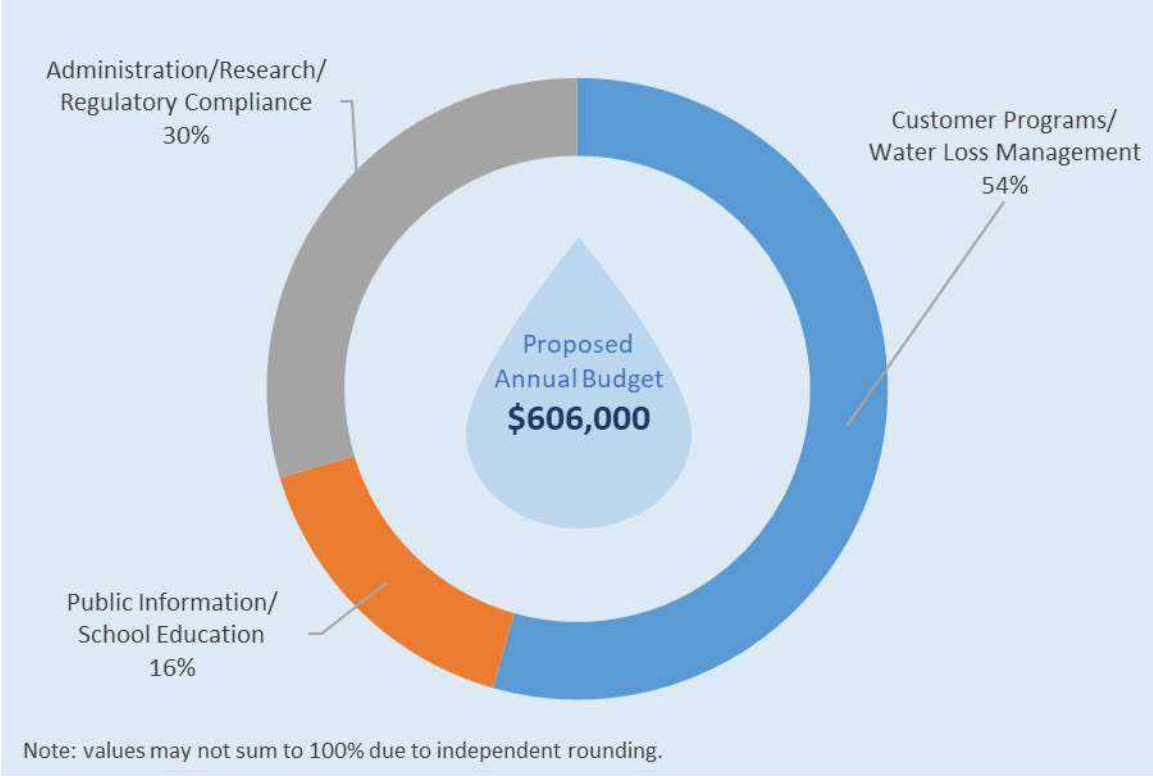


Figure 9. Conservation Program Assessment Method

Table 4. Conservation Measure Qualitative Screening Filters

Filter	Description
Water Savings Potential	The amount of water a measure can potentially save over its lifespan or over a certain period after an action that encourages behavioral change (such as receipt of a home water survey). This filter screens out measures where potential savings are too low to make it worthwhile.
Certainty of Water Savings	The certainty of the water savings estimated in Water Savings Potential. Some measures have high potential but low certainty because they are new and untested or because they rely on uncertain behavioral actions of participants. Other measures have low potential but high certainty. This filter screens out measures that have low expected savings (i.e., measures with high certainty but low potential or measures with high potential but low certainty) or flags these measures as candidates for pilot programs.
Implementation Feasibility	The ease with which a measure can be implemented, such as adequate budget and staff resources to handle outreach and ongoing administrative needs. This filter screens out measures than are considered infeasible to implement.
Customer Receptivity	The degree to which customers are receptive to a measure, such as how easy or difficult it is for a customer to apply for a certain rebate or arrange for a water survey. This filter screens out measures that are unlikely to be favored by customers.
Adaptability	The ease with which a measure can be scaled to react to a changing market (e.g., increasing or decreasing a toilet rebate to ramp up/down the participation rate), or adjusted to accommodate a different market sector (e.g., redesigning the incentives or other parameters of a single-family landscape turf replacement program to target the multi-family or commercial sectors). This filter screens out measures that cannot be readily adapted to changing circumstances of the market.
Cost	The expected cost-effectiveness of the measure relative to other measures. This filter screens out measures that are unlikely to be cost-effective or would crowd out other desirable measures because of its expense.

6 Performance Metrics

Cal Water periodically evaluates program savings potential and cost-effectiveness using the AWE Water Conservation Tracking Tool. Based on the most recent evaluation, the expected water savings and cost-effectiveness of Bear Gulch's conservation program are as follows:

- **Water Savings** – Up to 360 AF/year and cumulatively up to 5,600 AF over the useful life of the measures. Program water savings will help the District comply with new state water conservation regulations.
- **Unit Cost** – $700/AF (rounded to nearest $100), which is less than the District's purchased water cost.
- **Benefit-Cost Ratio** -- 2.9. The District's conservation program is expected to pay back $2.90 in avoided purchased water costs for every dollar of program expenditure.

7 Program Monitoring and Reporting

Cal Water regularly reviews its conservation programs to ensure they are performing as expected. This includes the following:

Program Tracking - Cal Water uses the AWE Water Conservation Tracking tool to track program participation, cost, and water savings. This data helps Cal Water monitor program performance, analyze water use trends, and forecast future water demand.

Research and Evaluation – Cal Water regularly evaluates program performance and undertakes pilot projects to assess the effectiveness of its programs. Examples include:

- Comprehensive statistical evaluations of bathroom retrofit programs operated between 2013 and 2018
- Statistical evaluations of water savings associated with high-efficiency irrigation nozzle replacement, smart irrigation controller installation, and turf replacement programs.
- Development of statistical models of customer program participation that help Cal Water target programs based on household and neighborhood attributes.
- AMR and AMI pilot projects.

Annual Conservation Report – Cal Water annually reports on the conservation program's progress and accomplishments, and posts public reports for each of its districts on its public website (https://www.calwater.com/conservation/water-conservation-reports/).

CPUC Reporting – Cal Water reports to the CPUC annually on the implementation, cost, and performance of its conservation programs.

State Reporting – Starting in 2023, Cal Water will annually report District water use relative to its water use objective as part of the new Making Water Conservation a California Way of Life regulations.

Appendix N: Resolution to Adopt UWMP

CALIFORNIA WATER SERVICE
1720 North First Street
San Jose, CA 95112-4598 *Tel:* (408) 367-8200

June 20, 2021

Julia Ekstrom, PhD
Supervisor, Urban Unit
California Department of Water Resources
Water Use Efficiency Section
P.O. Box 942836
Sacramento, CA 94236-0001

Re: Adoption of the 2020 Urban Water Management Plan and Water Shortage Contingency Plan
California Water Service – Bear Gulch District

Ms. Ekstrom:

This letter serves as notice that California Water Service Company (Cal Water) has formally adopted this 2020 Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) for our Bear Gulch District.

The attached resolution from Cal Water's Board of Directors on September 28, 2005 delegated authority for this approval to, among others, any Vice President. I have approved the attached UWMP and WSCP, which was developed by staff under my supervision in accordance with the Urban Water Management Planning Act contained in the California Water Code, Division 6, Part 2.6.

If you have any questions regarding this UWMP or WSCP, please contact Michael Bolzowski at the above mailing address, by telephone at (408) 367-8338, or by email at mbolzowski@calwater.com.

Sincerely,

Shannon Dean
Vice President, Customer Service and Chief Citizenship Officer

Attachments

cc: Ken Jenkins - Director, Water Resource Sustainability
Dawn Smithson - District Manager, Bear Gulch District

CALIFORNIA WATER SERVICE
1720 North First Street
San Jose, CA 95112-4598 *Tel:* (408) 367-8200

CALIFORNIA WATER SERVICE COMPANY

RESOLVED, that this Board of Directors delegates its authority to approve Urban Water Management Plans as required under the Urban Water Management Planning Act contained in California Water Code 6, Part 2.6 to the President and Chief Executive Officer, any Vice President, the Corporate Secretary and any Assistant Secretary of California Water Service Company.

--oOo--

I, DAN L. STOCKTON, Corporate Secretary of California Water Service Company, a California corporation, do hereby certify that the foregoing is a full, true and correct copy of certain resolution adopted by the Board of Directors of said corporation at a regular meeting of said Board duly called and held September 28, 2005, at which a quorum was present, that all Directors present voted in favor of said resolution, and that said resolution has never been annulled or revoked but is still in full force and effect.

IN WITNESS WHEREOF, I have hereunto signed my name this 7th day of September, 2005.

Dan L. Stockton
Corporate Secretary

Appendix B

Menlo Park Municipal Water, 2020 Urban Water Management Plan

June 2021

2020 Urban Water Management Plan

for Menlo Park Municipal Water

eki environment & water

TABLE OF CONTENTS

1 INTRODUCTION AND OVERVIEW 1
1.1 Background and Purpose 1
1.2 Urban Water Management Planning and the California Water Code 1
1.3 Relationship to Other Planning Efforts 2
1.4 Plan Organization 3
1.5 Demonstration of Consistency with the Delta Plan for Participants in Covered Actions 3
1.6 Lay Description 4
2 PLAN PREPARATION 7
2.1 Compliance with the UWMP Act 7
2.2 Coordination and Outreach 8
2.3 UWMP Structure, Standard Units, and Basis for Reporting 12
3 SYSTEM DESCRIPTION 14
3.1 Service Area Population and Demographics 14
3.2 Land Uses within Service Area 17
3.3 Climate 18
3.4 Water Distribution System 20
4 WATER USE CHARACTERIZATION 26
4.1 Historical and Current Total Water Demand 26
4.2 Projected Total Water Demand 33
4.3 Water Use Sectors Not Included in the Demand Projections 42
4.4 Climate Change Impacts to Demand 42
4.5 Coordinating Water Use Projections 43
4.6 Urban Water Use Objectives 44
5 SBX7-7 BASELINES, TARGETS, AND 2020 COMPLIANCE 47
5.1 Service Area Population 48
5.2 Baseline Water Use 48
5.3 Water Use Targets 49
5.4 2020 Target Compliance 51

6 WATER SUPPLY CHARACTERIZATION 52
6.1 Purchased or Imported Water 52
6.2 Groundwater 58
6.3 Surface Water 64
6.4 Stormwater 64
6.5 Wastewater and Recycled Water 64
6.6 Desalinated Water Opportunities 72
6.7 Water Exchanges and Transfers 73
6.8 Future Water Projects 74
6.9 Summary of Existing and Planned Sources of Water 75
6.10 Special Conditions 81
6.11 Energy Intensity 86
7 WATER SERVICE RELIABILITY AND DROUGHT RISK ASSESSMENT 88
7.1 Water Service Reliability Assessment 88
7.2 Drought Risk Assessment 114
8 WATER SHORTAGE CONTINGENCY PLAN 120
9 DEMAND MANAGEMENT MEASURES 129
9.1 Regional Water Conservation 129
9.2 Agency Water Conservation 131
9.3 Implementation over the Past Five Years 137
9.4 Planned Implementation to Achieve Water Use Targets 137
9.5 Urban Water Use Objectives (Future Requirement) 137
10 PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION 143
10.1 Notification of UWMP and WSCP Preparation 143
10.2 Notification of Public Hearing 143
10.3 Public Hearing and Adoption 144
10.4 Plan Submittal 145
10.5 Public Availability 145
REFERENCES 146

TABLES

Table 2-1 Public Water Systems (DWR Table 2-1)
Table 2-2 Plan Identification (DWR Table 2-2)
Table 2-3 Water Supplier Information Exchange (DWR Table 2-4)
Table 2-4 Notification to Cities and Counties (DWR Table 10-1)
Table 2-5 Supplier Identification (DWR Table 2-3)
Table 3-1 Population - Current and Projected (DWR Table 3-1)
Table 3-2 Employment - Current and Projected
Table 3-3 Demographic and Housing Characteristics
Table 3-4 Average Monthly Climate Characteristics
Table 4-1 Demands for Potable and Non-Potable Water - Actual (DWR Table 4-1)
Table 4-2 Historical and Current Potable Water Demand and Population
Table 4-3 Last Five Years of Water Loss Audit Reporting (DWR Table 4-4)
Table 4-4 Inclusion in Water Use Projections (DWR Table 4-5)
Table 4-5 Projected Total Water Demand and Projected Passive and Active Water Conservation
Table 4-6 Use for Potable and Non-Potable - Projected (DWR Table 4-2)
Table 4-7 Total Water Use (Potable and Non-Potable) (DWR Table 4-3)
Table 4-8 Characteristic Five-Year Water Use
Table 4-9 Current and Projected Residential Per Capita Water Use
Table 5-1 Baselines and Targets Summary (DWR Table 5-1)
Table 5-2 2020 Compliance (DWR Table 5-2)
Table 6-1 Groundwater Volume Pumped (DWR Table 6-1)
Table 6-2 Wastewater Collected Within Area in 2020 (DWR Table 6-2)
Table 6-3 Wastewater Treatment and Discharge Within Service Area in 2020 (DWR Table 6-3)
Table 6-4 Recycled Water Direct Beneficial Uses Within Service Area (DWR Table 6-4)
Table 6-5 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual (DWR Table 6-5)
Table 6-6 Methods to Expand Future Recycled Water Use (DWR Table 6-6)
Table 6-7 Expected Future Water Supply Projects or Programs (DWR Table 6-7)
Table 6-8 Water Supplies - Actual (DWR Table 6-8)
Table 6-9 Water Supplies - Projected (DWR Table 6-9)
Table 6-10 Recommended Energy Intensity - Total Utility Approach (DWR Table O-1B)
Table 7-1 Basis of SFPUC RWS Water Year Data (Reliability Assessment) (DWR Table 7-1)
Table 7-2 Basis of Recycled Water Year Data (Reliability Assessment) (DWR Table 7-1)
Table 7-3 RWS Wholesale Supply Availability During Normal and Dry Years for Based Years 2025 through 2040 (Responds to DWR Table 7-1)
Table 7-4 Normal Year Supply and Demand Comparison (DWR Table 7-2)
Table 7-5 Single Dry Year Supply and Demand Comparison (DWR Table 7-3)
Table 7-6 Multiple Dry Years Supply and Demand Comparison (DWR Table 7-4)
Table 7-7 MPMW Supply Availability During Multiple Dry Years for Base Year 2020

Table 7-8 Five-Year Drought Risk Assessment Tables to Address Water Code 10635(b) (DWR Table 7-5)
Table 8-1 Water Shortage Contingency Plan Levels (DWR Table 8-1)
Table 8-2 Demand Reduction Actions (DWR Table 8-2)
Table 8-3 Supply Augmentation and Other Actions (DWR Table 8-3)
Table 9-1 Summary of DMMs and Implementation over the Past Five Years (2015-2020)

FIGURES

Figure 3-1 Regional Vicinity Map
Figure 3-2 Water Purveyors within the City of Menlo Park
Figure 3-3 Land Use Designations within the MPMW Service Area
Figure 3-4 MPMW Service Area Map
Figure 6-1 Regional Water System
Figure 6-2 Groundwater Basins in the Vicinity of the MPMW Service Area

APPENDICES

Appendix A. Completed UWMP Checklist
Appendix B. UWMP Agency Notification Letters
Appendix C. UWMP Public Notification
Appendix D. Population and Employment Projections
Appendix E. SBx7-7 Compliance Tables
Appendix F. 2020 Current Population Estimate
Appendix G. SFPUC and BAWSCA Common Language for 2020 UWMPs
Appendix H. Letters from MPWD to BAWSCA and SFPUC
Appendix I. SFPUC Regional Water System Supply Reliability and BAWSCA Tier 2 Drought Implementation Scenarios
Appendix J. 26 March 2021 SFPUC Commission Special Meeting – Water Workshop Number 3 Water Supply Planning Scenarios SFPUC Staff Presentation Materials
Appendix K. Water Shortage Contingency Plan
Appendix L. Resolution 6630 Urban Water Management Plan, 2020 Update

ABBREVIATIONS

AB	Assembly Bill
ACWD	Alameda County Water District
AF	acre-foot
AFY	acre-foot per year
AMI	Advanced Metering Infrastructure
AWSP	Alternative Water Supply Planning Program
AWWA	American Water Works Association
BAIRWMP	Bay Area Integrated Regional Water Management Plan
BARR SWAP	Bay Area Regional Reliability Shared Water Access Program
BAWSCA	Bay Area Water Supply and Conservation Agency
BDPLs	Bay Division Pipelines
BG	billion gallon
CA	California
CASGEM	California Statewide Groundwater Elevation Monitoring
ccf	hundred cubic feet
CCR	California Code of Regulations
CCWD	Contra Costa Water District
CEQA	California Environmental Quality Act
CII	commercial, industrial, and institutional
CIP	Capital Improvement Plan
CUWCC	California Urban Water Conservation Council
CWC	California Water Code
DBP	disinfection by-product
DDW	Division of Drinking Water
DMM	Demand Management Measures
DOF	Department of Finance
DRA	Drought Risk Assessment
DSOD	Division of Safety of Dams
DSS	Decision Support System
DWR	California Department of Water Resources
EBMUD	East Bay Municipal Utilities District
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ETo	reference evapotranspiration
ft	foot
FTE	full-time equivalent
FY	fiscal year

GIS	geographic information system
GPCD	gallons per capita per day
gpf	gallons per flush
gpm	gallons per minute
GRP	Groundwater Reliability Partnership
GSP	Groundwater Sustainability Plan
GSR	Groundwater Storage and Recovery
GWMP	groundwater management plan
HET	High-Efficiency Toilet
HOA	homeowner's association
HTWTP	Harry Tracy Water Treatment Plant
IPCC	International Panel on Climate Change
ISG	Individual Supply Guarantee
JPA	Joint Powers Authority
kWh	kilowatt hours
LCSD	Lower Crystal Springs Dam
LOS	level of service
LVE	Los Vaqueros Reservoir Expansion
MCL	Maximum Contaminant Level
MG	million gallons
MGD	million gallons per day
MID	Modesto Irrigation District
MMWD	Marin Municipal Water District
MPMW	Menlo Park Municipal Water
MWELO	Model Water Efficient Landscape Ordinance
PAPMWC	Palo Alto Park Mutual Water Company
R-GPCD	residential gallons per capita per day
RUWMP	Regional Urban Water Management Plan
RWF	Recycled Water Facility
RWQCB	Regional Water Quality Control Board
RWS	Regional Water System
SB	Senate Bill
SCVWD	Santa Clara Valley Water District
SFPUC	San Francisco Public Utilities Commission
SGMA	Sustainable Groundwater Management Act
SHGCC	Sharon Heights Golf and Country Club
SLAC	SLAC National Accelerator Laboratory
SMP	Surface Mining Permit
SVCW	Silicon Valley Clean Water
SVWTP	Sunol Valley Water Treatment Plant
SWAP	Shared Water Access Program

SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
TID	Turlock Irrigation District
TRT	Tuolumne River Trust
U.S.	United States
USD	Union Sanitary District
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UV	ultraviolet
UWMP	Urban Water Management Plan
WBSD	West Bay Sanitary District
WCIP	Water Conservation Implementation Plan
WQD	Water Quality Division
WSA	Water Supply Assessment
WSAP	Water Shortage Allocation Plan
WSCP	Water Shortage Contingency Plan
WSIP	Water System Improvement Program
WWTP	Wastewater Treatment Plant

1 INTRODUCTION AND OVERVIEW

This chapter discusses the importance and uses of this Urban Water Management Plan (UWMP or Plan), the relationship of this Plan to the California Water Code (CWC), the relationship of this Plan to other local and regional planning efforts, and how this Plan is organized and developed in general accordance with the UWMP Guidebook 2020 (Guidebook; DWR, 2021).

1.1 Background and Purpose

Menlo Park Municipal Water (MPMW) serves water to approximately half of the City of Menlo Park (City), which is located along San Francisco Bay in San Mateo County. MPMW delivers water to residential, commercial, industrial, and governmental customers and purchases all of its potable water supplies from the San Francisco Public Utilities Commission (SFPUC). As of December 2020, MPMW serves 4,296 connections within its service area.

This UWMP is a foundational document and source of information about MPMW's historical and projected water demands, water supplies, supply reliability and potential vulnerabilities, water shortage contingency planning, and demand management programs. Among other things, it is used as:

- A long-range planning document for water supply and system planning; and
- A source for data on population, housing, water demands, water supplies, and capital improvement projects used in:
    - Regional water resource management plans prepared by wholesale water suppliers and other regional planning authorities (as applicable),
    - General Plans prepared by cities and counties, and
    - Statewide and broad regional water resource plans prepared by the California Department of Water Resources (DWR), the State Water Resources Control Board (State Board), or other state agencies.

MPMW's last UWMP was completed in 2016, referred to herein as the "2015 UWMP" (City of Menlo Park, 2016a). This Plan is an update to the 2015 UWMP and carries forward information that remains current and is relevant to this Plan, and provides additional information as required by amendments to the UWMP Act (CWC §10610 – 10657). Although this Plan is an update to the 2015 UWMP, it was developed to be a self-contained, stand-alone document and does not require readers to reference information contained in previous updates.

1.2 Urban Water Management Planning and the California Water Code

The UWMP Act requires urban water suppliers to prepare an UWMP every five years and to submit this plan to the DWR, the California State Library, and any city or county within which the supplier provides water supplies. All urban water suppliers, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet annually are required to prepare an UWMP (CWC §10617).

The UWMP Act was enacted in 1983. Over the years it has been amended in response to water resource challenges and planning imperatives confronting California. A significant amendment was made in 2009

as a result of the governor's call for a statewide 20 percent reduction in urban water use by 2020, referred to as "20x2020," the Water Conservation Act of 2009, and "SB X7-7." This amendment required urban retail water suppliers to establish water use targets for 2015 and 2020 that would result in statewide water savings of 20 percent by 2020. Beginning in 2016, urban retail water suppliers were required to comply with the water conservation requirements in SB X7-7 in order to be eligible for state water grants or loans. Chapter 5 of this plan contains the data and calculations used to determine compliance with these requirements.

A subsequent substantial revision to the UWMP Act was made in 2018 through a pair of bills (i.e., Assembly Bill 1668 and Senate Bill 606), referred to as "Making Water Conservation a California Way of Life" or the "2018 Water Conservation Legislation." These changes include, among other things, additional requirements for Water Shortage Contingency Plans (WSCPs), expansion of dry year supply reliability assessments to a five-year drought period, establishment of annual drought risk assessment procedures and reporting, and new conservation targets referred to as "annual water use objectives," which will require retailers to continue to reduce water use beyond the 2020 SB X7-7 targets.

As applicable, MPMW's 2020 UWMP reflects the following significant revisions to the UWMP Act that have been made since 2015.

- ***Five Consecutive Dry-Year Water Reliability Assessment***. The Legislature modified the dry-year water reliability planning from a "multiyear" time period to a "drought lasting five consecutive water years" designation.
- ***Drought Risk Assessment***. The Drought Risk Assessment (DRA) requires a supplier to assess water supply reliability over a five-year period from 2021 to 2025 that examines water supplies, water uses, and the resulting water supply reliability under a reasonable prediction for five consecutive dry years.
- ***Energy Analysis.*** UWMPs are now required to include water system energy usage information that can be readily obtained.
- ***Seismic Risk***. The Water Code now requires suppliers to specifically address seismic risk to various water system facilities and to have a mitigation plan.
- ***Water Shortage Contingency Plan***. In 2018, the Legislature modified the UWMP laws to require a WSCP with specific elements as explained in Appendix K.
- ***Lay Description***. The Legislature included a new statutory requirement for suppliers to include a lay description of the fundamental determinations of the UWMP, especially regarding water service reliability, challenges ahead, and strategies for managing reliability risks.

The UWMP Act contains numerous other requirements that an UWMP must satisfy. Appendix A to this Plan lists each of these requirements and where in the Plan they are addressed.

1.3 Relationship to Other Planning Efforts

This Plan provides information specific to water management and planning by MPMW. However, water management does not happen in isolation; there are other planning processes that integrate with the UWMP to accomplish urban planning. Some of these relevant planning documents include relevant city

and county General Plans, Water Master Plans, Recycled Water Master Plans, integrated resource plans, Integrated Regional Water Management Plans, and others.

This Plan is informed by and helps to inform these other planning efforts. In particular, this Plan was prepared in close coordination with the City of Menlo Park's Community Development Department (Planning) and the Public Works Department (Engineering). Primary coordination was achieved through City staff's participation in two UWMP workshops (held on 1 December 2020 and 16 February 2021). At these workshops, key information regarding the 2020 UWMP content was presented and City representatives were provided the opportunity to review, comment, and present additional information.

1.4 Plan Organization

The organization of this Plan follows the same sequence as outlined in the Guidebook (DWR, 2021).

Chapter 1 - Introduction and Overview

Chapter 2 - Plan Preparation

Chapter 3 - System Description

Chapter 4 - Water Use Characterization

Chapter 5 - SBx7-7 Baselines, Targets, and 2020 Compliance

Chapter 6 - Water Supply Characterization

Chapter 7 - Water Service Reliability and Drought Risk Assessment

Chapter 8 - Water Shortage Contingency Plan

Chapter 9 - Demand Management Measures

Chapter 10 - Plan Adoption, Submittal, and Implementation

In addition to these ten chapters, this Plan includes a number of appendices providing supporting documentation and supplemental information. Pursuant to CWC §10644(a)(2), this Plan utilizes the standardized forms, tables, and displays developed by DWR for the reporting of water use and supply information required by the UWMP Act. This Plan also includes additional tables, figures, and maps to augment the set developed by DWR, as appropriate. The table headers indicate if the table is part of DWR's standardized set of submittal tables.

1.5 Demonstration of Consistency with the Delta Plan for Participants in Covered Actions

The Sacramento-San Joaquin Delta Reform Act of 2009 (Delta Reform Act) (Water Code § 85000 et seq), established the coequal goals for the Sacramento-San Joaquin Delta (Delta) of "providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem." The Delta Reform Act also includes a state policy to reduce reliance on the Delta in meeting California's future water supply needs through a statewide strategy of investing in improved regional supplies, conservation, and water use efficiency.

In addition to establishing the coequal goals, the Delta Reform Act created the Delta Stewardship Council, which is tasked with furthering the state's coequal goals for the Delta through development of a Delta

Plan. Delta Stewardship Council released the Delta Plan in 2013, which adopted 14 recommendations to achieve the coequal goals of water supply and reliability.

Although not required by the UWMP Act, in the Guidebook (DWR, 2021), DWR recommends that all suppliers that are participating in, or may participate in, receiving water from a proposed project that is considered a "covered action" under the Delta Plan—such as a (1) multiyear water transfer; (2) conveyance facility; or (3) new diversion that involves transferring water through, exporting water from, or using water in the Delta —provide information in their UWMP to demonstrate consistency with the Delta Plan policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (California Code of Regulations, Title 23, Section 5003). The SFPUC, MPMW's wholesale agency, has made a legal determination that this requirement does not apply to their water sources.[1]

1.6 Lay Description

☑ ***CWC § 10630.5***

Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.

This Urban Water Management Plan (UWMP or Plan) is prepared for Menlo Park Municipal Water (MPMW), which serves drinking water to approximately 4,296 accounts within the City of Menlo Park. This UWMP serves as a foundational planning document and includes descriptions of historical and projected water demands and water supplies and reliability over a 20-year planning horizon. This document also describes the actions MPMW is taking to promote water conservation, both by the agency itself and by its customers (referred to as "demand management measures") and includes a plan to address potential water supply shortages such as drought or other impacts to supply availability (the "Water Shortage Contingency Plan"). This UWMP is updated every five years in accordance with state requirements under the Urban Water Management Planning Act and amendments (Division 6 Part 2.6 of the California Water Code [CWC] §10610 – 10656). Past plans developed for MPMW are available on the California Department of Water Resources (DWR) Water Use Efficiency Data Portal website: https://wuedata.water.ca.gov/. This document includes ten chapters, which are summarized below.

Chapter 1 – Introduction and Overview

This chapter presents the background and purpose of the UWMP, identifies the Plan organization, and provides this lay description overview of the document. For suppliers that receives water from a "covered action" under the Delta Plan, this section also discusses and demonstrates consistency with Delta Plan Policy WR P1. MPMW, however, does not receive water from a "covered action" under the Delta Plan, and thus this discussion is not applicable.

[1] Email from BAWSCA, dated 9 February 2021.

Chapter 2 - Plan Preparation

This chapter discusses key structural aspects related to the preparation of the UWMP, and describes the coordination and outreach conducted as part of the preparation of the Plan, including coordination with local agencies (i.e., the San Francisco Public Utilities Commission [SFPUC], members of the Bay Area Water Supply and Conservation Agency [BAWSCA], the West Bay Sanitary District [WBSD]) and the public.

Chapter 3 - System Description

This chapter provides a description of MPMW's water system and service area, including information related to the climate, demographics, and the water distribution system. The MPMW service area is located within a region characterized by a Mediterranean climate with cool, wet winters and warm, dry summers. The majority of precipitation falls during winter and spring, averaging 15 inches of rainfall annually. MPMW currently serves a population of approximately 18,276. Population is projected to increase steadily through 2040. Significant new development is envisioned in the General Plan within MPMW's service area. MPMW distributes water purchased from the SFPUC to its three pressure zones via five SFPUC service connections (turnouts). MPMW operates one emergency supply well as well as 13 interties with adjacent water systems.

Chapter 4 - Water Use Characterization

This chapter provides a description and quantifies MPMW's current and projected demands through the year 2040. MPMW provides drinking water (also referred to as "potable water") to customers. Water demands refer not only to the water used by customers, but also includes the water used as part of the system maintenance and operation, as well as unavoidable losses inherent in the operation of a water distribution system. MPMW water demand was 1,021 million gallons (MG) on average between 2016 and 2020. Taking into account historical water use, expected population increase and other growth, climatic variability, and other assumptions, water demand within MPMW is projected to increase to 1,483 MG by 2040, a change of 41% compared to the 2016-2020 average.

Chapter 5 - SBx7-7 Baselines, Targets, and 2020 Compliance

In this chapter, MPMW demonstrates compliance with its per capita water use target for the year 2020. The Water Conservation Act of 2009 (Senate Bill X7-7) was enacted in November 2009 and requires the state of California to achieve a 20 percent reduction in urban per capita water use by December 31, 2020. In order to achieve this, each urban retail water supplier was required to establish water use targets for 2015 and 2020 using methodologies established by DWR. MPMW is in compliance with its 2020 water use target of 204 gallons per capita per day (GPCD), having reduced its water use in 2020 to 160 GPCD.

Chapter 6 - Water Supply Characterization

This chapter presents an analysis of MPMW's water supplies, as well as an estimate of water-related energy consumption. The intent of this chapter is to present a comprehensive overview of MPMW's water supplies, estimate the volume of available supplies over the 20-year planning horizon, and assess the sufficiency of supplies to meet projected demands under "normal" hydrologic conditions.

The sole source of potable water supply for MPMW is purchased water from the SFPUC. MPMW has a contractual supply of 4.456 million gallons per day (MGD), or approximately 1,630 MG per year. Water supply for MPMW is expected to be sufficient during normal years to meet the projected water demand through 2040. MPMW has been working with West Bay Sanitary District (WBSD), the recycled water purveyor for MPMW's service area, to develop recycled water. Recycled water is currently used for

irrigation at the Sharon Heights Golf and Country Club. Another similar recycled water project in the Bayfront area is undergoing planning.

Calculation and reporting of water system energy intensity is a new requirement for the 2020 UWMPs. Energy intensity is defined as the net energy used for water treatment, conveyance, and distribution for all water entering the distribution system, less the amount of energy produced within the water system itself. The energy intensity for MPMW is estimated to be 349 kilowatt hours per MG of water (kWh/MG).

Chapter 7 - Water Service Reliability and Drought Risk Assessment

This chapter assesses the reliability of MPMW's water supplies, with a specific focus on potential constraints such as water supply availability, water quality, and climate change. The intent of this chapter is to identify any potential constraints that could affect the reliability of MPMW's supply (such as drought conditions) to support MPMW's planning efforts to ensure that it can meet projected demands. Water service reliability is assessed during normal, single dry-year, and multiple dry-year hydrologic conditions.

Based on this analysis, MPMW's supply is expected to be sufficient to meet demands in normal year conditions. However, MPMW is expected to experience significant shortfalls during single dry and multiple dry year conditions as a result of amendments to the Water Quality Control Plan for the San Francisco/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) implementation. Yet, numerous uncertainties remain in the implementation of the Bay-Delta Plan Amendment and the resultant allocation of the available supply between the Wholesale Customers.

Chapter 8 - Water Shortage Contingency Plan

This chapter describes the Water Shortage Contingency Plan (WSCP) for MPMW. The WSCP serves as a standalone document to be engaged in the case of a water shortage event, such as a drought or supply interruption, and defines specific policies and actions that will be implemented at various shortage level scenarios. For example, implementing customer water budgets and surcharges, or restricting landscape irrigation to specific days and/or times. Consistent with DWR requirements, the WSCP includes six levels to address shortage conditions ranging from up to 10% to greater than 50% shortage.

Chapter 9 - Demand Management Measures

This chapter includes descriptions of past and planned conservation programs that MPMW operates within each demand management measure (DMM) category outlined in the UWMP Act, specifically: (1) water waste prevention ordinances, (2) metering, (3) conservation pricing, (4) public education and outreach, (5) distribution system water loss management, (6) water conservation program coordination and staffing support, and (7) "other" DMMs. MPMW has developed a suite of conservation programs and policies, which address each DMM category. Additionally, MPMW participates in water conservation programs offered by BAWSCA. It is estimated that between the years 2016 and 2020, MPMW conserved over 6 MG through implementation of DMMs.

Chapter 10 - Plan Adoption, Submittal, and Implementation

This chapter provides information on a public hearing, the adoption process for the UWMP and the associated WSCP, the adopted UWMP and WSCP submittal process, plan implementation, and the process for amending the adopted UWMP and WSCP. MPMW adopted the UWMP and WSCP during a City Council meeting on 25 May 2021. This UWMP and the WSCP was submitted to DWR within 30 days of adoption and by the 1 July 2021 deadline.

2 PLAN PREPARATION

This chapter discusses the type of Urban Water Management Plan (UWMP or Plan) Menlo Park Municipal Water (MPMW) has prepared and includes information that will apply throughout the Plan. Coordination and outreach during the development of the Plan is also discussed.

2.1 Compliance with the UWMP Act

☑ ***CWC § 10620 (b)***

Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

The 2020 UWMP has been prepared in accordance with the Urban Water Plan Act (UWMP Act), which is defined by the California Water Code (CWC) §10610 - §10657. The UWMP Act requires every urban water supplier that provides water for municipal purposes to more than 3,000 connections, or supplies more than 3,000 acre-feet (AF) of water annually, to adopt and submit a plan every five years to the California Department of Water Resources (DWR). Table 2-1 provides information on MPMW's public water system which services 4,296 connections within its service area and is therefore subject to the requirements of the UWMP Act.

Table 2-1 Public Water Systems (DWR Table 2-1)

Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020 (MG)
CA4110017	City of Menlo Park	4,296	1,069
	TOTAL	4,296	1,069
NOTES: (a) Data provided by MPMW.			

As indicated in Table 2-2, MPMW's 2020 UWMP is an individual Plan. It has been prepared in general accordance with the format suggested in DWR's UWMP Guidebook (Guidebook; DWR, 2021). Text from the UWMP Act has been included in grey boxes at the beginning of relevant sections of this UWMP. The information presented in the respective UWMP sections and the associated text, figures, tables and charts are collectively intended to fulfill the requirements of that sub-section of the UWMP Act. To the extent practicable, supporting documentation has also been provided in Appendices A through N. Other sources for the information contained herein are provided in the references section of the document.

Per CWC §10644(a)(2), selected information for the 2020 UWMP updates must be presented in standardized tables for electronic submittal to DWR. To the extent applicable, text and tables in the main body of the UWMP document have been cross-referenced to the companion DWR tables. The DWR tables

include an optional column for 2045. However, MPMW's data are only reported up through 2040 to be consistent with the General Plan's planning horizon.

Table 2-2 Plan Identification (DWR Table 2-2)

Select Only One	Type of Plan		Name of RUWMP or Regional Alliance *if applicable*
X	Individual UWMP		
		Water Supplier is also a member of a RUWMP	
		Water Supplier is also a member of a Regional Alliance	
	Regional Urban Water Management Plan (RUWMP)		
NOTES:			

2.2 Coordination and Outreach

As described below and in Section 10, this UWMP has been prepared in coordination with the Bay Area Water Supply and Conservation Agency (BAWSCA), the BAWSCA member agencies, the San Francisco Public Utilities Commission (SFPUC), the West Bay Sanitary District (WBSD), the public, and other appropriate entities.

2.2.1 Role of BAWSCA and the UWMP Common Language

Among its other functions, BAWSCA represents MPMW and the 25 other water districts, cities, and utilities, collectively referred to as the "Wholesale Customers", in negotiations and other coordination efforts with the SFPUC. Together with the SFPUC, BAWSCA developed common language for inclusion in each Wholesale Customers' 2020 UWMP regarding the following common issues:

- Description of BAWSCA;
- Regional Water Demand and Conservation Projections;
- Long Term Reliable Water Supply Strategy;
- Making Conservation a Way of California Life Strategic Plan
- Tier One Drought Allocations;
- Tier Two Drought Allocations;
- SFPUC Regional Water System
- Individual Supply Guarantees (ISGs);
- 2028 SFPUC Decisions (formerly 2018 SFPUC Decisions);

- Reliability of the Regional Water System;
- Climate Change;
- SFPUC's Efforts to Develop Alternative Water Supplies
- SFPUC's Decision to use Bay-Delta Plan Scenario in UWMP Submittal Tables;
- Bay Delta Plan Implementation Starting Year;
- SFPUC's Decision to Present Both Modeling Results in its UWMP;
- Rate Impacts of Water Shortages; and
- BAWSCA Conservation Programs.

For clarification purposes, and as shown below, the common language provided by BAWSCA is shown in grey font and has been indented for emphasis; it is otherwise presented unchanged from the original text provide by BAWSCA. As a result, there may be some redundancy in the information presented and the number of times that certain terms are abbreviated or defined. A description of BAWSCA's role generally and related to the 2020 UWMP development process is provided below.

> BAWSCA provides regional water reliability planning and conservation programming for the benefit of its 26 member agencies that purchase wholesale water supplies from the San Francisco Public Utilities Commission (SFPUC). Collectively, the BAWSCA member agencies deliver water to over 1.8 million residents and nearly 40,000 commercial, industrial and institutional accounts in Alameda, San Mateo and Santa Clara Counties.
>
> BAWSCA also represents the collective interests of these wholesale water customers on all significant technical, financial, and policy matters related to the operation and improvement of the SFPUC's Regional Water System (RWS).
>
> BAWSCA's role in the development of the 2020 Urban Water Management Plan (UWMP) updates is to work with its member agencies and the SFPUC to seek consistency among UWMP documents.

2.2.2 Wholesale Coordination

☑ ***CWC § 10631 (h)***

An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).

The SFPUC is a wholesale water supplier to all of the BAWSCA member agencies, and is the only wholesale water supplier to MPMW. As part of the coordination efforts for the 2020 UWMP, and in compliance with CWC §10631(h), BAWSCA prepared water demand projections through 2040 on behalf of MPMW and transmitted MPMW's water demand projections to the SFPUC.

Additionally, as described in more detail in Section 6.11, MPMW has relied upon the water supply reliability projections provided by the SFPUC for the purposes of analyzing the reliability of its SFPUC supplies during normal and dry years through 2040 (see Table 2-3).[2]

Table 2-3 Water Supplier Information Exchange (DWR Table 2-4)

The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.
Wholesale Water Supplier Name
San Francisco Public Utilities Commission
NOTES:

2.2.3 Agency Coordination

☑ ***CWC § 10620 (d) (2)***

Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

As a member of BAWSCA and the BAWSCA Water Management Representative Committee, MPMW has coordinated closely with BAWSCA and its 25 other member agencies throughout the update of MPMW's UWMP. Between 12 February 2021 and 9 April 2021, MPMW attended a series of five webinars on supply reliability hosted by BAWSCA. During the webinar, BAWSCA and the member agencies reviewed the water supply reliability projections provided by the SFPUC, as well as the updated dry year supply allocations described in Section 7. MPMW also attends monthly water management meetings with BAWSCA and its member agencies that, among other topics, include discussion of items pertinent to the preparation of the 2020 UWMPs.

MPMW has also been supporting West Bay Sanitary District (WBSD), the wastewater agency serving MPMW's service area, to provide recycled water and assess potential recycled water supplies for the MPMW service area. The ongoing recycled water projects led by WBSD in coordination with MPMW are discussed in Section 6.

In addition, MPMW notified local and regional water retailers and public agencies of MPMW's intent to prepare the 2020 UWMP and Water Shortage Contingency Plan (WSCP), as well as the associated public hearing. A total of 68 recipients from 33 agencies and groups received notices as listed in Table 2-4 and

[2] Information provided by the SFPUC and BAWSCA are included in Appendix G.

Appendix B, including the SFPUC, BAWSCA, each BAWSCA member agency, and San Mateo County. Sample copies of the notices are provided in Appendix B.

Table 2-4 Notification to Cities and Counties (DWR Table 10-1)

City Name	60 Day Notice	Notice of Public Hearing
City of Menlo Park	X	X
County Name	**60 Day Notice**	**Notice of Public Hearing**
San Mateo County	X	X
Other Agency Name	**60 Day Notice**	**Notice of Public Hearing**
Note (a)	X	X

NOTES:
(a) See Appendix B for the full list of cities and agencies that MPMW provided notification to.

2.2.4 Public Participation

☑ *CWC § 10642*

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

The City established and maintains a website in support of the 2020 UWMP update process[3]. The website provides background information regarding UWMPs and includes information on key 2020 UWMP preparation activities, including the 13 April 2021 City Council Study Session, availability of the Public Review Draft 2020 UWMP and WSCP, and the 25 May 2021 Public Hearing to adopt the 2020 UWMP and WSCP. A copy of the Public Review Draft 2020 UWMP and WSCP was posted on this website for public review on 26 April 2021. Notices were also sent to MPMW customers via water bills.

On 7 May 2021 and 14 May 2021, MPMW published a notice in the *Redwood City Tribune* informing the public that the 2020 UWMP and WSCP would be available for public review on the City's website, consistent with requirements of California Government Code 6066[4]. The notice also informed the public that the 2020 UWMP and WSCP public hearing would be held via teleconference on 25 May 2021. Copies of the newspaper announcements are included in Appendix C.

2.3 UWMP Structure, Standard Units, and Basis for Reporting

Per CWC §10644(a)(2), selected information for the 2020 UWMP updates must be presented in standardized tables for electronic submittal to DWR. As such, tables in the UWMP document follows DWR required format and have been cross-referenced to DWR table numbers.

[3] Menlo Park Municipal Water 2020 UWMP Website: https://www.menlopark.org/150/Urban-Water-Management-Plan.

[4] Government Code section 6066. Publication of notice pursuant to this section shall be once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such publication dates, are sufficient. The period of notice commences upon the first day of publication and terminates at the end of the fourteenth day, including therein the first day.

Per the Guidebook, the UWMP preparer is requested to complete a checklist of specific UWMP requirements to assist DWR's review of the submitted UWMP. The completed checklist is included in Appendix A.

Information presented in this UWMP is reported on a calendar year basis. The unit of measure for reporting water volumes is million gallons (MG) and is maintained consistently throughout the UWMP, unless otherwise noted (see Table 2-5).

Further, consistent with the Guidebook, the terms "water use", "water consumption", and "water demand" are used interchangeably in this UWMP.

Table 2-5 Supplier Identification (DWR Table 2-3)

Type of Supplier	
	Supplier is a wholesaler
X	Supplier is a retailer
Fiscal or Calendar Year	
X	UWMP Tables are in calendar years
	UWMP Tables are in fiscal years
If using fiscal years provide month and date that the fiscal year begins (mm/dd)	
Units of measure used in UWMP	
Unit	MG
NOTES:	

3 SYSTEM DESCRIPTION

☑ ***CWC § 10631 (a)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

Describe the service area of the supplier, including current and projected population, climate, and other social, economic, and demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available. The description shall include the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

Menlo Park Municipal Water (MPMW) serves approximately half of the City of Menlo Park (City), which is located along San Francisco Bay in San Mateo County, between the cities of Redwood City, Palo Alto, and East Palo Alto (Figure 3-1). Other purveyors within City limits include the California Water Service Company (Cal Water), which serves the Bear Gulch District; the O'Connor Tract Co-operative Water Company, which serves a small area of the City using groundwater production wells; and the Palo Alto Park Mutual Water Company, which serves fewer than ten homes using groundwater production wells within the eastern portion of the City. Figure 3-2 shows MPMW's service area and the approximate service area extents of the other water purveyors within the City.

MPMW is a member of Bay Area Water Supply and Conservation Agency (BAWSCA) and purchases all of its potable water from the San Francisco Public Utilities Commission (SFPUC). MPMW is governed by the City Council and run by the City's Public Works Department. Water distribution, water conservation and maintenance of water quality are MPMW's main water resource functions, as water purchased from the SFPUC does not require further treatment.

As required by the Urban Water Management Planning Act (UWMP Act), specific information about MPMW's service area, population, and climate is provided below. A brief description of MPMW's potable water distribution system is also included herein.

3.1 Service Area Population and Demographics

MPMW's water distribution system provides water retail service to approximately half of the City's population through approximately 4,296 connections. The current and projected population and employment data from 2020 through 2040 within the MPMW service area are shown in Table 3-1 and, Table 3-2 and the associated charts.

3.1.1 Future Population Growth

MPMW's service area is largely built-out and population growth is attributed primarily to redevelopment projects within the existing urban footprint. The City's General Plan sets the framework for development. As with the 2015 UWMP, this Plan estimates future population based on the expected growth associated with the buildout of the previous General Plan and the additional growth created through the 2016

General Plan update (i.e., ConnectMenlo) (City of Menlo Park, 1994 and 2016). The projections have been updated by the City's Planning Division to account for frontloading of development between 2020 and 2025, as indicated by their review of the approved and pending projects[5].

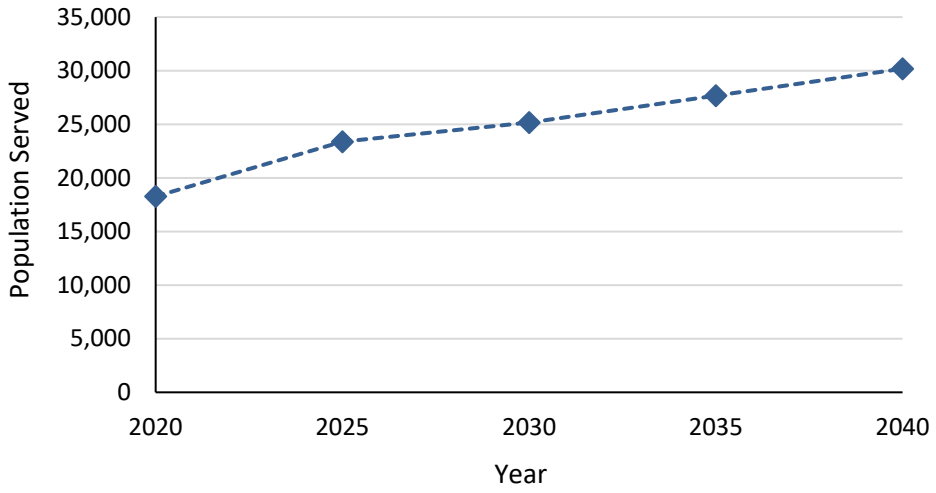
The total population within the MPMW service area is projected to be 30,184 by 2040. More than 40% of the increase is expected to take place within the next five years (2020 to 2025).

Table 3-1 Population - Current and Projected (DWR Table 3-1)

Population Served	2020	2025	2030	2035	2040	2045*(opt)*
	18,276	23,383	25,166	27,675	30,184	--

NOTES:
(a) Historical and current population data are further documented in Table 4-2.
(b) Data provided by the City (see Appendix D).

Chart 3-1 Current and Projected Population



3.1.2 Future Employment Growth

MPMW also supplies water to its commercial, industrial, and institutional (CII) customers, which were collectively estimated to provide 23,574 jobs within the MPMW service area in 2020 (see Table 3-2). Based

[5] Population and employment projections were estimated by the City's Planning Division, as documented in Appendix D.

on the previous General Plan, the ConnectMenlo update, and the City's approved and pending projects, the number of jobs within the MPMW service area is anticipated to grow to 37,311 in 2040[5], an increase of 58% relative to 2020.

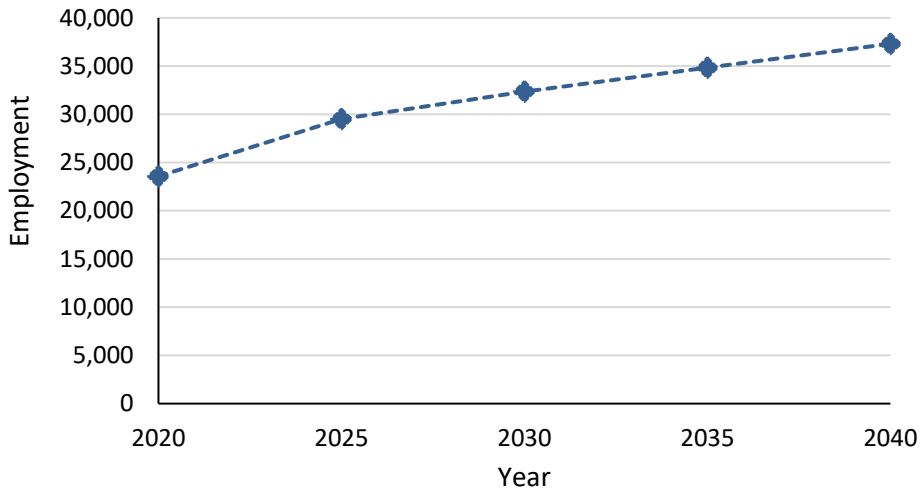
The anticipated job growth through 2040 is a combined effect of growth in the commercial sector and a decline in the industrial sector. Specifically, commercial jobs are expected to increase by 14,529 while industrial jobs are expected to decrease by 792 between 2020 and 2040. Additional details are provided in Appendix D.

Table 3-2 Employment - Current and Projected

Service Area Employment	2020	2025	2030	2035	2040	2045*(opt)*
	23,574	29,511	32,356	34,834	37,311	--

NOTES:
(a) Projected employment growth was provided by the City's Planning Division in October 2020 (see Appendix D).

Chart 3-2 Current and Projected Employment



3.1.3 Other Social, Economic, and Demographic Factors

Demographics for the City are summarized in Table 3-3 as they may affect water management and planning. The same data are also provided for the whole State of California as comparison. The City has a similar age and race structure to the State as a whole. Educational attainment and median household income in the City are much higher than for the State, and percent of population below the poverty level is comparatively lower.

Table 3-3 Demographic and Housing Characteristics

Demographics (a)	City of Menlo Park	California
Age and Sex		
Persons under 5 years	7.6%	6.0%
Persons under 18 years	24.9%	22.5%
Persons 65 years and older	14.0%	14.8%
Female persons	50.3%	50.3%
Race and Hispanic Origin		
White alone	67.2%	71.9%
Black or African American alone	4.5%	6.5%
American Indian and Alaska Native alone	0.7%	1.6%
Asian alone	15.0%	15.5%
Native Hawaiian and Other Pacific Islander alone	2.0%	0.5%
Two or More Races	5.0%	4.0%
Hispanic or Latino	15.5%	39.4%
White alone, not Hispanic or Latino	58.2%	36.5%
Families & Living Arrangements		
Persons per household	2.78	2.95
Living in same house 1 year ago, percent of persons age 1 year+	82.6%	87.1%
Language other than English spoken at home, age 5 years+	32.8%	44.2%
Education		
High school graduate or higher, persons age 25 years+	94.0%	83.3%
Bachelor's degree or higher, persons age 25 years+	69.6%	33.9%
Income & Poverty		
Median Household Income (2019 dollars)	$160,784	$75,235
Per capita income in past 12 months (2019 dollars)	$85,710	$36,955
Persons in poverty	7.6%	11.8%

NOTES:
(a) Demographic data per the U.S. Census Bureau QuickFacts website, https://www.census.gov/quickfacts/fact/table/menloparkcitycalifornia,CA/PST045219, accessed March 2021.

3.2 Land Uses within Service Area

General Plans are required by State law to guide land use and development within cities (California Government Code Section 65030.1). The Land Use and Circulation Elements are the central components of the General Plan as they frame the type and scale of potential development that may occur over a 20-year time horizon and informs associated transportation and water demand issues. Beginning in 2014, the

City initiated an effort to update the Land Use and Circulation Elements. This process, which is also known as ConnectMenlo, culminated in the adoption of the updated General Plan in 2016.

As reflected in the General Plan Land Use Element (City of Menlo Park, 2016b), the majority of the City's land use is residential (55%), while the remaining 45% is split among other uses, notably Bayfront Innovation Area (15%), Parks and Recreation (10%), and Commercial (7%). MPMW's service area is in the northeastern and southwestern portions of the City, covering approximately half of the City's area. Land uses within the MPMW service area generally consists of a mix of residential, commercial, light industrial uses (Figure 3-3).

The major land use changes included in the updated General Plan is the new development north of Highway 101 in the Bayfront Area (former M-2 Zoning Area), which is served by MPMW.[6] The maximum potential net increase from the Bayfront Area development includes approximately:

- 2.3 million non-residential square feet, including offices, life-sciences buildings, and other commercial uses;
- 400 hotel rooms;
- 4,500 multi-family residential units;
- Two transit centers; and
- Up to 61 acres of landscaped open space.

The future population, employment, and water demand projections presented in Sections 3 and 4 reflect buildout of the General Plan, including the additional allowable development associated with ConnectMenlo and other major development projects within the MPMW service area.

3.3 Climate

The MPMW service area is located within a region characterized by a Mediterranean climate with cool, wet winters and warm, dry summers. As shown in Table 3-4, rainfall in the area averages 15.2 inches per year and is generally confined to the wet season from late October to early May. The average reference evapotranspiration (ETo) for the region is 44 inches per year. The ETo is a standard measurement related to the water demand by plants in a specific region. Because the average annual ETo is approximately 30 inches more than the average annual precipitation, and because 90% of the annual precipitation occurs between the months of November and April, growing turf or other plantings in this region requires a significant amount of irrigation during the dry season. This irrigation demand contributes to the overall and observed seasonal variation in water demand throughout the MPMW service area.

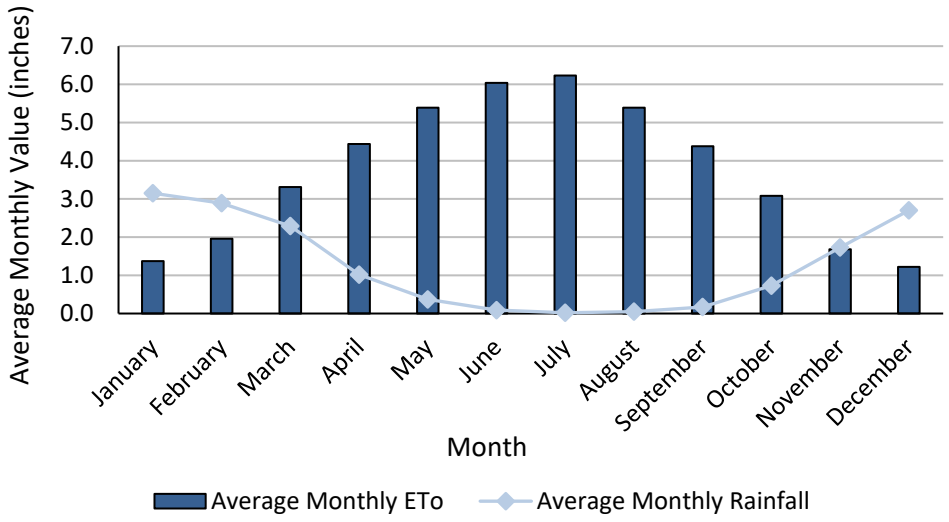
[6] A portion of the M-2 Area bounded by Highway 101, Marsh Road, and the Dumbarton Rail is served by California Water Service Company. The land use changes associated with ConnectMenlo in this area would generally reflect the same uses and intensity that is permitted under the current regulations.

Table 3-4 Average Monthly Climate Characteristics

Month	Average Temperature		Standard Average ETo (inches)	Average Rainfall (inches)
	Min (°F)	Max (°F)		
January	38.5	57.4	1.4	3.15
February	41.3	61.1	2.0	2.89
March	43.1	64.2	3.3	2.29
April	44.7	68.4	4.4	1.02
May	48.5	72.9	5.4	0.37
June	52.5	77.4	6.0	0.09
July	54.9	78.4	6.2	0.02
August	54.8	78.4	5.4	0.05
September	52.6	78.3	4.4	0.17
October	48.0	73.0	3.1	0.73
November	42.6	64.3	1.7	1.73
December	38.2	57.8	1.2	2.70
Annual	**46.6**	**69.3**	**44**	**15.2**

NOTES:
(a) Temperature and precipitation data are from the Western Regional Climate Center for Station #046646 PALO ALTO from 1 September 1953 to 4 June 2016.
(b) Reference evapotranspiration data for Union City station #171 are from the Department of Water Resources, California Irrigation Management Information System.

Chart 3-4 Average Monthly Climatic Conditions



3.4 Water Distribution System

As illustrated in Figure 3-4, MPMW's potable water distribution system is split into three different pressure zones, which are described below.

- The Lower Zone is generally located north and east of El Camino Real and serves residential, small commercial, and light industrial land uses. The lower zone includes the Belle Haven neighborhood, commercial and light industrial in the Bayfront Area, as well as portions of the Bay Road and Willows neighborhoods. It also includes the business parks between Willow Road and University Avenue north of O'Brien Drive.
- The High Pressure Zone is located in northern Menlo Park between Highway 101 and Bayfront Expressway, north of Chilco Street, and serves multi-family residential, commercial and light industrial, and a mobile home park outside the City's northern-most boundary. The High Pressure Zone is hydraulically disconnected from the other zones.
- The Upper Zone is located in the southwest portion of Menlo Park near Interstate 280 and is geographically and hydraulically disconnected from the other pressure zones. It primarily serves the residential Sharon Heights neighborhood and business parks along Sand Hill Road.

There are 31 MPMW customers located along Euclid Avenue (25 connections) and O'Brien Drive (six connections) that receive water from the City of East Palo Alto's water distribution system that are billed by MPMW. MPMW compensates City of East Palo Alto for water used by these customers and their water use is not included as part of MPMW's demand.

Water from the SFPUC's Regional Water System (RWS) enters MPMW's distribution system through five service connections (turnouts). The High Pressure Zone and the Upper Zone each have one turnout, and the Lower Zone has three turnouts. MPMW has two water storage tanks, which have capacities of 2 million gallons (MG) and 3.5 MG[7], and act together to serve the Upper Zone. A MPMW pump station conveys water from the upper zone turnout to supplement demands and to fill the storage tanks.

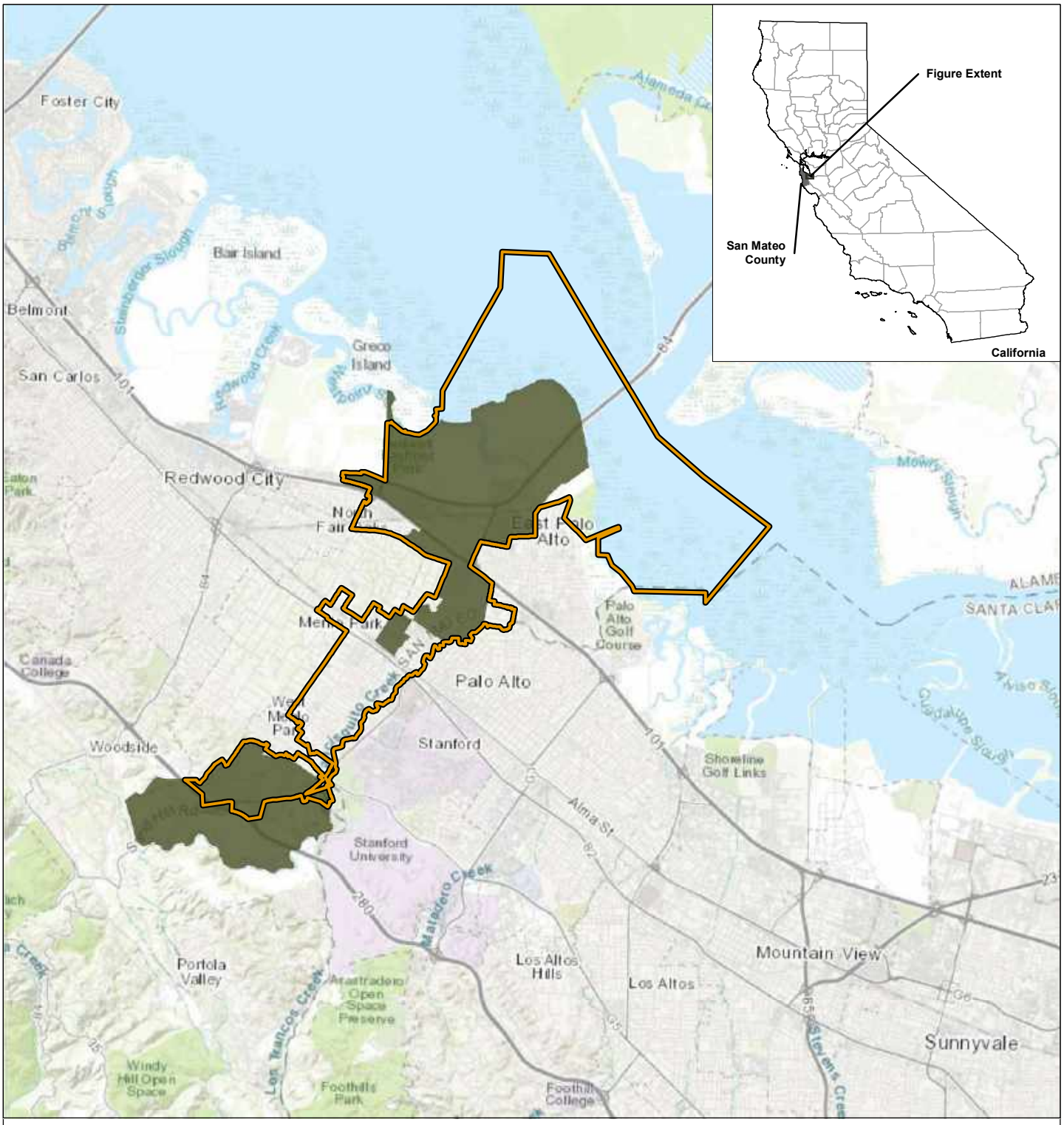
MPMW has 13 emergency interties with four adjacent water suppliers. Three connections (one metered) are with the Cal Water's Bear Gulch system; a metered connection with the O'Connor Tract Co-operative Water Company; a connection with the City of Redwood City; and eight interties with the City of East Palo Alto.

MPMW has one emergency groundwater well at the City's Corporation Yard located at 333 Burgess Drive. MPMW is in the midst of working with the State Water Resources Control Board (SWRCB) to permit the "Corp Yard Well" which can provide up to 1,500 gallons per minute (gpm) of back-up supply to the Lower Zone. MPMW plans to design and construct an additional one or two emergency wells in order to achieve another 1,500 gpm (for a total supply capacity of 3,000 gpm) as part of the Emergency Water

[7] An evaluation of MPMW's water system was documented in a Water System Evaluation Report (Metcalf and Eddy, 2000). Hydraulic modeling was performed to evaluate alternative projects to improve distribution system performance. The addition of a tank and pump station in the Upper Zone was evaluated to meet fire protection and emergency storage requirements. Construction of a 3.5 MG of storage and separate inlet and outlet structures for the storage tanks was implemented in 1997.

Storage/Supply Project. MPMW is also investigating locations for a future underground reservoir to serve the Lower and Higher Pressure Zones.

MPMW updated its Water System Master Plan in 2018. The Water System Master Plan identifies strategies for cost-effectively meeting MPMW's distribution system infrastructure needs for the next 25 years through year 2040; recommends capital expenditures for the system totaling $90.31 million; furnishes important guidance to enhance renewal and replacement strategies, operational and water quality practices; and provides a framework for diversifying MPMW's water supply. The 2018 Water System Master Plan can be viewed at menlopark.org/watersystemmasterplan.



Legend

- Menlo Park City Limit
- MPMW Service Area

Abbreviations

MPMW = Menlo Park Municipal Water

Notes

1. All locations are approximate.

Sources

1. Service area data were provided by MPMW on 6 July 2020.
2. World Topographic base map provided by ArcGIS Online.

N

0 2 4

Miles

Regional Vicinity Map

Menlo Park Municipal Water
2020 Urban Water Management Plan
Menlo Park, CA
June 2021
EKI C00050.00

Figure 3-1

eki environment & water

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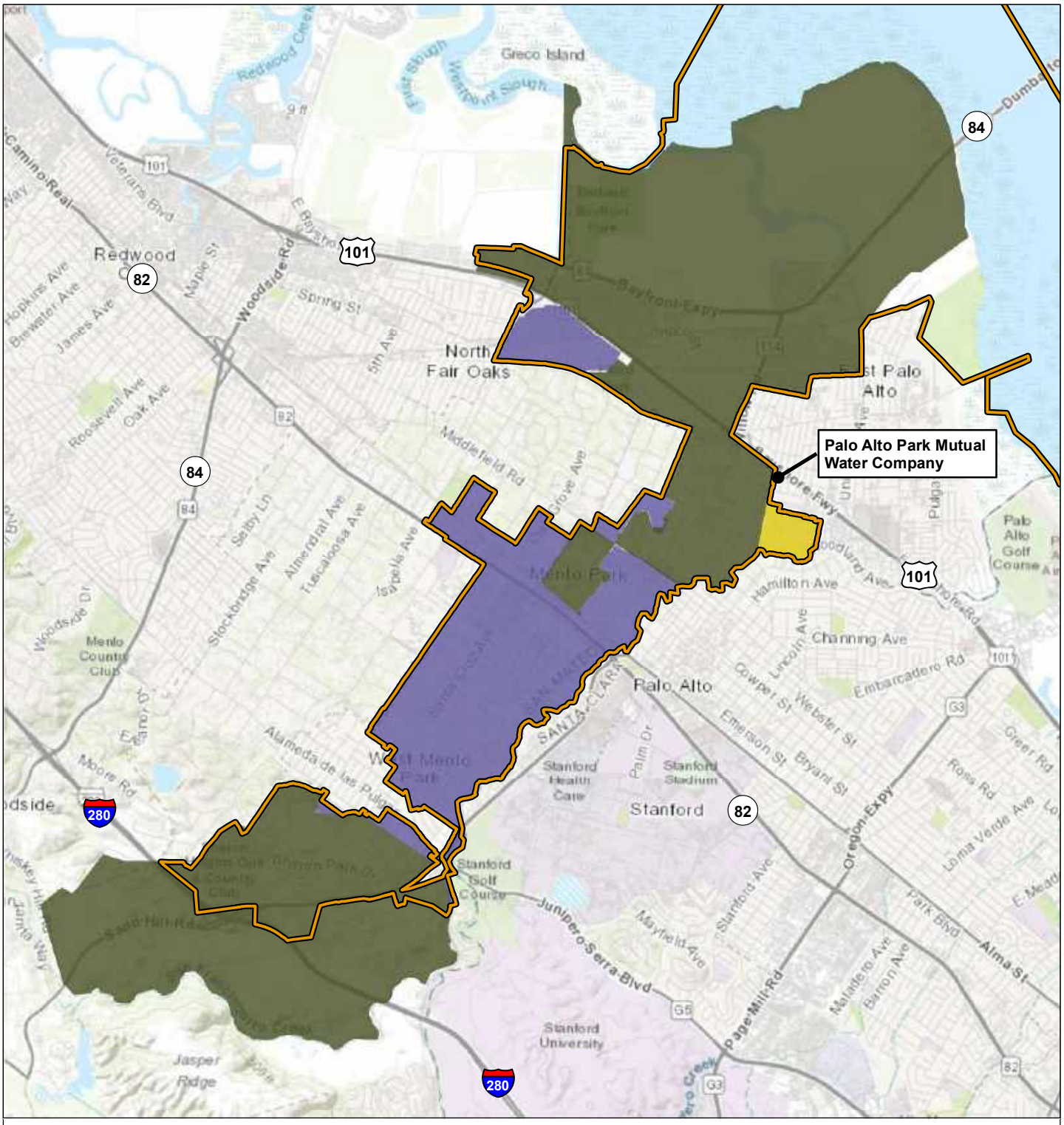

Legend

Service Areas

- MPMW
- California Water Service Company
- O'Connor Tract Co-operative Water Company

Menlo Park City Limit

N

0 1 2

Miles

Abbreviations

MPMW = Menlo Park Municipal Water

Notes

1. All locations are approximate.

Sources

1. Service area data were provided by MPMW on 6 July 2020.
2. Basemap provided by ArcGIS.

Water Purveyors within the City of Menlo Park

Menlo Park Municipal Water
2020 Urban Water Management Plan
Menlo Park, CA
June 2021
EKI C00050.00

Figure 3-2

eki environment & water

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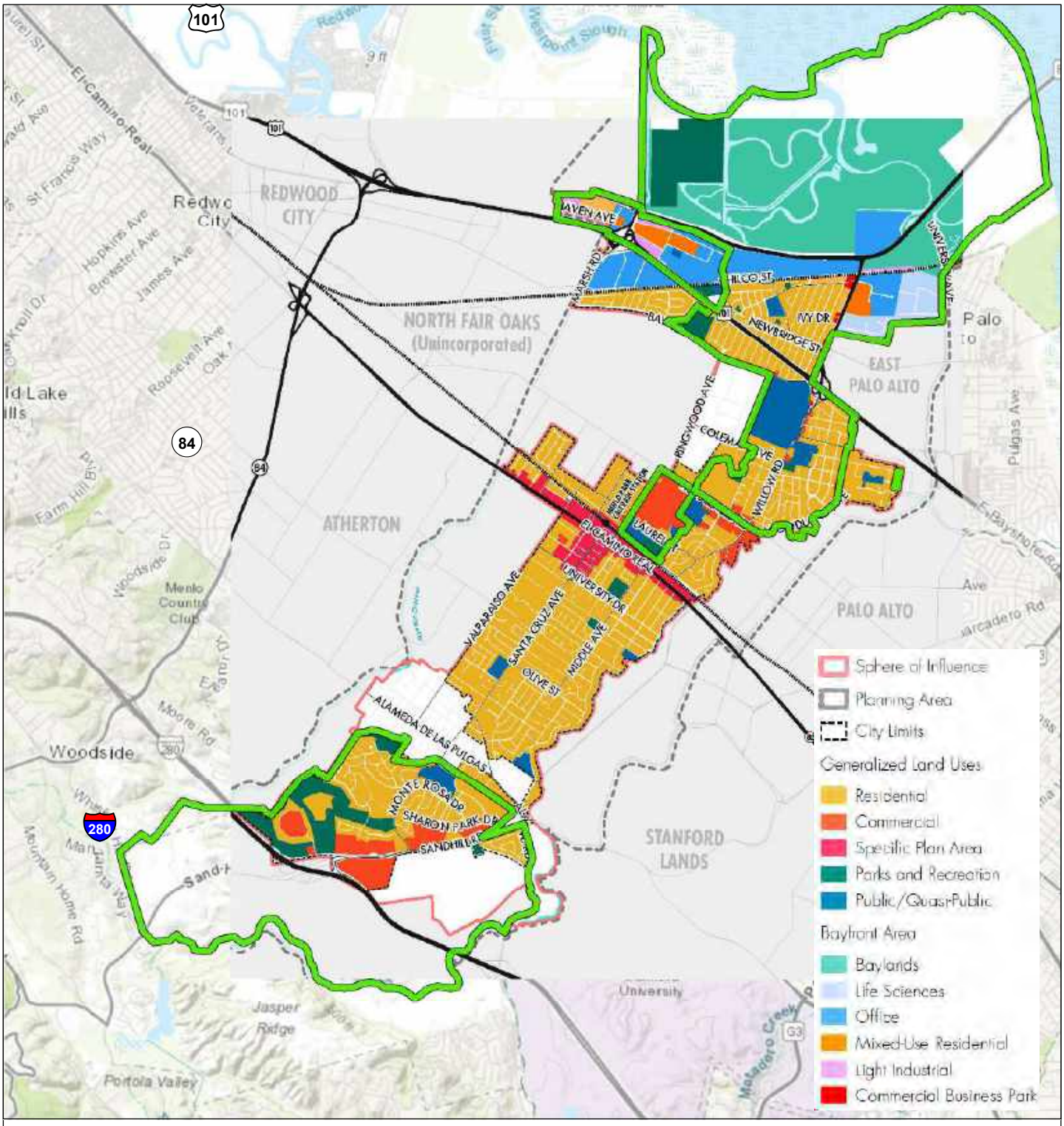

Legend

MPMW Service Areas

N

0 1 2

Miles

Abbreviations

MPMW = Menlo Park Municipal Water

Notes

1. All locations are approximate.

Sources

1. Service area data were provided by MPMW on 6 July 2020.
2. Land use obtained from City's General Plan.
3. Basemap provided by ArcGIS.

Land Use Designations within the MPMW Service Area

Menlo Park Municipal Water
2020 Urban Water Management Plan
Menlo Park, CA
June 2021
EKI C00050.00

Figure 3-3

eki environment & water

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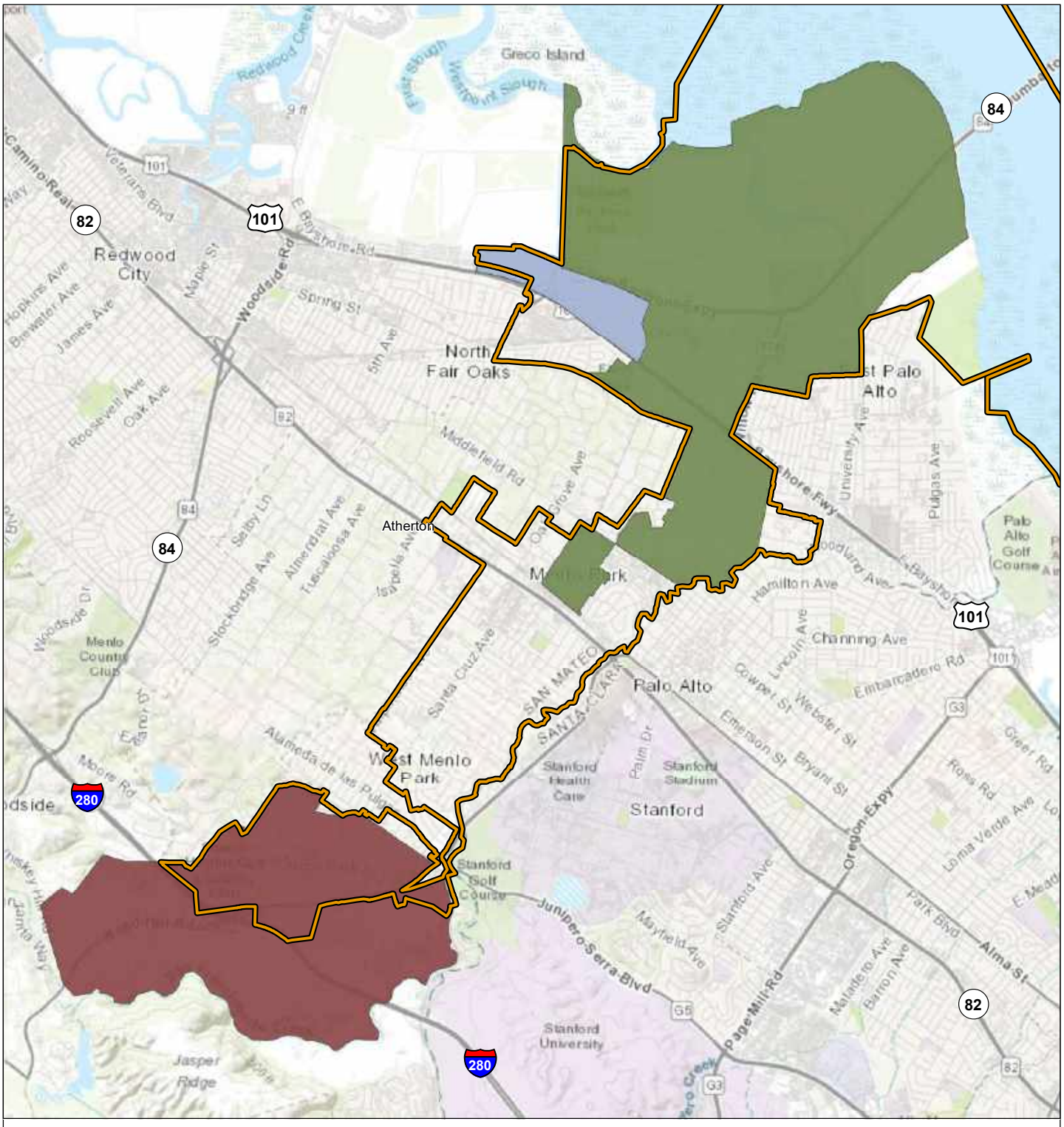

Legend

MPMW Service Areas

- Upper Zone
- Lower Zone
- High Pressure Zone
- Menlo Park City Limit

N

0 1 2

Miles

Abbreviations

MPMW = Menlo Park Municipal Water

Notes

1. All locations are approximate.

Sources

1. Service area data were provided by MPMW on 6 July 2020.
2. Basemap provided by ArcGIS Online.

MPMW Service Area Map

Menlo Park Municipal Water
2020 Urban Water Management Plan
Menlo Park, CA
June 2021
EKI C00050.00

Figure 3-4

eki environment & water

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4 WATER USE CHARACTERIZATION

☑ ***CWC § 10631 (d) (1)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(J) Distribution system water loss.

(2) *The water use projections shall be in the same five-year increments described in subdivision (a).*

For the purposes of this Urban Water Management Plan (UWMP or Plan), potable water demand is defined as the volume of potable water that Menlo Park Municipal Water (MPMW) purchases from the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS). Non-potable water demand is defined as the demand for recycled water provided by the West Bay Sanitary District (WBSD) to the MPMW service area, that would otherwise be served by MPMW. Among other things, water demand is dependent on climate, population, industry, and the types of development present in a community. Sections 4.1 and 4.2 describe the historical and projected water demands for the residential, commercial, industrial, institutional, and landscape irrigation sectors within the MPMW service area (water use sectors A through F and J, as described per California Water Code [CWC] §10631(d)(1)(A) though (F) and (J)). As described in Section 4.3, this discussion does not include demands for water use sectors per CWC §10631(d)(1)(G) through (I) as they are not applicable or present within the MPMW service area.

4.1 Historical and Current Total Water Demand

Prior to 2020, all potable water demands within the MPMW service area were met with water purchased from the SFPUC RWS. Starting in July 2020, recycled water became available and was used to meet a portion of the irrigation demand. The historical and current total water demands within the MPMW service area include the water consumed by metered accounts in the service area ("metered water consumption"), unmetered water used for fire services and flushing ("unmetered water consumption"), and the water that is lost within the distribution system ("losses").

4.1.1 Historical and Current Potable Water Demand

Potable water demand within the MPMW service area is measured using water meters that are installed at each customer account. Records of historical and current water use at each account are maintained by the City of Menlo Park's (City's) Public Works Department. Water demand within the MPMW service area is tracked and reported on a monthly basis for the following sectors:

- Single Family Residential;
- Multi-Family Residential;
- Commercial;
- Industrial;
- Institutional/Governmental;
- Landscape; and
- Other.

Total water demand within the MPMW service area was approximately 1,069 million gallons (MG) in 2020. As can be seen in Table 4-1 and the associated charts, the residential sector accounted for an average of approximately 41% of the total water demand between 2016 and 2020 (i.e., single family residential demands were approximately 31% of the total demand, while multi-family residential demands accounted for the remaining 10%). MPMW has a relatively large commercial, industrial, and institutional (CII) base, which together accounted for approximately 44% of potable water demand for the 2016-2020 period. The one remaining major use type is irrigation, which accounted for 12% of the total water demand on average[8].

There is a slightly increasing trend in potable water demand between 2016 and 2020, which likely reflects commercial development as well as a rebound from the historic drought. Commercial water use increased 56% from 2016 to 2019. Although commercial water use decreased slightly in 2020, it was likely due to temporary impacts from the shelter-in-place orders that were issued during COVID-19. Industrial water use, however, decreased by 37%, which reflects the shift in the City's development focus as discussed in Section 3.2.

[8] Irrigation services include irrigation water use at accounts that have a separate irrigation meter and does not represent all of the outdoor irrigation water use within the MPMW service area.

Table 4-1 Demands for Potable and Non-Potable Water - Actual (DWR Table 4-1)

Use Type	Additional Description *(as needed)*	Level of Treatment When Delivered	Volume				
			2016	2017	2018	2019	2020
Single Family		Drinking Water	277	306	315	309	361
Multi-Family		Drinking Water	95	106	101	97	113
Commercial		Drinking Water	157	179	245	244	203
Industrial		Drinking Water	222	240	140	143	140
Institutional/ Governmental		Drinking Water	42	58	58	67	98
Landscape	Note (b)	Drinking Water	97	116	125	122	139
Losses	Note (c)	Drinking Water	4	-4	120	42	12
Other	Note (d)	Drinking Water	5	2	4	2	3
		TOTAL	898	1,003	1,108	1,028	1,069

NOTES:
(a) Volumes are in units of MG.
(b) Irrigation water use includes water use recorded at dedicated irrigation meters and does not represent all of the outdoor irrigation water use within MPMW.
(c) Losses are further documented in Table 4-3. 2016 to 2019 losses were obtained from the AWWA Water Audit Reports. 2020 water loss was estimated as the difference between production and consumption.
(d) Other water uses include other billed metered consumption (e.g., temporary meters and hydrant), billed unmetered consumption and unbilled consumption which are obtained from the AWWA Water Audit Reports.
(e) Demand data provided by MPMW. Demands did not include accounts that received water from East Palo Alto but were billed by MPMW.
(f) Total water uses may not match the total water supplies reported in Table 6-8. This is because the water losses calculated in AWWA Water Audit Reports and presented here are based on invoices which usually do not start from the first day of the month. However, the supply data in Table 6-8 are based on real-time AMI meter reads and summed by natural month.
(g) Totals may not sum due to rounding.

Chart 4-1A Annual Water Demand by Sector: 2016-2020

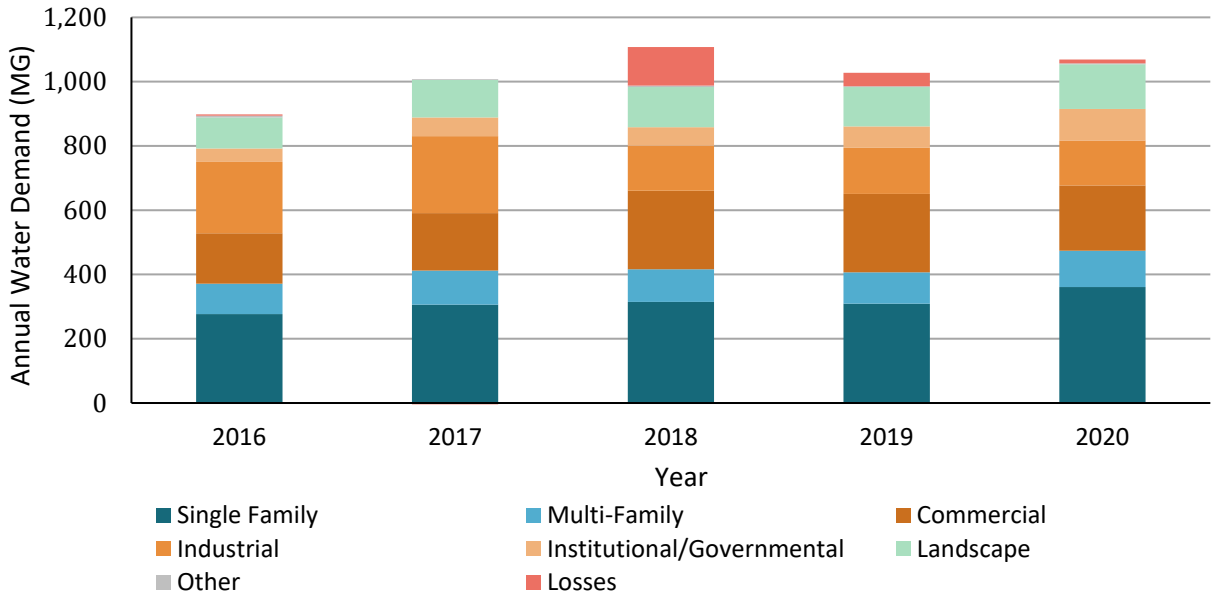


Chart 4-1B Percentage of Total Water Demand by Sector: 2016-2020

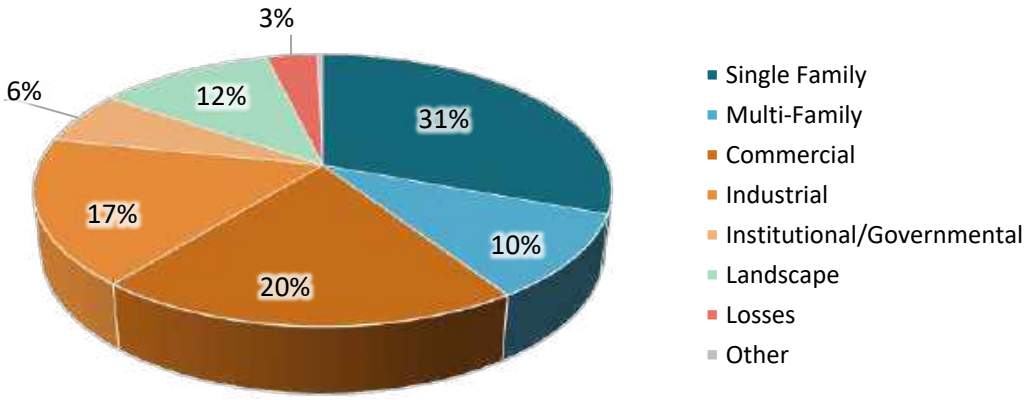


Table 4-2 and the associated charts present historic potable water use on a per capita basis. Per capita water use has shown a decreasing trend during the drought period of 2014 and 2017 as a result of the local water use cutbacks and the mandatory state-wide restrictions. The lowest per capita water use was observed in 2016 at 154 gallons per capita per day (GPCD). Per capita water use since then has shown a rebound to approximately 160 GPCD in 2020.

Table 4-2 Historical and Current Potable Water Demand and Population

Year	Potable Water Demand	Service Area Population	Per Capita Potable Water Use (GPCD)
2010	1,052	14,749	195
2011	1,033	14,829	191
2012	1,079	14,973	197
2013	1,189	15,129	215
2014	1,030	15,157	186
2015	883	15,342	158
2016	898	15,929	154
2017	1,003	16,516	166
2018	1,108	17,102	177
2019	1,028	17,689	159
2020	1,069	18,276	160

NOTES:
(a) Unless otherwise noted, volumes are in units of MG.
(b) 2010 to 2015 data are from the 2015 UWMP.
(c) 2016 to 2020 water demand data are from Table 4-1. 2016 to 2019 population is estimated based on interpolation between 2015 and 2020.
(d) Per capita water use is calculated by dividing the total annual water use by service area population and the number of days in a year.

Chart 4-2A Historical and Current Potable Water Demand and Population

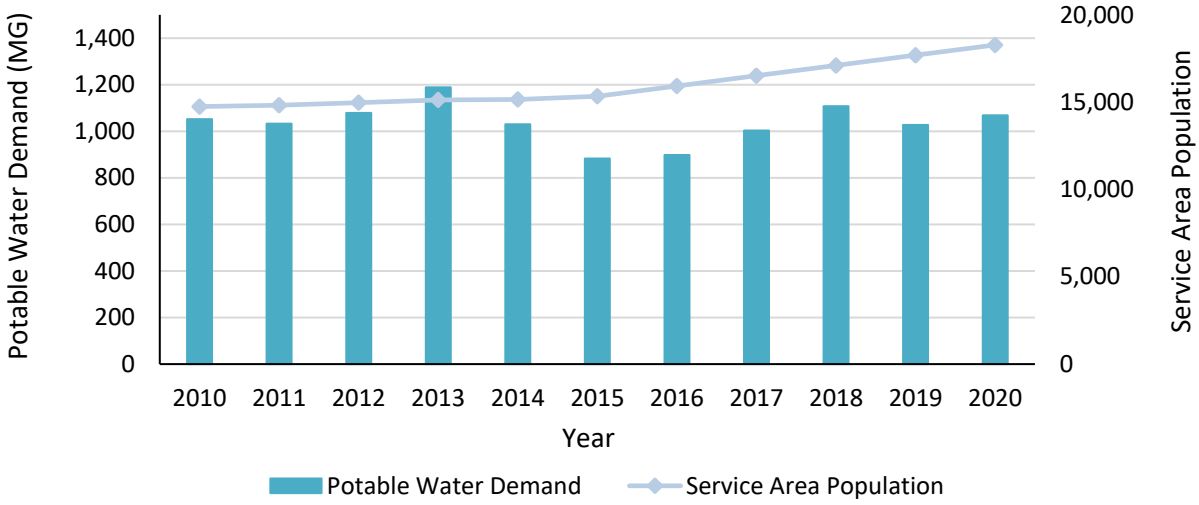
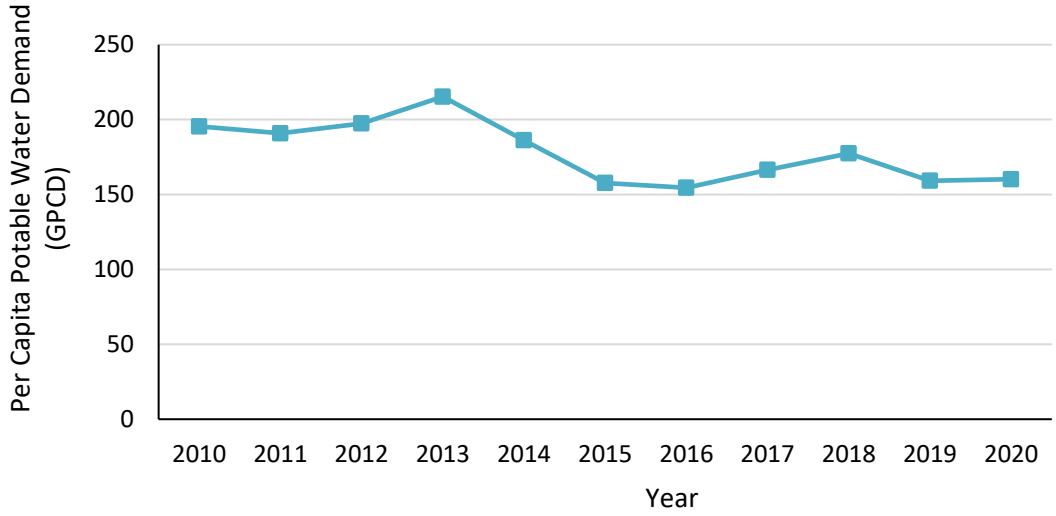


Chart 4-2B Historical and Current Per Capita Potable Water Use



4.1.2 Historical and Current Recycled Water Demand

Historically, no MPMW water demands were met with recycled water supplies. With the completion of the West Bay Sanitation Sanitary District's (WBSD's) Sharon Heights Recycled Water Facility in July 2020, approximately 20 MG of recycled water was used for irrigation at the Sharon Heights Golf and Country Club in 2020. Detailed discussion of recycled water use within the MPMW service area is provided in Section 6.5.

4.1.3 Distribution System Water Loss

☑ ***CWC § 10631 (3)***

(A) The distribution system water loss shall be quantified for each of the five years preceding the plan update, in accordance with rules adopted pursuant to Section 10608.34.

(B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.

(C) In the plan due July 1, 2021, and in each update thereafter, data shall be included to show whether the urban retail water supplier met the distribution loss standards enacted by the board pursuant to Section 10608.34.

Since 2016, urban retail water suppliers have been required under CWC §10608.34 and California Code of Regulations (CCR) § 638.1 et seq to quantify distribution system water losses using the American Water Works Association (AWWA) Water Audit Software (referred to as the "AWWA Water Loss Worksheet"). Water losses within MPMW's potable water distribution system over the last five years were estimated using the AWWA Water Loss Worksheet summarized in Table 4-3. Furthermore, CWC §10631 (3)(c) requires that this UWMP demonstrate whether the distribution loss standards enacted by the State Water Resources Control Board (SWRCB) pursuant to §10608.34 have been met. However, the SWRCB has yet to establish these standards, and thus consistency with these standards cannot be demonstrated herein.

The "Losses" are the sum of "apparent" and "real" losses estimated by the AWWA Water Loss Worksheet analysis. Apparent losses include metering inaccuracies, systematic data handling errors, and unauthorized consumption. Real losses represent water loss attributable to the distribution system and include physical water losses from the pressurized system and storage tanks up to the point of customer consumption.

The "Losses" are a portion of the total differential between water supply and metered water use, and the remaining portion is the "Other-Unbilled Consumption" which includes unbilled water uses such as system flushing and leak repair flushing.

As shown in Table 4-3, the water losses within MPMW were calculated to be variable between 2016 and 2020, ranging from negative 4 MG to a high of 120 MG. The five-year average of water losses was approximately 35 MG, or 3% of the average total water demand. The high variability of water losses during this period and the negative value of water losses in 2017 were likely due to the quality of the billing data and differences in meter reading cycles between the SFPUC supply meters and MPMW's meters. MPMW is anticipating that installation of Advanced Metering Infrastructure will improve billing data quality going forward. Metering of the MPMW distribution system is further discussed in Section 9.2.2.

Table 4-3 Last Five Years of Water Loss Audit Reporting (DWR Table 4-4)

Reporting Period Start Date	Volume of Water Loss
01/2016	4
01/2017	-4
01/2018	120
01/2019	42
01/2020	12
NOTES: (a) Volumes are in units of MG. (b) Water losses are reported on a calendar year basis. 2016 to 2019 losses were obtained from the AWWA Water Audit Reports. 2020 water loss was estimated as the difference between production and consumption.	

4.2 Projected Total Water Demand

Per CWC §10631(d)(1), potable and non-potable water demand projections are discussed in the following sections.

4.2.1 Projected Total Water Demand

In 2020, future water demands for MPMW's service area were projected by Bay Area Water Supply and Conservation Agency (BAWSCA) on behalf of MPMW. Future water demands were projected using the Demand Management Decision Support System Model (DSS Model) and were based on population and employment projections within MPMW's service area. The DSS Model and the associated water demand and conservation projection methodology is documented in detail in the *Regional Water Demand and Conservation Projections Report* (BAWSCA, 2020b). A brief description of BAWSCA's 2020 demand projections is provided below.

> In June 2020, BAWSCA completed the Regional Water Demand and Conservation Projections Report (Demand Study). The goal of the Demand Study was to develop transparent, defensible, and uniform demand and conservation savings projections for each wholesale customer using a common methodology to support both regional and individual agency planning efforts and compliance with the new statewide water efficiency targets required by Assembly Bill (AB) 1668 and Senate Bill (SB) 606.
>
> Through the Demand Study process, BAWSCA and the wholesale customers (1) quantified the total average-year water demand for each BAWSCA member agency through 2045, (2) quantified passive and active conservation water savings potential for each individual wholesale customer through 2045, and (3) identified 24 conservation programs with high water savings potential and/or member agency interest. Implementation of these conservation measures, along with passive conservation, is anticipated to yield an additional 37.3 MGD of water savings by 2045. Based on the revised water demand projections, the identified water conservation savings, increased development and use of other local supplies by the wholesale

customers, and other actions, the collective purchases of the BAWSCA member agencies from the SFPUC are projected to stay below 184 MGD through 2045.

As part of the Demand Study, each wholesale customer was provided with a demand model that can be used to support ongoing demand and conservation planning efforts, including UWMP preparation.

In 2021, as part of the 2020 UWMP update, MPMW's DSS Model was revised to account for several changes since the demand projections were estimated by BAWSCA. The baseline year for projections was updated to 2019, which was the most recent year with full data. Population and employment inputs were revised by the City's Planning Division based on information related to the City's recently approved projects and the current General Plan, as discussed in Section 3.1. Furthermore, assumptions associated with the partial rebound in demands to pre-drought conditions were adjusted to better reflect the observed demand patterns within MPMW in recent years.[9]

Demands are projected through 2040 to be consistent with the General Plan's planning horizon. It is estimated that the total water demand will be approximately 1,483 MG in 2040, inclusive of passive and active conservation savings (Table 4-5). There is a significant increase in demand projected over the next five years (i.e., a 19% increase between 2020 and 2025) which reflects conservative assumptions regarding: (1) a potential rebound from the drought-suppressed water demands, and (2) the accelerated growth between 2020 and 2025 attributable to the City's approved and planned projects, as described in Section 3.1.

As described further in Section 4.2.2, passive and active water conservation savings associated with existing water uses in MPMW's service area have been subtracted from the total water demand projections. The 2021 DSS Model update included conservation measure assumptions consistent with MPMW's planned Demand Management Measures (DMMs) that are described in Chapter 9.

[9] The DSS Model uses a Partial Rebound Scenario which assumes temporary behavioral changes to return to pre-drought norms, but water savings from historical water rate increases and active conservation programs are to be permanent. This scenario is further explained in BAWSCA's report (BAWSCA, 2020a). For MPMW, it is assumed that there will be a 1% rebound in single-family, multi-family, industrial, and irrigation sectors, and a 3% rebound in other sectors between 2019 and 2023.

4.2.2 Water Savings from Codes, Standards, Ordinances, or Transportation and Land Use Plans

☑ ***CWC § 10631 (d) (4)***

(A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.

(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:

(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.

(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.

"Passive conservation" refers to water savings resulting from actions and activities that do not depend on direct financial assistance or educational programs implemented by water suppliers. These savings result primarily from: (1) the natural replacement of existing plumbing fixtures with water-efficient models required under current plumbing code standards,[10] (2) the installation of water-efficient fixtures and equipment in new buildings and retrofits as required under CALGreen Building Code Standards,[11] and (3) inclusion of low-water use landscaping and high-efficiency irrigation systems to minimize outdoor water use in new connections and projects in accordance with the State's Model Water Efficient Landscape Ordinance (MWELO).

"Active conservation" refers to water savings resulting from MPMW's implementation of water conservation programs, education programs, and the offering of financial incentives (e.g., rebates). MPMW's current and planned active conservation programs are discussed in Section 9.

The water demand projections presented herein take into account both passive and active conservation savings, as shown in Table 4-4 and Table 4-5 and associated charts. Passive and active savings within the MPMW service area were estimated in the 2021 DSS Model (BAWSCA, 2020b). By 2040, it is estimated that the total annual water demand would be 1,634 MG, including potable and recycled water, without passive or active conservation savings. Passive conservation is projected to reduce this water demand by 124 MG and active conservation is projected to further reduce the demand by 27 MG. As such, it is estimated that the total annual water demands within MPMW's service area will be approximately 1,483 MG in 2040.

[10] Including the California Energy Commission Title 20 appliance standards for toilets, urinals, faucets, and showerheads – The appliance standards determine what can be sold in California and therefore will impact both new construction and replacement fixtures in existing homes.

[11] Adopted in the City's Municipal Code Chapter 12. All new residential and non-residential construction are required to comply with the mandatory CALGreen Requirements.

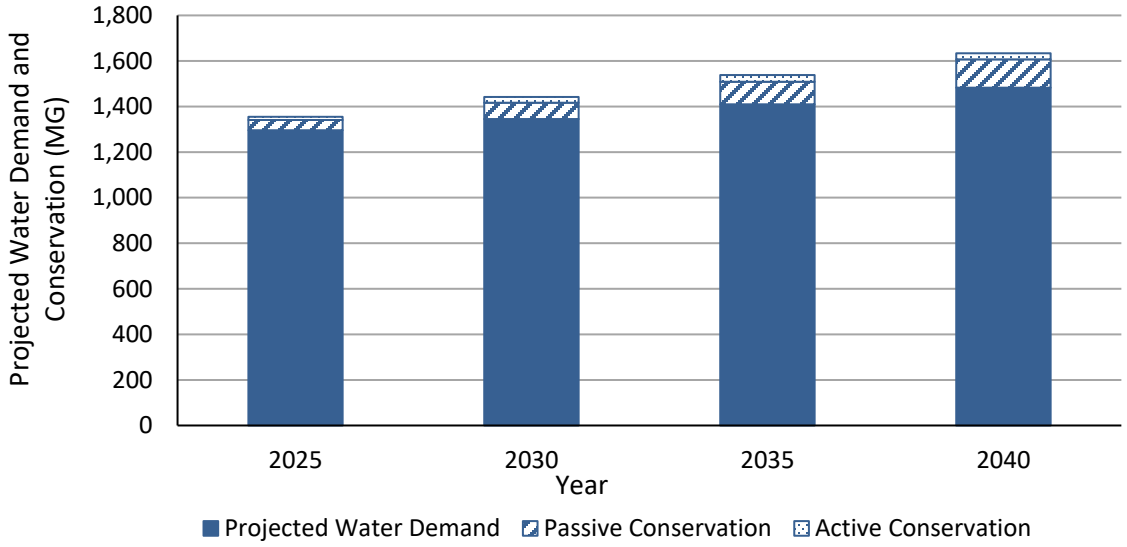
Table 4-4 Inclusion in Water Use Projections (DWR Table 4-5)

Are Future Water Savings Included in Projections?	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, or otherwise are utilized in demand projections are found.	UWMP Section 4.2.2
Are Lower Income Residential Demands Included In Projections?	Yes
NOTES:	

Table 4-5 Projected Total Water Demand and Projected Passive and Active Water Conservation

Water Conservation Type	Projected Total Water Demand				
	2025	2030	2035	2040	2045
Projected Water Demand	1,355	1,442	1,538	1,634	--
Projected Water Conservation					
Passive Conservation	45	72	99	124	--
Active Conservation	14	25	29	27	--
Projected Water Demand after Passive Conservation Savings	1,310	1,370	1,439	1,510	--
Projected Water Demand after Passive and Active Conservation Savings	1,296	1,345	1,410	1,483	--
NOTES: (a) Volumes are in units of MG. (b) Data from the DSS Model.					

Chart 4-5 Projected Water Demand and Conservation



4.2.3 Projected Recycled Water Demand

The Sharon Heights Golf and Country Club is projected to continue receiving approximately 48 MG of recycled water for irrigation from WBSD's Sharon Heights Recycled Water Facility. In addition, it is estimated that the WBSD's Bayfront Project will start supplying approximately 72 MG of recycled water to the City's Bayfront Area starting in 2030. MPMW's recycled water programs are further discussed in Section 6.5. MPMW does not supply other types of non-potable water.

4.2.4 Projected Potable Water Demand

After accounting for the recycled water use, the remaining demand is anticipated to be supplied by potable water from the SFPUC RWS. Projected potable water demand for each water use sector within MPMW's service area is shown in five-year increments through 2040 in Table 4-6. Potable water demand is anticipated to be approximately 1,363 MG in 2040, an increase of 28% compared to 2020. The sectors with the largest growth are multi-family and commercial, demands of which are projected to double by 2040.

MPMW's projected potable and recycled water demands (i.e., "total water use") in five-year increments are summarized in Table 4-7 and associated chart.

Table 4-6 Use for Potable and Non-Potable - Projected (DWR Table 4-2)

Use Type	Additional Description *(as needed)*	Projected Water Use				
		2025	2030	2035	2040	2045 *(opt)*
Single Family		306	299	293	288	--
Multi-Family		158	176	203	230	--
Commercial		346	345	373	401	--
Industrial		134	122	112	102	--
Institutional/ Governmental		98	105	115	126	--
Landscape	Note (b)	95	61	71	85	--
Losses		110	116	122	128	--
Other Potable	Note (c)	1	1	1	2	--
TOTAL		1,248	1,225	1,290	1,363	--

NOTES:
(a) Volumes are in units of MG.
(b) Irrigation water use includes water use recorded at dedicated irrigation meters and does not represent all of the outdoor irrigation water use within MPMW.
(c) Other potable water use includes water used for temporary meters.
(d) The projected water demands include savings from plumbing codes and active conservation efforts that MPMW plans to undertake.

Chart 4-6 Current and Projected Potable Water Demand by Sector

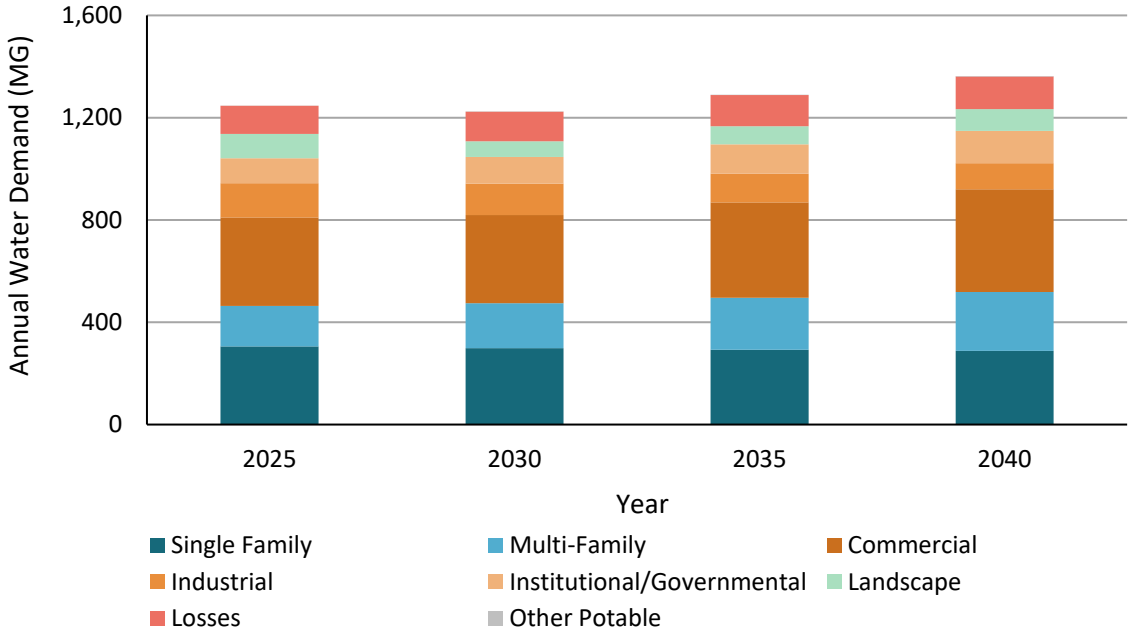
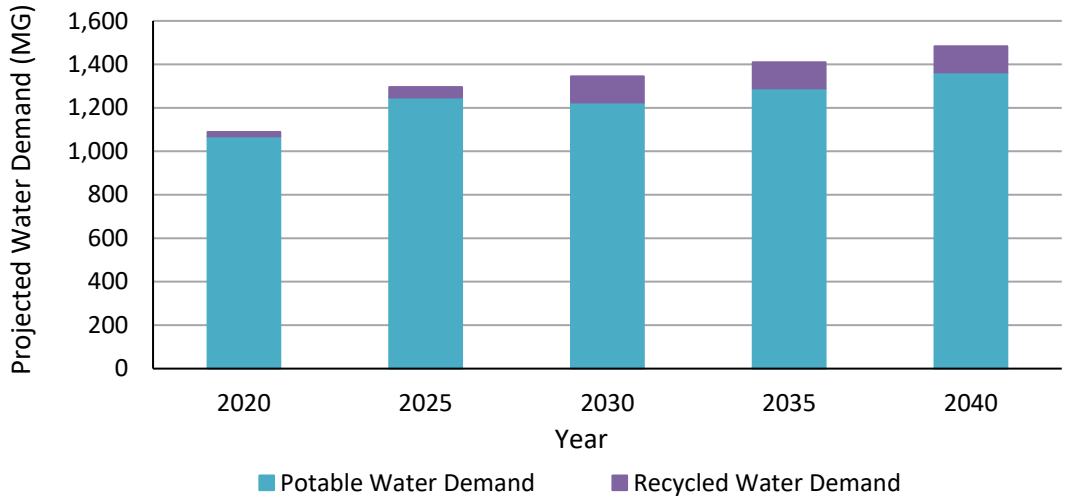


Table 4-7 Total Water Use (Potable and Non-Potable) (DWR Table 4-3)

	2020	2025	2030	2035	2040	2045*(opt)*
Potable Water, Raw, Other Non-potable *From DWR Tables 4-1 and 4-2*	1,069	1,248	1,225	1,290	1,363	--
Recycled Water Demand *From DWR Table 6-4*	20	48	120	120	120	--
Optional Deduction of Recycled Water Put Into Long-Term Storage	--	--	--	--	--	--
TOTAL WATER USE	1,089	1,296	1,345	1,410	1,483	--
NOTES: (a) Volumes are in units of MG.						

Chart 4-7 Current and Projected Total Water Use



4.2.5 Water Use for Lower Income Households

☑ ***CWC § 10631.1***

(a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirements under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

The water demands presented above include projected future water use by lower income households (Table 4-4). Per Health and Safety Code 50079.5, a lower income household is defined as a household with lower than 80% of the City's median income. The 2015-2023 Housing Element (City of Menlo Park, 2015) indicates that in 2012 there were 12,388 housing units within the City and that 41% of these units served residents with less than 80% of the median income adjusted for family size. Water demands associated with these households were included in the total water demand projections described above and shown in Table 4-7.

4.2.6 Characteristic Five-Year Water Use

☑ ***CWC § 10635(b)(3)***

(b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following…

(3) A comparison of the total water supply sources available to the water supplier with ***the total projected water use for the drought period.*** (Emphasis added).

A critical component of the new statutory language in Water Code §10635(b) is the requirement to prepare the five-year Drought Risk Assessment (DRA), which is included in Chapter 7. The five-year DRA can also be used to provide the water service reliability assessment for a drought lasting five years.

As a first step, DWR recommends that the expected gross water use for the next five years without drought conditions (also known as *unconstrained demand*) be estimated. These numbers can then be adjusted to estimate the five-years' cumulative drought effects. MPMW's unconstrained demand is based on the demand projections from the 2021 DSS Model over the next five years, as shown in Table 4-8.

Table 4-8 Characteristic Five-Year Water Use

2021	2022	2023	2024	2025
1,095	1,143	1,192	1,243	1,296
NOTES: (a) Volumes are in units of MG.				

4.3 Water Use Sectors Not Included in the Demand Projections

Historical and projected water demands for the water use sectors described in CWC §10631(d)(1)(G) through (I) and listed below were not included in the water demand calculations because they are not applicable to MPMW:

- Sales to other agencies;
- Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; and
- Agricultural.

4.3.1 Sales to Other Agencies

MPMW does not sell water to other agencies and does not expect to in the future.

4.3.2 Saline Water Intrusion Barriers, Groundwater Recharge, and Conjunctive Use

MPMW does not use water for saline water intrusion barriers and does not currently participate in active groundwater recharge activities or conjunctive use programs.

4.3.3 Agricultural

MPMW does not sell water to agricultural customers and does not expect to in the future.

4.4 Climate Change Impacts to Demand

☑ ***CWC § 10635(b)***

(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.

Hotter and drier weather may lead to an increased demand in landscape irrigation. The DSS Model assesses the sensitivity of MPMW's water demand to weather and then incorporates predicted weather and climate change data into demand projections. Therefore, the demand projections presented above include considerations of climate change.

A description of the weather and climate change data incorporated into the DSS Model is provided in Section 3.6 of the BAWSCA Demand Study (BAWSCA, 2020b). Based on data published by the International Panel on Climate Change (IPCC) and the California's Fourth Climate Change Assessment San Francisco Bay Area Summary Report (Ackerly et al., 2018), a predicted annual mean temperature increase of 1.7°F was incorporated into the DSS Model demand forecast.

4.5 Coordinating Water Use Projections

☑ ***CWC § 10631 (h)***

An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available.

MPMW provides SFPUC with water use projections annually as part of reporting to the BAWSCA Annual Surveys and other BAWSCA-led water demand and supply coordination efforts as dictated by the 2009 Water Supply Agreement. As part of the coordination effort for the 2020 UWMP, and in compliance with CWC §10631(h), MPMW supplied BAWSCA with its water demand projections through 2040 for transmittal to the SFPUC[12].

[12] Email from MPMW to BAWSCA dated 5 January 2021.

4.6 Urban Water Use Objectives

☑ ***CWC § 10609.20***

(a) Each urban retail water supplier shall calculate its urban water use objective no later than January 1, 2024, and by January 1 every year thereafter.

(b) The calculation shall be based on the urban retail water supplier's water use conditions for the previous calendar or fiscal year.

☑ ***CWC § 10609.22***

(a) An urban retail water supplier shall calculate its actual urban water use no later than January 1, 2024, and by January 1 every year thereafter.

(b) The calculation shall be based on the urban retail water supplier's water use for the previous calendar or fiscal year.

☑ ***CWC § 10609.24***

(a) An urban retail water supplier shall submit a report to the department no later than January 1, 2024, and by January 1 every year thereafter. The report shall include all of the following:

(1) The urban water use objective calculated pursuant to Section 10609.20 along with relevant supporting data.

(2) The actual urban water use calculated pursuant to Section 10609.22 along with relevant supporting data.

(3) Documentation of the implementation of the performance measures for CII water use.

(4) A description of the progress made towards meeting the urban water use objective.

(5) The validated water loss audit report conducted pursuant to Section 10608.34.

(b) The department shall post the reports and information on its internet website.

(c) The board may issue an information order or conservation order to, or impose civil liability on, an entity or individual for failure to submit a report required by this section.

Beginning in 2023, urban water retailers will be required to report on "annual water use objectives" by 1 January of each year and to achieve these objectives by 1 January 2027. The annual water use objectives will be calculated based on standards for indoor residential water use, outdoor residential water use, and distribution system water loss. Additionally, it is anticipated that performance-based standards for the commercial, industrial, and institutional sectors, separate from the annual water use objectives, will also be developed by Department of Water Resources (DWR) and be implemented in the future. However, the specific standards that will be used to determine a retailer's annual urban water use objectives are currently under development by DWR, and thus the annual urban water use objectives for MPMW cannot be calculated or estimated. Once the urban water use objectives are released, MPMW will evaluate its historical and current water use compared to the new objectives, and will evaluate the need to adjust its conservation and water loss management measures to meet the new objectives.

The indoor residential water use component of calculating future water use objectives is described in CWC §10609.4.(a), which states "(1) Until January 1, 2025, the standard for indoor residential water use shall be 55 gallons per capita daily. (2) Beginning January 1, 2025, and until January 1, 2030, the standard for indoor residential water use shall be the greater of 52.5 gallons per capita daily or a standard

recommended pursuant to subdivision (b). (3) Beginning January 1, 2030, the standard for indoor residential water use shall be the greater of 50 gallons per capita daily or a standard recommended pursuant to subdivision (b).” Table 4-9 and the associated chart shows an estimate of future per capita residential water use, broken out by estimated indoor and outdoor water use. Based on these estimates, per capita indoor residential potable water use within MPMW is expected to be below the indoor use standards presented in the legislation. However, it should be noted that because standards have not yet been developed for the outdoor water use or water loss components of the future water use objectives, it cannot be known whether projected demands for MPMW will be in compliance with the pending requirements.

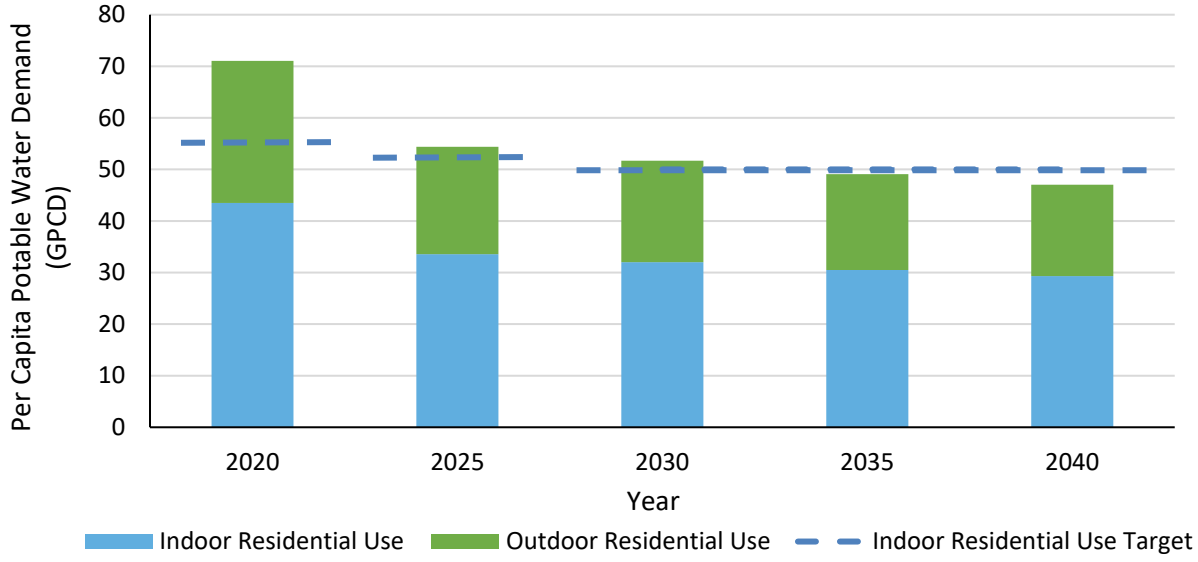
In the past decade, MPMW has made significant strides in reducing its per capita water demand to meet the targets delineated by the Water Conservation Act (see Chapter 5). MPMW plans to continue to implement conservation efforts to meet new legislative requirements. Potable water demand reductions will be achieved through the recycled water projects and implementation of DMMs as discussed in Chapters 6 and 9, respectively. MPMW will continue to monitor per capita water demand to ensure that its compliance targets are being met.

Table 4-9 Current and Projected Residential Per Capita Water Use

Year	Residential Potable Water Demand (MG)	Service Area Population	Per Capita Residential Potable Water Use (GPCD)	Approximate Per Capita Outdoor Residential Potable Water Use (GPCD)	Approximate Per Capita Indoor Residential Potable Water Use (GPCD)	Indoor Residential Water Use Target (GPCD)
2020	474	18,276	71	28	43	55
2025	464	23,383	54	21	34	52.5
2030	475	25,166	52	20	32	50
2035	496	27,675	49	19	30	50
2040	518	30,184	47	18	29	50

NOTES:
(a) Residential demand includes single family and multi-family residential.
(b) Per capita potable water demand is calculated by dividing the annual residential potable water demand by the service area population and the number of days in a year.
(c) Indoor and outdoor residential water use is estimated by the DSS Model.
(d) Urban water retailers will be required to report on "annual water use objectives" starting from 2023. Specific standards are currently under development by DWR.

Chart 4-8 Current and Projected Indoor and Outdoor Residential Per Capita Potable Water Use



5 SBX7-7 BASELINES, TARGETS, AND 2020 COMPLIANCE

☑ ***CWC § 10608.24 (b)***

Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

☑ ***CWC § 10608.28***

(a) An urban retail water supplier may meet its urban water use target within its retail service area, or through mutual agreement, by any of the following:

(1) Through an urban wholesale water supplier.

(2) Through a regional agency authorized to plan and implement water conservation, including, but not limited to, an agency established under the Bay Area Water Supply and Conservation Agency Act (Division 31 (commencing with Section 81300)).

(3) Through a regional water management group as defined in Section 10537.

(4) By an integrated regional water management funding area.

(5) By hydrologic region.

(6) Through other appropriate geographic scales for which computation methods have been developed by the department.

(b) A regional water management group, with the written consent of its member agencies, may undertake any or all planning, reporting, and implementation functions under this chapter for the member agencies that consent to those activities. Any data or reports shall provide information both for the regional water management group and separately for each consenting urban retail water supplier and urban wholesale water supplier.

With the adoption of the Water Conservation Act of 2009, also known as Senate Bill (SB) X7-7, the state is required to reduce urban water use by 20% by the year 2020. Each urban retail water supplier was required to develop a baseline daily per capita water use ("baseline water use") in their 2010 Urban Water Management Plan (UWMP or Plan) and establish per capita water use targets for 2015 and 2020 in order to help the state achieve the 20% reduction.

In support of implementing the requirements of SB X7-7, the California Department of Water Resources (DWR) produced a set of methodologies for developing baseline and compliance water use and targets, which are included in Methodologies for Calculating Baseline and Compliance Urban Per Capita Water, California Department of Water Resources Division of Statewide Integrated Water Management Water Use and Efficiency Branch (Methodologies; DWR, 2016).

Baselines and water use targets for Menlo Park Municipal Water (MPMW) were initially calculated in the 2010 UWMP in response to the Water Conservation Act. Per requirements of the DWR, the 2015 UWMP updated the baseline and water use target calculations using 2010 United States Census (Census) data.

This chapter discusses MPMW's compliance with its 2020 water use target. As part of the compliance reporting for SB X7-7, water suppliers are required to complete and submit a set of standardized verification tables in their 2020 UWMPs. The information in these tables is discussed and summarized in the following subsections, and the complete set of SB X7-7 standardized tables is included in Appendix E.

5.1 Service Area Population

☑ ***CWC § 10608.20 (e)***

An urban retail water supplier shall include in its urban water management plan due in 2010 pursuant to Part 2.6 (commencing with Section 10610) the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.

☑ ***CWC § 10608.20 (g)***

An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).

☑ ***Methodology 2 Service Area Population.***

DWR will examine discrepancy between the actual population estimate and DOF's projections for 2010; if significant discrepancies are discovered, DWR may require some or all suppliers to update their baseline population estimates. (DWR, 2016)

As reported in the 2015 UWMP, MPMW updated its service area population for baseline periods spanning from 1996 through 2010 to meet DWR's requirement of using 2010 Census data. The revised 2010 service area population was 14,749. The population of 14,749 was approximately 46% of the total population of City of Menlo Park (City), according to data published by the Department of Finance (DOF) for 2010 (DOF, 2012). The service area population during the baseline period was estimated based on the assumption that MPMW served the same percentage of City-wide population from 1996 through 2010.

The 2020 population was estimated by the City using the GIS-based method recommended in the Methodologies (DWR, 2016), as documented in Appendix F. Based on MPMW's service area map and the Census data, the 2020 population for the MPMW service area is estimated to be 18,276.

5.2 Baseline Water Use

Water suppliers were required to define a 10- or 15-year base (or baseline) period for water use that was then used to develop their future target per capita water use. Water suppliers were also required to calculate water use over a 5-year baseline period and use that value to determine a minimum required reduction in water use by 2020. Utilizing a 15-year baseline period was only allowed for water suppliers that meet at least 10% of their 2008 measured retail water demand through recycled water; MPMW did not meet this criterion and thus selected a 10-year baseline.

The 10-year baseline water use was calculated using gross per capita water usage data (calculated as total water entering the MPMW water distribution system, including uses by commercial, industrial, and other users, as well as water loses, divided by total population) for the 10-year period between 1 January 1996 and 31 December 2005. The 5-year baseline water use was calculated using per capita water usage data for the 5-year period between 1 January 2006 and 31 December 2010. The 5- and 10-year baseline water uses are shown in Table 5-1 and in Appendix E.

5.3 Water Use Targets

☑ ***CWC § 10608.20 (b)***

An urban retail water supplier shall adopt one of the following methods for determining its urban water use target pursuant to subdivision (a):

(1) Eighty percent of the urban retail water supplier's baseline per capita daily water use.

(2) The per capita daily water use that is estimated using the sum of the following performance standards:

(A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the department's 2016 report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.

(B) For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.

(C) For commercial, industrial, and institutional uses, a 10-percent reduction in water use from the baseline commercial, industrial, and institutional water use by 2020.

(3) Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). If the service area of an urban water supplier includes more than one hydrologic region, the supplier shall apportion its service area to each region based on population or area.

(4) A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31, 2020. In developing urban daily per capita water use targets, the department shall do all of the following:

(A) Consider climatic differences within the state.

(B) Consider population density differences within the state.

(C) Provide flexibility to communities and regions in meeting the targets.

(D) Consider different levels of per capita water use according to plant water needs in different regions.

(E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.

(F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.

☑ ***CWC § 10608.22***

Notwithstanding the method adopted by an urban retail water supplier pursuant to Section 10608.20, an urban retail water supplier's per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use as defined in paragraph (3) of subdivision (b) of Section 10608.12. This section does not apply to an urban retail water supplier with a base daily per capita water use at or below 100 gallons per capita per day.

Water suppliers were required to calculate their 2020 water use targets (Targets) and compare their actual water use in 2020 with the calculated Targets to assess compliance. The Water Conservation Act requires that water suppliers calculate their Targets using one of the following four methods:

- Method 1: Eighty percent of the water supplier's baseline per capita water use;
- Method 2: Per capita daily water use estimated using the sum of performance standards applied to indoor residential use, landscaped area water use, and commercial, industrial, and institutional uses;
- Method 3: Ninety-five percent of the applicable state hydrologic region target as stated in the State's 20x2020 Water Conservation Plan, dated February 2010; or
- Method 4: Total savings subtracted from baseline water use. Savings include metering savings, residential savings, commercial, industrial, and institutional savings, and landscape and water loss savings.

MPMW's 2020 Target was first calculated in its 2010 UWMP using Method 1 and was then recalculated in its 2015 UWMP using updated service area population. The updated 2020 Target was 204 gallons per capita per day (GPCD). Table 5-1 shows MPMW's 5- and 10-year baseline periods, the associated baseline water use in GPCD, and its 2020 target.

Table 5-1 Baselines and Targets Summary (DWR Table 5-1)

Baseline Period	Start Year	End Year	Average Baseline GPCD	Confirmed 2020 Target GPCD
10-15 year	1996	2005	255	204
5 Year	2006	2010	236	
NOTES:				

5.4 2020 Target Compliance

☑ ***CWC § 10608.24 (b)***

Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

☑ ***CWC § 10608.24 (d)***

(1) When determining compliance daily per capita water use, an urban retail water supplier may consider the following factors:

(A) Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.

(B) Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.

(C) Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.

(2) If the urban retail water supplier elects to adjust its estimate of compliance daily per capita water use due to one or more of the factors described in paragraph (1), it shall provide the basis for, and data supporting, the adjustment in the report required by Section 10608.40.

☑ ***CWC § 10608.40***

Urban water retail suppliers shall report to the department on their progress in meeting their urban water use targets as part of their urban water management plans submitted pursuant to Section 10631. The data shall be reported using a standardized form developed pursuant to Section 10608.52.

As shown in Table 3-1 and Table 4-1, MPMW's 2020 service area population was 18,276 and the 2020 water demand was 1,069 million gallons (MG). The per capita water use in 2020 was calculated to be 160 GPCD, approximately 78% of the 2020 Target of 204 GPCD. Per the Methodologies (DWR, 2016), there are several allowable adjustments that can be made to a supplier's 2020 per capita water use calculations as part of evaluating target compliance. However, no adjustments were made to MPMW's 2020 per capita water use calculations. As demonstrated in Table 5-2, MPMW is in compliance with SB X7-7 requirements.

Table 5-2 2020 Compliance (DWR Table 5-2)

2020 GPCD			2020 Confirmed Target GPCD	Did Supplier Achieve Targeted Reduction for 2020?
Actual 2020 GPCD	2020 TOTAL Adjustments	Adjusted 2020 GPCD *(Adjusted if applicable)*		
160	0	160	204	Yes
NOTES:				

6 WATER SUPPLY CHARACTERIZATION

☑ ***CWC § 10631 (b)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).

Menlo Park Municipal Water (MPMW) purchases all of its potable water from the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS) in accordance with the Water Supply Agreement (WSA) between the City and County of San Francisco and Wholesale Customers in Alameda, San Mateo and Santa Clara Counties, that was approved by the SFPUC on 28 April 2009 and amended on 12 February 2019.

To maintain consistency with the Urban Water Management Plans (UWMPs) prepared by the SFPUC and the other Bay Area Water Supply and Conservation Agency (BAWSCA) member agencies, much of the language describing the SFPUC wholesale water supply in the following sections is common language provided by BAWSCA, in coordination with the SFPUC.

6.1 Purchased or Imported Water

This section describes the sources of wholesale water provided by SFPUC, and the process for allocating water between SFPUC, BAWSCA, and wholesale customers.

6.1.1 Description of SFPUC RWS

Approximately 85% of the water supply to the SFPUC RWS originates in the Hetch Hetchy watershed, located in Yosemite National Park, and flows down the Tuolumne River into the Hetch Hetchy Reservoir. Water from the Hetch Hetchy watershed is managed through the Hetch Hetchy Water and Power Project. The remaining 15% of the water supply to the SFPUC RWS originates locally in the Alameda and Peninsula watersheds and is stored in six different reservoirs in Alameda and San Mateo Counties. Details of the various components of the SFPUC RWS are provided below and are shown on Figure 6-1. Information regarding the Hetch Hetchy, Alameda, and Peninsula water systems is sourced from the SFPUC's 2020 UWMP and is provided verbatim below.

6.1.1.1 Water Distribution

> The RWS, shown on Figure 6-1, consists of more than 280 miles of pipelines, 60 miles of tunnels, 11 reservoirs, five pump stations, and two water treatment plants. It includes the Hetch Hetchy Project and the Bay Area water system facilities. The Hetch Hetchy Project is generally composed of the reservoirs, hydroelectric generation and transmission facilities, and water transmission facilities from the Hetch Hetchy Valley west to the Alameda East Portal of the Coast Range Tunnel in Sunol Valley. Water system components of the Hetch Hetchy Project are also referred to as the Hetch Hetchy System. The local Bay Area water system is comprised of two parts—the Alameda System and the Peninsula System—generally consisting of the facilities west of the Alameda East Portal of the Coast Range Tunnel, including the 63,000-acre Alameda and Peninsula watersheds, storage reservoirs, two water treatment plants,

and the distribution system that delivers water to both retail and wholesale customers. The Hetch Hetchy, Alameda, and Peninsula Systems are described in more detail below.

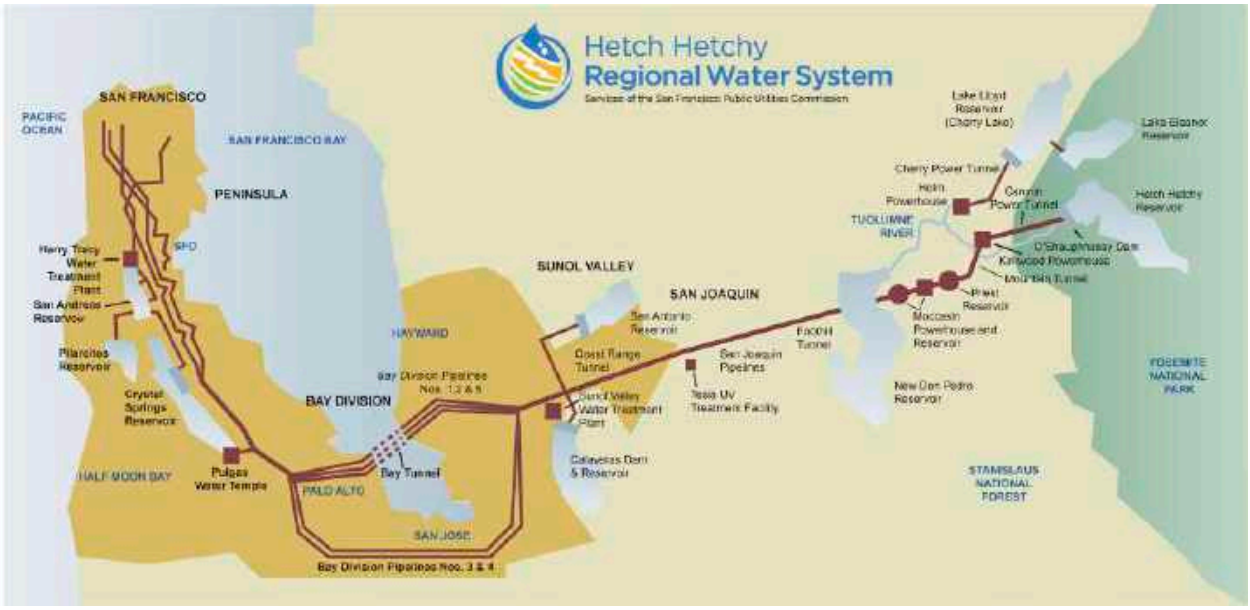


Figure 6-1 Regional Water System

Hetch Hetchy System

In the Hetch Hetchy System, water is diverted from Hetch Hetchy Reservoir into a series of tunnels and aqueducts from the Sierra Nevada to the San Joaquin Pipelines that cross the San Joaquin Valley to the Coast Range Tunnel, which connects to the Alameda System at the Alameda East Portal. Hetch Hetchy System water is disinfected at the Tesla Treatment Facility.

Alameda System

The Alameda System includes two reservoirs, San Antonio Reservoir and Calaveras Reservoir, which collect water from the San Antonio Creek, Upper Alameda Creek, and Arroyo Hondo watersheds in Alameda County. San Antonio Reservoir also receives water from the Hetch Hetchy System. Conveyance facilities in the Alameda System connect the Hetch Hetchy System and Alameda water sources to the Peninsula System. The BDPLs [Bay Division Pipelines] cross the South Bay to the Peninsula System delivering water to customers along the pipeline route. The Sunol Valley Water Treatment Plant (SVWTP) filters and disinfects water supplied from San Antonio Reservoir and Calaveras Reservoir.

Peninsula System

The Peninsula System includes conveyance facilities connecting the BDPLs to the in-City distribution system and to other customers on the Peninsula. Two reservoirs,

Crystal Springs Reservoir and San Andreas Reservoir, collect runoff from the San Mateo Creek watershed. Crystal Springs Reservoir also receives water from the Hetch Hetchy System. A third reservoir, Pilarcitos Reservoir, collects runoff from the Pilarcitos Creek watershed and directly serves one of the Wholesale Customers, the Coastside County Water District (which includes the City of Half Moon Bay), along with delivering water to Crystal Springs and San Andreas Reservoirs. The Harry Tracy Water Treatment Plant (HTWTP) filters and disinfects water supplied from Crystal Springs Reservoir and San Andreas Reservoir before it is delivered to customers on the Peninsula and the in-City distribution system.

6.1.1.2 *Water Treatment*

The Hetch Hetchy Reservoir is the largest unfiltered water supply on the West Coast, and one of only a few large unfiltered municipal water supplies in the nation. The water originates from well-protected wilderness areas in Yosemite National Park, which flows down the Tuolumne River to Hetch Hetchy Reservoir. This water meets or exceeds all federal and State criteria for watershed protection. Water from Hetch Hetchy Reservoir is protected in pipes and tunnels as it is conveyed to the Bay Area, and requires pH adjustment to control pipeline corrosion and disinfection for bacteria control. Based on the SFPUC's disinfection treatment practice, extensive bacteriological quality monitoring, and high operational standards, the U.S. Environmental Protection Agency (USEPA) and the SWRCB Division of Drinking Water (DDW) determined that the Hetch Hetchy water source meets federal and State drinking water quality requirements without the need for filtration.

A new USEPA regulation took effect in 2012 requiring secondary disinfection for all unfiltered drinking water systems to control the waterborne parasite cryptosporidium. To comply with this regulation, the SFPUC completed construction of a new ultraviolet (UV) treatment facility in 2011. The Tesla Treatment Facility is a key component of the Water System Improvement Program (WSIP) and enhances the high-quality water from the RWS. The facility has a capacity of 315 mgd, making it the third largest UV drinking water disinfection facility in the U.S.

All water derived from sources other than Hetch Hetchy Reservoir is treated at one of two treatment plants: the SVWTP or the HTWTP. The SVWTP primarily treats water from the Alameda System reservoirs and has both a peak capacity and sustainable capacity of 160 mgd. Treatment processes include coagulation, flocculation, sedimentation, filtration, fluoridation, corrosion control treatment, and chloramination. Fluoridation, chloramination, and corrosion control treatment can also be provided for the combined Hetch Hetchy System and SVWTP water at the Sunol Valley Chloramination Facility. The HTWTP treats water from the Peninsula System reservoirs and has a peak capacity of 180 mgd and a sustainable capacity of 140 mgd. Treatment processes include ozonation, coagulation, flocculation, filtration, disinfection, fluoridation, corrosion control treatment, and chloramination. Major upgrades to the SVWTP were completed in 2013 and to the HTWTP in 2015.

6.1.1.3 *Water Storage*

The majority of the water delivered by the SFPUC is supplied by runoff from the upper Tuolumne River watershed on the western slope of the central Sierra Nevada. Three major reservoirs collect runoff: Hetch Hetchy Reservoir, Lake Lloyd (a.k.a., Cherry

Lake), and Lake Eleanor. A "water bank" in Don Pedro Reservoir is also integrated into system operations.[13] Don Pedro Reservoir, which is jointly owned and operated by Modesto Irrigation District and Turlock Irrigation District (the Districts), is located on the Tuolumne River downstream of the Hetch Hetchy System.

As a by-product of water delivery and water supply management, hydroelectric power is generated by the Hetch Hetchy Water and Power System. Water stored in Hetch Hetchy Reservoir is used for hydroelectric generation and also satisfies instream flow requirements when released downstream. Normally, only Hetch Hetchy Reservoir water supplies are exported to the Bay Area, while releases from Lake Eleanor and Lake Lloyd are used to satisfy instream flow requirements, satisfy Raker Act entitlements to the Districts downstream, and produce hydroelectric power. The Hetch Hetchy Water and Power System includes three major hydroelectric powerhouses along the Tuolumne River—Holm, Kirkwood, and Moccasin—that have a collective generating capacity of nearly 400 megawatts.

Downstream of the Hetchy Hetchy System, the SFPUC utilizes local watersheds in the Bay Area. Crystal Springs, San Andreas, and Pilarcitos Reservoirs, located in San Mateo County, capture local runoff in the Peninsula watershed, and Calaveras and San Antonio Reservoirs, located in Alameda Country, capture local runoff in the Alameda watershed. In addition to capturing local runoff, San Andreas, San Antonio, and Crystal Springs Reservoirs also provide storage for water from the Hetch Hetchy System and, along with Calaveras Reservoir, are an important water supply in the event of an interruption to Hetch Hetchy System deliveries.

Calaveras Reservoir had been operating in recent years at one-third of its capacity due to restrictions imposed by the DWR Division of Safety of Dams (DSOD). The Calaveras Dam Replacement Project, which took place from 2011 to 2019, involved the construction of a new dam downstream of the existing dam. The SFPUC began impounding water behind the new dam in the winter of 2018/2019 and continued the initial fill of the reservoir during the 2019/2020 winter season.

[13] Turlock and Modesto Irrigation Districts have senior water rights to the SFPUC for the Tuolumne River water and are entitled to the first increment of flow in the basin. Water bank provides a credit and debit system which allows the SFPUC to divert water upstream while meeting its obligations to Modesto and Turlock Irrigation Districts. Through this mechanism the SFPUC may pre-deliver the Districts entitlements and credit the water bank so that at other times the SFPUC may retain water upstream while the Districts debit water bank.

Regional Water System Storage Capacity

Reservoir	Storage	
	Acre-Feet (AF)	Billions of Gallons (BG)
Up-Country[a]		
Hetch Hetchy	360,360	117.4
Lake Lloyd[b]	273,300	89.1
Lake Eleanor	27,100	8.8
Subtotal Up-Country	**660,760**	**215.3**
Local		
Calaveras (East Bay)[c]	96,800	31.5
San Antonio (East Bay)	50,500	16.5
Crystal Springs (Peninsula)[d]	69,300	22.6
San Andreas (Peninsula)	19,000	6.2
Pilarcitos (Peninsula)	3,100	1.0
Subtotal Local	**238,700**	**77.8**
Total Regional Water System[e]	**899,460**	**293.1**

a Three other regulating reservoirs are also part of the RWS: Early Intake, Priest, and Moccasin Reservoirs.
b Storage capacity shown includes flashboards, which are structures placed in a spillway to increase the capacity of a reservoir.
c Calaveras Reservoir was constructed with a storage capacity of 96,800 AF. Since December 2001, in response to safety concerns about the seismic stability of the dam and a directive from the Division of Safety of Dams (DSOD), the SFPUC held the maximum water level at approximately 37,800 AF (roughly 40% of its maximum capacity). The construction of a new replacement dam downstream was completed in 2019 to restore the dam's full storage capacity and the dam was continuing to be filled over the 2019/2020 winter season.
d Crystal Springs Reservoir has a maximum storage capacity of 22.6 BG (at 291.8 feet). Based on permit conditions, the reservoir is currently operated at 287.8 feet (4 feet below capacity).
e This includes 63,700 AF in dead storage (i.e., the volume in a reservoir below the lowest controllable level). In addition, the SFPUC may draw against a credit of up to 570,000 AF in storage in a water bank account in Don Pedro Reservoir, for total storage for planning purposes of 1,469,460 AF.

6.1.2 Individual Supply Guarantees

> San Francisco has a perpetual commitment (Supply Assurance) to deliver 184 mgd to the 24 permanent Wholesale Customers collectively. San Jose and Santa Clara are not included in the Supply Assurance commitment and each has temporary and interruptible water supply contracts with San Francisco. The Supply Assurance is allocated among the 24 permanent Wholesale Customers through Individual Supply Guarantees (ISG), which represent each Wholesale Customer's allocation of the 184 mgd Supply Assurance.

MPMW's Individual Supply Guarantee (ISG) is 4.456 million gallons per day (MGD), or approximately 1,630 million gallons (MG) per year. Between 2016 and 2020, MPMW purchased between 52% and 66% of its ISG (see Table 6-8).

6.1.3 2028 SFPUC Decisions (formerly 2018 SFPUC Decisions)

Information regarding the 2028 SFPUC Decisions (formerly 2018 SFPUC Decision) was provided by BAWSCA in coordination with SFPUC and is provided verbatim below.

> In the 2009 WSA, the SFPUC committed to make three decisions before 2018 that affect water supply development:
>
> - Whether or not to make the cities of San Jose and Santa Clara permanent customers,
> - Whether or not to supply the additional unmet supply needs of the Wholesale Customers beyond 2018, and
> - Whether or not to increase the wholesale customer Supply Assurance above 184 mgd.
>
> Events since 2009 made it difficult for the SFPUC to conduct the necessary water supply planning and CEQA analysis required to make these three decisions before 2018. Therefore, in the 2018 Amended and Restated WSA, the decisions were deferred for 10 years to 2028.
>
> Additionally, there have been recent changes to instream flow requirements and customer demand projections that have affected water supply planning beyond 2018. As a result, the SFPUC has established an Alternative Water Supply Planning program to evaluate several regional and local water supply options. Through this program, the SFPUC will conduct feasibility studies and develop an Alternative Water Supply Plan by July 2023 to support the continued development of water supplies to meet future needs.

6.2 Groundwater

☑ ***CWC § 10631***

(b) (4) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information:

(A) The current version of any groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720), any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management for basins underlying the urban water supplier's service area.

(B) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For a basin that has not been adjudicated, information as to whether the department has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to coordinate with groundwater sustainability agencies or groundwater management agencies listed in subdivision (c) of Section 10723 to maintain or achieve sustainable groundwater conditions in accordance with a groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720).

(C) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

To date, MPMW has not utilized groundwater as a potable water source (i.e., as described above, the sole source of MPMW's potable water has been wholesale water supplied by the SFPUC RWS) and does not expect to utilize groundwater as a regular source in the future. However, because the Lower Zone and the High Pressure Zone of its distribution system lack emergency storage (see Section 3.4), MPMW anticipates bringing one groundwater well online in spring 2021 and is planning to construct an additional one or two wells to provide up to 3,000 gallons per minute (gpm) of potable and fire supply in these zones. Potential future use of the groundwater supply wells and information related to the local groundwater basin is described in more detail below.

6.2.1 Groundwater Basin Description

MPMW overlies the southern end of the San Mateo Plain Groundwater Subbasin (groundwater basin number 2-009.03; DWR, 2004; or "subbasin") of the Santa Clara Valley Groundwater Basin. The subbasin is not adjudicated, nor has it been found by Department of Water Resources (DWR) to be in a condition of overdraft. As part of the implementation of the Sustainable Groundwater Management Act (SGMA), the subbasin was ranked as a "very low priority" basin under the 2014 California Statewide Groundwater Elevation Monitoring (CASGEM) basin prioritization process and maintained this ranking in DWR's latest basin prioritization effort in 2019. The subbasin is therefore not subject to the requirements of SGMA.

6.2.1.1 Physical Setting

The subbasin is approximately 38,000 acres[14] and is bounded by the Santa Cruz Mountains on the west, San Francisco Bay and the Niles Cone subbasin on the east, the Westside Basin on the north near Burlingame Avenue and Coyote Point, and the San Francisquito Creek and the Santa Clara subbasin to the south. Figure 6-2 shows the subbasin boundary, the surrounding subbasins of the Santa Clara Valley Groundwater Basin, and the location of the MPMW service area within the subbasin.

The subbasin is filled with alluvial fan deposits formed by tributaries to San Francisco Bay that drained across the basin and toward the center of the Bay (RWQCB, 2003; EKI et al., 2018). These alluvial fan deposits are interbedded with thick clay aquitards or confining layers and comprise the main water bearing formations within the subbasin. The major water bearing formation of the subbasin is the Quaternary alluvium, from which all larger yielding wells acquire their water. The Santa Clara Formation underlies the Quaternary alluvium and is the other water bearing formation of the subbasin. In general, the groundwater system is unconfined in the higher elevations, and confined or semiconfined at lower elevations closer to San Francisco Bay.

Groundwater flow in the subbasin is generally from west-southwest to east-northeast, from the edge of the Santa Cruz Mountains to San Francisco Bay. Both the southern and eastern edges of the subbasin are political boundaries that are roughly coincident with County lines, rather than physical hydrogeologic barriers to groundwater flow (Fio and Leighton, 1995; RWQCB 2003; EKI et al., 2018). Depending upon temporally varying streamflow, recharge, and pumping conditions, groundwater flow likely occurs in variable directions across each boundary.

Natural recharge occurs by infiltration of water from streams that enter the valley from the upland areas within the drainage basin, including San Francisquito Creek, San Mateo Creek, and other smaller creeks, and by percolation of precipitation that falls directly on the land surface. Additional recharge occurs as a result of infiltration of applied irrigation water. Subbasin outflows include limited municipal and private well pumping and groundwater outflows across subbasin boundaries.

It is further noted that the United States Geological Survey (USGS) has defined the "San Francisquito Cone" as a unique groundwater subbasin that is roughly coincident with the known lateral extent of the San Francisquito Creek alluvial fan deposits. The San Francisquito Cone subbasin underlies portions of MPMW and East Palo Alto, and overlaps with the southern end of the subbasin (see Figure 6-2). The San Francisquito Cone subbasin has been the subject of several hydrologic and water balance studies. As described in the Final Feasibility of Supplemental Groundwater Resources Development in Menlo Park and East Palo Alto (Todd Engineers, 2005), the San Francisquito Cone subbasin encompasses mountainous bedrock terrain and relatively flat alluvial fan deposits. The geology is composed of the coarse- and fine-grained alluvial deposits of San Francisquito Creek. The groundwater system includes a shallow aquifer, a laterally extensive confining clay layer, and a multi-layered deep aquifer that extends to depths of up to 1,000 feet below ground surface. Storativity values indicate the shallow aquifer is unconfined and the deeper aquifer system is semi-confined. Pumping test and empirical transmissivity and well yield data

[14] Basin area is based on the SGMA 2019 Basin Prioritization results.

indicate that development of a municipal supply wells within the San Francisquito Cone portion of the subbasin is feasible.

6.2.1.2 Groundwater Conditions

Groundwater use in the subbasin has been relatively limited for the last several decades, as the primary water supply source for the overlying population has been imported water from the SFPUC RWS. The only municipal water suppliers within the subbasin that utilize groundwater as a potable supply source are Palo Alto Park Mutual Water Company (PAPMWC), O'Connor Tract Co-operative Water Company (O'Connor Tract CWC), and the City of East Palo Alto. Groundwater is also used for landscape or domestic irrigation purposes. Total groundwater production for water supply within the subbasin is approximately 2,300 acre-feet per year (AFY) as of 2018 (EKI et al., 2018)[15].

Based on limited available groundwater level information, the subbasin is currently in a relatively full and stable condition. However, historical information indicates that during past periods of high groundwater production in the 1850s to 1960s, groundwater levels in the subbasin were significantly lower and negative impacts including seawater intrusion and land subsidence were observed (EKI et al., 2018). A recent renewed interest in groundwater development in the subbasin has increased the need and interest in gaining a better understanding of the subbasin and evaluating the extent to which increased groundwater development can be pursued, while mitigating potential negative impacts. Details on the subbasin groundwater management efforts are described in the section below.

6.2.2 Groundwater Management

As stated above, the subbasin is currently designated by the DWR as a "very low priority" basin and is exempt from complying with SGMA. However, multiple entities overlying the subbasin have expressed interests in maintaining groundwater sustainability and/or established a formal role in the subbasin management.

The San Mateo County conducted a comprehensive groundwater basin assessment in 2018 (EKI et al., 2018). The study provided a more complete understanding of the subbasin hydrogeologic framework and groundwater flow and quality conditions. It also identified potential groundwater management strategies for the subbasin.

Informed by this study, San Mateo County has begun to participate in the CASGEM program. CASGEM is a groundwater elevation monitoring program that was developed by DWR per the requirements of SBx7-6. The objective of CASGEM is to establish a permanent, locally managed program of regular groundwater monitoring to track seasonal and long-term trends in groundwater elevations. The County provided initial notification to DWR of its intent to become the CASGEM Monitoring Entity for the subbasin in 2019. A CASGEM Monitoring Plan including a monitoring network of approximately ten wells throughout the

[15] The groundwater production value stated above excludes East Palo Alto which did not start pumping from its re-activated Gloria Way Well in 2018.

subbasin was developed and submitted for DWR review in 2020. Compliance with CASGEM is an important first step in setting the subbasin up for long-term sustainable management and funding.

There has also been widespread agreement among the overlying cities, water suppliers and other interested parties that cooperative, sustainable groundwater management of the entire subbasin is needed. Several entities have passed resolutions in support of sustainable groundwater management. In particular, the City of Menlo Park (City) adopted Resolution 6239 in 2014. As per this Resolution, the City is committed to: (1) working with other agencies and organizations to better understand the hydrology and geology of the San Francisquito Creek area; and (2) the sustainable management of local groundwater, including conjunctive water management and aggressive conservation, to protect its quality and ensure its availability during droughts and emergency situations.

The subbasin is currently not managed pursuant to any groundwater management plan (GWMP). However, Santa Clara Valley Water District (SCVWD) and the City of East Palo Alto adopted their own GWMPs in 2012 and 2015, respectively. The SCVWD GWMP covers the small far southern portion of the subbasin within Santa Clara County, and was updated in 2016 (SCVWD, 2016) and submitted to DWR as an Alternative to a Groundwater Sustainability Plan (GSP). The East Palo Alto GWMP addresses groundwater conditions within the jurisdictional boundary of the City of East Palo Alto in the southeastern portion of the subbasin (Todd Engineers, 2015). The East Palo Alto GWMP was prepared in accordance with Assembly Bill (AB) 3030 and the amendments to AB 3030 provided by Senate Bill (SB) 1938 and AB 359.

In addition, BAWSCA initiated work with San Mateo County and its member agencies to form the Groundwater Reliability Partnership (GRP) in 2015. The main focus of the GRP was to provide information regarding SGMA and other locally relevant groundwater management efforts to the BAWSCA member agencies and other interested parties. The GRP has not been active since 2018.

6.2.3 Historical Groundwater Use

As discussed above, MPMW has not historically used groundwater as a potable water source (see Table 6-1).

Table 6-1 Groundwater Volume Pumped (DWR Table 6-1)

X	Supplier does not pump groundwater. The supplier will not complete the table below.					
	All or part of the groundwater described below is desalinated.					
Groundwater Type	Location or Basin Name	2016	2017	2018	2019	2020
TOTAL						
NOTES:						

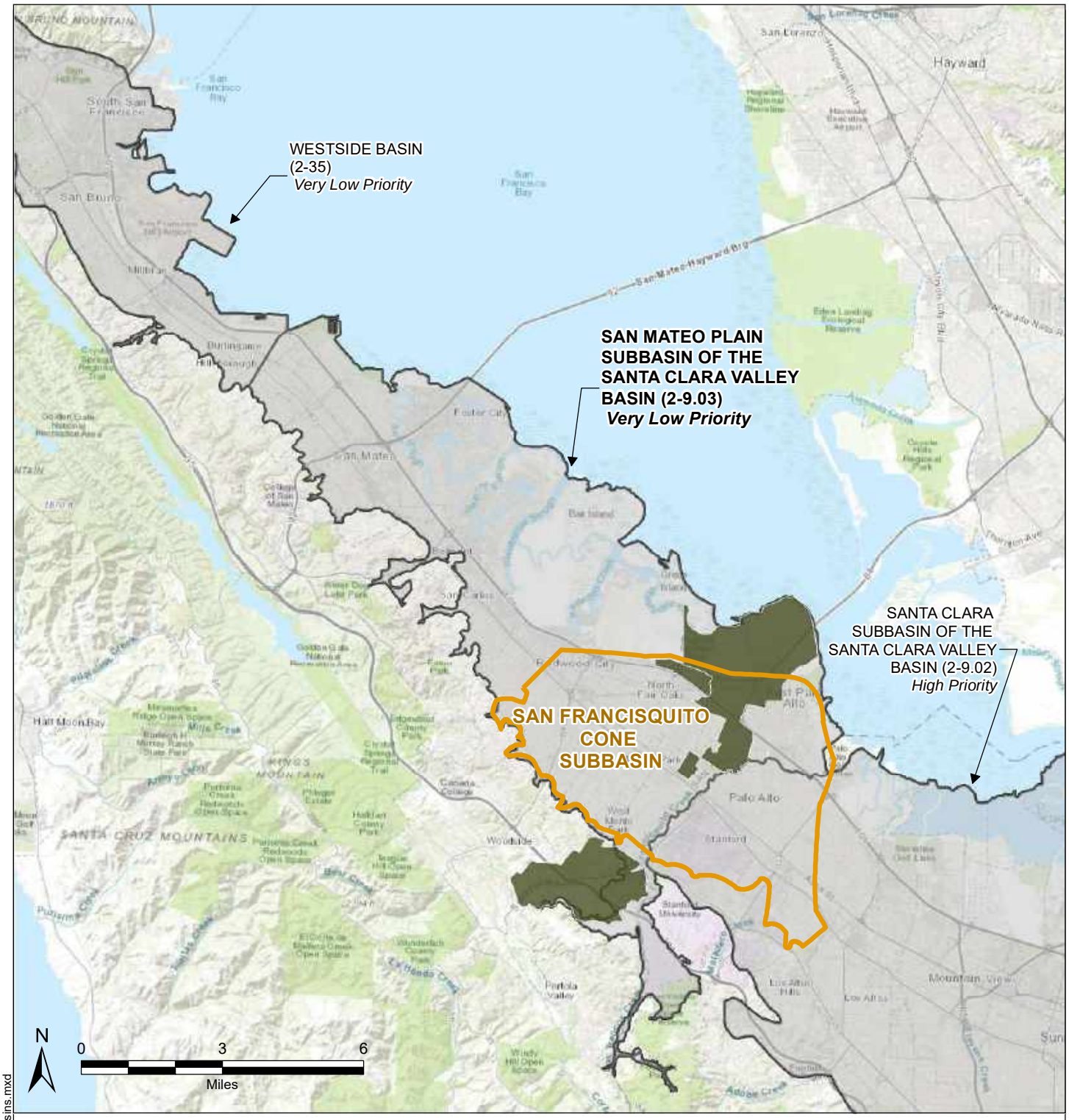
6.2.4 Projected Future Groundwater Use

MPMW purchases all of its potable water from the SFPUC RWS. Groundwater is currently not part of its potable water supply. However, as described previously, MPMW has long recognized the need for emergency storage and/or supply in the distribution system and has been pursuing the Emergency Water Storage/Supply Project for a number of years. After extensive planning, siting, and exploratory drilling efforts, in 2017, the first groundwater well was drilled in the City's Corporation Yard at 333 Burgess Drive. Based on aquifer testing data, the Corporation Yard Well can produce up to 1,500 gpm of emergency/backup supply to the Lower Zone. Construction of the above-grade facilities for the Corporation Yard well was completed in late 2020, and MPMW is in the midst of working with the State Water Resources Control Board (SWRCB) to permit the well.

MPMW plans to construct an additional one or two emergency wells in order to achieve another 1,500 gpm (for a total supply capacity of 3,000 gpm) as part of the Emergency Water Storage/Supply Project. Groundwater is currently not considered as a regular normal or dry year supply for MPMW. The wells are envisioned to serve as a supplemental supply as needed during significant water shortages due to an emergency or drought conditions (see MPMW's Water Shortage Contingency Plan in Appendix K).

MPMW is also investigating locations for a future underground reservoir for the Lower Zone and High Pressure Zone. Extensive information regarding the Emergency Water Storage/Supply Project can be found on the City's website:

https://www.menlopark.org/141/Emergency-water-supply-wellshttps://www.menlopark.org/141/Emergency-water-supply-wells



Legend

- San Francisquito Cone Subbasin
- MPMW Service Area
- DWR Bulletin 118 Groundwater Basin

Abbreviations

CASGEM = California Statewide Groundwater Elevation Monitoring Program
DWR = Department of Water Resources
MPMW = Menlo Park Municipal Water

Notes

1. All locations are approximate.
2. Priority rankings from CASGEM groundwater basin prioritization, May 2020.
3. DWR Bulletin 118 Groundwater Basin Boundaries, Feb 2019.

Sources

1. World Topographic base map provided by ArcGIS Online
2. San Francisquito Cone data provided by Metzger, L. F. 2002. Streamflow gains and losses along San Francisquito Creek and characterization of surface-water and ground-water quality, Southern San Mateo and Northern Santa Clara counties, California, 1996-97. U.S. Geological Survey, Water-Resources Investigations. Report 02-4078.

Groundwater Basins in the Vicinity of the MPMW Service Area

Menlo Park Municipal Water
2020 Urban Water Management Plan
Menlo Park, CA
June 2021
EKI C00050.00
Figure 6-2

eki environment & water

Path: X:\C00050\Maps\2021\06\Fig 6-2_MPMW_GroundwaterBasins.mxd

6.3 Surface Water

Water that is self-supplied to agencies from streams, lakes and reservoirs is considered a surface water supply. Although MPMW's potable water supply is originally derived from surface water, it is categorized as "purchased" water since the water is obtained from the SFPUC RWS. MPMW does not currently, nor does it plan to in the future, use self-supplied surface water as part of its water supply portfolio.

6.4 Stormwater

MPMW does not currently, nor does it plan to in the future, use diverted stormwater as part of its water supply portfolio.

6.5 Wastewater and Recycled Water

☑ ***CWC § 10633***

The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.

Recycling water involves treating wastewater to an acceptable level such that it can be reused for irrigation, cooling, and other non-potable applications. A key benefit of water recycling is its potential to offset the use of potable supplies. The regulatory requirements for recycled water are defined in the California Code of Regulations, Title 22, Article 3 (Title 22) and differ for different uses (e.g. irrigation for food crops, landscape, and recreation). The sections below describe wastewater collection and treatment for the MPMW service area and summarize MPMW's efforts with respect to recycled water planning and use.

6.5.1 Recycled Water Coordination

West Bay Sanitary District (WBSD) provides wastewater collection services to the MPMW service area. WBSD also acts as the recycled water purveyor. As described in Section 2.2.3, MPMW relies on and coordinates with WBSD on the relevant wastewater and recycled water issues.

6.5.2 Wastewater Collection, Treatment, and Disposal

☑ ***CWC § 10633 (a)***

A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

☑ ***CWC § 10633 (b)***

A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

Wastewater in the MPMW service area is collected by WBSD, which also serves other customers within the remainder of Menlo Park, Atherton, sections of East Palo Alto, Portola Valley, Woodside, and unincorporated San Mateo and Santa Clara Counties. The WBSD collection system conveys wastewater through the Menlo Park Pumping Station located at the entrance to Bedwell Bayfront Park to the Silicon Valley Clean Water (SVCW) facilities in Redwood City for treatment and discharge to the San Francisco Bay. The volume of wastewater collected from the MPMW service area in 2020 was approximately 873 MG (Table 6-2).

The SVCW wastewater treatment plant (WWTP) is jointly owned and operated by WBSD and the Cities of Redwood City, Belmont, and San Carlos as a joint powers authority. The SVCW WWTP is located at the northeastern end of Redwood Shores, approximately nine miles from the northeastern boundary of the MPMW service area. The treatment processes at the SVCW WWTP involve the following: primary sedimentation, dual secondary treatment with fixed film reactors and activated sludge, filtration, disinfection using sodium hypochlorite, and dechlorination with sodium bisulfide. Discharge of the advanced secondarily-treated effluent is permitted by the San Francisco Regional Water Quality Control Board (RWQCB).

A limited volume of wastewater is treated within the MPMW service area at the Sharon Heights Recycled Water Facility (RWF; see Table 6-3). The Sharon Heights RWF, located at the Sharon Heights Golf and Country Club (SHGCC), was constructed and managed by WBSD in coordination with MPMW. It is a 0.5 MGD satellite WWTP which produces tertiary-treated recycled water under Title 22 for reuse within MPMW's service area. Wastewater is diverted from WBSD's collection system and pumped into the RWF. The treatment process includes screening, membrane bioreactor, and UV disinfection. In 2020, approximately 63 MG of wastewater was treated at the Sharon Heights RWF, among which 20 MG was recycled and the remaining 43 MG was conveyed to SVCW WWTP for discharge. Recycled water uses are further described in the section below.

Table 6-2 Wastewater Collected Within Area in 2020 (DWR Table 6-2)

	There is no wastewater collection system. The supplier will not complete the table below.
	Percentage of 2020 service area covered by wastewater collection system *(optional)*
	Percentage of 2020 service area population covered by wastewater collection system *(optional)*

Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected from UWMP Service Area 2020	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party? *(optional)*
West Bay Sanitary District	Estimated	873	Silicon Valley Clean Water	Silicon Valley Clean Water Wastewater Treatment Plant	No	
Total Wastewater Collected from Service Area in 2020:		873				

NOTES:
(a) Volumes are in units of MG.
(b) The volume of wastewater collected within the MPMW service area is estimated using information provided by WBSD. These estimates assume that sewer flow from residential units is 200 gallons per day and that sewer flow from non-residential accounts equals the volume of water consumed.
(c) The SVCW WWTP is jointly owned and operated by WBSD and the Cities of Redwood City, Belmont, and San Carlos as a joint powers authority.

Table 6-3 Wastewater Treatment and Discharge Within Service Area in 2020 (DWR Table 6-3)

	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.										
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2020 volumes				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
Recycled Water Facility - Sharon Heights	WBSD wastewater collection system	WBSD wastewater collection system		Other	No	Tertiary	63	43	20	0	0
						Total	63	43	20	0	0

NOTES:
(a) Volumes are in units of MG.
(b) Data provide by WBSD.
(c) Tertiary treated recycled water produced by the Sharon Heights Recycled Water Facility is either delivered to SHGCC for beneficial use or returned to the WBSD wastewater collection system

6.5.3 Recycled Water System Description

☑ ***CWC § 10633 (c)***

A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

MPMW has been working with WBSD, which is the recycled water purveyor, to develop the recycled water system within MPMW's service area. WBSD is responsible for recycled water system operation and maintenance.

Currently, recycled water is only used at the SHGCC which is a 170-acre property located in the Upper Zone of MPMW's service area. The recycled water system consists of the Sharon Heights RWF, a pump station, recycled water distribution pipelines to the golf course irrigation system, and a solids disposal pipeline. In 2020, the satellite WWTP provided 20 MG recycled water to the SHGCC, offsetting demand in potable water purchased from SFPUC. A second phase of the project that could supply approximately 28 MG of recycled water over seven months a year to Stanford Linear Accelerator Center (SLAC) for irrigation and industrial uses such as for cooling towers is in very early planning stages.

Planning for a similar recycled water facility in the Bayfront Area is ongoing. WBSD completed a Bayfront Recycled Water Facilities Plan in May 2019 (Woodard and Curran, 2019). The study included additional market assessment, evaluated potential project alternatives, and identified a recommended project. The recommended project involves construction of a 0.4 MGD treatment facility along with the associated pump stations and distribution systems. WBSD anticipates that the project could deliver up to 72 MG of recycled water for irrigation, cooling towers, and other uses within the Bayfront Area starting around 2030.

6.5.4 Potential, Current, and Projected Recycled Water Uses

☑ ***CWC § 10633 (b)***

A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

☑ ***CWC § 10633 (d)***

A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

☑ ***CWC § 10633 (e)***

The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

Historically there was no recycled water use within MPMW's service area. Starting in July 2020, with the completion of the Sharon Heights Recycled Water Project, recycled water provided by WBSD became available to certain MPMW's customers. The SHGCC used 20 MG of recycled water for irrigation in 2020.

Recycled water use projections for the MPMW service area are shown in Table 6-4, which include projected demands from SHGCC and demands associated with the planned Bayfront Recycled Water Facility. SHGCC's future demand was assumed to remain constant at approximately 48 MG per year. The Bayfront Recycled Water Facility was projected to come online by 2030 and provide approximately 39 MG per year of recycled water for irrigation and 33 MG per year for indoor non-potable uses (Woodard and Curran, 2019). As the SLAC recycled water project is still in its early planning phases, it was not included in Table 6-4.

No recycled water use projections were made in previous UWMPs. As described above, the SHGCC started to use recycled water for irrigation in late 2020. Table 6-5 lists the 2020 actual recycled water use, as reported in Table 6-4.

Table 6-4 Recycled Water Direct Beneficial Uses Within Service Area (DWR Table 6-4)

	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.
Name of Supplier Producing (Treating) the Recycled Water:	West Bay Sanitary District
Name of Supplier Operating the Recycled Water Distribution System:	West Bay Sanitary District
Supplemental Water Added in 2020 (volume)	0
Source of 2020 Supplemental Water	--

Beneficial Use Type	**Potential** Beneficial Uses of Recycled Water (Describe)	Amount of **Potential** Uses of Recycled Water (Quantity)	General Description of 2020 Uses	Level of Treatment	2020	2025	2030	2035	2040	2045 *(opt)*
Landscape irrigation (excludes golf courses)	Irrigation in Bayfront area	39 MG/year	--	Tertiary	0	0	39	39	39	--
Golf course irrigation	Irrigation of 170 acres of golf course at the SHGCC	48 MG/year	Irrigation of 170 acres of golf course at the SHGCC	Tertiary	20	48	48	48	48	--
Commercial use	Indoor non-potable use in Bayfront area	33 MG/year	--	Tertiary	0	0	33	33	33	--
				Total:	20	48	120	120	120	--
				2020 Internal Reuse	0					

NOTES:
(a) Volumes are in units of MG.
(b) The projected demands at Sharon Heights are estimated based on the average of historical demands in 2017 to 2019.
(c) Bayfront recycled water demands are estimated based on information provided by WBSD and in Bayfront Recycled Water Facilities Plan.

Table 6-5 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual (DWR Table 6-5)

	Recycled water was not used in 2015 nor projected for use in 2020. The supplier will not complete the table below.	
Beneficial Use Type	2015 Projection for 2020	2020 Actual Use
Golf course irrigation	0	20
Total	0	20
NOTES: (a) Volumes are in units of MG.		

6.5.5 Actions to Encourage and Optimize Future Recycled Water Use

☑ ***CWC § 10633 (f-g)***

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

As part of the 2016 General Plan Update (i.e., ConnectMenlo), several new zoning district categories, including Office (or "O"), Life Science (or "LS"), and Mixed Use Residential (or "R-MU"), were adopted for consistency with the new Bayfront Area land use designations. The green and sustainable building requirements of these zoning districts include policies that promote recycled water use (see Table 6-6). Specifically, new development in the Bayfront Area is required to be dual plumbed for the internal use of recycled water. In addition, all new buildings 250,000 square feet or more in gross floor area should identify and use an alternate water source for all City approved non-potable applications such as on-site and offsite recycled water, or if recycled water is not feasible, incorporate conservation measures equivalent to the building's non-potable demand. As described in Section 6.5.3, the recycled water use within the MPMW service area is projected to increase by 72 MG per year in 2030, assuming development of the Bayfront Recycled Water Facility.

Table 6-6 Methods to Expand Future Recycled Water Use (DWR Table 6-6)

	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
Section 6.5.5	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Zoning Ordinance	Require new construction in the Bayfront area to incorporate recycled water measures	Ongoing	72
		Total	72

NOTES:
(a) Volumes are in units of MG.
(b) The expected increase in recycled water use is estimated based on the Bayfront Recycled Water Facilities Plan (Woodard & Curran, 2019).

6.6 Desalinated Water Opportunities

☑ ***CWC § 10631 (g)*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

Opportunities to develop desalinated water supplies from ocean water, brackish surface, and brackish groundwater were investigated by BAWSCA as part of Phase II of its Long-Term Reliable Water Supply Strategy (Strategy, see Section 7.1.1.1). According to BAWSCA, there are high costs and intensive permitting requirements associated with desalination. However, it does potentially provide a substantial yield given the limited options for generating significant new water supplies for the region. SFPUC is also exploring desalination as part of its Alternative Water Supply Planning Program (see Section 7.1.1.1).

MPMW does not anticipate opportunities for development of desalinated water supplies within the planning horizon of this UWMP and this water supply is not being considered.

6.7 Water Exchanges and Transfers

☑ ***CWC § 10631 (c)*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

6.7.1 Exchanges and Transfers

There are potential transfer and exchange opportunities within and outside of the SFPUC RWS. MPMW does not presently anticipate the need for water right transfers during normal year conditions. However, should that condition change in the future, it is possible that MPMW could purchase water from another agency or entity either within or outside of the SFPUC RWS.

Within the SFPUC RWS, it is possible to transfer water entitlements and/or banked water among agencies. The Water Shortage Allocation Plan (WSAP) adopted by all BAWSCA agencies and the SFPUC provides the basis for voluntary transfers of water among BAWSCA agencies during periods when mandatory rationing is in effect on the SFPUC RWS (see Section 7.1.1.1). Some BAWSCA agencies have the capacity to rely on groundwater or other sources during dry years and thus may be willing to transfer a portion of their wholesale water entitlement to other BAWSCA agencies in need of supply above their allocations. Securing water from willing sellers outside the SFPUC RWS is a more complex process than transfers within the RWS, which requires both a contract with the seller agency and approval by the SFPUC. BAWSCA has the authority to plan for and acquire supplemental water supplies, and continues to evaluate the feasibility of water transfers as part of its implementation of the Strategy (see Section 7.1.1.1).

6.7.2 Emergency Interties

As discussed in Section 3.4, MPMW has 13 emergency interties with four adjacent water suppliers. Three connections (one metered) are with the Cal Water's system; a metered connection with the O'Connor Tract Co-operative Water Company; a connection with the City of Redwood City; and eight interties with the City of East Palo Alto.

6.8 Future Water Projects

☑ ***CWC § 10631*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

(b) (3) For any planned sources of water supply, a description of the measures that are being undertaken to acquire and develop those water supplies.

(f) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in normal and single-dry water years and for a period of drought lasting five consecutive water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

This section lists the water supply projects that may be undertaken by both the wholesaler SFPUC and MPMW (in coordination with WBSD). The effects of these projects on MPMW's long-term water supply are not all quantifiable at this point in time, therefore not all of them are included as future supplies in Table 6-9. The local projects are also documented in the City's five-year Capital Improvement Plan (CIP), which is an annually-updated, planning document that provides a long-term approach for prioritizing and implementing new projects within the City. The most recent update to the City's CIP is the FY 2020-2025 CIP (City of Menlo Park, 2020).

6.8.1 SFPUC Water Supply Projects

MPMW's wholesaler SFPUC has been implementing its Water System Improvement Plan (WSIP) since it was adopted in 2008. The WSIP includes several water supply projects to address the level of service (LOS) Goals and Objective established in the WSIP and updated in February 2020. SFPUC has also developed an Alternative Water Supply Planning Program to explore other projects that would increase overall water supply resiliency. These programs and future water supply projects are described in Section 7.1.1.1.

6.8.2 Emergency Water Supply Wells

As described in Section 6.2.4, MPMW completed construction of its first emergency groundwater well and anticipates bringing the well online in 2021. An additional one or two emergency wells are being considered as part of the Emergency Water Storage/Supply Project. The total supply capacity is targeted at 3,000 gpm. In addition, MPMW is also investigating locations for a future underground reservoir for the Lower Zone and the High Pressure Zone. Extensive information regarding the Emergency Water Storage/Supply Project can be found on the City's website: www.menlopark.org/emergencywatersupply.

6.8.3 Recycled Water

As described in Section 6.5.3, the Sharon Heights Recycled Water Project will potentially be expanded to connect SLAC. In addition, WBSD has been evaluating the project alternatives of constructing another recycled water facility in the Bayfront Area. A recommended project has been identified, which would deliver an estimated total of 72 MG of recycled water for irrigation, cooling towers, and other uses. The

facility is anticipated to come online by 2030. WBSD is continuing coordination with the City to determine next steps in recycled water planning.

Table 6-7 Expected Future Water Supply Projects or Programs (DWR Table 6-7)

	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
X	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
Section 6.8	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other suppliers?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier
	Y/N	*Supplier Name*				
Sharon Heights Recycled Water Project - Delivery to SLAC	Y	WBSD	--	Unknown	All Year Types	28
Bayfront Recycled Water Project	Y	WBSD	--	2030	All Year Types	72

NOTES:
(a) Volumes are in units of MG.
(b) The recycled water purveyorship for both projects listed above have been delegated to WBSD. WBSD is responsible for the project development.
(c) Expected increase in water supply is estimated based on information presented in the Recycled Water Project - Sharon Heights Mitigated Negative Declaration report (RMC, 2015) and the Bayfront Recycled Water Facilities Plan (Woodard & Curran, 2019).
(d) Projects to be constructed by SFPUC are documented in the narrative of this UWMP and in the SFPUC's 2020 UWMP.

6.9 Summary of Existing and Planned Sources of Water

☑ ***CWC § 10631 (b)*** *Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).*

☑ ***CWC § 10631 (b) (4) (D)*** *A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

MPMW purchases potable water from the SFPUC RWS to meet all of the potable water demands within the service area. In 2020, MPMW received approximately 1,069 MG from the SFPUC. An additional 20 MG

of recycled water was supplied to SHGCC to meet its irrigation demand. MPMW's historical and current supply is presented in Table 6-8.

MPMW plans to continue purchasing wholesale water from the SFPUC RWS. Water supplies from the SFPUC through 2040 are projected to be equivalent to MPMW's ISG of 1,630 MG, which is MPMW's contractual entitlement to SFPUC wholesale water, and which survives in perpetuity. Although MPMW currently owns one groundwater well, groundwater will not normally be distributed to customers unless there is a significant water shortage and normal water supplies are low or unavailable (see the City's Water Shortage Contingency Plan in Appendix K). Therefore, groundwater is not included in the supply projections. MPMW does not anticipate developing additional long-term potable water supplies from other sources in the near future.

In addition to the potable water supply from SFPUC RWS, approximately 48 MG and 72 MG of recycled water are projected to be supplied by the Sharon Heights and Bayfront Recycled Water Facilities per year, respectively. The recycled water supply is reported to the extent that it is needed to meet the recycled water demand identified in Table 6-4. Excess available supplies are not included.

MPMW's total water supply projections are shown in Table 6-9 in five-year increments through 2040.

Table 6-8 Water Supplies - Actual (DWR Table 6-8)

Water Supply	Additional Detail on Water Supply	Actual Volume					Water Quality	Total Right or Safe Yield *(optional)*
		2016	2017	2018	2019	2020		
Potable								
Purchased or Imported Water	SFPUC RWS	847	965	1,069	1,031	1,069	Drinking Water	1,630
Total Potable		847	965	1,069	1,031	1,069		1,630
Non-Potable								
Recycled Water	Sharon Heights Recycled Water Facility	0	0	0	0	20	Recycled Water	--
Total Non-Potable		0	0	0	0	20		--

NOTES:
(a) Volumes are in units of MG.
(b) The annual water supplies are based on SFPUC Eye On Water AMI data. 2018 and 2019 data are adjusted for meter and supply errors based on the AWWA Water Audit Reports.
(c) Total supplies may not match the total water demands reported in Table 4-1. This is because the water losses calculated in AWWA Water Audit Reports and presented in Table 4-1 are based on invoices which usually do not start from the first day of the month. However, the supply data in the above table are based on real-time AMI meter reads and summed by natural month.
(d) MPMW has an ISG of 4.456 MGD, which is approximately 1,630 MG per year.

Chart 6-8 Current and Historical Water Supply

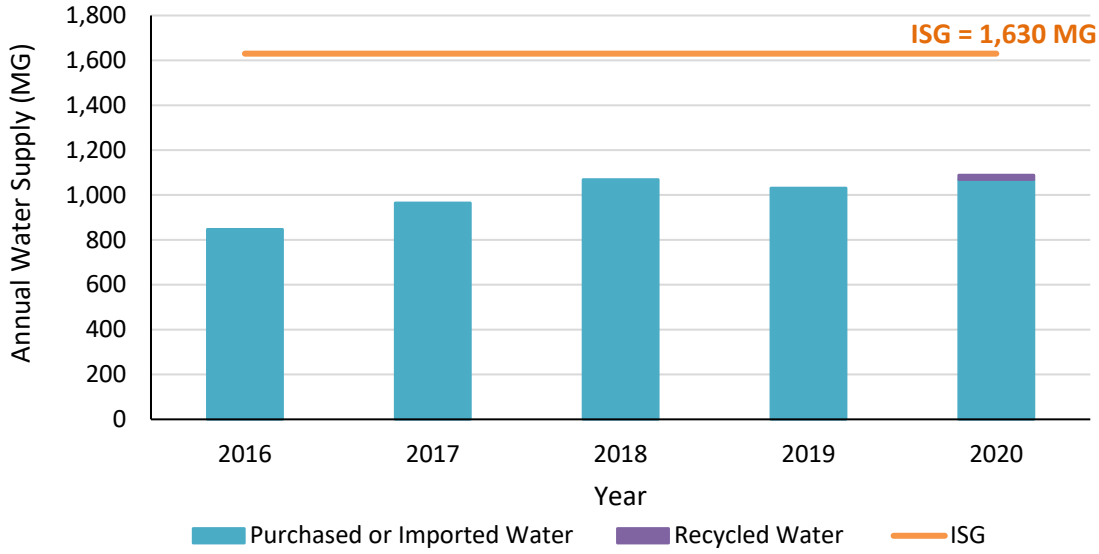
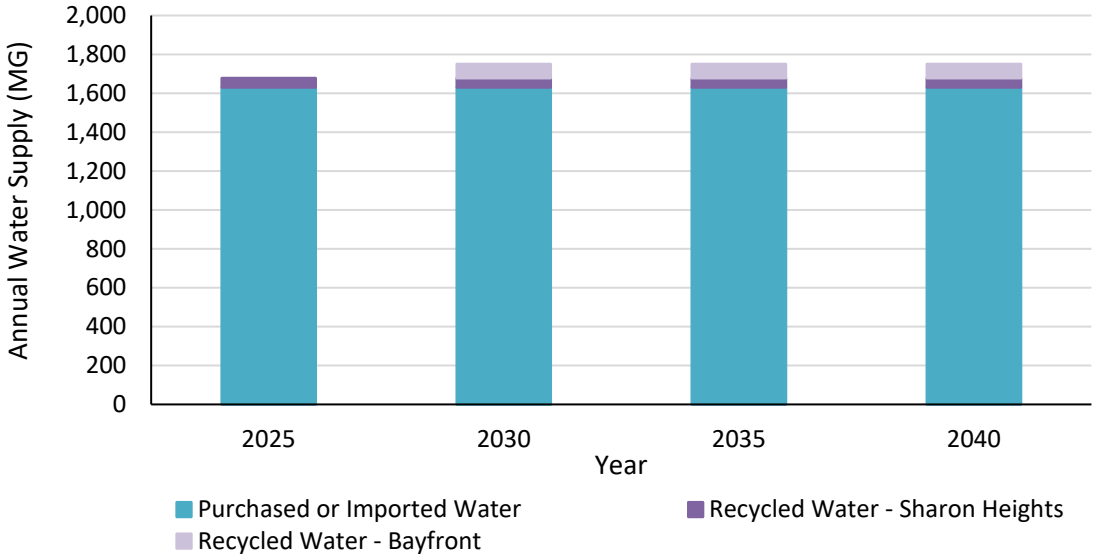


Table 6-9 Water Supplies - Projected (DWR Table 6-9)

Water Supply	Additional Detail on Water Supply	Projected Water Supply									
		2025		2030		2035		2040		2045 *(opt)*	
		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Projected Potable											
Purchased or Imported Water	SFPUC RWS	1,630	--	1,630	--	1,630	--	1,630	--	--	--
Total Potable		1,630	--	1,630	--	1,630	--	1,630	--	--	--
Projected Non-Potable											
Recycled Water	Sharon Heights Recycled Water Facility	48	--	48	--	48	--	48	--	--	--
Recycled Water	Bayfront Recycled Water Facility	0	--	72	--	72	--	72	--	--	--
Total Non-Potable		48	--	120	--	120	--	120	--	--	--

NOTES:
(a) Volumes are in units of MG.
(b) MPMW has an ISG of 4.456 MGD, which is approximately 1,630 MG per year.
(c) The recycled water supply reported herein are reported to the extent that they are needed to meet the recycled water demand in Table 6-4. Excess available supplies are not reported.

Chart 6-9 Projected Water Supply



6.10 Special Conditions

☑ ***CWC § 10635(b)***

(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.

6.10.1 Climate Change Effects

Information regarding the impacts of climate change to the SFPUC RWS supply was provided by BAWSCA in coordination with SFPUC and is provided verbatim below:

> The issue of climate change has become an important factor in water resources planning in California, and is frequently considered in urban water management planning processes, though the extent and precise effects of climate change remain uncertain. There is convincing evidence that increasing concentrations of greenhouse gasses have caused and will continue to cause a rise in temperatures around the world, which will result in a wide range of changes in climate patterns. Moreover, observational data show that a warming trend occurred during the latter part of the 20th century and virtually all projections indicate this will continue through the 21st century. These changes will have a direct effect on water resources in California, and numerous studies have been conducted to determine the potential impacts to water resources. Based on these studies, climate change could result in the following types of water resource impacts, including impacts on the watersheds in the Bay Area:
>
> - Reductions in the average annual snowpack due to a rise in the snowline and a shallower snowpack in the low and medium elevation zones, such as in the Tuolumne River basin, and a shift in snowmelt runoff to earlier in the year;
> - Changes in the timing, annual average, intensity and variability of precipitation, and an increased amount of precipitation falling as rain rather than snow;
> - Long-term changes in watershed vegetation and increased incidence of wildfires that could affect water quality and quantity;
> - Sea level rise and an increase in saltwater intrusion;
> - Increased water temperatures with accompanying potential adverse effects on some fisheries and water quality;
> - Increases in evaporation and concomitant increased irrigation need; and
> - Changes in urban and agricultural water demand.
>
> Both the SFPUC and BAWSCA participated in the 2020 update of the Bay Area Integrated Regional Water Management Plan (BAIRWMP), which includes an assessment of the potential climate change vulnerabilities of the region's water resources and identifies climate change adaptation strategies. In addition, the SFPUC continues to study the effect of climate change on the RWS. These works are summarized below.

6.10.1.1 *Bay Area Integrated Regional Water Management Plan*

Climate change adaptation continues to be an overarching theme for the 2019 BAIRWMP update. As stated in the BAIRWMP, identification of watershed characteristics that could potentially be vulnerable to future climate change is the first step in assessing vulnerabilities of water resources in the Bay Area Region (Region). Vulnerability is defined as the degree to which a system is exposed to, susceptible to, and able to cope with or adjust to, the adverse effects of climate change. A vulnerability assessment was conducted in accordance with the DWR's Climate Change Handbook for Regional Water Planning and using the most current science available for the Region. The vulnerability assessment, summarized in the table below, provides the main water planning categories applicable to the Region and a general overview of the qualitative assessment of each category with respect to anticipated climate change impacts.

Summary of BAIRWMP Climate Change Vulnerability Assessment

Vulnerability Areas	General Overview of Vulnerabilities
Water Demand	**Urban and Agricultural Water Demand** – Changes to hydrology in the Region as a result of climate change could lead to changes in total water demand and use patterns. Increased irrigation (outdoor landscape or agricultural) is anticipated to occur with temperature rise, increased evaporative losses due to warmer temperature, and a longer growing season. Water treatment and distribution systems are most vulnerable to increases in maximum day demand.
Water Supply	**Imported Water** – Imported water derived from the Sierra Nevada sources and Delta diversions provide 66 percent of the water resources available to the Region. Potential impacts on the availability of these sources resulting from climate change directly affect the amount of imported water supply delivered to the Region. **Regional Surface Water** – Although future projections suggest that small changes in total annual precipitation over the Region will not change much, there may be changes to when precipitation occurs with reductions in the spring and more intense rainfall in the winter. **Regional Groundwater** – Changes in local hydrology could affect natural recharge to the local groundwater aquifers and the quantity of groundwater that could be pumped sustainably over the long-term in some areas. Decreased inflow from more flashy or more intense runoff, increased evaporative losses and warmer and shorter winter seasons can alter natural recharge of groundwater. Salinity intrusion into coastal groundwater aquifers due to sea-level rise could interfere

Vulnerability Areas	General Overview of Vulnerabilities
	with local groundwater uses. Furthermore, additional reductions in imported water supplies would lead to less imported water available for managed recharge of local groundwater basins and potentially more groundwater pumping in lieu of imported water availability.
Water Quality	**Imported Water** – For sources derived from the Delta, sea-level rise could result in increases in chloride and bromide (a disinfection by-product (DBP) precursor that is also a component of sea water), potentially requiring changes in treatment for drinking water. Increased temperature could result in an increase in algal blooms, taste and odor events, and a general increase in DBP formation **Regional Surface Water** – Increased temperature could result in lower dissolved oxygen in streams and prolong thermocline stratification in lakes and reservoirs forming anoxic bottom conditions and algal blooms. Decrease in annual precipitation could result in higher concentrations of contaminants in streams during droughts or in association with flushing rain events. Increased wildfire risk and flashier or more intense storms could increase turbidity loads for water treatment. **Regional Groundwater** – Sea-level rise could result in increases in chlorides and bromide for some coastal groundwater basins in the Region. Water quality changes in imported water used for recharge could also impact groundwater quality.
Sea-Level Rise	Sea-level rise is additive to tidal range, storm surges, stream flows, and wind waves, which together will increase the potential for higher total water levels, overtopping, and erosion. Much of the bay shoreline is comprised of low-lying diked baylands which are already vulnerable to flooding. In addition to rising mean sea level, continued subsidence due to tectonic activity will increase the rate of relative sea-level rise. As sea-level rise increases, both the frequency and consequences of coastal storm events, and the cost of damage to the built and natural environment, will increase. Existing coastal armoring (including levees, breakwaters, and other structures) is likely to be insufficient to protect against projected sea-level rise. Crest elevations of structures will have to be raised or structures relocated to reduce hazards from higher total water levels and larger waves.

Vulnerability Areas	General Overview of Vulnerabilities
Flooding	Climate change projections are not sensitive enough to assess localized flooding, but the general expectation is that more intense storms would occur thereby leading to more frequent, longer and deeper flooding. Changes to precipitation regimes may increase flooding. Elevated Bay elevations due to sea-level rise will increase backwater effects exacerbating the effect of fluvial floods and storm drain backwater flooding.
Ecosystem and Habitat	Changes in the seasonal patterns of temperature, precipitation, and fire due to climate change can dramatically alter ecosystems that provide habitats for California's native species. These impacts can result in species loss, increased invasive species ranges, loss of ecosystem functions, and changes in vegetation growing ranges. Reduced rain and changes in the seasonal distribution of rainfall may alter timing of low flows in streams and rivers, which in turn would have consequences for aquatic ecosystems. Changes in rainfall patterns and air temperature may affect water temperatures, potentially affecting coldwater aquatic species. Bay Area ecosystems and habitat provide important ecosystem services, such as: carbon storage, enhanced water supply and quality, flood protection, food and fiber production. Climate change is expected to substantially change several of these services. The region provides substantial aquatic and habitat-related recreational opportunities, including: fishing, wildlife viewing, and wine industry tourism (a significant asset to the region) that may be at risk due to climate change effects.
Hydropower	Currently, several agencies in the Region produce or rely on hydropower produced outside of the Region for a portion of their power needs. As the hydropower is produced in the Sierra, there may be changes in the future in the timing and amount of energy produced due to changes in the timing and amount of runoff as a result of climate change. Some hydropower is also produced within the region and could also be affected by changes in the timing and amount of runoff.

Source: 2019 Bay Area Integrated Regional Water Management Plan (BAIRWMP), Table 16-3.

6.10.1.2 *SFPUC Climate Change Studies*

The SFPUC views assessment of the effects of climate change as an ongoing project requiring regular updating to reflect improvements in climate science, atmospheric/ocean modeling, and human response to the threat of greenhouse gas emissions. Climate change research by the SFPUC began in 2009 and continues to be refined. In its 2012 report "Sensitivity of Upper Tuolumne River Flow to Climate Change Scenarios," the SFPUC assessed the sensitivity of runoff into Hetch Hetchy Reservoir to a range of changes in temperature and precipitation due to climate change. Key conclusions from the report include the following:

- With differing increases in temperature alone, the median annual runoff at Hetch Hetchy would decrease by 0.7-2.1 percent from present-day conditions by 2040 and by 2.6-10.2 percent from present-day by 2100. Adding differing decreases in precipitation on top of temperature increases, the median annual runoff at Hetch Hetchy would decrease by 7.6-8.6 percent from present-day conditions by 2040 and by 24.7-29.4 percent from present-day conditions by 2100.
- In critically dry years, these reductions in annual runoff at Hetch Hetchy would be significantly greater, with runoff decreasing up to 46.5 percent from present day conditions by 2100 utilizing the same climate change scenarios.
- In addition to the total change in runoff, there will be a shift in the annual distribution of runoff. Winter and early spring runoff would increase and late spring and summer runoff would decrease.
- Under all scenarios, snow accumulation would be reduced and snow would melt earlier in the spring, with significant reductions in maximum peak snow water equivalent under most scenarios.

Currently, the SFPUC is conducting a comprehensive assessment of the potential effects of climate change on water supply using a wide range of plausible increases in temperature and changes in precipitation to address the wide uncertainty in climate projections over the planning horizon 2020 to 2070. There are many uncertain factors such as climate change, changing regulations, water quality, growth and economic cycles that may create vulnerabilities for the Regional Water System's ability to meet levels of service. The uncertainties associated with the degree to which these factors will occur and how much risk they present to the water system is difficult to predict, but nonetheless they need to be considered in SFPUC planning. To address this planning challenge, the project uses a vulnerability-based planning approach to explore a range of future conditions to identify vulnerabilities, assess the risks associated with these vulnerabilities that could lead to developing an adaptation plan that is flexible and robust to a wide range of future outcomes.

6.10.2 Regulatory Conditions and Project Development

Emerging regulatory conditions (e.g., issues surrounding the amendments to the Water Quality Control Plan for the San Francisco/Sacramento-San Joaquin Delta Estuary [Bay-Delta Plan Amendment]) may affect planned future projects and the characterization of future water supply availability and analysis. A detailed description of the potential impacts of Bay-Delta Plan Amendment implementation on RWS supply reliability is included in Section 7.1.1.1. MPMW currently does not have any plans to develop new

supply sources. If MPMW does move forward with any plans to develop supply projects, emerging regulatory conditions will be considered, and the associated water supply reliability impacts will be assessed in future UWMP updates.

6.10.3 Other Locally Applicable Criteria

Other locally applicable criteria may affect characterization and availability of an identified water supply (e.g., changes in regional water transfer rules may alter the availability of a water supply that had historically been readily available). Reliability of the RWS supply is further discussed in Section 7.1.1.1. MPMW does not have any current plans to develop new supply sources. If MPMW does move forward with any plans to develop supply projects, locally applicable criteria will be considered, and the associated water supply reliability impacts will be assessed in future UWMP updates.

6.11 Energy Intensity

☑ ***CWC § 10631.2***

(a) In addition to the requirements of Section 10631, an urban water management plan shall include any of the following information that the urban water supplier can readily obtain:
(1) An estimate of the amount of energy used to extract or divert water supplies.
(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.
(3) An estimate of the amount of energy used to treat water supplies.
(4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.
(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.
(6) An estimate of the amount of energy used to place water into or withdraw from storage.
(7) Any other energy-related information the urban water supplier deems appropriate.
(b) The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.
(c) The Legislature finds and declares that energy use is only one factor in water supply planning and shall not be considered independently of other factors.

MPMW used the "Total Utility Approach" defined by DWR in the UWMP Guidebook 2020 to report water-related energy consumption. Calendar year 2019 is selected as the one-year reporting period, and utility bills for the whole year are used as the source for energy consumption data. It is estimated that a total of approximately 359,907 kilowatt hours (kWh) of energy was consumed for operation of water facilities in MPMW's water system in 2019. As the total volume of water entering the system was 1,031 MG, the energy intensity was calculated to be 349 kWh/MG (Table 6-10).

Table 6-10 Recommended Energy Intensity - Total Utility Approach (DWR Table O-1B)

Urban Water Supplier: *MPMW*

Water Delivery Product
Retail Potable Deliveries

Enter Start Date for Reporting Period	1/1/2019	Urban Water Supplier Operational Control		
End Date	12/31/2019			
Is upstream embedded in the values reported?	N	Sum of All Water Management Processes	Non-Consequential Hydropower	
Water Volume Units Used	MG	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process (MG)		*1,031*	*0*	*1,031*
Energy Consumed (kWh)		*359,907*	*0*	*359,907*
Energy Intensity (kWh/MG)		*349.2*	*0.0*	*349.2*

Quantity of Self-Generated Renewable Energy
0 kWh

Data Quality
Metered Data

Data Quality Narrative:
Volume of water data is from the SFPUC AMI meters. Energy usage is for water facilities and is from the City's energy bills.

Narrative:
MPMW utilizes the pump station to convey water from the Upper Zone turnout to supplement demands and to fill the storage tanks.

7 WATER SERVICE RELIABILITY AND DROUGHT RISK ASSESSMENT

☑ ***CWC § 10620 (f)***

An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

☑ ***CWC § 10630.5***

Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.

This chapter assesses the reliability of Menlo Park Municipal Water's (MPMW's) water supplies, with a specific focus on potential constraints, including purchased water supply availability, water quality, and climate change. The intent of this chapter is to identify any potential constraints that could affect the reliability of MPMW's supply during normal, single dry-year, and multiple dry-year hydrologic conditions.

As described in Section 6, all of MPMW's potable water supply is purchased from the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS) and a portion of the irrigation use is served by recycled water. The reliability of the SFPUC RWS is anticipated to vary greatly in different year types. MPMW has relied on SFPUC's RWS supply reliability estimates and the drought allocation structure provided by SFPUC and the Bay Area Water Supply and Conservation Agency (BAWSCA) to estimate available RWS supplies in all year types through 2040. In addition to the long-term water service reliability assessment, this chapter also presents a Drought Risk Assessment (DRA) to evaluate MPMW's supply risks under a severe drought period lasting for the next five consecutive years (i.e., through 2025).

7.1 Water Service Reliability Assessment

The following sections describe MPMW's water service reliability assessment, which presents MPMW's expected water service reliability for a normal year, single dry year, and five consecutive dry years projections in five-year increments between 2025 and 2040.

7.1.1 Service Reliability – Constraints on Water Sources

Several potential constraints have been identified on future supply availability, water quality, and climate change. These constraints are summarized in the following sections.

7.1.1.1 Regional Water System Supply Constraints

☑ ***CWC § 10631 (h)*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).

Detailed information is provided below regarding factors that impact the SFPUC RWS supply reliability. The source for this information is the common language provided by the SFPUC and BAWSCA (see Appendix G).

Level of Service Goals

The SFPUC historically has met demand in its service area in all year types from its watersheds, which consist of:

- Tuolumne River watershed
- Alameda Creek watershed
- San Mateo County watersheds

In general, 85 percent of the supply comes from the Tuolumne River through Hetch Hetchy Reservoir and the remaining 15 percent comes from the local watersheds through the San Antonio, Calaveras, Crystal Springs, Pilarcitos and San Andreas Reservoirs. The adopted Water Supply Improvement Program (WSIP) retains this mix of water supply for all year types.

In 2008, the SFPUC adopted Level of Service (LOS) Goals and Objectives in conjunction with the adoption of WSIP. The SFPUC updated the LOS Goals and Objectives in February 2020. The SFPUC's LOS Goals and Objectives related to water supply are:

Program Goal	System Performance Objective
Water Supply *– meet customer water needs in non-drought and drought periods*	• Meet all state and federal regulations to support the proper operation of the water system and related power facilities. • Meet average annual water demand of 265 mgd from the SFPUC watersheds for retail and Wholesale Customers during non–drought years for system demands consistent with the 2009 Water Supply Agreement. • Meet dry-year delivery needs while limiting rationing to a maximum 20 percent system-wide reduction in water service during extended droughts. • Diversify water supply options during non-drought and drought periods. • Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers.

Bay-Delta Plan Amendment Impacts

Based on information provided by SFPUC and BAWSCA (Appendix G and Appendix I) the adoption of the 2018 Bay-Delta Plan Amendment is anticipated to impact the reliability of the RWS supplies in the future.

> In December 2018, the State Water Resources Control Board (SWRCB) adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) to establish water quality objectives to maintain the health of the Bay-Delta ecosystem. The SWRCB is required by law to regularly review this plan. The adopted Bay-Delta Plan Amendment was developed with the stated goal of increasing salmon populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay-Delta. The Bay-Delta Plan Amendment requires the release of 30-50% of the "unimpaired flow"[16] on the three tributaries from February through June in every year type. In SFPUC modeling of the new flow standard, it is assumed that the required release is 40% of unimpaired flow.
>
> If the Bay-Delta Plan Amendment is implemented, the SFPUC will be able to meet the projected water demands presented in this Urban Water Management Plan (UWMP) in normal years but would experience supply shortages in single dry years or multiple

[16] "Unimpaired flow represents the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds." (Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Dec. 12, 2018) p.17, fn. 14, available at https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf.)

dry years. Implementation of the Bay-Delta Plan Amendment will require rationing in all single dry years and multiple dry years. The SFPUC has initiated an Alternative Water Supply Planning Program (AWSP) to ensure that San Francisco can meet its Retail and Wholesale Customer water needs, address projected dry years shortages, and limit rationing to a maximum 20 percent system-wide in accordance with adopted SFPUC policies. This program is in early planning stages and is intended to meet future water supply challenges and vulnerabilities such as environmental flow needs and other regulatory changes; earthquakes, disasters, and emergencies; increases in population and employment; and climate change. As the region faces future challenges – both known and unknown – the SFPUC is considering this suite of diverse non-traditional supplies and leveraging regional partnerships to meet Retail and Wholesale Customer needs through 2045.

The SWRCB has stated that it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, assuming all required approvals are obtained by that time. But implementation of the Plan Amendment is uncertain for multiple reasons.

First, since adoption of the Bay-Delta Plan Amendment, over a dozen lawsuits have been filed in both state and federal courts, challenging the SWRCB's adoption of the Bay-Delta Plan Amendment, including a legal challenge filed by the federal government, at the request of the U.S. Department of Interior, Bureau of Reclamation. This litigation is in the early stages and there have been no dispositive court rulings as of this date.

Second, the Bay-Delta Plan Amendment is not self-implementing and does not automatically allocate responsibility for meeting its new flow requirements to the SFPUC or any other water rights holders. Rather, the Bay-Delta Plan Amendment merely provides a regulatory framework for flow allocation, which must be accomplished by other regulatory and/or adjudicatory proceedings, such as a comprehensive water rights adjudication or, in the case of the Tuolumne River, may be implemented through the water quality certification process set forth in section 401 of the Clean Water Act as part of the Federal Energy Regulatory Commission's licensing proceedings for the Don Pedro and La Grange hydroelectric projects. It is currently unclear when the license amendment process is expected to be completed. This process and the other regulatory and/or adjudicatory proceedings would likely face legal challenges and have lengthy timelines, and quite possibly could result in a different assignment of flow responsibility (and therefore a different water supply impact on the SFPUC).

Third, in recognition of the obstacles to implementation of the Bay-Delta Plan Amendment, the SWRCB Resolution No. 2018-0059 adopting the Bay-Delta Plan Amendment directed staff to help complete a "Delta watershed-wide agreement, including potential flow measures for the Tuolumne River" by March 1, 2019, and to incorporate such agreements as an "alternative" for a future amendment to the Bay-Delta Plan to be presented to the SWRCB "as early as possible after December 1, 2019." In accordance with the SWRCB's instruction, on March 1, 2019, SFPUC, in partnership with other key stakeholders, submitted a proposed project description for the Tuolumne River that could be the basis for a voluntary substitute agreement with the SWRCB ("March 1st Proposed Voluntary Agreement"). On March 26, 2019, the Commission adopted Resolution No. 19-0057 to support the SFPUC's participation in the Voluntary Agreement negotiation process. To date, those negotiations are ongoing

> under the California Natural Resources Agency and the leadership of the Newsom administration.[17]

Drought Allocation Methodology

Given the constraints described above, the SFPUC has provided all of the Wholesale Customers with estimates of the RWS reliability in all year types though 2045, as shown in Appendix I. The Tier One Plan describes the method for allocating RWS water between Retail and Wholesale Customers during system-wide shortages of 20% or less. The Tier Two Plan allocates the collective Wholesale Customer share from the Tier One Plan among each of SFPUC's 26 Wholesale Customers.

For the purposes of 2020 UWMP development only, SFPUC and BAWSCA have provided revised methodologies to allocate RWS supplies during projected future single dry and multiple dry years in instances where the projects supply shortfalls are greater than 20%. SFPUC and BAWSCA assumed that Tier One allocations for system-wide shortfalls of 16% to 20% would apply for all shortfalls greater than 20%. BAWSCA provided a revised methodology to allocate RWS supplies to Wholesale Agencies. The inclusion of these revised methodologies, which serve as the preliminary basis for UWMP supply reliability analyses, does not in any way imply an agreement by BAWSCA member agencies as to the exact allocation methodologies.

The Tier One and Tier Two Plans and the drought allocation methodologies used in the 2020 UWMP for shortfalls of greater than 20% are further described below.

Tier One Drought Allocations

> In July 2009, San Francisco and its Wholesale Customers in Alameda County, Santa Clara County, and San Mateo County (Wholesale Customers) adopted the Water Supply Agreement (WSA), which includes a Water Shortage Allocation Plan (WSAP) that describes the method for allocating water from the RWS between Retail and Wholesale Customers during system-wide shortages of 20 percent or less. The WSAP, also known as the Tier One Plan, was amended in the 2018 Amended and Restated WSA.
>
> The SFPUC allocates water under the Tier One Plan when it determines that the projected available water supply is up to 20 percent less than projected system-wide water purchases. The following table shows the SFPUC (i.e, Retail Customers) share and the Wholesale Customers' share of the annual water supply available during shortages depending on the level of system-wide reduction in water use that is required. The Wholesale Customers' share will be apportioned among the individual Wholesale Customers based on a separate methodology adopted by the Wholesale Customers, known as the Tier Two Plan, discussed further below.

[17] California Natural Resources Agency, "Voluntary Agreements to Improve Habitat and Flow in the Delta and its Watersheds," available at https://files.resources.ca.gov/voluntary-agreements/.

Level of System-Wide Reduction in Water Use Required	Share of Available Water	
	SFPUC Share	Wholesale Customers Share
5% or less	35.5%	64.5%
6% through 10%	36.0%	64.0%
11% through 15%	37.0%	63.0%
16% through 20%	37.5%	62.5%

> The Tier One Plan allows for voluntary transfers of shortage allocations between the SFPUC and any Wholesale Customer as well as between Wholesale Customers themselves. In addition, water "banked" by a Wholesale Customer, through reductions in usage greater than required, may also be transferred.
>
> As amended in 2018, the Tier One Plan requires Retail Customers to conserve a minimum of 5 percent during droughts. If Retail Customer demands are lower than the Retail Customer allocation (resulting in a "positive allocation" to Retail[18]) then the excess percentage would be re-allocated to the Wholesale Customers' share. The additional water conserved by Retail Customers up to the minimum 5 percent level is deemed to remain in storage for allocation in future successive dry years.
>
> The Tier One Plan will expire at the end of the term of the WSA in 2034, unless mutually extended by San Francisco and the Wholesale Customers.
>
> The Tier One Plan applies only when the SFPUC determines that a system-wide water shortage exists and issues a declaration of a water shortage emergency under California Water Code Section 350. Separate from a declaration of a water shortage emergency, the SFPUC may opt to request voluntary cutbacks from its Retail and Wholesale Customers to achieve necessary water use reductions during drought periods.

As discussed above, the Tier One Plan only applies to system-wide shortages of 20% or less, and there is currently no methodology for sharing available water between SFPUC and Wholesale Customers for system-wide shortages of greater than 20%. SFPUC and BAWSCA assumed that Tier One allocations for System-Wide shortfalls of 16% to 20% would apply for all shortfalls greater than 20% for purposes of the UWMP supply reliability analyses. The analysis included herein does not in any way imply an agreement by BAWSCA member agencies with the assumed application of the Tier One allocations by SFPUC and BAWSCA for shortages of greater than 20%.

Tier Two Drought Allocations

> The Wholesale Customers have negotiated and adopted the Tier Two Plan, referenced above, which allocates the collective Wholesale Customer share from the Tier One Plan

[18] See Water Supply Agreement, Water Shortage Allocation Plan (Attachment H), Section 2.1.

among each of the 26 Wholesale Customers. These Tier Two allocations are based on a formula that takes into account multiple factors for each Wholesale Customer including:

- Individual Supply Guarantee;
- Seasonal use of all available water supplies; and
- Residential per capita use.

The water made available to the Wholesale Customers collectively will be allocated among them in proportion to each Wholesale Customer's Allocation Basis, expressed in millions of gallons per day (MGD), which in turn is the weighted average of two components. The first component is the Wholesale Customer's Individual Supply Guarantee, as stated in the WSA, and is fixed. The second component, the Base/Seasonal Component, is variable and is calculated using the monthly water use for three consecutive years prior to the onset of the drought for each of the Wholesale Customers for all available water supplies. The second component is accorded twice the weight of the first, fixed component in calculating the Allocation Basis. Minor adjustments to the Allocation Basis are then made to ensure a minimum cutback level, a maximum cutback level, and a sufficient supply for certain Wholesale Customers.

The Allocation Basis is used in a fraction, as numerator, over the sum of all Wholesale Customers' Allocation Bases to determine each wholesale customer's Allocation Factor. The final shortage allocation for each Wholesale Customer is determined by multiplying the amount of water available to the Wholesale Customers' collectively under the Tier One Plan, by the Wholesale Customer's Allocation Factor.

The Tier Two Plan requires that the Allocation Factors be calculated by BAWSCA each year in preparation for a potential water shortage emergency. As the Wholesale Customers change their water use characteristics (e.g., increases or decreases in SFPUC purchases and use of other water sources, changes in monthly water use patterns, or changes in residential per capita water use), the Allocation Factor for each Wholesale Customer will also change. However, for long-term planning purposes, each Wholesale Customer shall use as its Allocation Factor, the value identified in the Tier Two Plan when adopted.

Per WSA Section 3.11, the Tier One and Tier Two Plans will be used to allocate water from the Regional Water System between Retail and Wholesale Customers during system-wide shortages of 20% or less. For Regional Water System shortages in excess of 20%, San Francisco shall (a) follow the Tier 1 Shortage Plan allocations up to the 20% reduction, (b) meet and discuss how to implement incremental reductions above 20% with the Wholesale Customers, and (c) make a final determination of allocations above the 20% reduction. After the SFPUC has made the final allocation decision, the Wholesale Customers shall be free to challenge the allocation on any applicable legal or equitable basis. For purposes of the 2020 UWMPs, for San Francisco Regional Water System (RWS) shortages in excess of 20%, the allocations among the Wholesale Customers is assumed to be equivalent among them and to equal the drought cutback to Wholesale Customer by the SFPUC.

The Tier Two Plan, which initially expired in 2018, has been extended by the BAWSCA Board of Directors every year since for one additional calendar year. In November 2020, the BAWSCA Board voted to extend the Tier Two Plan through the end of 2021.

Revised Drought Allocation Plan

As detailed by BAWSCA in multiple memos and workshops (Appendix I), the Tier Two Plan was not designed for RWS shortages greater than 20%.[19] In a memorandum dated 1 March 2021, BAWSCA provided a refined methodology to allocate RWS supplies during projected future single dry and multiple dry years in the instance where the supply shortfalls are greater than 20%. The revised methodology developed by BAWSCA allocates the wholesale RWS supplies as follows:

1. When the average Wholesale Customers' RWS shortages are 10 percent or less, an equal percent reduction will be applied across all agencies. This is consistent with the existing Tier Two requirement of a minimum 10 percent cutback in any Tier Two application scenario.
2. When average Wholesale Customers' shortages are between 10 and 20 percent, the Tier Two Plan will be applied.
3. When the average Wholesale Customers' RWS shortages are greater than 20 percent, an equal percent reduction will be applied across all agencies.

The associated allocations based on the updated BAWSCA methodology are included as Appendix I. While this allocation methodology has been used herein, MPMW notes per BAWSCA's memoranda dated 18 February 2021 (Appendix I)

> "BAWSCA recognizes that this is not an ideal situation or method for allocation of available drought supplies. In the event of actual RWS shortages greater than 20 percent, the Member Agencies would have the opportunity to negotiate and agree upon a more nuanced and equitable approach. Such an approach would likely consider basic health and safety needs, the water needs to support critical institutions such as hospitals, and minimizing economic impacts on individual communities and the region."

As such, this allocation method is only intended to serve as the preliminary basis for the 2020 UWMP supply reliability analysis. The analysis provided herein does not in any way imply an agreement by BAWSCA member agencies as to the exact allocation methodology. BAWSCA member agencies are in discussions about jointly developing an allocation method that would consider additional equity factors in the event that SFPUC is not able to deliver its contractual supply volume, and its cutbacks to the RWS supply exceed 20%.

7.1.1.2 Recycled Water Supply Constraints

Recycled water currently supplies 2% of MPMW's total demand and is anticipated to supply 8% of MPMW's total demand by 2040 (see Chapters 4 and 6). Recycled water is assumed to be a reliable and stable water supply source and is estimated to be available during all hydrologic years at a volume that meets MPMW's projected recycled water demands.

[19] Note that the Tier One Drought Allocations were also not designed for shortages greater than 20%. SFPUC and BAWSCA have assumed for UWMP planning purposes that the Wholesale Share will remain 62.5% for all shortfalls greater than 16%.

7.1.1.3 Water Quality

☑ ***CWC § 10634***

The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Impaired water quality also has the potential to affect water supply reliability. As discussed in Section 6, the majority of the water supply to the SFPUC RWS is from the Hetch Hetchy Reservoir in the Sierra Nevada Mountains. The Hetch Hetchy Reservoir is considered a very high-quality water source due to low total dissolved solid (TDS) concentrations and other factors. Additional water supplies from the Alameda and Peninsula sources come from areas with restricted access to protect the source water quality.

The SFPUC's Water Quality Division (WQD) regularly collects and tests water samples from reservoirs and designated sampling points throughout the RWS to ensure that the SFPUC's water meets or exceeds federal and state drinking water standards. In 2019, the WQD conducted more than 53,650 drinking water tests in the sources and transmission systems. This is in addition to the extensive treatment process control monitoring performed by the SFPUC's certified operators and online instruments. The SFPUC also has online instruments providing continuous water quality monitoring at numerous locations.

Additionally, MPMW routinely collects water quality samples and monitors water quality within its own distribution system. The results of the testing are summarized annually in Water Quality Reports (also known as "Consumer Confidence Reports"), which are available on the City's website: https://www.menlopark.org/waterquality. As can be seen therein, all of the analyzed constituents were detected at concentrations below the Maximum Contaminant Level (MCL) in 2019.

The results of MPMW's and SFPUC's water quality assessments show that SFPUC RWS watersheds have very low levels of contaminants, and that those contaminants that are found at low levels are associated with wildlife and, to a limited extent, human recreation. For the purposes of this UWMP, it is anticipated that this high-quality potable water source will continue to be available to MPMW through the planning horizon ending in the year 2040. Water quality is not expected to impact the reliability of MPMW's supplies.

7.1.1.4 Climate Change

☑ ***CWC § 10631 (b) (1)***

…For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.

Section 6.10.1 provides a summary of the assessments of the applicable climate change on supplies that SFPUC has previously performed and those planned for the near term. The anticipated effects of climate change have been directly factored into MPMW's assessment of its supply reliability. MPMW is actively working with SFPUC and BAWSCA to further quantify and consider future climate change impacts as part of its ongoing supply and operations planning.

7.1.2 Service Reliability - Year Type Characterization

☑ ***CWC § 10631 (b)***

Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following:

☑ ***CWC § 10631 (b)(1)***

A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.

☑ ***CWC § 10635 (a)***

Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

Per the UWMP Guidebook 2020, the water service reliability assessment includes three unique year types:

- A normal hydrologic year represents the water supplies available under normal conditions, this could be an averaged range of years or a single representative year,
- A single dry year represents the lowest available water supply, and
- A five-consecutive year drought represents the driest five-year period in the historical record.

The available SFPUC RWS supplies by year type is provided by BAWSCA and SFPUC in Appendix G and Appendix I and are presented in Table 7-1 and Table 7-3. Data and methods used to develop these dry year supply availabilities are consistent with the UWMP Guidebook 2020 methodology and are described in the sections below.

Table 7-1 Basis of SFPUC RWS Water Year Data (Reliability Assessment) (DWR Table 7-1)

Year Type	Base Year	Available Supplies if Year Type Repeats	
		X	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location: Table 7-3
			Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available	% of Average Supply
Average Year			100%
Single-Dry Year			
Consecutive Dry Years 1st Year			
Consecutive Dry Years 2nd Year			
Consecutive Dry Years 3rd Year			
Consecutive Dry Years 4th Year			
Consecutive Dry Years 5th Year			
NOTES:			

In addition, a portion of MPMW's irrigation use is served by recycled water. As discussed in Section 7.1.1.2, MPMW anticipates that 100% of its recycled water supply will be available during all year types (Table 7-2).

Table 7-2 Basis of Recycled Water Year Data (Reliability Assessment) (DWR Table 7-1)

Year Type	Base Year	Available Supplies if Year Type Repeats		
		---	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____	
		X	Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available		% of Average Supply
Average Year				100%
Single-Dry Year				100%
Consecutive Dry Years 1st Year				100%
Consecutive Dry Years 2nd Year				100%
Consecutive Dry Years 3rd Year				100%
Consecutive Dry Years 4th Year				100%
Consecutive Dry Years 5th Year				100%
NOTES:				

7.1.2.1 SFPUC Supply Modeled RWS Dry Year Supply Availability

As described in SFPUC's 2020 UWMP, SFPUC used the Hetch Hetchy and Local Simulation Model (HHLSM) to estimate SFPUC RWS supply availability for water service reliability assessment and the DRA (Section 7.2). HHLSM simulates supplies over a historical record of hydrology from 1920 through 2017 with a representation of current and planned SFPUC RWS infrastructure and operations.

Water supply shortfalls presented by SFPUC in Appendix I were estimated using SFPUC's design drought methodology. The SFPUC uses a hypothetical 8.5-year design drought that is more severe than what the RWS has historically experienced as the basis for planning and modeling of future scenarios. The design drought consists of the 1987-92 drought, followed by an additional 2.5 years of dry conditions from the hydrologic record that include the 1976-77 drought. The five-consecutive-year dry sequence used for the UWMP represents years 2 through 6 of the design drought. However, the modeling approach assumes water supply rationing each year that is designed to provide sufficient carry-over water in SFPUC reservoirs to continue delivering water, although at reduced levels, during each year of the five-consecutive year drought and the remaining years of the design drought (SFPUC, 2021).

SFPUC provided results for two modeled scenarios, which show significantly different supply reliability projections for the RWS:

1. With full implementation of the Bay-Delta Plan Amendment in 2023
2. Without implementation of the Bay-Delta Plan Amendment

The SFPUC decided to present the water reliability analysis with full implementation of the Bay-Delta Plan Amendment in the SFPUC 2020 UWMP Submittal Tables and provided the following rationale for that decision:

> The adoption of the Bay-Delta Plan Amendment may significantly impact the supply available from the RWS. SFPUC recognizes that the Bay-Delta Plan Amendment has been adopted and that, given that it is now state law, we must plan for a future in which it is fully implemented. SFPUC also acknowledges that the plan is not self-implementing and therefore does not automatically go into effect. SFPUC is currently pursuing a voluntary agreement as well as a lawsuit which would limit implementation of the Plan. With both of these processes occurring on an unknown timeline, SFPUC does not know at this time when the Bay-Delta Plan Amendment is likely to go into effect. As a result, it makes sense to conduct future supply modeling for a scenario that doesn't include implementation of the Bay-Delta Plan Amendment, as that represents a potential supply reliability scenario.
>
> Because of the uncertainty surrounding implementation of the Bay-Delta Plan Amendment, the SFPUC conducted water service reliability assessment that includes: (1) a scenario in which the Bay-Delta Plan Amendment is fully implemented in 2023, and (2) a scenario that considers the SFPUC system's current situation without the Bay-Delta Plan Amendment. The two scenarios provide a bookend for the possible future scenarios regarding RWS supplies. The standardized tables associated with the SFPUC's UWMP contain the future scenario that assumes implementation of the Bay-Delta Plan Amendment starting in 2023.
>
> Although the SWRCB has stated it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, given the current level of uncertainty, it is assumed for the purposes of the SFPUC's draft UWMP that the Bay-Delta Plan Amendment will be fully implemented starting in 2023.

As shown in Appendix I, SFPUC also provided results for each of the modeling scenarios described above assuming demands on the RWS equal to both: (1) the total of projected retail demands and projected Wholesale Customer purchases and (2) a constant water demand of 265 million gallons per day (MGD) from the SFPUC watersheds for retail and Wholesale Customers, consistent with SFPUC's contractual obligation. According to the SFPUC, the modeling based on a demand of 265 MGD was used to "facilitate planning that supports meeting this Level of Service goal and their contractual obligations." Supply modeling results presented in the text of the SFPUC's 2020 UWMP reflect an input of projected retail and Wholesale demands on the RWS.

Consistent with SFPUC's approach and guidance from SFPUC and BAWSCA, MPMW's UWMP presents results for the water service reliability assessment and the DRA (Section 7.2) based on the modeling scenario that assumes full implementation of the Bay Delta Plan Amendment in 2023 and uses projected demands on the RWS. SFPUC modeling results for this scenario showing the total RWS supply available to Wholesale Customers during the characteristic year types can be found in Tables 3a-3g of the SFPUC letter

dated March 30, 2021. These results show total Wholesale RWS supply shortfalls ranging from 36% to 54% of projected purchases during dry years after 2023.

For comparison purposes, results for the scenario without the Bay-Delta Plan Amendment can be found in Tables 4a-4g of the same SFPUC letter. These results indicated that the SFPUC would be able to meet 100% of Wholesale projected purchases during all year types except during the fourth and fifth consecutive dry years for base year 2045 when 15% Wholesale supply shortages are projected.

7.1.2.2 MPMW's Year-Type Characterization

As discussed in Section 6.1.2, in accordance with the SFPUC's perpetual obligation to MPMW's Supply Assurance, MPMW has an Individual Supply Guarantee (ISG) of 4.456 MGD, or 1,630 million gallons (MG) per year. SFPUC is obligated to provide MPMW with up to 100% of MPMW's ISG during normal years.

Using the SFPUC modeling results presented in the SFPUC letter dated March 30, 2021, BAWSCA provided single and five-consecutive dry-year allocations for each agency based on the methodology described in Section 7.1.1.1. As discussed in therein, for the purposes for the 2020 UWMP supply reliability analysis only, Wholesale Agency drought allocations assume an equal percent reduction across all agencies when the average Wholesale Customers' RWS shortages are greater than 20%. These percent reductions for the scenario that assumes the implementation of the Bay-Delta Plan Amendment in 2023 are included in Table E of the BAWSCA updated drought allocation memorandum dated 1 April 2021 (Appendix I). BAWSCA then applied these percent reductions to each agency's projected demands to calculate the drought allocation volumes for base year 2025 through 2045, which are included in Table G2 to K2 of the same memorandum. Results for MPMW are reproduced in Table 7-3 below and are used to calculate the total supplies presented in Table 7-5 and Table 7-6.

Table 7-3 RWS Wholesale Supply Availability During Normal and Dry Years for Based Years 2025 through 2040 (Responds to DWR Table 7-1)

Year Type		2025	2030	2035	2040
Normal Year		1,630	1,630	1,630	1,630
Single Dry Year		829	858	898	942
Multiple Dry Years	First year	829	858	898	942
	Second year	712	734	767	807
	Third year	712	734	767	807
	Fourth year	712	734	767	712
	Fifth year	712	734	704	712

NOTES:
(a) Volumes are in units of MG.
(b) Normal-year water supply is presented as MPMW's ISG (4.456 MGD or approximately 1,630 MG).
(c) Dry-year water supplies are MPMW's drought allocations provided by BAWSCA based on the revised BAWSCA Drought Methodology that assumes equal percent cutbacks across all Wholesale Agencies.
(c) Results reflect scenario with Bay-Delta Plan Amendment implemented in 2023.

7.1.3 Service Reliability - Supply and Demand Assessment

☑ ***CWC § 10635 (a)***

Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

The following sections compare MPMW's projected water demands with projected water supply availability during normal years, single dry years, and multiple dry year periods.

7.1.3.1 Water Service Reliability - Normal Year

Table 7-4 shows the projected supply and demand totals for a normal year. The supply and demand totals are consistent with those in Table 6-9 and Table 4-7, respectively. MPMW is expected to have adequate water supplies during normal years to meet its projected demands through 2040.

Table 7-4 Normal Year Supply and Demand Comparison (DWR Table 7-2)

	2025	2030	2035	2040	2045*(opt)*
Supply totals *From DWR Table 6-9*	1,678	1,750	1,750	1,750	--
Demand totals *From DWR Table 4-3*	1,296	1,345	1,410	1,483	--
Difference	382	405	340	267	--
NOTES: (a) Volumes are in units of MG. (b) Supply and demand include both potable water and recycled water.					

7.1.3.2 Water Service Reliability – Single Dry Year

The reliability of the SFPUC RWS supply is anticipated to vary greatly in different year types. As described above and detailed in Appendix I, MPMW has relied on SFPUC's RWS supply reliability estimates and the drought allocation structure provided by SFPUC and BAWSCA to estimate available RWS supplies in dry year types through 2040. Recycled water supply is expected to be 100% reliable in all year types.

Table 7-5 shows the projected supply and demand totals for the single dry year.

Table 7-5 Single Dry Year Supply and Demand Comparison (DWR Table 7-3)

	2025	2030	2035	2040	2045*(opt)*
Supply totals	877	978	1,018	1,062	--
Demand totals	1,296	1,345	1,410	1,483	--
Difference	(419)	(367)	(392)	(422)	--
NOTES: (a) Volumes are in units of MG. (b) Supply and demand include both potable water and recycled water.					

7.1.3.3 Water Service Reliability – Five Consecutive Dry Years

Based on the supply reliability estimates and allocation structure provided by SFPUC and BAWSCA and the assumed 100% reliability for recycled water supply, Table 7-6 shows the projected supply and demand totals for multiple dry year periods extending five years.

Table 7-6 Multiple Dry Years Supply and Demand Comparison (DWR Table 7-4)

		2025	2030	2035	2040	2045*(opt)*
First year	Supply totals	877	978	1,018	1,062	--
	Demand totals	1,296	1,345	1,410	1,483	--
	Difference	(419)	(367)	(392)	(422)	--
Second year	Supply totals	760	854	887	927	--
	Demand totals	1,296	1,345	1,410	1,483	--
	Difference	(536)	(491)	(523)	(557)	--
Third year	Supply totals	760	854	887	927	--
	Demand totals	1,296	1,345	1,410	1,483	--
	Difference	(536)	(491)	(523)	(557)	--
Fourth year	Supply totals	760	854	887	832	--
	Demand totals	1,296	1,345	1,410	1,483	--
	Difference	(536)	(491)	(523)	(652)	--
Fifth year	Supply totals	760	854	824	832	--
	Demand totals	1,296	1,345	1,410	1,483	--
	Difference	(536)	(491)	(585)	(652)	--

NOTES:
(a) Volumes are in units of MG.
(b) Supply and demand include both potable water and recycled water.

7.1.3.4 Uncertainties in Dry Year Water Supply Projections

As shown in the above tables, significant water supply shortfalls are currently projected in future single and multiple dry years, directly because of the Bay-Delta Plan Amendment implementation. However, numerous uncertainties remain in the implementation of the Bay-Delta Plan Amendment. The water supply projections presented above likely represent a worst-case scenario in which the Bay-Delta Plan Amendment is implemented without the SFPUC and the State Water Resources Control Board (SWRCB) reaching a Voluntary Agreement and do not account for implementation of SFPUC's Alternative Water Supply Program (AWSP), described in more detail below. Under this supply scenario, SFPUC appears not to be able to meet its contractual obligations (i.e., Level of Service goals) and MPMW's forecasted demands during droughts.

As discussed in Section 7.1.2.1, SFPUC also provided water supply reliability projections without the Bay-Delta Plan Amendment (see Appendix I), which likely represents a highly optimistic water supply reliability outcome. These projections indicated that without the Bay-Delta Plan Amendment SFPUC would be able to supply 100% of projected RWS demands in all year types through 2045, except for the 4th and 5th consecutive dry year in 2045, during which 90% of projected RWS demands (85% of the Wholesale demands) would be met. The large disparity in projected water supply reliability between these two scenarios demonstrate the current level uncertainty.

In addition to these two UWMP scenarios, in a March 26, 2021 Special Commission Meeting, SFPUC staff presented HHLSM modeling results for 10 different scenarios, including scenarios with the

implementation of the Tuolumne River Voluntary Agreement (TRVA), with the implementation of the Bay-Delta Plan Amendment and the AWSP, and with the use of a modified rationing policy and a modified design drought (Appendix J). Results for the scenarios with the TRVA and with the AWSP (particularly with a modified rationing policy and design drought) showed significantly improved RWS supply availability compared to the Bay-Delta Plan Amendment scenario shown herein.

The current sources of uncertainty in the dry year water supply projections are summarized below:

- *Implementation of the Bay-Delta Plan Amendment is under negotiation.* The SFPUC is continuing negotiations with the SWRCB on implementation of the Bay-Delta Plan Amendment for water supply cutbacks, particularly during droughts. The SFPUC, in partnership with other key stakeholders, has proposed a voluntary substitute agreement to the Bay-Delta Plan Amendment, the TRVA, that provides a collaborative approach to protect the environment and plan for a reliable and high-quality future potable water supply. This is a dynamic situation and the projected drought cutback allocations may need to be revised before the next (i.e., 2025) UWMP depending on the outcome of ongoing negotiations.
- *Benefits of the AWSP are not accounted for in current supply projections.* As discussed in Section 7.1.3.5 and Appendix I, SFPUC is exploring options to increase its supplies through the AWSP. Implementation of feasible projects developed under the AWSP is not yet reflected in the supply reliability scenarios presented herein and is anticipated to reduce the projected RWS supply shortfalls (Appendix J).
- *SFPUC is considering modifications to its design drought methodology and rationing policy.* Shortening the 8.5-year design drought or modifying the rationing policy to increase rationing in the early years of a drought are anticipated to reduce projected RWS supply shortfalls (Appendix J). On 7 June 2021, MPMW sent a letter to the SFPUC requesting the inclusion of a reduced duration drought scenario, if and when SFPUC's current climate change study merits doing so, as in appendix to SFPUC 2020 UWMP (Appendix H).
- *Methodology for Tier One and Tier Two Wholesale drought allocations have not been established for wholesale shortages greater than 20%.* As discussed in Section 7.1.1.1, the current Tier One and Tier Two Plans are not designed for RWS supply shortages of greater than 20%. For UWMP planning purposes per BAWSCA guidance, the Tier One Wholesale share for a 16% to 20% supply reduction (62.5%) has been applied for reductions greater than 20% and an equal percent reduction has been applied across all Wholesale agencies. BAWSCA member agencies have not formally agreed to adopt this shortage allocation methodology and are in discussions about jointly developing an alternative allocation method that would consider additional equity factors if SFPUC is unable to deliver its contractual supply volume and cutbacks to the RWS supply exceed 20%.
- *RWS demands are subject to change.* The RWS supply availability is dependent upon the system demands. As discussed in Section 7.1.2, the supply scenarios are based on the total projected Wholesale Customer purchases provided by BAWSCA to SFPUC in January 2021. Many BASCWA agencies have refined their projected demands during the UWMP process after these estimates were provided to SFPUC. Furthermore, the RWS demand projections are subject to change in the future based upon future housing needs, increased conservation, and development of additional local supplies.

- *Frequency and duration of cutbacks are also uncertain.* While the projected shortfalls presented in the UWMP appear severe, the actual frequency and duration of such shortfalls are uncertain. Based on the HHLSM simulations provided by BAWSCA for the with Bay-Delta Plan Amendment scenario (Appendix I), rationing is anticipated to be required 20% of years for base year 2025 through 2035, 23% of all years for base year 2040, and 25% of years for base year 2045. In addition to the supply volumes, the above listed uncertainties would also impact the projected frequency and duration of shortfalls.

As such, in addition to evaluating local options to increase supply reliability, MPMW has placed high priority on working with BAWSCA and SFPUC in the upcoming years to better refine the estimates of RWS supply reliability and may amend this UWMP when new information becomes available.

The above uncertainties notwithstanding, BAWSCA's current drought allocation cutbacks will require MPMW to apply its Water Shortage Contingency Plan (WSCP) Stage 5, for water use restrictions up to 50% (see Appendix K) and will affect MPMW's short- and long-term water management decisions. As described further below (Section 7.1.3.5), MPMW is working independently and with the other BAWSCA agencies to identify regional mitigation measures to improve reliability for regional and local water supplies and meet its customers' water needs. If conditions for large drought cutbacks to the RWS persist, MPMW will need to implement additional demand management practices to invoke strict restrictions on potable water use and accelerate efforts to develop alternative supplies of water.

MPMW recommends that users of its 2020 UWMP contact MPMW staff for potential updates about its water supply reliability before using the 2020 UWMP drought cutback projections for their planning projects and referencing the drought.

7.1.3.5 Strategies and Actions to Address Dry Year Supply Shortfalls

Although there remains significant uncertainty in future supply availability, as discussed above, MPMW, SFPUC, and BAWSCA have developed strategies and actions to address the projected dry year supply shortfalls. These efforts are discussed in the following sections.

SFPUC and Other Regional Strategies and Actions

Dry Year Water Supply Projects

The WSIP authorized the SFPUC to undertake a number of water supply projects to meet dry-year demands with no greater than 20% system-wide rationing in any one year. Implementation of these projects is also expected to mitigate impacts of the implementation of the Bay-Delta Plan Amendment. Those projects include the following:

- *Calaveras Dam Replacement Project*. Calaveras Dam is located near a seismically active fault zone and was determined to be seismically vulnerable. To address this vulnerability, the SFPUC constructed a new dam of equal height downstream of the existing dam. Construction on the project occurred between 2011 and July 2019. The SFPUC began impounding water behind the new dam in accordance with California Division of Safety of Dams (DSOD) guidance in the winter of 2018/2019.
- *Alameda Creek Recapture Project*. As a part of the regulatory requirements for future operations of Calaveras Reservoir, the SFPUC must implement bypass

and instream flow schedules for Alameda Creek. The Alameda Creek Recapture Project will recapture a portion of the water system yield lost due to the instream flow releases at Calaveras Reservoir or bypassed around the Alameda Creek Diversion Dam and return this yield to the RWS through facilities in the Sunol Valley. Water that naturally infiltrates from Alameda Creek will be recaptured into an existing quarry pond known as SMP (Surface Mining Permit)-24 Pond F2. The project will be designed to allow the recaptured water to be pumped to the Sunol Valley Water Treatment Plant or to San Antonio Reservoir. Construction of this project will occur from spring 2021 to fall 2022.

- *Lower Crystal Springs Dam Improvements*. The Lower Crystal Springs Dam (LCSD) Improvements were substantially completed in November 2011. The joint San Mateo County/SFPUC Bridge Replacement Project to replace the bridge across the dam was completed in January 2019. A WSIP follow up project to modify the LCSD Stilling Basin for fish habitat and upgrade the fish water release and other valves started in April 2019. While the main improvements to the dam have been completed, environmental permitting issues for reservoir operation remain significant. While the reservoir elevation was lowered due to DSOD restrictions, the habitat for the Fountain Thistle, an endangered plant, followed the lowered reservoir elevation. Raising the reservoir elevation now requires that new plant populations be restored incrementally before the reservoir elevation is raised. The result is that it may be several years before pre-project water storage volumes can be restored.
- *Regional Groundwater Storage and Recovery Project*. The Groundwater Storage and Recovery Project (GSRP) is a strategic partnership between SFPUC and three San Mateo County agencies – Cal Water, the City of Daly City, and the City of San Bruno – to conjunctively operate the south Westside Groundwater Basin. The project sustainably manages groundwater and surface water resources in a way that provides supplies during times of drought. During years of normal or heavy rainfall, the project would provide additional surface water to the partner agencies in San Mateo County in lieu of groundwater pumping. Over time, reduced pumping creates water storage through natural recharge of up to 20 billion gallons of new water supply available during dry years.

  The project's Final Environmental Impact Report was certified in August 2014, and the project also received Commission approval that month. Phase 1 of this project consists of construction of thirteen well sites and is over 99 percent complete. Phase 2 of this project consists of completing construction of the well station at the South San Francisco Main site and some carryover work that has not been completed from Phase 1. Phase 2 design work began in December 2019.
- *2 MGD Dry-year Water Transfer*. In 2012, the dry-year transfer was proposed between the Modesto Irrigation District and the SFPUC. Negotiations were terminated because an agreement could not be reached. Subsequently, the SFPUC had discussions with the Oakdale Irrigation District for a one-year transfer agreement with the SFPUC for 2 MGD (2,240 acre-feet). No progress towards agreement on a transfer was made in 2019, but the irrigation districts recognize SFPUC's continued interest and SFPUC will continue to pursue transfers.

> In order to achieve its target of meeting at least 80 percent of its customer demand during droughts with a system demand of 265 MGD, and to mitigate the impacts of the Bay-Delta Plan, the SFPUC must successfully implement the dry-year water supply projects included in the WSIP.
>
> Furthermore, the permitting obligations for the Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements include a combined commitment of 12.8 MGD for instream flows on average. When this is reduced for an assumed Alameda Creek Recapture Project recovery of 9.3 MGD, the net loss of water supply is 3.5 MGD.

Alternative Water Supply Program

As discussed below, BAWSCA has taken steps to ensure that SFPUC develops alternative water supplies:

> With the adoption of the Bay-Delta Plan Phase 1 (Bay-Delta Plan) by the State Water Resources Control Board in December of 2018, coupled with the uncertainties associated with litigation and the development of Voluntary Agreements that, if successful, would provide an alternative to the 40% unimpaired flow requirement that is required by the Bay-Delta Plan, BAWSCA redoubled its efforts to ensure that the SFPUC took necessary action to develop alternative water supplies such that they would be in place to fill any potential gap in supply by implementation of the Bay-Delta Plan and that the SFPUC would be able to meet its legal and contractual obligations to its Wholesale Customers.
>
> In 2019, BAWSCA held numerous meetings with the SFPUC encouraging them to develop a division within their organization whose chief mission was to spearhead alternative water supply development. On June 25, 2019, BAWSCA provided a written and oral statement to the Commissioners urging the SFPUC to focus on developing new sources of supply in a manner similar to how it addressed the implementation of the Water System Improvement Program (WSIP). BAWSCA urged that a new water supply program was called for, with clear objectives, persistent focus, a dedicated team, adequate funding, and a plan for successful execution. The SFPUC Commission supported BAWSCA's recommendation and directed staff to undertake such an approach.
>
> In early 2020, the SFPUC began implementation of the Alternative Water Supply Planning Program (AWSP), a program designed to investigate and plan for new water supplies to address future long-term water supply reliability challenges and vulnerabilities on the RWS.
>
> Included in the AWSP is a suite of diverse, non-traditional supply projects that, to a great degree, leverage regional partnerships and are designed to meet the water supply needs of the SFPUC Retail and Wholesale Customers through 2045. As of the most recent Alternative Water Supply Planning Quarterly Update, SFPUC has budgeted $264 million over the next ten years to fund water supply projects. BAWSCA is heavily engaged with the SFPUC on its AWSP efforts.

SFPUC's AWSP is described in more detail below:

> The SFPUC is increasing and accelerating its efforts to acquire additional water supplies and explore other projects that would increase overall water supply resilience through the AWSP. The drivers for the program include: (1) the adoption of the Bay-Delta Plan Amendment and the resulting potential limitations to RWS supply during dry years,

(2) the net supply shortfall following the implementation of WSIP, (3) San Francisco's perpetual obligation to supply 184 MGD to the Wholesale Customers, (4) adopted LOS Goals to limit rationing to no more than 20 percent system-wide during droughts, and (5) the potential need to identify water supplies that would be required to offer permanent status to interruptible customers. Developing additional supplies through this program would reduce water supply shortfalls and reduce rationing associated with such shortfalls. The planning priorities guiding the framework of the AWSP are as follows:

1. Offset instream flow needs and meet regulatory requirements
2. Meet existing obligations to existing permanent customers
3. Make interruptible customers permanent
4. Meet increased demands of existing and interruptible customers

In conjunction with these planning priorities, the SFPUC considers how the program fits within the LOS Goals and Objectives related to water supply and sustainability when considering new water supply opportunities. The key LOS Goals and Objectives relevant to this effort can be summarized as:

- Meet dry-year delivery needs while limiting rationing to a maximum of 20 percent system-wide reduction in water service during extended droughts;
- Diversify water supply options during non-drought and drought periods;
- Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers;
- Meet, at a minimum, all current and anticipated legal requirements for protection of fish and wildlife habitat;
- Maintain operational flexibility (although this LOS Goal was not intended explicitly for the addition of new supplies, it is applicate here).

Together, the planning priorities and LOS Goals and Objectives provide a lens through which the SFPUC considers water supply options and opportunities to meet all foreseeable water supply needs.

In addition to the Daly City Recycled Water Expansion project[20], which was a potential project identified in the SFPUC's 2015 UWMP and had committed funding at that time, the SFPUC has taken action to fund the study of potential additional water supply projects. Capital projects under consideration to develop additional water supplies include surface water storage expansion, recycled water expansion, water transfers, desalination, and potable reuse. A more detailed list and descriptions of these efforts are provided below.

The capital projects that are under consideration would be costly and are still in the early feasibility or conceptual planning stages. Because these water supply projects

[20] While this potential project was identified in the 2015 UWMP, it has since been approved by Daly City following environmental review and has a higher likelihood of being implemented.

would take 10 to 30 years to implement, and because required environmental permitting negotiations may reduce the amount of water that can be developed, the yield from these projects are not currently incorporated into SFPUC's supply projections. State and federal grants and other financing opportunities would be pursued for eligible projects, to the extent feasible, to offset costs borne by ratepayers.

- *Daly City Recycled Water Expansion (Regional, Normal- and Dry-Year Supply)*. This project can produce up to 3 MGD of tertiary recycled water during the irrigation season (~7 months). On an average annual basis, this is equivalent to 1.25 MGD or 1,400 AFY. The project is envisioned to provide recycled water to 13 cemeteries and other smaller irrigation customers, offsetting existing groundwater pumping from the South Westside Groundwater Basin; this will free up groundwater, enhancing the reliability of the Basin. The project is a regional partnership between the SFPUC and Daly City. The irrigation customers are located largely within California Water Service's (Cal Water's) service area. RWS customers will benefit from the increased reliability of the South Westside Basin for additional drinking water supply during droughts. In this way, this project supports the GSR Project, which is under construction.
- *ACWD-USD Purified Water Partnership (Regional, Normal- and Dry-Year Supply)*. This project could provide a new purified water supply utilizing Union Sanitary District's (USD) treated wastewater. Purified water produced by advanced water treatment at USD could be transmitted to the Quarry Lakes Groundwater Recharge Area to supplement recharge into the Niles Cone Groundwater Basin or put to other uses in Alameda County Water District's (ACWD) service area. With the additional water supply to ACWD, an in-lieu exchange with the SFPUC would result in more water left in the RWS. Additional water supply could also be directly transmitted to the SFPUC through a new intertie between ACWD and the SFPUC.
- *Crystal Springs Purified Water (Regional, Normal- and Dry-Year Supply)*. The Crystal Springs Purified Water (PREP) Project is a purified water project that could provide 6-12 MGD of water supply through reservoir water augmentation at Crystal Springs Reservoir, which is a facility of the RWS. Treated wastewater from Silicon Valley Clean Water (SVCW) and/or the City of San Mateo would go through an advanced water treatment plant to produce purified water that meets state and federal drinking water quality standards. The purified water would then be transmitted 10 to 20 miles (depending on the alignment) to Crystal Springs Reservoir, blended with regional surface water supplies and treated again at Harry Tracy Water Treatment Plant. Project partners include the SFPUC, Bay Area Water Supply and Conservation Agency (BAWSCA), SVCW, CalWater, Redwood City, Foster City, and the City of San Mateo. Partner agencies are contributing financial and staff resources towards the work effort.
- *Los Vaqueros Reservoir Expansion (Regional, Dry Year Supply)*. The Los Vaqueros Reservoir Expansion (LVE) Project is a storage project that will enlarge the existing reservoir located in northeastern Contra Costa County from 160,000 acre-feet to 275,000 acre-feet. While the existing reservoir is owned and operated by the Contra Costa Water District (CCWD), the expansion will have regional benefits and will be managed by a Joint Powers Authority (JPA) that will be set up prior to construction. Meanwhile, CCWD is leading the planning, design and environmental review efforts. CCWD's Board certified the

EIS/EIR and approved the LVE Project on May 13, 2020. The additional storage capacity from the LVE Project would provide a dry year water supply benefit to the SFPUC. BAWSCA is working in concert with the SFPUC to support their work effort on the LVE project.

  - Conveyance Alternatives: The SFPUC is considering two main pathways to move water from storage in a prospective LVE Project to the SFPUC's service area, either directly to RWS facilities or indirectly via an exchange with partner agencies. The SFPUC is evaluating potential alignments for conveyance.
  - Bay Area Regional Reliability Shared Water Access Program (BARR SWAP): As part of the BARR Partnership, a consortium of 8 Bay Area water utilities (including ACWD, BAWSCA, CCWD, EBMUD, Marin Municipal Water District (MMWD), SFPUC, Valley Water, and Zone 7 Water Agency) are exploring opportunities to move water across the region as efficiently as possible, particularly during times of drought and emergencies. The BARR agencies are proposing two separate pilot projects in 2020-2021 through the Shared Water Access Program (SWAP) to test conveyance pathways and identify potential hurdles to better prepare for sharing water during a future drought or emergency. A strategy report identifying opportunities and considerations will accompany these pilot transfers and will be completed in 2021.

- *Bay Area Brackish Water Desalination (Regional, Normal- and Dry-Year Supply)*. The Bay Area Brackish Water Desalination (Regional Desalination) Project is a partnership between CCWD, the SFPUC, Valley Water, and Zone 7 Water Agency. The East Bay Municipal Utilities District (EBMUD) and ACWD may also participate in the project. The project could provide a new drinking water supply to the region by treating brackish water from CCWD's existing Mallard Slough intake in Contra Costa County. While this project has independent utility as a water supply project, for the current planning effort the SFPUC is considering it as a source of supply for storage in LVE. While the allocations remain to be determined among partners, the SFPUC is considering a water supply benefit of between 5 and 15 MGD during drought conditions when combined with storage at LVE.
- *Calaveras Reservoir Expansion (Regional, Dry Year Supply)*. Calaveras Reservoir would be expanded to create 289,000 acre-feet (AF) additional capacity to store excess Regional Water System supplies or other source water in wet and normal years. In addition to reservoir enlargement, the project would involve infrastructure to pump water to the reservoir, such as pump stations and transmission facilities.
- *Groundwater Banking*. Groundwater banking in the Modesto Irrigation District (MID) and Turlock Irrigation District (TID) service areas could be used to provide some additional water supply to meet instream releases in dry years reducing water supply impacts to the SFPUC service area. For example, additional surface water could be provided to irrigators in wet years, which would offset the use of groundwater, thereby allowing the groundwater to remain in the basin rather than be consumptively used. The groundwater that remains in the basin can then be used in a subsequent dry year for irrigation,

freeing up surface water that would have otherwise been delivered to irrigators to meet instream flow requirements.

A feasibility study of this option is included in the proposed Tuolumne River Voluntary Agreement. Progress on this potential water supply option will depend on the negotiations of the Voluntary Agreement.

- *Inter-Basin Collaborations*. Inter-Basin Collaborations could provide net water supply benefits in dry years by sharing responsibility for in-stream flows in the San Joaquin River and Delta more broadly among several tributary reservoir systems. One mechanism by which this could be accomplished would be to establish a partnership between interests on the Tuolumne River and those on the Stanislaus River, which would allow responsibility for streamflow to be assigned variably based on the annual hydrology.

  As is the case with Groundwater Banking, feasibility of this option is included in the proposed Tuolumne River Voluntary Agreement.

If all the projects identified through the current planning process can be implemented, there would still be a supply shortfall to meet projected needs. Furthermore, each of the supply options being considered has its own inherent challenges and uncertainties that may affect the SFPUC's ability to implement it.

Given the limited availability of water supply alternatives - unless the supply risks are significantly reduced or our needs change significantly - the SFPUC will continue to plan, develop and implement all project opportunities that can help bridge the anticipated water supply gaps during droughts. In 2019, the SFPUC completed a survey among water and wastewater agencies within the service area to identify additional opportunities for purified water. Such opportunities remain limited, but the SFPUC continues to pursue all possibilities.

BAWSCA's Long Term Reliability Water Supply Strategy

BAWSCA's Long-Term Reliable Water Supply Strategy (Strategy), completed in February 2015, quantified the water supply reliability needs of the BAWSCA member agencies through 2040, identified the water supply management projects and/or programs (projects) that could be developed to meet those needs, and prepared an implementation plan for the Strategy's recommendations.

When the 2015 Demand Study concluded it was determined that while there is no longer a regional normal year supply shortfall, there was a regional drought year supply shortfall of up to 43 MGD. In addition, key findings from the Strategy's project evaluation analysis included:

- Water transfers represent a high priority element of the Strategy.
- Desalination potentially provides substantial yield, but its high effective costs and intensive permitting requirements make it a less attractive drought year supply alternative.
- Other potential regional projects provide tangible, though limited, benefit in reducing dry-year shortfalls given the small average yields in drought years.

Since 2015, BAWSCA has completed a comprehensive update of demand projections and engaged in significant efforts to improve regional reliability and reduce the dry-year water supply shortfall.

- *Water Transfers*. BAWSCA successfully facilitated two transfers of portions of Individual Supply Guarantee (ISG) between BAWSCA agencies in 2017 and 2018. Such transfers benefit all BAWSCA agencies by maximizing use of existing supplies. BAWSCA is currently working on an amendment to the Water Supply Agreement between the SFPUC and BAWSCA agencies to establish a mechanism by which member agencies that have an ISG may participate in expedited transfers of a portion of ISG and a portion of a Minimum Annual Purchase Requirement. In 2019, BAWSCA participated in a pilot water transfer that, while ultimately unsuccessful, surfaced important lessons learned and produced interagency agreements that will serve as a foundation for future transfers. BAWSCA is currently engaged in the Bay Area Regional Reliability Partnership (BARR)[21], a partnership among eight Bay Area water utilities (including the SFPUC, Alameda County Water District, BAWSCA, Contra Costa Water District, Santa Clara Valley Water District) to identify opportunities to move water across the region as efficiently as possible, particularly during times of drought and emergencies.
- *Regional Projects*. Since 2015, BAWSCA has coordinated with local and State agencies on regional projects with potential dry-year water supply benefits for BAWSCA's agencies. These efforts include storage projects, indirect/direct water reuse projects, and studies to evaluate the capacity and potential for various conveyance systems to bring new supplies to the region.

BAWSCA continues to implement the Strategy recommendations in coordination with BAWSCA member agencies. Strategy implementation will be adaptively managed to account for changing conditions and to ensure that the goals of the Strategy are met in an efficient and cost-effective manner. On an annual basis, BAWSCA will reevaluate Strategy recommendations and results in conjunction with development of the BAWSCA's FY 2021-22 Work Plan. In this way, actions can be modified to accommodate changing conditions and new developments.

MPMW Strategies and Actions

In addition to the management tools and options discussed below, MPMW has been involved directly and through BAWSCA to advocate for an alternative to the Bay-Delta Plan Amendment, including submitting letters and testimony (see Appendix H) that identify, among other things, the significant impact to local water supply reliability.

Further, as part of this UWMP process, MPMW submitted letters to both BAWSCA and SFPUC (see Appendix H) enumerating concerns regarding the fact that the SFPUC RWS supply allocations do not meet the Level of Service Goals included in the WSA (see Section 7.1.1.1) and, therefore, SFPUC is not meeting its contractual obligations to the Wholesale Customers.

MPMW's letter to BAWSCA further states that while it is applying BAWSCA's revised Tier Two allocation methodology for RWS shortages greater than 20% for preliminary planning purposes, MPMW is not

[21] https://www.bayareareliability.com/

agreeing to, or adopting, the revised Tier Two methodology. Among other issues, MPMW notes that the revised Tier Two methodology does not take minimum health and safety standards into account.

As described in Sections 6 and 9, MPMW is committed to improving its supply reliability, including development of recycled water and groundwater supply sources and continued commitment to its water conservation program.

7.2 Drought Risk Assessment

☑ ***CWC § 10635(b)***

Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following:

(1) A description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted.

(2) A determination of the reliability of each source of supply under a variety of water shortage conditions. This may include a determination that a particular source of water supply is fully reliable under most, if not all, conditions.

(3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.

(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.

In addition to the long-term water service reliability assessment presented above, the DRA evaluates MPMW's supply risks under a severe drought period lasting for the next five consecutive years after the assessment is completed, i.e., from 2021 through 2025. The DRA is intended to inform the demand management measures and water supply projects and programs to be included in the UWMP (see Chapters 8 and 9). Suppliers may conduct an interim update or updates to this DRA within the five-year cycle of its UWMP update, i.e., before the 2025 UWMP.

7.2.1 Data, Methods, and Basis for Water Shortage Condition

As a first step to the DRA, MPMW has estimated unconstrained water demand for the next five years (2021-2025). Unconstrained water demand is the expected water use in the absence of drought water use restrictions. The characteristic five-year water demand is described in Section 4.2.6 and is from the Decision Support System (DSS) Water Demand and Conservation Model.

The available potable water supplies assumed in the DRA are based upon the same methodology and assumptions used for the long-term water service reliability assessment (Section 7.1) and relies on information provided by SFPUC and BAWSCA (Appendix G and Appendix I). The available RWS water supplies are estimated based on the following assumptions: (1) The RWS demands are held constant at

132.1 MGD (i.e., 2020 demand levels), (2) implementation of the Bay-Delta Plan Amendment occurs in 2023, and (3) the 2020 infrastructure conditions are maintained (see Table 1 of the January 22, 2021 SFPUC letter in Appendix I). Details of how MPMW's available supplies are then estimated as part of the DRA are provided below.

7.2.2 DRA Individual Water Source Reliability

As described in Chapter 6, MPMW relies on imported surface water supply purchased from the SFPUC RWS for potable uses and utilizes recycled water for non-potable uses.

MPMW's available potable water supplies during the five-consecutive-year drought are based upon information provided by SFPUC and BAWSCA included in Appendix I, as indicated in Section 7.2.1. Specifically, based on the modeling results presented in the 30 March 2021 SFPUC letter, BAWSCA provided percent reductions in RWS supply for 2021 to 2025 in Table E of the 1 April 2021 BAWSCA updated drought allocation memorandum, which are reproduced for MPMW in Table 7-7 below.

Prior to the assumed implementation of the Bay-Delta Plan Amendment in 2023, sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests during the first two consecutive dry years (i.e., 2021 and 2022). Shortages are projected to begin in 2023 with the implementation of the Bay-Delta Plan Amendment. In the event of a shortage, the current Tier 2 Drought Allocation Plan (Section 7.1.1.1) specifies that each agencies' Allocation Factor would be calculated once at the onset of a shortage based on the previous year's use and remain the same until the shortage condition is over. Therefore, for the purpose of drought allocations for the DRA, the available RWS supply is assumed to remain static in 2023-2025 and is calculated based on MPMW's projected potable demands in 2022 and the percent reductions provided by BAWSCA, as shown in Table 7-7.[22]

[22] BAWSCA also provided drought allocation volumes for each agency, as mentioned in Section 7.1.2. However, MPMW's 2021-2025 demands that were used for the calculations were outdated. Therefore, the DRA performed here used percent cutbacks provided by BAWSCA and re-calculated the supply volumes based on corrected 2021-2025 demands.

Table 7-7 MPMW Supply Availability During Multiple Dry Years for Base Year 2020

Year	2021	2022	2023	2024	2025
Potable Supply (c)					
Allocation Basis (d)	*1,047*	*1,095*	*1,095*	*1,095*	*1,095*
Percent Cutback (e)	*0%*	*0%*	*47%*	*47%*	*47%*
Total Potable Supply	1,047	1,095	580	580	580
Recycled Water Supply	48	48	48	48	48
Total Supplies	**1,095**	**1,143**	**628**	**628**	**628**

NOTES:
(a) Volumes are in units of MG.
(b) Five consecutive year drought assumed to start in 2021.
(c) Scenario reflects implementation of the Bay-Delta Plan Amendment in 2023. Sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests during the first two consecutive dry years, prior to implementation of the Bay-Delta Plan Amendment. System-wide shortages are projected to start in 2023. Wholesale RWS demand is assumed to be static for the remainder of the drought sequence per the Water Supply Agreement. As such, the percent cutbacks in 2023 to 2025 are applied to 2022 demand to calculate each year's projected supply.
(d) MPMW's potable water demand projected for years 2021 and 2022.
(e) Source: Table E from the BAWSCA drought allocation tables dated April 1, 2021.

MPMW considers recycled water to be a reliable and stable water supply source and its recycled water supply is estimated to be available during all hydrologic years at a volume that meets its projected recycled water demands (see Chapters 4 and 6).

As shown in Table 7-7, prior to the assumed implementation of the Bay-Delta Plan Amendment in 2023, sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests during the first two consecutive years (i.e., 2021 and 2022).

Shortages are projected to begin in 2023 with the implementation of the Bay-Delta Plan Amendment. In the event of a shortage, the current Tier 2 Drought Allocation Plan (Section 7.1.1.1) specifies that each agencies' Allocation Factor would be calculated once at the onset of a shortage based on the previous year's use and remain the same until the shortage condition is over. Therefore, for the purpose of drought allocations for the DRA, the available RWS supply is assumed to remain static in 2023-2025 as shown in Table 7-7.

7.2.3 Management Tools and Options

☑ ***CWC § 10620 (f)***

An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

At a regional level, MPMW maintains active involvement in the work that SFPUC and BAWSCA are doing with respect to optimizing the use of regional water supplies and pursuing additional supplies. These efforts are detailed above in Section 7.1.3.5.

In addition to supporting SFPUC and BAWSCA, MPMW has been working with West Bay Sanitary District (WBSD) to develop recycled water supplies. If additional recycled water is made available, the potable water demands will be less than the current projections and therefore the resultant supply shortage will likely to be smaller.

MPMW has also been implementing, and plans to continue to implement, the demand management measures described in Section 9. Further, in response to the anticipated future dry-year shortfalls, MPMW has developed a robust WSCP that systematically identifies ways in which MPMW can reduce water demands. The WSCP is included in Appendix K.

MPMW has also been exploring groundwater resources as a supplemental supply. As part of the WSCP, MPMW plans to operate its emergency groundwater well as a supplemental supply during significant water shortages during a water supply emergency or drought conditions. An additional one or two emergency wells are being considered as part of the Emergency Water Storage/Supply Project.

7.2.4 Drought Risk Assessment Total Water Supply and Use Comparison

Table 7-8 provides a comparison of the water supply sources available to MPMW with the total projected water use for an assumed drought period from 2021 through 2025. MPMW is expected to experience significant shortfalls in years 2023-2025 of the DRA with unconstrained demands because of the assumed implementation of the Bay-Delta Plan Amendment in 2023.

MPMW has developed a WSCP (Appendix K) to address water shortage conditions resulting from any cause (e.g., droughts, impacted distribution system infrastructure, regulatory-imposed shortage restrictions, etc.). The WSCP identifies a variety of actions that MPMW will implement to reduce demands and further ensure supply reliability at various levels of water shortage. MPMW intends to implement its WSCP to reduce water use and address the projected supply shortfalls.

Given the current uncertainty discussed in Section 7.1.3.4, MPMW could update its DRA prior to the 2025 UWMP update if significant new information becomes available. CWC §10635(b) permits urban water suppliers to conduct an interim update or updates to their DRA within the five-year cycle of its UWMP update. MPMW anticipates that by the 2025 UWMP update, SFPUC will provide more specific information about the AWSP, with estimated water supply contributions from such projects. Additionally, MPMW expects that SFPUC will provide more specific information and a refined estimate of the Bay-Delta Plan Amendment impacts to the SFPUC supply. MPMW will also have more information regarding the available uses of recycled water by the 2025 UWMP update. Further, it is anticipated that the Wholesale Customers will negotiate a revised Tier 2 allocation formula that could affect each agency's share of available supplies in drought years relative to what has been presented herein.

MPMW recommends that users of its 2020 UWMP contact MPMW staff for potential updates to the DRA presented in the 2020 UWMP for their planning projects.

Table 7-8 Five-Year Drought Risk Assessment Tables to Address Water Code 10635(b) (DWR Table 7-5)

2021	Total
Total Water Use	1,095
Total Supplies	1,095
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	--
WSCP - use reduction savings benefit	--
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%

2022	Total
Total Water Use	1,143
Total Supplies	1,143
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	--
WSCP - use reduction savings benefit	--
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%

2023	Total
Total Water Use	1,192
Total Supplies	628
Surplus/Shortfall w/o WSCP Action	(564)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	564
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	47%

Table 7-8 Five-Year Drought Risk Assessment Tables to Address Water Code 10635(b) (DWR Table 7-5)

2024	Total
Total Water Use	1,243
Total Supplies	628
Surplus/Shortfall w/o WSCP Action	(615)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	615
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	49%

2025	Total
Total Water Use	1,296
Total Supplies	628
Surplus/Shortfall w/o WSCP Action	(668)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	668
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	52%

NOTES:
(a) Volumes are in units of MG.
(b) Supply and demand include both potable water and recycled water.

8 WATER SHORTAGE CONTINGENCY PLAN

Menlo Park Municipal Water's (MPMW's) Water Shortage Contingency Plan (WSCP) is included as Appendix K. The WSCP serves as a standalone document to be engaged in the case of a water shortage event, such as a drought or supply interruption, and defines specific policies and actions that will be implemented at various shortage level scenarios. The primary objective of the WSCP is to ensure that MPMW has in place the necessary resources and management responses needed to protect health and human safety, minimize economic disruption, and preserve environmental and community assets during water supply shortages and interruptions. Consistent with California Water Code (CWC) §10632, the WSCP includes six levels to address shortage conditions ranging from up to 10% to greater than 50% shortage, identifies a suite of demand mitigation measures for MPMW to implement at each level, and identifies procedures for MPMW to annually assess whether or not a water shortage is likely to occur in the coming year, among other things.

A summary of the key elements of the WSCP including water shortage levels and demand-reduction actions is shown in Table 8-1, Table 8-2, and Table 8-3. Additional details are provided in Appendix K.

Table 8-1 Water Shortage Contingency Plan Levels (DWR Table 8-1)

Shortage Level	Percent Shortage Range	Shortage Response Actions
No-Drought	N/A	• Includes water waste prohibitions effective at all times.
1	Up to 10%	• Declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use of up to 10% due to water supply shortages or an emergency. • Includes implementation of mandatory restrictions on end uses (see Table 8-2) as well as agency actions (see Table 8-3).
2	Up to 20%	• Declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use from 10% to 20% due to water supply shortages or emergency. • Includes implementation of mandatory restrictions on end uses (see Table 8-2) as well as agency actions (see Table 8-3).
3	Up to 30%	• Declaration by the City Council upon the determination that the SFPUC or another governing

Shortage Level	Percent Shortage Range	Shortage Response Actions
		authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use from 20% to 30% due to water supply shortages or emergency. • Includes implementation of mandatory restrictions on end uses (see Table 8-2) as well as agency actions (see Table 8-3).
4	Up to 40%	• Declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use from 30% to 40% due to water supply shortages or emergency. • Includes implementation of mandatory restrictions on end uses (see Table 8-2) as well as agency actions (see Table 8-3).
5	Up to 50%	• Declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use from 40% to 50% due to water supply shortages or emergency. • Includes implementation of mandatory restrictions on end uses and water use budgets for customers (see Table 8-2), as well as agency actions and groundwater supply augmentation (see Table 8-3).
6	>50%	• Declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use greater than 50% due to water supply shortages or emergency. • Includes implementation of mandatory restrictions on end uses and water use budgets for customers (see Table 8-2), as well as agency actions and groundwater supply augmentation (see Table 8-3).

Table 8-2 Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
No Drought	Other	--	1. Hoses must be equipped with a shut-off valve for washing vehicles, sidewalks, walkways, or buildings. 2. Ornamental fountains shall use only re-circulated or recycled water. 3. Potable water shall not be applied in any manner to any driveway, sidewalk, or other hard surface except when necessary to address immediate health or safety concerns. 4. Potable water shall not be used to water outdoor landscapes in a manner that causes more than incidental runoff onto non-irrigated areas, walkways, roadways, parking lots, or other hard surfaces. 5. Potable water cannot be applied to outdoor landscapes during and up to 48 hours after measurable rainfall. 6. Potable water shall not be used to irrigate ornamental turf on public street medians. 7. Hotels and motels shall provide guests an option whether to launder towels and linens daily. Hotels and motels shall prominently display notice of this option in each bathroom using clear and easily understood language. 8. Restaurants and other food service operations shall serve water to customers only upon request during a period for which the Governor has issued a proclamation of a state of emergency. 9. Broken or defective plumbing and irrigation systems must be repaired or replaced within a reasonable period. 10. Recreational water features shall be covered when not in use. 11. Single-pass cooling systems on new construction shall not be allowed. 12. Other measures as may be approved by the State Water Resources Control Board or City Council Resolution.	Yes

Table 8-2 Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
1	Other	5%	1. Continue with "no drought" restrictions and prohibitions except where superseded by more stringent requirements. 2. Newly constructed homes and buildings must irrigate with drip or microspray only. 3. Other measures as may be approved by City Council Resolution.	Yes
2	Other	15%	1. Continue with Stage 1 restrictions and prohibitions except where superseded by more stringent requirements. 2. Irrigating outdoor ornamental landscapes or turf with potable water is limited to no more than two (2) days per week on a schedule established by the Director and posted on the City's website, except for hand watering. Water customers may be granted an exception upon review and approval of a Drought Response Plan by the Public Works Director pursuant to such policies and procedures as may be established by the Public Works Director provided that such plan results in an equivalent or greater reduction in water use. 3. Hand watering must be with a continuously monitored hose fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored. 4. Other measures as may be approved by City Council Resolution.	Yes
3	Other	25%	1. Continue with Stage 2 restrictions and prohibitions except where superseded by more stringent requirements. 2. Permits for construction of new pools shall include a requirement that MPMW water shall not be used to fill new pools. 3. Vehicles may only be washed at vehicle washing facilities using recycled or recirculating water. 4. Other measures as may be approved by City Council Resolution.	Yes

Table 8-2 Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
4	Other	35%	1. Continue with Stage 3 restrictions and prohibitions except where superseded by more stringent requirements. 2. Irrigating outdoor ornamental landscapes or turf with potable water is limited to no more than one (1) day per week on a schedule established by the Director and posted on the City's website, except for hand watering. Water customers may be granted an exception upon review and approval of a Drought Response Plan by the Public Works Director pursuant to such policies and procedures as may be established by the Public Works Director provided that such plan results in an equivalent or greater reduction in water use. 3. Potable water shall not be used for construction or dust control. 4. Potable water shall not be used for commercial vehicles that provide street washing, sweeping, or cleaning. 5. Other measures as may be approved by City Council Resolution.	Yes
5	Other	45%	1. Continue with Stage 4 restrictions and prohibitions except where superseded by more stringent requirements. 2. Water use shall not exceed water budgets established for each customer. 3. Hand watering outdoor ornamental landscapes is only allowed between designated hours, as determined by the Public Works Director. 4. Turf irrigation is prohibited at all times, including artificial turf. 5. Existing irrigation systems shall not be expanded. 6. Other measures as may be approved by City Council Resolution.	Yes
6	Other	55%	1. Continue with Stage 5 restrictions and prohibitions except where superseded by more stringent requirements. 2. Hand watering outdoor ornamental landscapes is prohibited at all times. 3. Other measures as may be approved by City Council Resolution.	Yes

Table 8-2 Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
NOTES: (a) The percentages listed in this table are the cumulative savings for each shortage level with implementation of corresponding supply augmentation and other agency actions in Table 8-3. Detailed saving estimates based on end use, response action, and implementation rates can be found in Appendix K.				

Table 8-3 Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference
1	Other	5%	1. Initiate public outreach to inform customers that there is a water shortage emergency. 2. Implement Stage 1 drought surcharge.
2	Other	15%	1. Continue with actions and measures from Stage 1. 2. Increase public outreach for added restrictions and prohibitions, and to provide information regarding fines or penalties for non-compliance. 3. Coordinate with BAWSCA, SFPUC, and other Menlo Park water agencies (California Water Service, O'Connor Cooperative Water Tract, East Palo Alto, Palo Alto Park Mutual Water Company). 4. Evaluate if participation in BAWSCA's subscription water conservation programs can be increased. 5. Train City staff and billing contractor customer service representatives how to respond to customer calls, reports and complaints. 6. Evaluate options to capture water during routine flushing of water mains. 7. Implement Stage 2 drought surcharge.
3	Other	25%	1. Continue with actions and measures from Stage 2. 2. Increase public outreach for added restrictions and prohibitions, and to provide information how to report water waste to the City. 3. Increase public outreach to the top 10% water users in each customer category. 4. Coordinate with Police code enforcement to investigate water waste reports. 5. Request cooperation from Menlo Park Fire District to reduce fire training water use. 6. Implement Stage 3 drought surcharge.

Table 8-3 Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference
4	Other	35%	1. Continue with actions and measures from Stage 3. 2. Increase public outreach for added restrictions and prohibitions. 3. Increase public outreach to the top 20% water users in each customer category. 4. Evaluate staff resources. May include hiring temporary staff or training additional City staff to assist with customer service and enforcement. 5. Reevaluate routine flushing of water mains except when necessary to address immediate health or safety concerns. 6. Consider increasing fines for multiple violations. 7. Implement Stage 4 drought surcharge.
5	Other	45%	1. Continue with actions and measures from Stage 4. 2. Increase public outreach for added restrictions and prohibitions. 3. Increase public outreach to the top 30% water users in each customer category. 4. Implement water waste patrols and increase enforcement. 5. Halt installations of new potable water meters (temporary or permanent) or meter upgrades except if a valid, unexpired building permit has been issued for the project; or the project is necessary to protect the public's health, safety, and welfare. 6. Halt issuing statements of immediate ability to serve or provide potable water service. 7. Consider increasing fines for multiple violations. 8. Develop water budgets for all accounts. 9. Use emergency groundwater well(s). 10. Implement Stage 5 drought surcharge.

Table 8-3 Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference
6	Other	55%	1. Continue with actions and measures from Stage 5. 2. Increase public outreach for added restrictions and prohibitions. 3. Increase public outreach to the top 40% water users in each customer category. 4. Halt installations of new potable water meters (temporary or permanent) even if a valid, unexpired building permit has been issued for the project. 5. Consider increasing fines for multiple violations. 6. Increase water budget reduction requirements. 7. Implement other short-term emergency actions from the Emergency Response Plan. 8. Implement Stage 6 drought surcharge.
NOTES: (a) The percentages listed in this table are the cumulative savings for each shortage level with implementation of corresponding demand reduction actions in Table 8-2. Detailed saving estimates based on end use, response action, and implementation rates can be found in Appendix K.			

9 DEMAND MANAGEMENT MEASURES

☑ ***CWC § 10631 (e)***

Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:

(i) Water waste prevention ordinances.

(ii) Metering.

(iii) Conservation pricing.

(iv) Public education and outreach.

(v) Programs to assess and manage distribution system real loss.

(vi) Water conservation program coordination and staffing support.

(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.

This section provides an overview of Menlo Park Municipal Water's (MPMW's) current and planned demand management measures (DMMs), which include specific types and groupings of water conservation measures typically implemented by water suppliers; the DMMs are closely aligned with the California Urban Water Conservation Council (CUWCC) Best Management Practices. MPMW administers several of its DMMs through participation in Bay Area Water Supply and Conservation Agency's (BAWSCA's) Regional Water Conservation Program. The following sections describe BAWSCA's Regional Water Conservation Program and the nature and extent of the specific DMMs implemented by MPMW.

9.1 Regional Water Conservation

MPMW participates in BAWSCA's Regional Water Conservation Program, as a part of its overall water conservation program.

> BAWSCA manages a Regional Water Conservation Program comprised of several programs and initiatives that support and augment member agencies' and customers' efforts to use water more efficiently. These efforts extend limited water supplies that are available to meet both current and future water needs; increase drought reliability of the existing water system; and save money for both the member agencies and their customers.

> The implementation of the Regional Water Conservation Program builds upon both the Water Conservation Implementation Plan (WCIP, completed in September 2009) and the Regional Demand and Conservation Projections Project (Demand Study, completed in June of 2020). These efforts include both Core Programs (implemented regionally throughout the BAWSCA service area) and Subscription Programs (funded by individual member agencies that elect to participate and implement them within their respective service areas).
>
> BAWSCA's Core Conservation Programs include organizing classes open to the public on topics such as water efficient landscape education and water-wise gardening, assistance related to automated metering infrastructure, and other associated programs that work to promote smart water use and practices. BAWSCA's Subscription Programs include numerous rebate programs, educational programs that can be offered to area schools, technical assistance to member agencies in evaluating water loss, and programs to train and certify contractors employed to install water efficient landscape. In total, BAWSCA offers 22 programs to its member agencies and that number continues to grow over time.
>
> Each fiscal year, BAWSCA prepares an Annual Water Conservation Report that documents how all of BAWSCA's 26 member agencies have benefitted from the Core Conservation Programs. Additionally, the report highlights how all 26 member agencies participate in one or more of the Subscription Programs offered by BAWSCA, such as rebates, water loss management and large landscape audits. The Demand Study indicates that through a combination of active and passive conservation, 37.3 MGD will be conserved by BAWSCA's member agencies by 2045.
>
> Following the 2014-2016 drought, the State of California (State) developed the "Making Water Conservation a California Way of Life" framework to address the long-term water use efficiency requirements called for in executive orders issued by Governor Brown. In May of 2018, AB 1668 and SB 606 (collectively referred to as the efficiency legislation) went into effect, which built upon the executive orders implementing new urban water use objectives for urban retail water suppliers.

Although the BAWSCA Regional Water Conservation Program was designed and available at a regional level, most of the implementation of the individual programs within the MPMW service area is done by MPMW staff.

The Core Programs provided as a part of the Regional Water Conservation Program include conservation measures that benefit from regional implementation and provide overall regional benefit, and are funded through the annual BAWSCA budget. The Subscription Programs are conservation measures that individual agencies must elect to participate in, and whose benefits are primarily realized within individual water agency service areas. As such, the Subscription Programs are funded by individual member agencies, based on their participation level. MPMW is actively participating in the following Subscription Programs.

- Water Conservation School Education Program
- EarthCapades School Assembly Program
- Large Landscape Program
- Lawn Be Gone! Rebate Program

- Lawn Be Gone! Inspection Services Program
- Rain Barrel Program
- Smart Irrigation Controller Program
- Water Loss Management Program
- Decision Support System (DSS) Model Technical Support

MPMW's implementation, and participation in, the Core and Subscription Programs are described in detail below, as they relate to MPMW's implementation of the DMMs.

9.2 Agency Water Conservation

☑ ***CWC § 10631 (e)***

Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years.

MPMW implements all of the DMMs, as described below.

9.2.1 DMM 1 – Water Waste Prevention Ordinances

As discussed in the Water Shortage Contingency Plan (WSCP; Appendix K), MPMW has the authority within Section 7.35 of the City's Municipal Code to require water rationing and conservation and to enforce penalties. The City's current WSCP stage and water waste prohibitions in effect were adopted in 2017 in Resolution 6383. An adopted water shortage contingency resolution corresponding to this 2020 WSCP update is included in Appendix K.

Prohibitions to prevent water waste are included as the Non-Drought Stage of MPMW's 2020 WSCP, and remain in place at all times, irrespective of water supply conditions. The Non-Drought Stage includes the following water waste prohibitions:

- Hoses must be equipped with a shut-off valve for washing vehicles, sidewalks, walkways, or buildings.
- Ornamental fountains shall use only re-circulated or recycled water.
- Potable water shall not be applied in any manner to any driveway, sidewalk, or other hard surface except when necessary to address immediate health or safety concerns.
- Potable water shall not be used to water outdoor landscapes in a manner that causes more than incidental runoff onto non-irrigated areas, walkways, roadways, parking lots, or other hard surfaces.
- Potable water cannot be applied to outdoor landscapes during and up to 48 hours after measurable rainfall.
- Potable water shall not be used to irrigate ornamental turf on public street medians.

- Hotels and motels shall provide guests an option whether to launder towels and linens daily. Hotels and motels shall prominently display notice of this option in each bathroom using clear and easily understood language.
- Restaurants and other food service operations shall serve water to customers only upon request during a period for which the Governor has issued a proclamation of a state of emergency.
- Broken or defective plumbing and irrigation systems must be repaired or replaced within a reasonable period.
- Recreational water features shall be covered when not in use.
- Single-pass cooling systems on new construction shall not be allowed.

In subsequent stages of the WSCP, the water waste prohibitions become increasingly restrictive to respond to water shortages.

9.2.2 DMM 2 – Metering

☑ ***CWC § 526 (a)***

Notwithstanding any other provision of law, an urban water supplier that, on or after January 1, 2004, receives water from the federal Central Valley Project under a water service contract or subcontract … shall do both of the following:

(1) On or before January 1, 2013, install water meters on all service connections to residential and nonagricultural commercial buildings constructed prior to January 1, 1992, located within its service area.

(2) On and after March 1, 2013, or according to the terms of the Central Valley Project water contract in operation, charge customers for water based on the actual volume of deliveries, as measured by a water meter.

☑ ***CWC § 527 (a)***

(a) An urban water supplier that is not subject to Section 526 shall do both of the following:

(1) Install water meters on all municipal and industrial service connections located within its service area on or before January 1, 2025.

MPMW has water meters on each water service connection, with the exception of fire services. All of the meters within the MPMW service area are read on a monthly basis. Some non-residential and multi-family customers also have separate irrigation meters to monitor water use for landscape irrigation separately from indoor uses. The City's updated Water Efficient Landscaping Ordinance (effective February 2016) requires non-residential projects to install a separate irrigation meter if landscaped areas meet specific size thresholds, as discussed in Section 4.

The 2018 Water System Master Plan included a meter replacement/enhancement program as a high priority. In addition, per the City's 2020-2025 five-year Capital Improvement Plan, MPMW plans to install Advanced Metering Infrastructure (AMI) within the next three years (i.e., by Fiscal Year [FY] 2022-23). Implementation of AMI will allow MPMW to automate meter reading and provide real-time water use data to MPMW staff and customers that can be used to aggressively target leaks and atypically high water

use during normal years and periods of water shortage. MPMW may also consider a customer portal for accounts with AMI meters. The system can better identify water theft and improve customer service.

9.2.3 DMM 3 – Conservation Pricing

MPMW's current water rate structure for all customers includes a monthly fixed meter charge based on meter size, plus a capital surcharge and a tiered water consumption charge based on water usage.[23] The water consumption charge is tiered such that customers are billed at a lower rate for efficient water use and a higher rate for high water use. The current rate structure for the water consumption charge includes two tiers of monthly water use: (1) 0 to 6 hundred cubic feet (ccf), and (2) greater than 6 ccf. MPMW recently completed a water rate study and is proposing new rates for the next five years. The proposed rate structure for the water consumption charge includes three tiers of monthly water use: (1) 0 to 6 ccf, (2) 7 to 12 ccf, and (3) greater than 12 ccf. MPMW has scheduled a water rate public hearing for 11 May 2021. If the proposed rates are adopted, they will go into effect on 1 July 2021.

In addition, as discussed in Section 8, MPMW's water rate structure also includes drought surcharge rates, which are applied temporarily upon implementation of the WSCP and are designed to recover drought-related expenditures and lost revenue. The drought surcharge rates increase according to each stage of the WSCP as declared by the City Council.

9.2.4 DMM 4 – Public Education and Outreach

MPMW implements a number of public education and outreach initiatives with support from the BAWSCA Regional Water Conservation Program. Specific initiatives include:

- EarthCapades School Assembly Program: MPMW facilitates the school assemblies performed by EarthCapades at schools within its service area. The EarthCapades' performances combine age-appropriate state science standards with circus skills, juggling, music, storytelling, comedy, and audience participation to teach environmental awareness, water science, and conservation. EarthCapades' assemblies are designed to include local water source and watershed education and specific information pertaining to the MPMW service area. MPMW and BAWSCA provide specific information to EarthCapades regarding the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS) and other topics (e.g., recycled water). EarthCapades integrates this information into the specific scripts used for assemblies conducted within the MPMW service area.
- Water Conservation School Education Program: The water conservation school education program, formerly known as the Water-Wise school education program, is provided by Resource Action Programs (a contractor to BAWSCA) to 5th grade students within the MPMW service area. Resource Action Programs works directly with teachers and schools to provide them with turn-key, in-classroom water conservation curriculum and indoor and outdoor water conservation kits

[23] Current City of Menlo Park five-year water rate structure including drought surcharge rates are located online at http://www.menlopark.org/135/Water-rates..

(i.e., the Water-Wise Kits). The Water-Wise curriculum has been designed to be easily implemented by teachers, and easily understood and taken back into the home by the students. The Water-Wise Kits include water saving devices that can be installed at the student's homes (e.g., low-flow showerheads and faucet aerators) and a water audit that the students can perform with their parents.

The students are provided with the motivation, information, and tools they need to perform an in-home water audit. The information and material provided to the teachers and students also includes methods that can be used to quantify the water savings as a result of installing the equipment contained in the kit and performing the recommended, water-conserving actions. After the student performs the audit and installs the water and energy saving devices, affidavits signed by the parents are returned to the school, collected by the teacher, and forwarded to Resource Action Programs for documentation of measure implementation and the estimated water savings. Resource Action Programs then prepares a final report for distribution to MPMW.

- Water efficient landscape education classes: MPMW hosts a series of Water-Efficient Landscape Education Classes developed by BAWSCA that are free to the public and are designed to introduce homeowners and landscape professionals to the concepts of sustainable landscape design. The classes focus on creating beautiful, water-efficient gardens as an alternative to lawns. Examples of specific class topics include "Lawn Replacement 101", "Drought Tolerant Plants", and "From Graywater to Green Garden", among others. This program was implemented through 2018.
- Hosting information booths at fairs and public events: The City sets up information booths at large City public events to distribute information regarding MPMW's water conservation programs including rebate programs, landscape analysis programs, and fixture give-aways.
- Informative website, online tools, or social media: The City maintains pages on its website (www.menlopark.org) that are dedicated to its water conservation program. The website provides information regarding its rebate programs, water-saving fixture give-aways, water regulations, and conservation tips and links to interactive tools such as *Water-Wise Gardening in the Bay Area* and a consumption calculator. MPMW also posts outreach materials on its Twitter, Instagram and Facebook accounts.
- Media campaigns and other outreach: MPMW encourages water conservation and markets its rebate programs and water-saving fixture give-aways through direct mail, newsletters, local newspapers, and water billing inserts.

The full extent of public outreach that MPMW has conducted between 2015 and 2020 is discussed in Section 9.3.

9.2.5 DMM 5 – Programs to Assess and Manage Distribution System Real Loss

As discussed in Section 4.1.3, distribution system water loss was estimated to be approximately 3% of total water demand between 2015 and 2020. MPMW does not currently implement a program to assess and manage distribution system losses, however, the 2018 Water System Master Plan (City of Menlo Park, 2018) included a meter replacement/enhancement program as a high priority. In addition, per the City's 2020-2025 five-year Capital Improvement Plan, MPMW plans to install Advanced Metering Infrastructure

(AMI) by FY 2022-23. The future AMI system will help evaluate water use and be instrumental in detecting leaks to prevent distribution system losses.

9.2.6 DMM 6 – Water Conservation Program Coordination and Staffing Support

For FY 2015-16 through FY 2018-19, Sustainability Division staff, equating to one full-time equivalent (FTE), administered MPMW water conservation programs. In FY 2019-20, managing water conservation transitioned to Engineering staff with reduced staff resources equating to 0.08 FTE. Contact information for water conservation staff is listed below:

Phone: 650-330-6750

Email: water@menlopark.org

MPMW's water conservation program is funded through its water fund. The total water conservation program budget for FY 2020-21 is $120,000, including the cost for participation in the Subscription Programs through BAWSCA's Regional Water Conservation Program.

9.2.7 DMM 7 – Other DMMs

Other DMMs provided by MPMW, in addition to those discussed above, include the following:

- Water-Saving Fixtures Give-away: MPMW offers its residential customers free water-saving fixtures. MPMW encourages its customers to pick up and install the following free water saving fixtures from City Hall:
    - Bathroom aerator - uses 1 gallons per minute (gpm)
    - Kitchen aerator - uses 1.5 gpm
    - Low-flow shower head - uses 1.5 gpm
    - Toilet leak detection tablets (2 tablets per packet)
    - Water conserving hose nozzles (with shut-off valve)
- HET Rebates: MPMW administered a High Efficiency Toilet (HET) Rebate Program for its residential and commercial customers from 2008 through 2018. The HET program was one of the Subscription Programs available to BAWSCA member agencies. MPMW offered customers the following rebates for customers replacing a high-volume toilet (i.e., 3.5 gallons per flush, gpf, or more):
    - Up to a $125 Rebate for replacing an existing toilet with a qualifying MaP® Premium model toilet (1.06 gallons or less per flush); or
    - Up to a $75 Rebate per standard HET (i.e., between 1.06 gallons and 1.28 gallons per flush).

  Up to three rebates were allowed per residential account and up to ten rebates were allowed per commercial customer account.

- Large Landscape Audits: MPMW administers the BAWSCA Large Landscape Audits program to commercial and multi-family residential accounts, as described below. Waterfluence, BAWSCA's contractor, implements the program:
    - Landscape Analysis Program: MPMW currently offers a Large Landscape Analysis (a $1,400 value) for free to multi-family and commercial accounts. An irrigation expert evaluates landscapes and provides customers with a personalized report on how they can improve water efficiency and save on water costs.
    - Large Landscape Water Budgets: MPMW distributes water budgets to select accounts and has recently targeted irrigation accounts, which include a mix of churches, parks, schools, home owner associations, and office complexes. However, the program can be applied to any account MPMW chooses. Currently, MPMW provides and tracks water budgets for approximately the top 100 irrigation accounts.
- Lawn Be Gone! Turf Replacement Rebates and Lawn Be Gone! Inspection Services Program: MPMW administers the BAWSCA Lawn Be Gone! turf replacement rebate program for its residential and commercial customers. MPMW offers its customers $2 per square foot of turf removed. MPMW previously capped the rebate at $1,400 per account, but the cap was removed in June 2014. In order to qualify for participation in the Lawn Be Gone! Program, the new landscape must include at least 80% live plant coverage, with the difference completed in permeable hardscape, and all plants must be low water use plants from the BAWSCA-approved plant list. Global Sun Landscape, BAWSCA's contractor, performs the inspection services for this program. A pre and post inspection is required. This program offers MPMW's customers a financial incentive to reduce their outdoor water use and create permanent and lasting water savings. Also, because eligible landscapes must include front yards and areas visible to the public, this program has an educational and public-outreach element (i.e., demonstrating to the wider public that low water use landscaping can be an attractive alternative to lawns and encouraging conversations about responsible water use among neighbors).
- Rain Barrel Program: MPMW administers the BAWSCA Rain Barrel program in partnership with the San Mateo Countywide Water Pollution Prevention Program (a program of the City/County Association of Governments of San Mateo County). MPMW offers rebates of up to $200 per barrel for the purchase and installation of qualifying rain barrels and cisterns. This program is only offered to residential customers. BAWSCA and MPMW review installation images and approve applications. Rain barrels are a low-cost system that allow residents to supplement their water supply with a sustainable source and help preserve local watersheds by detaining rainfall.
- Smart Irrigation Controller Program: This program works with Rachio, BAWSCA's contractor, to offer residential customers a Rachio 3 Smart Sprinkler Controller at a discounted price. The Rachio 3 Smart Sprinkler Controller allows users to save up to 20% or more on their outdoor water use. The controller allows residents to check and manage watering from anywhere with their smartphone by creating tailored schedules and make automatic weather adjustments.

The full extent of the DMMs that MPMW has implemented between 2015 and 2020 is discussed in Section 9.3.

9.3 Implementation over the Past Five Years

Table 9-1 and the associated chart summarizes the DMMs implemented by MPMW and the extent of implementation (e.g., number of kits, number of rebates) for each of the programs each year between 2015 and 2020.

Water savings from the HET rebates and the Lawn Be Gone! Turf Replacement Program are conservatively estimated to be over 6 million gallons (MG) over the past five years.[24] Through implementation of the DMMs, MPMW has been able to significantly reduce water demands in its service area and help its customers to achieve water and cost savings.

9.4 Planned Implementation to Achieve Water Use Targets

☑ ***CWC § 10631 (e)***

Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) (A) … The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

MPMW implemented all of the DMMs described in Section 9.2 to achieve its Senate Bill (SB) X7-7 water use targets. As shown in Chapter 5, MPMW's water use in 2020 was 160 gallons per capital per day (GPCD), which is substantially lower than its SB X7-7 water use target of 204 GPCD.

9.5 Urban Water Use Objectives (Future Requirement)

CWC §10609 requires that urban retail water suppliers develop new water use objectives that are based on specific standards for certain water use sectors. These water use objectives will not be developed until 2023. Suppliers are encouraged in this UWMP cycle to consider how they will align their conservation management actions in order to meet these future obligations.

MPMW intends to continue and expand implementation of the DMMs discussed above and will continue to participate in BAWSCA's Regional Water Conservation Program.

[24] Expected annual water savings per each HET change out would be approximately 4,862 gallons per year, using the following calculation (BAWSCA, n.d.): (3.5 gpf - 1.28 gpf) x 5 flushes/day/person x 2.64 persons/house / 2.2 toilets/house x 365 days = 4,862 gal. This calculation assumes that a toilet rated at 3.5 gpf actually operates at 3.5 gpf.

Expected annual water savings per lawn replacement, assuming average area converted per rebate between FY 2015-2017, would be approximately 19,730 gallons per year, using the following calculation (BAWSCA, n.d.): (3.5 acre-feet/acre - 1.0 acre-feet/acre) /43,560 square feet/acre x 1,055 square feet x 325,851 gallons/acre-foot = 19,730 gallons.

BAWSCA led its member agencies in a multi-year effort to develop and implement a strategy to meet these new legislative requirements. BAWSCA's Making Conservation a Way of Life Strategic Plan (Strategic Plan) provided a detailed roadmap for member agencies to improve water efficiency. BAWSCA implementing the following elements of the Strategic Plan:

- Conducted an assessment of the agencies' current practices and water industry best practices for three components of the efficiency legislation that, based on a preliminary review, present the greatest level of uncertainty and potential risk to the BAWSCA agencies. The three components were:
    1. Development of outdoor water use budgets in a manner that incorporates landscape area, local climate, and new satellite imagery data.
    2. Commercial, Industrial, and Institutional water use performance measures.
    3. Water loss requirements.
- Organized an Advanced Metering Infrastructure symposium to enable information exchange, including case studies, implementation strategies, and data analysis techniques.
- Initiated a regional CII audit pilot program, which BAWSCA aims to complete in 2021.[25]
- Implemented a regional program for water loss control to help BAWSCA agencies comply with regulatory requirements and implement cost-effective water loss interventions.
- Engaged with the SFPUC to audit meter testing and calibration practices for SFPUC's meters at BAWSCA agency turnouts.

Finally, BAWSCA's Demand Study developed water demand and conservation projections through 2045 for each BAWSCA agency. These projects are designed to provide valuable insights on long-term water demand patterns and conservation savings potential to support regional efforts, such as implementation of BAWSCA's Long-Term Reliable Water Supply Strategy.

As described in Section 4.2, MPMW's 2021 Demand Management Decision Support System Model (DSS Model) estimates projected water demands and quantifies passive and active conservation water savings potential. As discussed in Section 4.6, the DSS Model projections demonstrate that per capita indoor residential potable water use within MPMW is expected to be below the indoor use standards presented in the legislation.

[25] Efforts on the CII audit pilot program stalled in March 2020 due to the COVID 19 pandemic and related shelter-in-place orders.

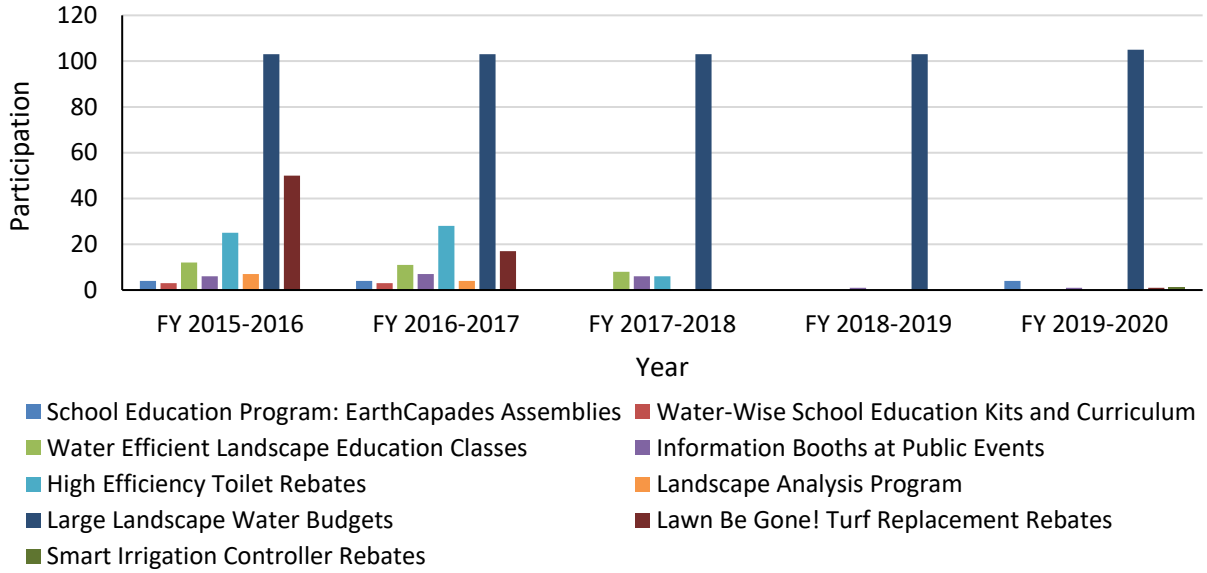
Table 9-1 Summary of DMMs and Implementation over the Past Five Years (2015-2020)

DMM Category	Program or Activity	Target Sector	Nature of Implementation	Extent of Implementation
1	Water Waste Prevention Ordinances	SF, MF, CII And IRR	Prohibition of water uses to prevent water waste included under Stage 1 of the WSCP are in place at all times, irrespective of water supply condition.	Stage 1 water waste prohibitions have been in place since adoption of the 2014 WSCP. The 2016 WSCP adds additional prohibitions.
2	Metering	SF, MF, CII And IRR	All water service connections are metered, with the exception of fire services. Per the City's 2020-2025 five-year CIP, MPMW plans to install AMI within the next three years.	All accounts are metered and read on a monthly basis.
3	Conservation Pricing	SF, MF, CII And IRR	The current water rate structure includes a tiered water consumption charge based on water usage and additional drought surcharge rates: http://www.menlopark.org/waterrates	Tiered rate structure in place during 2015-2020. Drought surcharge rates were established in 2015.
4	School Education Program: EarthCapades Assemblies	SF, MF	School assemblies that teach water science and conservation to students, including local water source and watershed education and specific information pertaining to the MPMW service area. MPMW participates through the BAWSCA Regional Water Conservation Program.	FY 2015-16: 4 assemblies FY 2016-17: 4 assemblies FY 2017-18: Not implemented FY 2018-19: Not implemented FY 2019-20: 4 assemblies
4	Water-Wise School Education Kits and Curriculum	SF, MF	Fifth grade teachers are provided with a water conservation curriculum. Kits are distributed to 5th grade students that enable them to install water saving devices and perform a water audit in their home. MPMW participates through the BAWSCA Regional Water Conservation Program.	FY 2015-16: 3 events FY 2016-17: 3 events FY 2017-18: Not implemented FY 2018-19: Not implemented FY 2019-20: Not implemented
4	Water Efficient Landscape Education Classes	SF, MF	Free classes developed by BAWSCA and hosted by MPMW provide information regarding water efficient landscaping and MPMW's water conservation programs. The classes focus on creating beautiful, water-efficient gardens as an alternative to lawns, and include "Lawn Replacement 101," "Drought Tolerant Plants," and "From Graywater to Green Garden," among others. MPMW participates through the BAWSCA Regional Water Conservation Program.	FY 2015-16: 12 classes FY 2016-17: 11 classes FY 2017-18: 8 classes FY 2018-19: Not implemented FY 2019-20: Not implemented

DMM Category	Program or Activity	Target Sector	Nature of Implementation	Extent of Implementation
4	Information Booths at Public Events	SF, MF, CII And IRR	At public events, MPMW distributes information and materials to participants regarding its water conservation programs.	FY 2015-16: 6 event FY 2016-17: 7 events FY 2017-18: 6 events FY 2018-19: 1 event FY 2019-20: 1 event
4	Other Public Outreach	SF, MF, CII And IRR	MPMW encourages water conservation and markets its rebate programs and water-saving fixture give-aways through newsletters, local newspapers, and water bill inserts. MPMW also maintains water conservation program pages on its website and posts outreach materials on its social media accounts: .http://www.menlopark.org/waterconservation.	FY 2015-16: Not tracked FY 2016-17: Not tracked FY 2017-18: Not tracked FY 2018-19: Not implemented FY 2019-20: Not implemented
5	Programs to Assess and Manage Distribution System Real Loss	Non-revenue	The 2018 Water System Master Plan includes a meter replacement/enhancement program as a high priority. In addition, per the City's 2020-2025 five-year Capital Improvement Plan, MPMW plans to install AMI within the next three years. The future AMI system will help evaluate water use and be instrumental in detecting leaks to prevent distribution system losses.	
6	Conservation Program Coordination and Staff	SF, MF, CII And IRR	City employs coordination staff and funds the water conservation program.	For FY 2015-16 through FY 2018-19, Environmental Services staff, equating to one FTE, administered MPMW water conservation programs. In FY 2019-20, managing water conservation transitioned to Engineering staff with reduced staff resources equating to 0.08 FTE.
7	Free Water-Saving Fixtures	SF, MF	Water-saving fixture kits are available to residential customers at City Hall, and include a bathroom aerator, a kitchen aerator, a low-flow shower head, two (2) toilet leak detection tablets, and water conserving hose nozzles (with shut-off valve).	FY 2015-26: Not tracked FY 2016-17: Not tracked FY 2017-18: Not tracked FY 2018-19: Not tracked FY 2019-20: Not tracked
7	High Efficiency Toilet Rebate	SF, MF, CII	Up to $125 rebate for qualifying toilets less than 1.06 gpf; up to $75 rebate per HET (between 1.06 and 1.28 gpf). Up to three rebates are allowed per residential units and up to ten rebates are allowed per commercial customer account. MPMW participated through the BAWSCA Regional Water Conservation Program.	FY 2015-16: 25 rebates FY 2016-17: 28 rebates FY 2017-18: 6 rebates FY 2018-19: Not implemented FY 2019-20: Not implemented

DMM Category	Program or Activity	Target Sector	Nature of Implementation	Extent of Implementation
7	Landscape Analysis Program	MF, CII	Free landscape analyses (value of $1,400) are offered to commercial and multi-family residential accounts, and provide customers with reports on how to improve landscape water efficiency. MPMW participates through the BAWSCA Regional Water Conservation Program.	FY 2015-16: 7 participants FY 2016-17: 4 participants FY 2017-18: Not implemented FY 2018-19: Not implemented FY 2019-20: Not implemented
7	Large Landscape Water Budgets	IRR, SF	MPMW provides and track water budgets for approximately the top 100 irrigation accounts, including churches, parks, schools, HOA's and office complexes.	FY 2015-16: 103 participants FY 2016-17: 103 participants FY 2017-18: 103 participants FY 2018-19: 103 participants FY 2019-20: 105 participants
7	Lawn Be Gone! Turf Replacement Rebates	SF, MF, CII	Customers are offered $2 per square foot of turf removed and replaced with water-efficient landscaping. The new landscape must include at least 80% live plant coverage, permeable hardscape, and all plants must be low water use plants from the BAWSCA-approved plant list. The rebate was previously capped at $1,400, but as of 17 June 2014, the rebate cap was removed. MPMW participates through the BAWSCA Regional Water Conservation Program.	FY 2015-16: 50 accounts FY 2016-17: 17 accounts FY 2017-18: Not implemented FY 2018-19: Not implemented FY 2019-20: 1 account
7	Rain Barrel Program	SF, MF	MPMW administers this program in partnership with the San Mateo Countywide Water Pollution Prevention Program (a program of the City/County Association of Governments of San Mateo County). MPMW offers rebates of up to $200 per barrel for the purchase and installation of qualifying rain barrels and cisterns.	As this is a new program, no participation data for previous years.
7	Smart Irrigation Controller Rebates	SF	Customers are offered a Rachio 3 Smart Sprinkler Controller at a discounted price which allows users to save 20% or more on their outdoor water use. The controller allows customers to check and manage watering from anywhere with their smartphone, create tailored schedules, and make automatic weather adjustments.	FY 2015-16: Not implemented FY 2016-17: Not implemented FY 2017-18: Not implemented FY 2018-19: Not implemented FY 2019-20: 1 participant

Chart 9-1 DMM Participation (2015-2020)



10 PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

Preparation of the Urban Water Management Plan (UWMP) and the Water Shortage Contingency Plan (WSCP) began in April 2020 for completion in July 2021, with notifications and interactions between stakeholders as discussed further below.

10.1 Notification of UWMP and WSCP Preparation

☑ ***CWC § 10621 (b)***

Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

On 16 February 2021, Menlo Park Municipal Water (MPMW) sent a letter to 68 recipients from 33 entities, including the San Francisco Public Utilities Commission (SFPUC), Bay Area Water Supply and Conservation Agency (BAWSCA), each BAWSCA member agency, San Mateo County, and other local agencies informing them that MPMW was in the process of updating its UWMP and WSCP and soliciting their input in the update process. A listing of the entities contacted is provided in Table 2-4 and Appendix B. The letter was sent more than 60 days before the public hearing as required by code. A sample outreach letter is included in Appendix B.

10.2 Notification of Public Hearing

☑ ***CWC § 10642***

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

10.2.1 Notice to Cities and Counties

On 6 May 2021, MPMW sent a letter to each of the above-mentioned entities informing them the Public Review Draft 2020 UWMP and the updated WSCP were available for review on the City's website and

welcoming their input and comments on the documents. The letter also informed the agencies that the UWMP and WSCP public hearing would be occurring via teleconference on 25 May 2021. A sample copy of the notification letters is included in Appendix B.

10.2.2 Notice to the Public

MPMW issued public notifications soliciting public input during the preparation of 2020 UWMP and WSCP.

The City Council held a Study Session on 13 April 2021 regarding the 2020 UWMP and WSCP development. The City Council meeting agenda and copy of the Staff Report and accompanying presentation were made available to the public on the City's website. As directed by MPMW staff, comments received from the City Council during the Study Session were incorporated into the UWMP and the WSCP.

On 7 May 2021 and 14 May 2021, MPMW published a notice in the *Redwood City Tribune* informing the public that the 2020 UWMP and WSCP would be available for public review on the City's website, consistent with requirements of California Government Code 6066. The notice also informed the public that the 2020 UWMP and WSCP public hearing would be held via teleconference on 25 May 2021. Copies of the newspaper announcements are included in Appendix C.

10.3 Public Hearing and Adoption

☑ ***CWC § 10608.26***

(a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:

(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.

(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.

(3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.

As described above, MPMW informed the public and the appropriate agencies of (1) its intent to prepare a UWMP and the associated WSCP, (2) where the UWMP and WSCP were available for public review, and (3) when the public hearing regarding the UWMP and WSCP would be held. All notifications were completed in compliance with the stipulations of Section 6066 of the Government Code.

As part of the public hearing, MPMW provided the audience with information on compliance with the Senate Bill (SB) X7-7, including its baseline daily per capita water use, water use targets, implementation plan, and 2020 compliance.

This UWMP was adopted by Resolution No. 6630 by the City Council during its 25 May 2021 City Council meeting. The WSCP included as Appendix K was adopted by Resolution No. 6630 during the same meeting. A copy of the resolutions is included in Appendix L.

10.4 Plan Submittal

☑ ***CWC § 10621***

(f) (1) Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.

☑ ***CWC § 10635 (c)***

The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

☑ ***CWC § 10644***

(a) (1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1) shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

(b) If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its water shortage contingency plan prepared pursuant to subdivision (a) of Section 10632 no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.

A copy of the adopted 2020 UWMP and associated WSCP will be provided to the Department of Water Resources (DWR), the California State Library, San Mateo County, and SFPUC within 30 days of the adoption. An electronic copy of the adopted 2020 UWMP will be submitted to the DWR using the DWR online submittal tool.

10.5 Public Availability

☑ ***CWC § 10645***

(a) Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

(b) Not later than 30 days after filing a copy of its water shortage contingency plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

A copy of the adopted 2020 UWMP and associated WSCP will be available for public review in City Hall during normal business hours and on the City's website within 30 days of filing the plan with DWR.

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APPENDIX A
COMPLETED UWMP CHECKLIST

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities.	Introduction and Overview	Section 1 Section 1.6
x	x	Chapter 1	10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a supplier may also choose to include a simple description at the beginning of each chapter.	Summary	Section 1.6
x	x	Section 2.2	10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.1
x	x	Section 2.6	10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.2.3

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 2.6.2	10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	Section 1.3 Section 2.2.4
x		Section 2.6, Section 6.1	10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	Section 2.2.2
	x	Section 2.6	10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	N/A
x	x	Section 3.1	10631(a)	Describe the water supplier service area.	System Description	Section 3
x	x	Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3
x	x	Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Section 3.1.1
x	x	Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 3.1.2 Section 3.1.3

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Sections 3.4 and 5.4	10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Section 3.1 Section 5.1
x	x	Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	Section 3.2
x	x	Section 4.2	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4
x	x	Section 4.2.4	10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Section 4.1.3
x	x	Section 4.2.6	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System Water Use	Section 4.2.2
x	x	Section 4.2.6	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System Water Use	Section 4.2.2
x	optional	Section 4.3.2.4	10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	System Water Use	Section 4.1.3
x	optional	Section 4.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.2.5
x	x	Section 4.5	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System Water Use	Section 4.4

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x		Chapter 5	10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Section 5
x		Chapter 5	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 5.4
	x	Section 5.1	10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	N/A
x		Section 5.2	10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Section 5.4
x		Section 5.5	10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5-year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.3

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x		Section 5.5 and Appendix E	10608.4	Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SBX7-7 2020 Compliance Form.	Baselines and Targets	Appendix E
x	x	Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	System Supplies	Section 7.1.1 Section 7.1.2
x	x	Sections 6.1	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, *including changes in supply due to climate change.*	System Supplies	Section 6.10.1 Section 7.1.1.4
x	x	Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	Section 6
x	x	Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Section 6.8
x	x	Section 6.2.8	10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Section 6.9

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 6.2	10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2
x	x	Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.2.2
x	x	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 6.2.1
x	x	Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.1
x	x	Section 6.2.2.1	10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	Section 6.2.1

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 6.2.2.4	10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Section 6.2.3
x	x	Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Section 6.2.4
x	x	Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System Supplies	Section 6.7
x	x	Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.5.2
x	x	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.4
x	x	Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.5.4

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 6.2.5	10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.5.4
x	x	Section 6.2.5	10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.5.5
x	x	Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.5
x	x	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6
x	x	Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area with quantified amount of collection and treatment and the disposal methods.	System Supplies (Recycled Water)	Section 6.5.2
x	x	Section 6.2.8, Section 6.3.7	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	Section 6.8

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 6.4 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a supplier can readily obtain.	System Suppliers, Energy Intensity	Section 6.11
x	x	Section 7.2	10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Section 7.1.1.3
x	x	Section 7.2.4	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.1.4
x	x	Section 7.3	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.1.3
x	x	Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Section 7.2

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	Section 7.2.1
x	x	Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Section 7.2.2
x	x	Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Section 7.2.3
x	x	Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Section 7.2.1
x	x	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Section 8 Appendix K
x	x	Chapter 8	10632(a)(1)	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP	Water Shortage Contingency Planning	Appendix K Section 2

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	Appendix K Section 12
x	x	Section 8.2	10632(a)(2)(A)	Provide the written decision- making process and other methods that the supplier will use each year to determine its water reliability.	Water Shortage Contingency Planning	Appendix K Section 4
x	x	Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water Shortage Contingency Planning	Appendix K Section 4
x	x	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	Appendix K Section 5
x	x	Section 8.3	10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	N/A

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 8.4	10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	Appendix K Section 6.2
x	x	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Appendix K Section 6.1
x	x	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Appendix K Section 6.3
x	x	Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions.	Water Shortage Contingency Planning	Appendix K Section 6.4
x	x	Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	Appendix K Section 6.6
x	x	Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	Appendix K Section 7
x	x	Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	Appendix K Section 8

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 8.5 and 8.6	10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water Shortage Contingency Planning	Appendix K Section 8
x		Section 8.6	10632(a)(6)	Retail supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water Shortage Contingency Planning	Appendix K Section 9
x	x	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	Appendix K Section 10
x	x	Section 8.7	10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	Appendix K Section 10
x	x	Section 8.7	10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water Shortage Contingency Planning	Appendix K Section 10
x	x	Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix K Section 11
x	x	Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	Appendix K Section 11

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x		Section 8.8	10632(a)(8)(C)	Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought	Water Shortage Contingency Planning	Appendix K Section 11
x		Section 8.9	10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	Appendix K Section 12
x		Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water Shortage Contingency Planning	Appendix K Section 6.5
x	x	Sections 8.12 and 10.4	10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Appendix K Section 14
x	x	Section 8.14	10632(c)	Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan.	Water Shortage Contingency Planning	Appendix K Section 14

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
	x	Sections 9.1 and 9.3	10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	N/A
x		Sections 9.2 and 9.3	10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Section 9.1 Section 9.2 Section 9.3
x		Chapter 10	10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan Adoption, Submittal, and Implementation	Section 10.3
x	x	Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1.	Plan Adoption, Submittal, and Implementation	Section 10.1
x	x	Section 10.4	10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	Section 10.4

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	Section 10.5
x	x	Section 10.2.2	10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Section 10.2.1
x	x	Section 10.3.2	10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3
x	x	Section 10.4	10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Section 10.4	10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4
x	x	Sections 10.4.1 and 10.4.2	10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Section 10.4

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5
x	x	Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5
x	x	Section 10.6	10621(c)	If supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan Adoption, Submittal, and Implementation	N/A
x	x	Section 10.7.2	10644(b)	If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4

APPENDIX B
UWMP AGENCY NOTIFICATION LETTERS

Notification Distribution List

Alameda County Water District

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EKI Environment & Water, Inc.

Estero Municipal Improvement District

Menlo Park Chamber of Commerce

Menlo Park Fire District

Mid-Peninsula Water District

North Coast County Water Dist.

O'Connor Tract Co-Operative Water Company

Palo Alto Park Mutual Water Company

Purissima Hills Water District

Ravenswood School District

San Francisco Public Utilities Commission

San Jose Municipal Water System

San Mateo County Environmental Health

Stanford University

Town of Hillsborough

West Bay Sanitary District

Westborough Water District

Jaw, Scott

From: Jaw, Scott
Sent: Tuesday, February 16, 2021 2:01 PM
To: 'Leonard.Ash@acwd.com'; 'kelsi.oshiro@acwd.com'; 'NSandkulla@bawsca.org'; 'dmcpherson@bawsca.org'; 'nashoori@bawsca.org'; 'Acarrasco@calwater.com'; 'dsmithson@calwater.com'; 'mbolzowski@calwater.com'; 'jflanagan@ci.brisbane.ca.us'; 'rbreault@ci.brisbane.ca.us'; 'jlee@burlingame.org'; 'amorimoto@burlingame.org'; 'gkrauss@dalycity.org'; 'wdonnelly@dalycity.org'; 'richard.perez@veolia.com'; 'alex.ameri@hayward-ca.gov'; 'Michelle.Tran@hayward-ca.gov'; 'klim@ci.millbrae.ca.us'; 'Bgiang@ci.millbrae.ca.us'; 'tndah@ci.milpitas.ca.gov'; 'hsiddiqui@ci.milpitas.ca.gov'; 'lisa.au@mountainview.gov'; 'Elizabeth.Flegel@mountainview.gov'; 'karla.dailey@cityofpaloalto.org'; 'Lisa.Bilir@CityofPaloAlto.org'; 'tkyaw@redwoodcity.org'; 'jchapel@redwoodcity.org'; 'jtan@sanbruno.ca.gov'; 'MReinhardt@sanbruno.ca.gov'; 'gwelling@santaclaraca.gov'; 'DAsuncion@SantaClaraCA.gov'; 'mnasser@ci.sunnyvale.ca.us'; 'RChinnakotla@sunnyvale.ca.gov'; 'mrogren@coastsidewater.org'; 'cbrennan@coastsidewater.org'; 'twang@ekiconsult.com'; 'ndorais@fostercity.org'; 'asmith@fostercity.org'; 'harolds@menlofire.org'; 'tammyr@midpeninsulawater.org'; 'jeanettek@midpeninsulawater.org'; 'acarr@nccwd.com'; 'stephaniedalton@nccwd.com'; 'philw@purissimawater.org'; 'samv@purissimawater.org'; 'aakastama@sfwater.org'; 'sritchie@sfwater.org'; 'henry.louie@sanjoseca.gov'; 'nicole.harvie@sanjoseca.gov'; 'hforshey@smcgov.org'; 'ekudyba@stanford.edu'; 'juliann@stanford.edu'; 'ecooney@hillsborough.net'; 'pwillis@hillsborough.net'; 'SRamirez@westbaysanitary.org'; 'dbarrow@westboroughwater.com'; 'pmairena@westboroughwater.com'; 'davidlawjones@gmail.com'; 'oconnorwater@gmail.com'; 'papmwc@yahoo.com'; 'info@papmwc.org'; 'gsudaria@ravenswoodschools.org'; 'weger@ravenswoodschools.org'; 'mpfd@menlofire.org'; 'info@westbaysanitary.org'; 'info@menloparkchamber.com'; Dehn Fran
Cc: Lowe, Pam H; Lamm, Christopher T
Subject: City of Menlo Park - Notice of Preparation of the 2020 Urban Water Management Plan

Re: Notice of Preparation of the City of Menlo Park's 2020 Urban Water Management Plan and Water Shortage Contingency Plan

The Urban Water Management Planning Act (California Water Code §10608–10656) requires the City's Menlo Park Municipal Water to update its Urban Water Management Plan (UWMP) and associated Water Shortage Contingency Plan (WSCP) every 5 years. The City is currently reviewing its existing UWMP and WSCP, which were updated in 2016, and considering revisions to the documents. The UWMP integrates land use, water needs and supply, and demand management measures to document the City's ability to provide a reliable supply of water to its customers. The associated WSCP considers dry-year water supply planning, including strategies to address six levels of water supply shortage conditions, and a drought risk assessment.

The City coordinates with its wholesale water supplier, nearby water agencies, relevant public entities, and other interested parties in preparing the UWMP and WSCP. A draft of the 2020 UWMP and WSCP will be made available for public review, and a public hearing is tentatively scheduled for late-spring. If you would like

more information regarding the 2020 UWMP and WSCP, and the schedule for updating these documents, please visit menlopark.org/urbanwatermanagementplan or contact us at:

City of Menlo Park, Menlo Park Municipal Water
701 Laurel Street,
Menlo Park, CA 94025
Phone: (650) 330-6694
Email: scjaw@menlopark.org

Sincerely,
Scott

Jaw, Scott

From: Jaw, Scott
Sent: Thursday, May 6, 2021 12:16 PM
To: 'Leonard.Ash@acwd.com'; 'kelsi.oshiro@acwd.com'; 'NSandkulla@bawsca.org'; 'dmcpherson@bawsca.org'; 'nashoori@bawsca.org'; 'Acarrasco@calwater.com'; 'dsmithson@calwater.com'; 'mbolzowski@calwater.com'; 'jflanagan@ci.brisbane.ca.us'; 'rbreault@ci.brisbane.ca.us'; 'jlee@burlingame.org'; 'amorimoto@burlingame.org'; 'gkrauss@dalycity.org'; 'wdonnelly@dalycity.org'; 'richard.perez@veolia.com'; 'alex.ameri@hayward-ca.gov'; 'Michelle.Tran@hayward-ca.gov'; 'klim@ci.millbrae.ca.us'; 'Bgiang@ci.millbrae.ca.us'; 'tndah@ci.milpitas.ca.gov'; 'hsiddiqui@ci.milpitas.ca.gov'; 'lisa.au@mountainview.gov'; 'Elizabeth.Flegel@mountainview.gov'; 'karla.dailey@cityofpaloalto.org'; 'Lisa.Bilir@CityofPaloAlto.org'; 'tkyaw@redwoodcity.org'; 'jchapel@redwoodcity.org'; 'jtan@sanbruno.ca.gov'; 'MReinhardt@sanbruno.ca.gov'; 'gwelling@santaclaraca.gov'; 'DAsuncion@SantaClaraCA.gov'; 'mnasser@ci.sunnyvale.ca.us'; 'RChinnakotla@sunnyvale.ca.gov'; 'mrogren@coastsidewater.org'; 'cbrennan@coastsidewater.org'; 'twang@ekiconsult.com'; 'ndorais@fostercity.org'; 'asmith@fostercity.org'; 'harolds@menlofire.org'; 'tammyr@midpeninsulawater.org'; 'jeanettek@midpeninsulawater.org'; 'acarr@nccwd.com'; 'stephaniedalton@nccwd.com'; 'philw@purissimawater.org'; 'samv@purissimawater.org'; 'aakastama@sfwater.org'; 'sritchie@sfwater.org'; 'henry.louie@sanjoseca.gov'; 'nicole.harvie@sanjoseca.gov'; 'hforshey@smcgov.org'; 'ekudyba@stanford.edu'; 'juliann@stanford.edu'; 'ecooney@hillsborough.net'; 'pwillis@hillsborough.net'; 'SRamirez@westbaysanitary.org'; 'dbarrow@westboroughwater.com'; 'pmairena@westboroughwater.com'; 'davidlawjones@gmail.com'; 'oconnorwater@gmail.com'; 'papmwc@yahoo.com'; 'info@papmwc.org'; 'gsudaria@ravenswoodschools.org'; 'weger@ravenswoodschools.org'; 'mpfd@menlofire.org'; 'info@westbaysanitary.org'; 'info@menloparkchamber.com'; Dehn Fran
Cc: Lowe, Pam H; Lamm, Christopher T
Subject: City of Menlo Park - Draft 2020 Urban Water Management Plan Available for Public Review

Re: City of Menlo Park's Draft 2020 Urban Water Management Plan and Water Shortage Contingency Plan available for public review

The Urban Water Management Planning Act (California Water Code §10608–10656) requires the City's Menlo Park Municipal Water to update its Urban Water Management Plan (UWMP) and associated Water Shortage Contingency Plan (WSCP) every 5 years. The City is currently reviewing its existing UWMP and WSCP, which were updated in 2016, and considering revisions to the documents. The UWMP integrates land use, water needs and supply, and demand management measures to document the City's ability to provide a reliable supply of water to its customers. The associated WSCP considers dry-year water supply planning, including strategies to address six levels of water supply shortage conditions, and a drought risk assessment.

The City coordinates with its wholesale water supplier, nearby water agencies, relevant public entities, and other interested parties in preparing the UWMP and WSCP. A draft of the 2020 Urban Water Management Plan and Water Shortage Contingency Plan is now available for public review. A public hearing to adopt the

UWMP and WSCP is scheduled for May 25, 2021. If you would like more information, please visit menlopark.org/watermanagementplan or contact us at:

City of Menlo Park, Menlo Park Municipal Water
701 Laurel Street,
Menlo Park, CA 94025
Phone: (650) 330-6694
Email: scjaw@menlopark.org

Sincerely,
Scott

APPENDIX C
UWMP PUBLIC NOTIFICATION

From: City of Menlo Park <water@menlopark.org>
Sent: Wednesday, February 24, 2021 8:59 AM
To: Lowe, Pam H
Subject: Draft 2020 Urban Water Management Plan coming soon for public review

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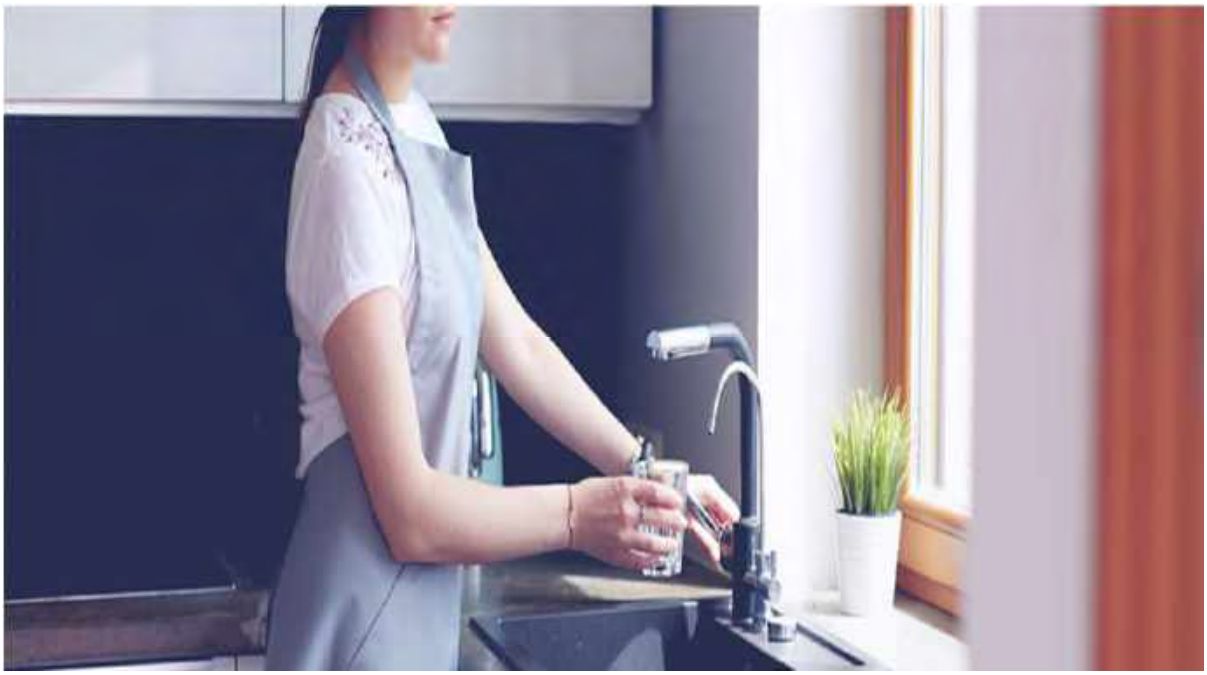

Draft 2020 Urban Water Management Plan coming soon for public review

Menlo Park Municipal Water customers:

The Urban Water Management Plan, and associated Water Shortage Contingency Plan, are a critical part of meeting the long-range water supply needs of Menlo Park Municipal Water customers for both normal and dry year weather conditions. As we face increasingly unpredictable climate patterns, the new state planning requirements ensure we will be prepared for various scenarios and continue to be a reliable and dependable water supplier.

An update to the plan for meeting its long-term water needs is under development. Once completed, the 2020 Urban Water Management Plan will serve as the long-term guide to ensure a reliable water supply for the next 20 years.

- Read the previous update, the 2015 Urban Water Management Plan

- Read the latest staff report on the progress of the 2020 planning process

The City Council approved an agreement with EKI Environment & Water, Inc. to develop the 2020 Urban Water Management Plan. A draft of the 2020 Urban Water Management Plan and Water Shortage Contingency Plan is expected to be released for public review in March or April 2021 for a 60-day public comment period. The City Council is then expected to consider adoption of the final plan in May or June 2021. The adopted plans must be submitted to the state by July 1, 2021.

For additional information, please visit the Urban Water Management Plan webpage or contact Senior Civil Engineer Pam Lowe.

Sent by the City of Menlo Park
701 Laurel St., Menlo Park, CA 94025
650-330-6600 phone | 650-679-7022 text
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Menlo Park Municipal Water customers,

The Urban Water Management Plan and Water Shortage Contingency Plan are a critical part of meeting the long-range water supply needs of Menlo Park Municipal Water customers for both normal and dry year weather conditions.

The Urban Water Management Plan serves as the long-term guide to ensure a reliable water supply for the next 20 years, and the Water Shortage Contingency Plan outlines the actions and demand management measures that may be implemented based on various future drought conditions.

The City contracted with EKI Environment & Water, Inc. to develop both plans, and presented a study session at the April 13, 2021, City Council meeting.

A draft of the 2020 Urban Water Management Plan and Water Shortage Contingency Plan is available for public review. The City Council is scheduled to hold a public hearing to adopt both plans May 25, 2021.

- Draft 2020 Urban Water Management Plan and Water Shortage Contingency Plan and Appendices
- April 13 City Council study session – Staff Report

The City must submit the plans to the California Department of Water Resources by June 30.

For additional information, please visit the Urban Water Management Plan webpage or contact Senior Civil Engineer Pam Lowe.

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May (May 10) 10

Draft urban water management and water shortage contingency plan available for review

Posted on May 10, 2021 at 6:18 pm by Clay Curtin

The Urban Water Management Plan and Water Shortage Contingency Plan are a critical part of meeting the long-range water supply needs of Menlo Park Municipal Water customers for both normal and dry year weather conditions.

The Urban Water Management Plan serves as the long-term guide to ensure a reliable water supply for the next 20 years, and the Water Shortage Contingency Plan outlines the actions and demand management measures that may be implemented based on various future drought conditions.

The City contracted with EKI Environment & Water, Inc. to develop both plans, and presented a study session at the April 13, 2021, City Council meeting.

The Draft 2020 Urban Water Management Plan and Water Shortage Contingency Plan is available for public review. The City Council is scheduled to hold a public hearing to adopt both plans May 25, 2021. The City must submit the plans to the California Department of Water Resources by June 30.

For additional information, please visit the Urban Water Management Plan webpage or contact Senior Civil Engineer Pam Lowe.

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JUDI HERREN
MENLO PARK/CITY MANAGER, CITY CLERK'S OFFICE
701 LAUREL ST/ CITY HALL 2ND FL.
MENLO PARK, CA 94025

SPEN# 3466088

COPY OF NOTICE

Notice Type: HRG NOTICE OF HEARING

Ad Description
Public hearing on the 2020 urban water management plan and the water shortage contingency plan

To the right is a copy of the notice you sent to us for publication in the REDWOOD CITY TRIBUNE. Please read this notice carefully and call us with any corrections. The Proof of Publication will be filed with the County Clerk, if required, and mailed to you after the last date below. Publication date(s) for this notice is (are):

05/07/2021 , 05/14/2021

The charge(s) for this order is as follows. An invoice will be sent after the last date of publication. If you prepaid this order in full, you will not receive an invoice.

Publication	$127.60
Total	$127.60

Public hearing on the 2020 urban water management plan and the water shortage contingency plan

NOTICE IS HEREBY GIVEN that the City Council of the City of Menlo Park will hold a public hearing to consider proposed revisions and updates to the 2020 urban water management plan (UWMP) and the water shortage contingency plan (WSCP). In conjunction with the update to the UWMP and WSCP, the community must be given an opportunity to give input on the City's urban water use target in the UWMP, any impacts to the local economy, and the City's method of determining its urban water use target. A draft of the 2020 UWMP and WSCP is available for public review on the City's webpage at menlo-park.org/watermanagementplan.

NOTICE IS HEREBY FURTHER GIVEN that the City Council of the City of Menlo Park will hold this public hearing on Tuesday, May 25, 2021 at 5 p.m. or as near as possible thereafter, by virtual meeting, at which time and place interested persons may participate and be heard on the matter. If you challenge this item in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice, or in written correspondence delivered to the City of Menlo Park at, or prior to, the public hearing.
Please call Menlo Park Municipal Water, at 650-330-6750 or email water@menlopark.org if you have any questions or comments.
Visit the City's website at menlopark.org/agenda for the City Council meeting agenda and for links to the public hearing staff report which will be available one week before the public hearing.
DATED: May 3, 2021
BY: Judi A. Herren, City Clerk
5/7, 5/14/21
SPEN-3466088#
EXAMINER - REDWOOD CITY TRIBUNE

APPENDIX D
POPULATION AND EMPLOYMENT PROJECTIONS

CITY OF MENLO PARK

MEMORANDUM

Date: 10/5/2020
To: Menlo Park Water Department
From: Kyle Perata, Principal Planner
Re: ConnectMenlo Population and Employment Projections for 2020 Urban Water Management Plan

The City of Menlo Park Water Department (Water Department) asked the Planning Division to review the 2015 Urban Water Management Plan (2015 UWMP) projections for employment and population within the Water Department's service area and update the projections for population and employment growth from the City's 2016 General Plan Update (ConnectMenlo) for the period from 2020 through 2045. The General Plan sets the framework for development, with growth focused on the Bayfront Area of the Water Department's service area, through 2040, so the Planning Division has updated residential and employment projections from ConnectMenlo through 2040, not 2045. Projections beyond 2040 would be speculative.

This memo outlines the Planning Division's approach to the updated residential population and commercial employment projections. Outside of ConnectMenlo and the Facebook Campus Expansion Project, Planning Division staff did not adjust the population and employment growth in the remainder of the Water Department's service area.

Residential population within service area

Table 2-1 of the 2015 UWMP identifies the population growth expected through 2040 from the previous general plan and the population expected through 2040 with full buildout of the additional housing units created through ConnectMenlo. ConnectMenlo created the potential for up to 4,500 new housing units and a population of 11,570 new residents[1]. All of these new housing units would be located within the Water Department's service area. Planning Division staff did not modify the total residential population in the projections as the number of housing units is capped in ConnectMenlo; however, Planning Staff reviewed the City's approved and pending projects under ConnectMenlo to reallocate residential population increases within the five year planning increments based on when the currently proposed projects would likely be completed and occupied. The Planning Division is currently reviewing projects for a total of 3,049 housing units and all except Willow Village are anticipated to be complete and occupied by 2025. This shifts much of the residential population growth to 2025, including approximately half of the total proposed housing units in the Willow Village project. For 2030, the second half of the Willow Village project would be expected to be completed. No projects currently on file would be anticipated to be completed after 2030; for those years Planning staff split the additional expected population growth equally between 2035 and 2040. As stated previously, no population growth from ConnectMenlo is projected beyond 2040.

[1] The residential population projection is based on an average household size of 2.57 persons multiplied by the total (4,500) housing units available under ConnectMenlo.

Housing element

The Planning Division will be embarking on the next Housing Element update in 2021, which will require that the City plan for additional housing units. The Regional Housing Needs Assessment (RHNA) allocation from Association of Bay Area Governments (ABAG) has not occurred yet. However, the Planning Division anticipates that the City will be required to plan for approximately 3,000 housing units to accommodate population growth in the City, approximately half of which could be located in the Menlo Park Water Department service area. Since approximately slightly fewer than 1,500 housing units are still available under ConnectMenlo, those units would be able to be applied toward the RHNA allocation. The remaining anticipated approximately 1,500 housing units would likely be planned for outside of the Water Department's service area. Planning staff believe that the Housing Element update can be accommodated in the 2020 UWMP based on the available units under ConnectMenlo.

Employment projections within service area

Commercial square footage within the office, life sciences, and commercial (non-office retail/services) are capped but employees were not limited. Further, hotel rooms are capped at 400 rooms, also without an employment cap. While housing units are capped by ConnectMenlo, employment was not capped and the projections provided in the 2015 UWMP were based on the Planning Division's estimates at the time.

Table 2-2 of the 2015 UWMP identified an increase in approximately 5,500 employees within the Water Department's service area through ConnectMenlo. In addition to the 5,500 employees anticipated by ConnectMenlo, buildout of the previous general plan could accommodate approximately 3,400 employees within the Bayfront Area[2]. The total projected employment by 2040 in the Bayfront Area would be 8,900 employees (ConnectMenlo plus growth available under previous general plan). These are two distinct calculations; however, with 5,500 employees directly related to the net increase in growth under ConnectMenlo and 3,400 employees under the previous general plan and identified in general plan build out within the Water Department's service area. The total estimated employment based on the additional development potential (office, life sciences, commercial-retail, and hotels) created by ConnectMenlo, and accounting for the growth under the existing general plan, would be up to approximately 10,218 employees. This total employment could occur if ConnectMenlo was completely built out. The ConnectMenlo employment projection in Table 3-2 of the Draft EIR did not account for the Facebook office density at the Commonwealth Corporate Center Building 3 project proposal, nor did it accommodate the proposed Willow Village master plan project.

The majority of the proposed projects with commercial components require environmental review under the California Environmental Quality Act (CEQA) to determine if the proposed projects would result in impacts not identified through the ConnectMenlo certified EIR. Therefore, population increases above the estimated projections would be reviewed for potential environmental impacts through the CEQA

[2] Employment projection of previous general plan in Bayfront Area identified in Table 3-2 of the ConnectMenlo Draft Environmental Impact Report.

environmental analysis process for individual projects.

Planning Staff updated the ConnectMenlo employment projections based on approved and built projects, pending projects, and the net available development potential after accounting for all approved/built and pending projects. Reviewing these projects results in some employment growth by 2020 and moves all pending projects, with the exception of Willow Village into 2025. As with the residential population half of Willow Village is assumed to be constructed by 2025 with the second half built out by 2030. For the remaining development potential within ConnectMenlo, Planning staff allocated the employee growth, based on square footage, equally between 2035 and 2040. These projections account for the total available square footage in the Bayfront Area. The growth associated with the previous general plan would be accounted for in the Projected GP Build Out column. To ensure that the employment associated with the previous general plan was not double counted, Planning staff removed the 3,400 employees from the ConnectMenlo column after accounting for full build out since those employees would already have been accounted for in the general plan buildout without ConnectMenlo.

Conclusions and updated projections

The total residential population is static and the Planning Division limited modifications to the allocation of growth over the time period from 2020 to 2040 and did not modify the total expected population. Planning staff believe that ConnectMenlo can accommodate the forthcoming RHNA numbers for housing units that would need to be served by the Menlo Park Water Department. The remaining units would likely be located within the Cal Water service area.

With regard to employment growth, the estimate in ConnectMenlo was lower than the employment that could be accommodated within the square footage within the development cap because it did not account for the proposed Willow Village project or the employment density at the Commonwealth Building 3 project. Those projects are being reviewed through the CEQA process to determine if the proposed projects would result in any environmental effects.

The attached updated projections identify the ConnectMenlo growth in population and employment in five year increments. While the tables in the UWMP showed population and employment cumulatively, the Planning Division has shown the projections by year to help show the actual numbers per planning year for discussion purposes. The Water Department may wish to convert to a cumulative/running total for the projections to be consistent with the 2015 UWMP tables after reviewing the Planning Division’s updates.

	Population						Jobs					
Date	2015 UWMP	Actual (CM)	HE	Projected (CM) - net new	Projected (GP Buildout - net new + growth) (former UWMP #)	Total Projected (GP buildout + CM)	2015 UWMP	Actual (CM)	Projected (CM)	Other (FB West Campus)	Projected (GP Buildout) (numbers from UWMP #)	Total Projected (GP buildout + CM + FB)
2010	14,749						11,637					
2011	14,829						11,798					
2012	14,973						11,959					
2013	15,129						12,121					
2014	15,157						12,282					
2015	15,342						12,443					
2016	15,918						14,693					
2017	16,495						16,943					
2018	17,071						19,193					
2019	17,648											
2020	18,224	0		0	18,224	18,224	23,693	31	0	6,400	17,143	23,574
2025	21,214	5,062		2,893	18,321	23,383	25,918	4,937	1,375	150	17,993	29,511
2030	24,204	1,685		5,785	18,419	25,166	28,143	1,995	2,750	0	18,843	32,356
2035	27,194	2,412		8,678	18,516	27,675	30,368	1,628	4,125	0	19,693	34,834
2040	30,184	2,411		11,570	18,614	30,184	32,593	1,628	5,500	0	20,543	37,311
2045												

APPENDIX E
SBX7-7 COMPLIANCE TABLES

SB X7-7 Table 0: Units of Measure Used in 2020 UWMP* *(select one from the drop down list)*
Million Gallons
**The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.*
NOTES:

SB X7-7 Table 2: Method for 2020 Population Estimate	
Method Used to Determine 2020 Population (may check more than one)	
☐	**1. Department of Finance** (DOF) or **American Community Survey** (ACS)
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☑	**4. Other** DWR recommends pre-review
NOTES: (a) The 2020 population was estimated by the City using the GIS-based method recommended by DWR and is described in Section 5.1.	

SB X7-7 Table 3: 2020 Service Area Population	
2020 Compliance Year Population	
2020	18,276
NOTES:	

SB X7-7 Table 4: 2020 Gross Water Use							
Compliance Year 2020	**2020 Volume Into Distribution System** *This column will remain blank until SB X7-7 Table 4-A is completed.*	**2020 Deductions**					**2020 Gross Water Use**
		Exported Water *	**Change in Dist. System Storage*** (+/-)	**Indirect Recycled Water** *This column will remain blank until SB X7-7 Table 4-B is completed.*	**Water Delivered for Agricultural Use***	**Process Water** *This column will remain blank until SB X7-7 Table 4-D is completed.*	
	1,069	-	-	-	-	-	**1,069**
*** Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.							
NOTES:							

SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD)		
2020 Gross Water *Fm SB X7-7 Table 4*	**2020 Population** *Fm SB X7-7 Table 3*	**2020 GPCD**
1,069	18,276	**160**
NOTES:		

SB X7-7 Table 9: 2020 Compliance

Actual 2020 GPCD[1]	Optional Adjustments to 2020 GPCD (Enter "0" if Adjustment Not Used)			TOTAL Adjustments[1]	Adjusted 2020 GPCD [1] *(Adjusted if applicable)*	2020 Confirmed Target GPCD [1, 2]	**Did Supplier Achieve Targeted Reduction for 2020?**
	Extraordinary Events[1]	Weather Normalization[1]	Economic Adjustment[1]				
160	-	-	-	-	160	204	**YES**

[1] *All values are reported in GPCD*

[2] ***2020 Confirmed Target GPCD*** *is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.*

NOTES:

SB X7-7 Table 7: 2020 Target Method *Select Only One*		
Target Method		Supporting Documentation
☑	Method 1	SB X7-7 Table 7A
☐	Method 2	SB X7-7 Tables 7B, 7C, and 7D *Contact DWR for these tables*
☐	Method 3	SB X7-7 Table 7-E
☐	Method 4	Method 4 Calculator
NOTES:		

SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	**2020 Target GPCD**
255	**204**
NOTES:	

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target			
5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target[1]	Calculated 2020 Target[2]	**Confirmed 2020 Target**
236	224	204	**204**

[1] Maximum 2020 Target is 95% of the 5 Year Baseline GPCD *[2] 2020 Target is calculated based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target.*

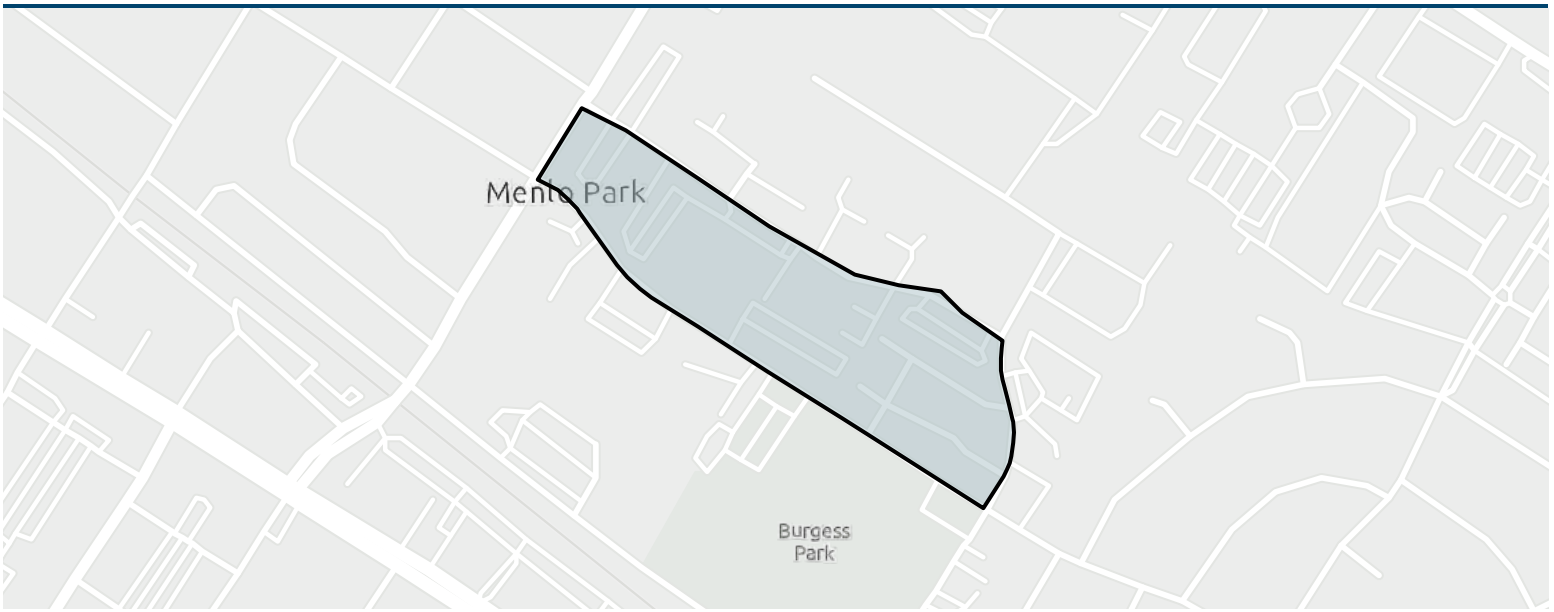
NOTES:

APPENDIX F
2020 CURRENT POPULATION ESTIMATE

MP Water Demographic and Income Profile

Burgess SRI Census Blocks-Combined
Area: 0.02 square miles

Prepared by Menlo Park GIS



Summary	Census 2010	2020	2025
Population	90	94	94
Households	31	31	31
Families	17	17	17
Average Household Size	2.90	3.03	3.03
Owner Occupied Housing Units	14	15	15
Renter Occupied Housing Units	17	16	16
Median Age	37.8	37.8	38.0

Trends: 2020-2025 Annual Rate	Area	State	National
Population	0.00%	0.55%	0.72%
Households	0.00%	0.50%	0.72%
Families	0.00%	0.50%	0.64%
Owner HHs	0.00%	0.65%	0.72%
Median Household Income	0.00%	1.81%	1.60%

	2020		2025	
Households by Income	Number	Percent	Number	Percent
<$15,000	0	0.0%	0	0.0%
$15,000 - $24,999	1	3.2%	0	0.0%
$25,000 - $34,999	0	0.0%	0	0.0%
$35,000 - $49,999	0	0.0%	0	0.0%
$50,000 - $74,999	2	6.5%	1	3.2%
$75,000 - $99,999	2	6.5%	2	6.5%
$100,000 - $149,999	4	12.9%	4	12.9%
$150,000 - $199,999	5	16.1%	5	16.1%
$200,000+	16	51.6%	17	54.8%

Median Household Income	$200,001	$200,001
Average Household Income	$269,643	$291,603
Per Capita Income	$118,544	$128,199

Source: Esri, U.S. Census

February 04, 2021

MP Water Demographic and Income Profile

Burgess SRI Census Blocks-Combined
Area: 0.02 square miles

Prepared by Menlo Park GIS

	Census 2010		2020		2025	
Population by Age	Number	Percent	Number	Percent	Number	Percent
0 - 4	7	7.7%	7	7.5%	7	7.4%
5 - 9	6	6.6%	6	6.5%	6	6.4%
10 - 14	5	5.5%	5	5.4%	5	5.3%
15 - 19	2	2.2%	2	2.2%	2	2.1%
20 - 24	3	3.3%	3	3.2%	3	3.2%
25 - 34	17	18.7%	18	19.4%	18	19.1%
35 - 44	18	19.8%	18	19.4%	18	19.1%
45 - 54	13	14.3%	12	12.9%	11	11.7%
55 - 64	9	9.9%	9	9.7%	9	9.6%
65 - 74	6	6.6%	8	8.6%	8	8.5%
75 - 84	3	3.3%	3	3.2%	5	5.3%
85+	2	2.2%	2	2.2%	2	2.1%
	Census 2010		**2020**		**2025**	
Race and Ethnicity	Number	Percent	Number	Percent	Number	Percent
White Alone	72	80.0%	69	74.2%	67	70.5%
Black Alone	1	1.1%	1	1.1%	1	1.1%
American Indian Alone	0	0.0%	0	0.0%	0	0.0%
Asian Alone	10	11.1%	15	16.1%	18	18.9%
Pacific Islander Alone	0	0.0%	0	0.0%	0	0.0%
Some Other Race Alone	1	1.1%	1	1.1%	1	1.1%
Two or More Races	6	6.7%	7	7.5%	8	8.4%
Hispanic Origin (Any Race)	5	5.6%	5	5.3%	5	5.3%

Data Note: Income is expressed in current dollars.

Source: Esri, U.S. Census

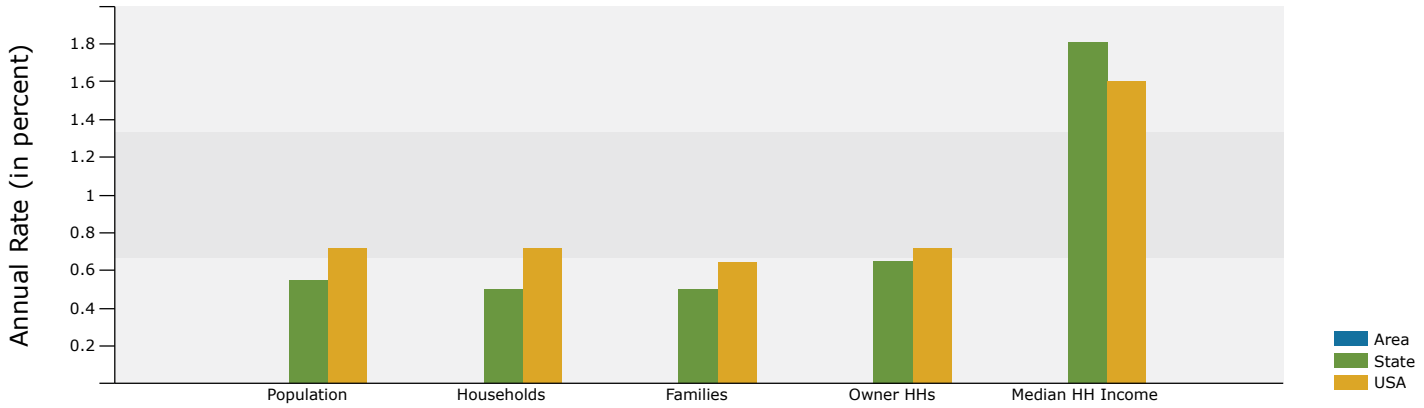
February 04, 2021

MP Water Demographic and Income Profile

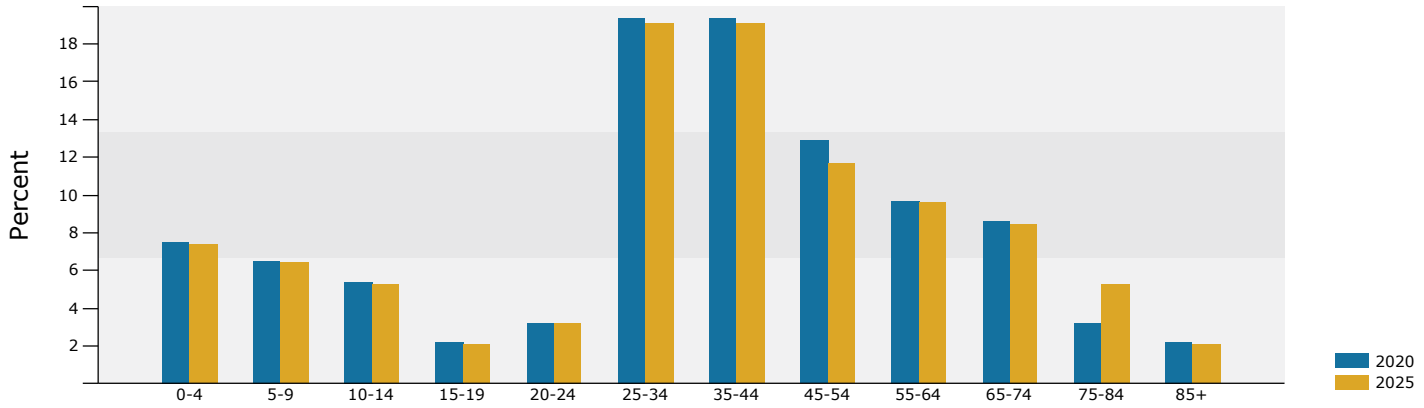
Burgess SRI Census Blocks-Combined
Area: 0.02 square miles

Prepared by Menlo Park GIS

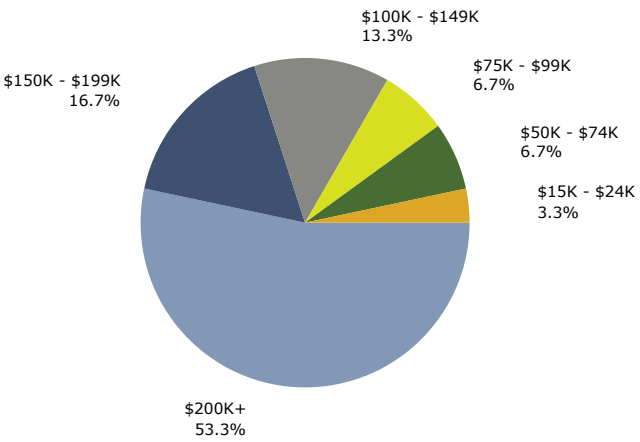
Trends 2020-2025



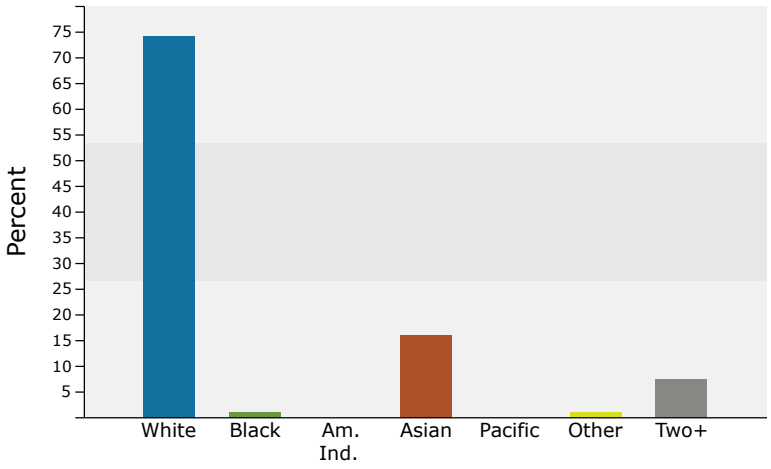
Population by Age



2020 Household Income



2020 Population by Race



2020 Percent Hispanic Origin:5.3%

Source: Esri, U.S. Census

February 04, 2021

MP Water Demographic and Income Profile

Block 1005

Prepared by Menlo Park GIS

Summary	Census 2010	2020	2025
Population	113	114	114
Households	52	52	52
Families	30	30	30
Average Household Size	2.13	2.15	2.15
Owner Occupied Housing Units	33	34	35
Renter Occupied Housing Units	19	18	18
Median Age	38.4	40.9	41.4

Trends: 2020-2025 Annual Rate	Area	State	National
Population	0.00%	0.55%	0.72%
Households	0.00%	0.50%	0.72%
Families	0.00%	0.50%	0.64%
Owner HHs	0.58%	0.65%	0.72%
Median Household Income	0.00%	1.81%	1.60%

	2020		2025	
Households by Income	Number	Percent	Number	Percent
<$15,000	2	3.8%	2	3.8%
$15,000 - $24,999	1	1.9%	1	1.9%
$25,000 - $34,999	1	1.9%	1	1.9%
$35,000 - $49,999	0	0.0%	0	0.0%
$50,000 - $74,999	3	5.8%	3	5.8%
$75,000 - $99,999	3	5.8%	3	5.8%
$100,000 - $149,999	5	9.6%	5	9.6%
$150,000 - $199,999	7	13.5%	7	13.5%
$200,000+	29	55.8%	32	61.5%

Median Household Income	$200,001	$200,001
Average Household Income	$259,604	$283,748
Per Capita Income	$105,255	$115,041

Source: Esri, U.S. Census

February 04, 2021

MP Water Demographic and Income Profile

Block 1005

Prepared by Menlo Park GIS

	Census 2010		2020		2025	
Population by Age	Number	Percent	Number	Percent	Number	Percent
0 - 4	10	8.8%	7	6.2%	7	6.1%
5 - 9	10	8.8%	8	7.1%	8	7.0%
10 - 14	5	4.4%	9	8.0%	8	7.0%
15 - 19	3	2.7%	9	8.0%	8	7.0%
20 - 24	5	4.4%	4	3.5%	7	6.1%
25 - 34	16	14.2%	11	9.7%	10	8.8%
35 - 44	22	19.5%	15	13.3%	14	12.3%
45 - 54	16	14.2%	20	17.7%	18	15.8%
55 - 64	16	14.2%	14	12.4%	16	14.0%
65 - 74	6	5.3%	11	9.7%	11	9.6%
75 - 84	3	2.7%	4	3.5%	6	5.3%
85+	1	0.9%	1	0.9%	1	0.9%
	Census 2010		**2020**		**2025**	
Race and Ethnicity	Number	Percent	Number	Percent	Number	Percent
White Alone	88	77.9%	83	72.8%	79	69.3%
Black Alone	3	2.7%	2	1.8%	2	1.8%
American Indian Alone	0	0.0%	0	0.0%	0	0.0%
Asian Alone	11	9.7%	16	14.0%	19	16.7%
Pacific Islander Alone	0	0.0%	0	0.0%	0	0.0%
Some Other Race Alone	4	3.5%	4	3.5%	4	3.5%
Two or More Races	7	6.2%	9	7.9%	10	8.8%
Hispanic Origin (Any Race)	11	9.7%	10	8.8%	10	8.8%

Data Note: Income is expressed in current dollars.

Source: Esri, U.S. Census

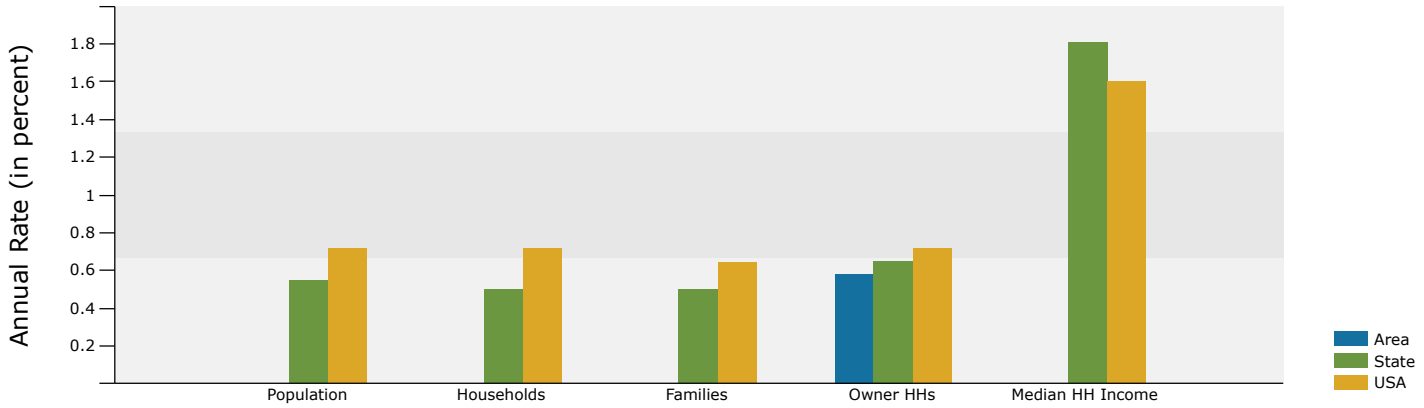
February 04, 2021

MP Water Demographic and Income Profile

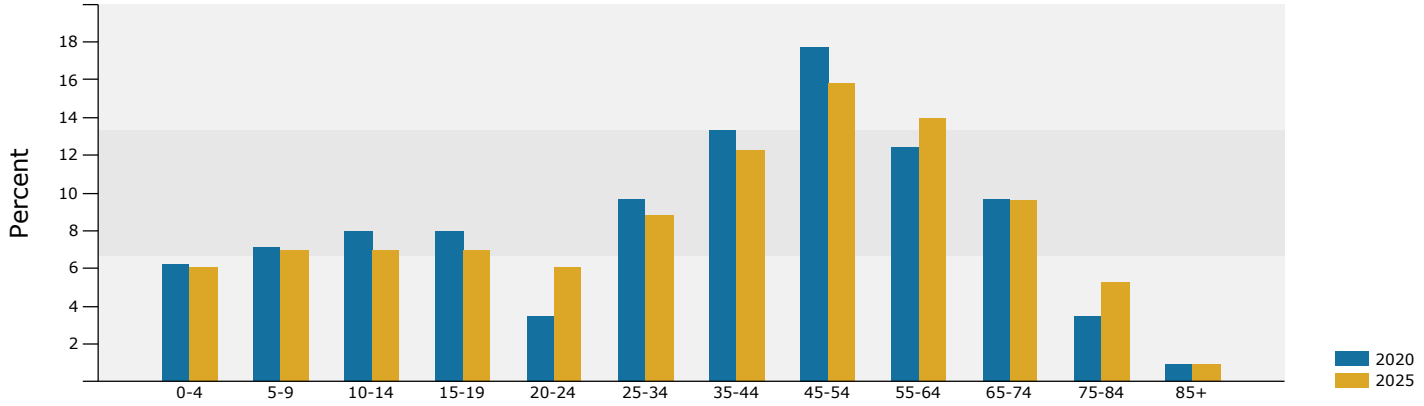
Block 1005

Prepared by Menlo Park GIS

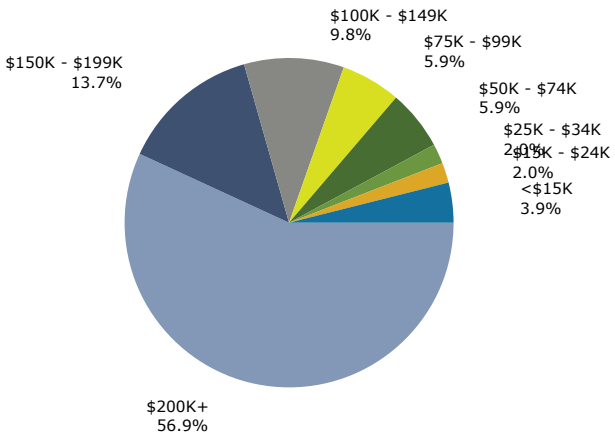
Trends 2020-2025



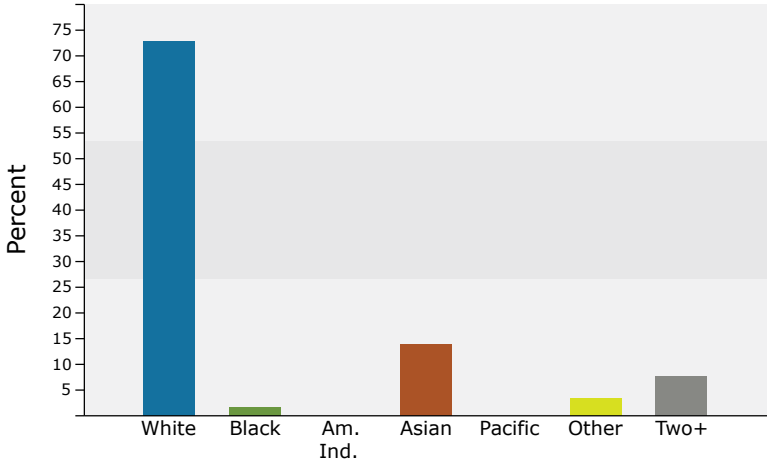
Population by Age



2020 Household Income



2020 Population by Race



2020 Percent Hispanic Origin:8.8%

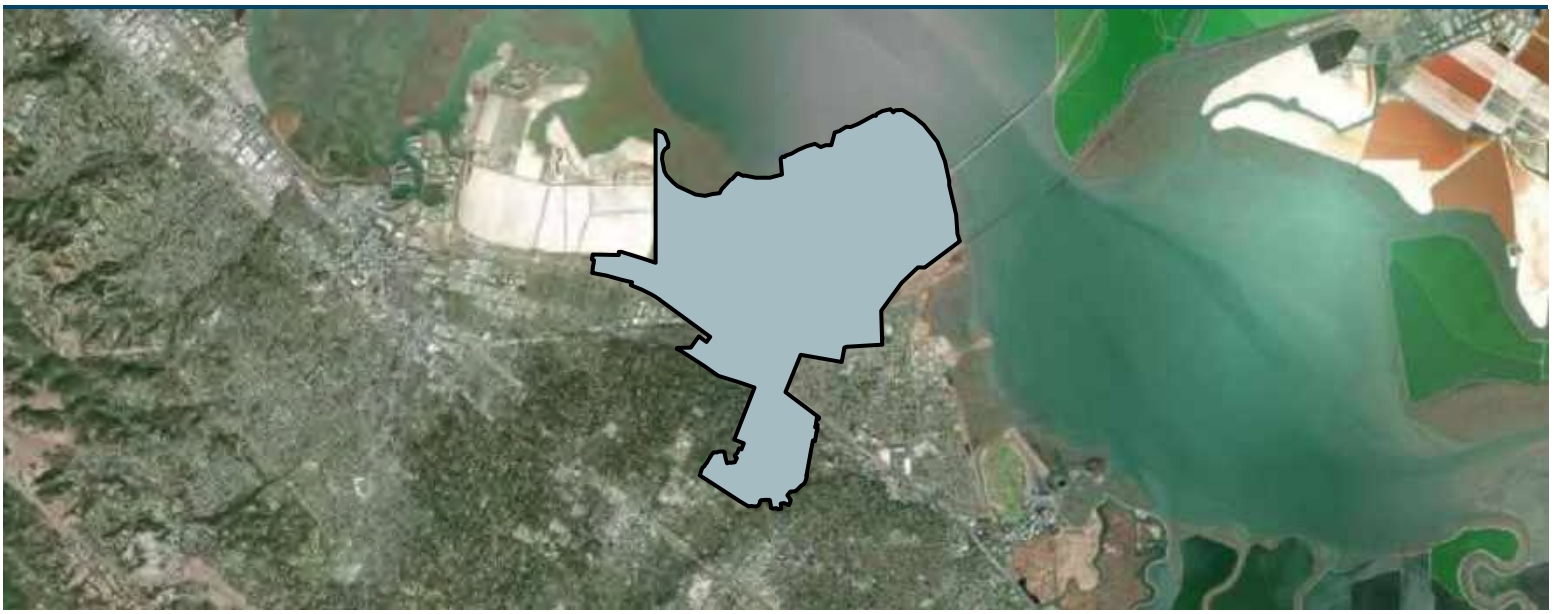
Source: Esri, U.S. Census

February 04, 2021

MP Water Demographic and Income Profile

Menlo Park Municipal Water-Lower Zone
Area: 5.78 square miles

Prepared by Menlo Park GIS



Summary	Census 2010	2020	2025
Population	11,931	14,235	14,748
Households	3,556	4,335	4,451
Families	2,536	3,167	3,262
Average Household Size	3.27	3.22	3.25
Owner Occupied Housing Units	2,173	2,281	2,368
Renter Occupied Housing Units	1,383	2,054	2,083
Median Age	34.5	34.6	35.3

Trends: 2020-2025 Annual Rate	Area	State	National
Population	0.71%	0.55%	0.72%
Households	0.53%	0.50%	0.72%
Families	0.59%	0.50%	0.64%
Owner HHs	0.75%	0.65%	0.72%
Median Household Income	1.88%	1.81%	1.60%

	2020		2025	
Households by Income	Number	Percent	Number	Percent
<$15,000	356	8.2%	302	6.8%
$15,000 - $24,999	134	3.1%	117	2.6%
$25,000 - $34,999	147	3.4%	125	2.8%
$35,000 - $49,999	257	5.9%	247	5.5%
$50,000 - $74,999	504	11.6%	481	10.8%
$75,000 - $99,999	382	8.8%	399	9.0%
$100,000 - $149,999	659	15.2%	688	15.5%
$150,000 - $199,999	450	10.4%	490	11.0%
$200,000+	1,448	33.4%	1,603	36.0%
Median Household Income	$125,133		$137,379	
Average Household Income	$185,593		$203,256	
Per Capita Income	$58,093		$62,929	

Source: Esri, U.S. Census

February 04, 2021

MP Water Demographic and Income Profile

Menlo Park Municipal Water-Lower Zone
Area: 5.78 square miles

Prepared by Menlo Park GIS

	Census 2010		2020		2025	
Population by Age	Number	Percent	Number	Percent	Number	Percent
0 - 4	1,072	9.0%	1,120	7.9%	1,168	7.9%
5 - 9	981	8.2%	1,112	7.8%	1,109	7.5%
10 - 14	843	7.1%	1,111	7.8%	1,066	7.2%
15 - 19	757	6.3%	912	6.4%	932	6.3%
20 - 24	699	5.9%	848	6.0%	856	5.8%
25 - 34	1,695	14.2%	2,096	14.7%	2,183	14.8%
35 - 44	1,919	16.1%	2,008	14.1%	2,131	14.5%
45 - 54	1,724	14.4%	1,868	13.1%	1,818	12.3%
55 - 64	1,143	9.6%	1,583	11.1%	1,652	11.2%
65 - 74	573	4.8%	947	6.7%	1,056	7.2%
75 - 84	357	3.0%	424	3.0%	560	3.8%
85+	168	1.4%	204	1.4%	215	1.5%
	Census 2010		**2020**		**2025**	
Race and Ethnicity	Number	Percent	Number	Percent	Number	Percent
White Alone	6,335	53.1%	6,919	48.6%	6,850	46.4%
Black Alone	1,288	10.8%	1,355	9.5%	1,343	9.1%
American Indian Alone	111	0.9%	127	0.9%	134	0.9%
Asian Alone	792	6.6%	1,515	10.6%	1,781	12.1%
Pacific Islander Alone	376	3.2%	442	3.1%	461	3.1%
Some Other Race Alone	2,466	20.7%	3,078	21.6%	3,291	22.3%
Two or More Races	563	4.7%	799	5.6%	888	6.0%
Hispanic Origin (Any Race)	4,689	39.3%	5,784	40.6%	6,116	41.5%

Data Note: Income is expressed in current dollars.

Source: Esri, U.S. Census

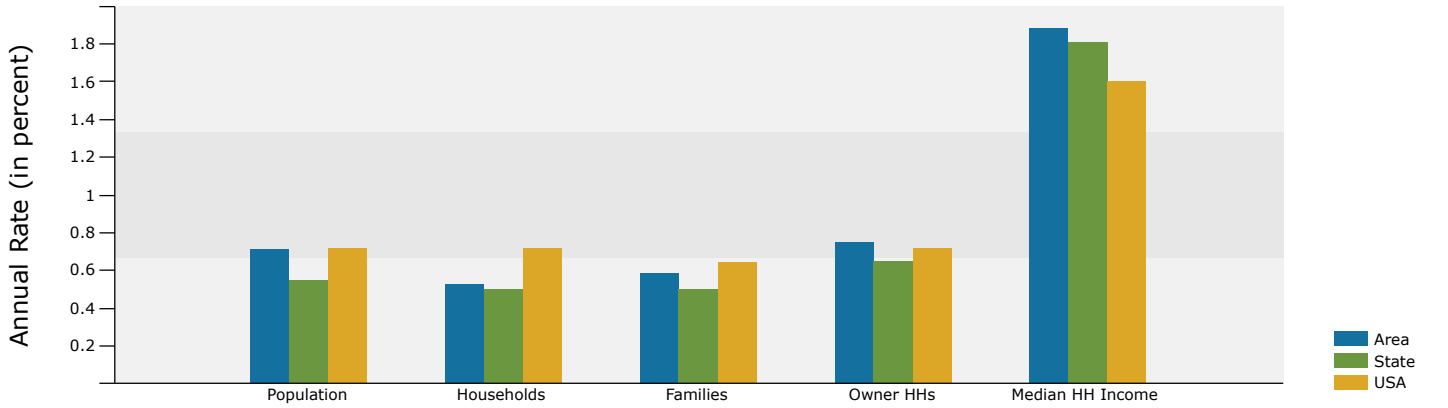
February 04, 2021

MP Water Demographic and Income Profile

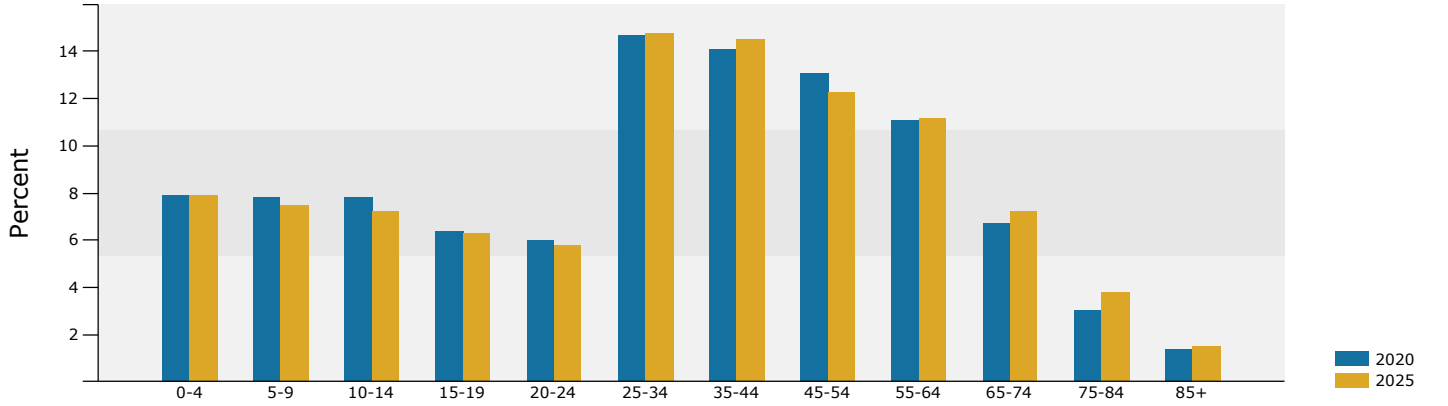
Menlo Park Municipal Water-Lower Zone
Area: 5.78 square miles

Prepared by Menlo Park GIS

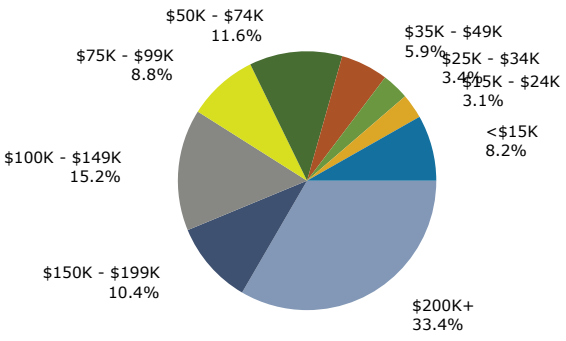
Trends 2020-2025



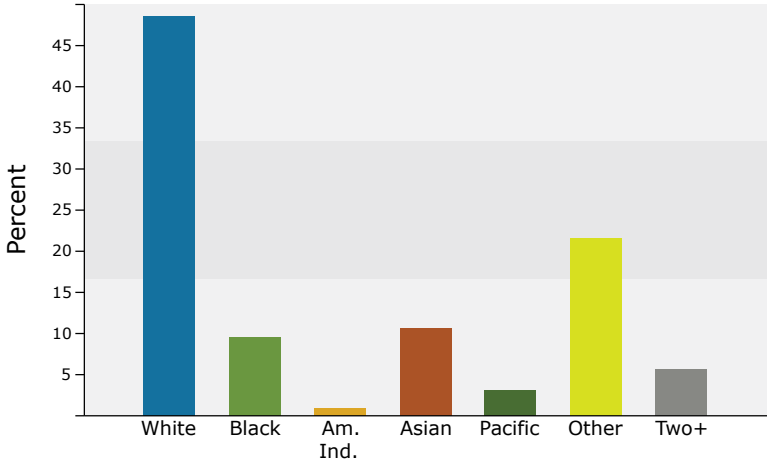
Population by Age



2020 Household Income



2020 Population by Race



2020 Percent Hispanic Origin:40.6%

Source: Esri, U.S. Census

February 04, 2021

MP Water Demographic and Income Profile

Uninc Area
Area: 0.02 square miles

Prepared by Menlo Park GIS

Summary	Census 2010	2020	2025
Population	305	609	706
Households	111	184	214
Families	59	99	115
Average Household Size	2.48	3.12	3.14
Owner Occupied Housing Units	67	97	115
Renter Occupied Housing Units	44	87	99
Median Age	40.3	40.1	40.6

Trends: 2020-2025 Annual Rate	Area	State	National
Population	3.00%	0.55%	0.72%
Households	3.07%	0.50%	0.72%
Families	3.04%	0.50%	0.64%
Owner HHs	3.46%	0.65%	0.72%
Median Household Income	0.71%	1.81%	1.60%

	2020		2025	
Households by Income	Number	Percent	Number	Percent
<$15,000	13	7.1%	14	6.5%
$15,000 - $24,999	13	7.1%	14	6.5%
$25,000 - $34,999	13	7.1%	14	6.5%
$35,000 - $49,999	19	10.3%	21	9.8%
$50,000 - $74,999	31	16.8%	38	17.8%
$75,000 - $99,999	8	4.3%	10	4.7%
$100,000 - $149,999	18	9.8%	27	12.6%
$150,000 - $199,999	24	13.0%	30	14.0%
$200,000+	45	24.5%	44	20.6%
Median Household Income	$83,298		$86,309	
Average Household Income	$132,620		$132,127	
Per Capita Income	$53,121		$53,085	

Source: Esri, U.S. Census

February 04, 2021

MP Water Demographic and Income Profile

Uninc Area
Area: 0.02 square miles

Prepared by Menlo Park GIS

Population by Age	Census 2010 Number	Census 2010 Percent	2020 Number	2020 Percent	2025 Number	2025 Percent
0 - 4	19	6.2%	35	5.7%	41	5.8%
5 - 9	12	3.9%	36	5.9%	42	5.9%
10 - 14	14	4.6%	36	5.9%	43	6.1%
15 - 19	17	5.6%	29	4.8%	42	5.9%
20 - 24	21	6.9%	36	5.9%	37	5.2%
25 - 34	45	14.8%	89	14.6%	91	12.9%
35 - 44	47	15.4%	84	13.8%	98	13.9%
45 - 54	55	18.0%	85	13.9%	94	13.3%
55 - 64	44	14.4%	88	14.4%	97	13.7%
65 - 74	19	6.2%	61	10.0%	76	10.8%
75 - 84	10	3.3%	23	3.8%	36	5.1%
85+	2	0.7%	8	1.3%	9	1.3%

Race and Ethnicity	Census 2010 Number	Census 2010 Percent	2020 Number	2020 Percent	2025 Number	2025 Percent
White Alone	176	57.7%	330	54.2%	366	51.8%
Black Alone	9	3.0%	16	2.6%	17	2.4%
American Indian Alone	5	1.6%	9	1.5%	11	1.6%
Asian Alone	26	8.5%	73	12.0%	99	14.0%
Pacific Islander Alone	4	1.3%	8	1.3%	9	1.3%
Some Other Race Alone	64	21.0%	127	20.9%	148	21.0%
Two or More Races	21	6.9%	46	7.6%	56	7.9%
Hispanic Origin (Any Race)	123	40.3%	242	39.7%	279	39.5%

Data Note: Income is expressed in current dollars.

Source: Esri, U.S. Census

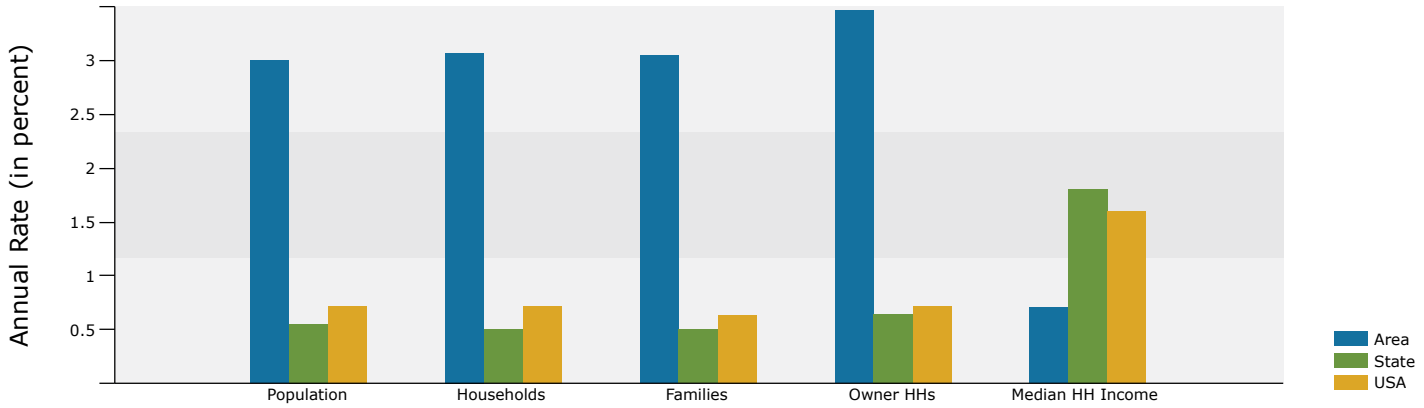
February 04, 2021

MP Water Demographic and Income Profile

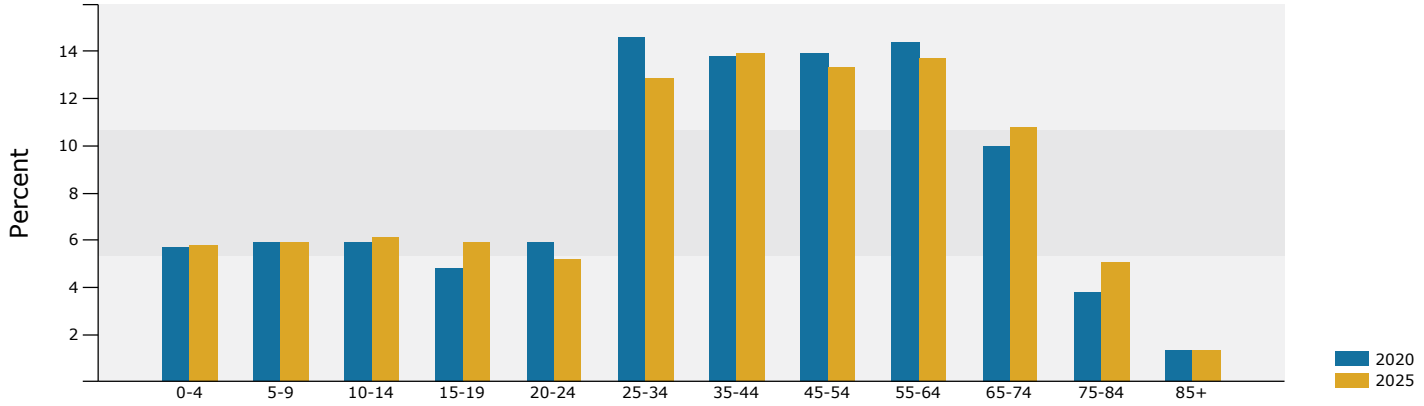
Uninc Area
Area: 0.02 square miles

Prepared by Menlo Park GIS

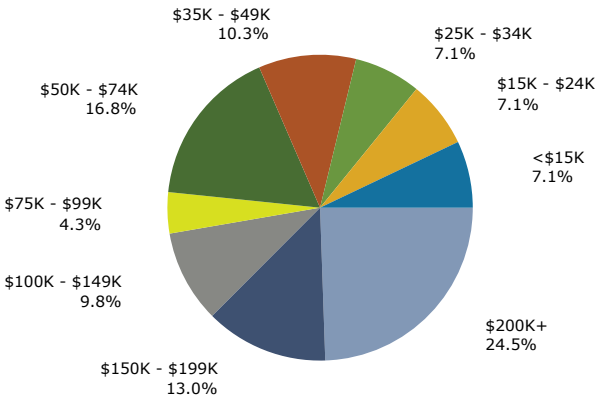
Trends 2020-2025



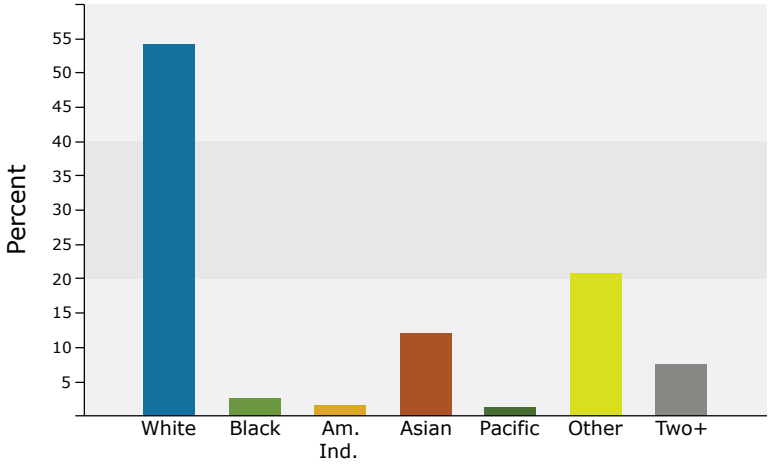
Population by Age



2020 Household Income



2020 Population by Race



2020 Percent Hispanic Origin:39.7%

Source: Esri, U.S. Census

February 04, 2021

APPENDIX G
SFPUC AND BAWSCA COMMON LANGUAGE FOR 2020 UWMPS

February 3, 2021

Draft Common Language for BAWSCA Member Agencies' 2020 UWMPs

Tier One Drought Allocations

In July 2009, San Francisco and its Wholesale Customers in Alameda County, Santa Clara County, and San Mateo County (Wholesale Customers) adopted the Water Supply Agreement (WSA), which includes a Water Shortage Allocation Plan (WSAP) that describes the method for allocating water from the Regional Water System (RWS) between Retail and Wholesale Customers during system-wide shortages of 20 percent or less. The WSAP, also known as the Tier One Plan, was amended in the 2018 Amended and Restated WSA.

The SFPUC allocates water under the Tier One Plan when it determines that the projected available water supply is up to 20 percent less than projected system-wide water purchases. The following table shows the SFPUC (i.e, Retail Customers) share and the Wholesale Customers' share of the annual water supply available during shortages depending on the level of system-wide reduction in water use that is required. The Wholesale Customers' share will be apportioned among the individual Wholesale Customers based on a separate methodology adopted by the Wholesale Customers, known as the Tier Two Plan, discussed further below.

Level of System-Wide Reduction in Water Use Required	Share of Available Water	
	SFPUC Share	Wholesale Customers Share
5% or less	35.5%	64.5%
6% through 10%	36.0%	64.0%
11% through 15%	37.0%	63.0%
16% through 20%	37.5%	62.5%

The Tier One Plan allows for voluntary transfers of shortage allocations between the SFPUC and any Wholesale Customer as well as between Wholesale Customers themselves. In addition, water "banked" by a Wholesale Customer, through reductions in usage greater than required, may also be transferred.

As amended in 2018, the Tier One Plan requires Retail Customers to conserve a minimum of 5% during droughts. If Retail Customer demands are lower than the Retail Customer allocation (resulting in a "positive allocation" to Retail[1]) then the excess percentage would be re-allocated to the Wholesale Customers' share. The additional water conserved by Retail Customers up to the minimum 5% level is deemed to remain in storage for allocation in future successive dry years.

The Tier One Plan will expire at the end of the term of the WSA in 2034, unless mutually extended by San Francisco and the Wholesale Customers.

The Tier One Plan applies only when the SFPUC determines that a system-wide water shortage exists and issues a declaration of a water shortage emergency under California Water Code

[1] See Water Supply Agreement, Water Shortage Allocation Plan (Attachment H), Section 2.1.

Section 350. Separate from a declaration of a water shortage emergency, the SFPUC may opt to request voluntary cutbacks from its Retail and Wholesale Customers to achieve necessary water use reductions during drought periods.

Tier Two Drought Allocations

The Wholesale Customers have negotiated and adopted the Tier Two Plan, referenced above, which allocates the collective Wholesale Customer share from the Tier One Plan among each of the 26 Wholesale Customers. These Tier Two allocations are based on a formula that takes into account multiple factors for each Wholesale Customer including:

- Individual Supply Guarantee;
- Seasonal use of all available water supplies; and
- Residential per capita use.

The water made available to the Wholesale Customers collectively will be allocated among them in proportion to each Wholesale Customer's Allocation Basis, expressed in millions of gallons per day (mgd), which in turn is the weighted average of two components. The first component is the Wholesale Customer's Individual Supply Guarantee, as stated in the WSA, and is fixed. The second component, the Base/Seasonal Component, is variable and is calculated using the monthly water use for three consecutive years prior to the onset of the drought for each of the Wholesale Customers for all available water supplies. The second component is accorded twice the weight of the first, fixed component in calculating the Allocation Basis. Minor adjustments to the Allocation Basis are then made to ensure a minimum cutback level, a maximum cutback level, and a sufficient supply for certain Wholesale Customers.

The Allocation Basis is used in a fraction, as numerator, over the sum of all Wholesale Customers' Allocation Bases to determine each wholesale customer's Allocation Factor. The final shortage allocation for each Wholesale Customer is determined by multiplying the amount of water available to the Wholesale Customers' collectively under the Tier One Plan, by the Wholesale Customer's Allocation Factor.

The Tier Two Plan requires that the Allocation Factors be calculated by BAWSCA each year in preparation for a potential water shortage emergency. As the Wholesale Customers change their water use characteristics (e.g., increases or decreases in SFPUC purchases and use of other water sources, changes in monthly water use patterns, or changes in residential per capita water use), the Allocation Factor for each Wholesale Customer will also change. However, for long-term planning purposes, each Wholesale Customer shall use as its Allocation Factor, the value identified in the Tier Two Plan when adopted.

The Tier Two Plan, which initially expired in 2018, has been extended by the BAWSCA Board of Directors every year since for one additional calendar year. In November 2020, the BAWSCA Board voted to extend the Tier Two Plan through the end of 2021.

Individual Supply Guarantee

San Francisco has a perpetual commitment (Supply Assurance) to deliver 184 mgd to the 24 permanent Wholesale Customers collectively. San Jose and Santa Clara are not included in the Supply Assurance commitment and each has temporary and interruptible water supply

contracts with San Francisco. The Supply Assurance is allocated among the 24 permanent Wholesale Customers through Individual Supply Guarantees (ISG), which represent each Wholesale Customer's allocation of the 184 mgd Supply Assurance.

[Name of Agency's] ISG is _____ mgd.

2028 SFPUC Decisions (formerly 2018 SFPUC Decisions)
[Note: This section is intended to be optional language that individual BAWSCA member agencies may use.]

In the 2009 WSA, the SFPUC committed to make three decisions before 2018 that affect water supply development:

- Whether or not to make the cities of San Jose and Santa Clara permanent customers,
- Whether or not to supply the additional unmet supply needs of the Wholesale Customers beyond 2018, and
- Whether or not to increase the wholesale customer Supply Assurance above 184 mgd.

Events since 2009 made it difficult for the SFPUC to conduct the necessary water supply planning and CEQA analysis required to make these three decisions before 2018. Therefore, in the 2018 Amended and Restated WSA, the decisions were deferred for 10 years to 2028.

Additionally, there have been recent changes to instream flow requirements and customer demand projections that have affected water supply planning beyond 2018. As a result, the SFPUC has established an Alternative Water Supply Planning program to evaluate several regional and local water supply options. Through this program, the SFPUC will conduct feasibility studies and develop an Alternative Water Supply Plan by July 2023 to support the continued development of water supplies to meet future needs.

Reliability of the Regional Water System

In 2008, the SFPUC adopted Level of Service (LOS) Goals and Objectives in conjunction with the adoption of WSIP. The SFPUC updated the LOS Goals and Objectives in February 2020.

The SFPUC's LOS Goals and Objectives related to water supply are:

Program Goal	System Performance Objective
Water Supply – *meet customer water needs in non-drought and drought periods*	• Meet all state and federal regulations to support the proper operation of the water system and related power facilities. • Meet average annual water demand of 265 mgd from the SFPUC watersheds for retail and Wholesale Customers during non–drought years for system demands consistent with the 2009 Water Supply Agreement. • Meet dry-year delivery needs while limiting rationing to a maximum 20 percent system-wide reduction in water service during extended droughts. • Diversify water supply options during non-drought and drought periods. • Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers.

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Factors Impacting Supply Reliability

Adoption of the 2018 Bay-Delta Plan Amendment

In December 2018, the State Water Resources Control Board (SWRCB) adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) to establish water quality objectives to maintain the health of the Bay-Delta ecosystem. The SWRCB is required by law to regularly review this plan. The adopted Bay-Delta Plan Amendment was developed with the stated goal of increasing salmonid populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay-Delta. The Bay-Delta Plan Amendment requires the release of 30-50% of the "unimpaired flow"[2] on the three tributaries from February through June in every year type. In SFPUC modeling of the new flow standard, it is assumed that the required release is 40% of unimpaired flow.

If the Bay-Delta Plan Amendment is implemented, the SFPUC will be able to meet the projected water demands presented in this UWMP in normal years but would experience supply shortages in single dry years or multiple dry years. Implementation of the Bay-Delta Plan Amendment will require rationing in all single dry years and multiple dry years. The SFPUC has initiated an Alternative Water Supply Planning Program to ensure that San Francisco can meet its Retail and Wholesale Customer water needs, address projected dry years shortages, and limit rationing to a maximum 20 percent system-wide in accordance with adopted SFPUC policies. This program is in early planning stages and is intended to meet future water supply challenges and vulnerabilities such as environmental flow needs and other regulatory changes; earthquakes, disasters, and emergencies; increases in population and employment; and climate

[2] "Unimpaired flow represents the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds." (Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Dec. 12, 2018) p.17, fn. 14, available at https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf.)

change. As the region faces future challenges – both known and unknown – the SFPUC is considering this suite of diverse non-traditional supplies and leveraging regional partnerships to meet Retail and Wholesale Customer needs through 2045.

The SWRCB has stated that it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, assuming all required approvals are obtained by that time. But implementation of the Plan Amendment is uncertain for multiple reasons.

First, since adoption of the Bay-Delta Plan Amendment, over a dozen lawsuits have been filed in both state and federal courts, challenging the SWRCB's adoption of the Bay-Delta Plan Amendment, including a legal challenge filed by the federal government, at the request of the U.S. Department of Interior, Bureau of Reclamation. This litigation is in the early stages and there have been no dispositive court rulings as of this date.

Second, the Bay-Delta Plan Amendment is not self-implementing and does not automatically allocate responsibility for meeting its new flow requirements to the SFPUC or any other water rights holders. Rather, the Bay-Delta Plan Amendment merely provides a regulatory framework for flow allocation, which must be accomplished by other regulatory and/or adjudicatory proceedings, such as a comprehensive water rights adjudication or, in the case of the Tuolumne River, may be implemented through the water quality certification process set forth in section 401 of the Clean Water Act as part of the Federal Energy Regulatory Commission's licensing proceedings for the Don Pedro and La Grange hydroelectric projects. It is currently unclear when the license amendment process is expected to be completed. This process and the other regulatory and/or adjudicatory proceedings would likely face legal challenges and have lengthy timelines, and quite possibly could result in a different assignment of flow responsibility (and therefore a different water supply impact on the SFPUC).

Third, in recognition of the obstacles to implementation of the Bay-Delta Plan Amendment, the SWRCB Resolution No. 2018-0059 adopting the Bay-Delta Plan Amendment directed staff to help complete a "Delta watershed-wide agreement, including potential flow measures for the Tuolumne River" by March 1, 2019, and to incorporate such agreements as an "alternative" for a future amendment to the Bay-Delta Plan to be presented to the SWRCB "as early as possible after December 1, 2019." In accordance with the SWRCB's instruction, on March 1, 2019, SFPUC, in partnership with other key stakeholders, submitted a proposed project description for the Tuolumne River that could be the basis for a voluntary substitute agreement with the SWRCB ("March 1st Proposed Voluntary Agreement"). On March 26, 2019, the Commission adopted Resolution No. 19-0057 to support the SFPUC's participation in the Voluntary Agreement negotiation process. To date, those negotiations are ongoing under the California Natural Resources Agency and the leadership of the Newsom administration.[3]

Water Supply – All Year Types

The SFPUC historically has met demand in its service area in all year types from its watersheds, which consist of:

- Tuolumne River watershed
- Alameda Creek watershed

[3] California Natural Resources Agency, "Voluntary Agreements to Improve Habitat and Flow in the Delta and its Watersheds," available at https://files.resources.ca.gov/voluntary-agreements/.

- San Mateo County watersheds

In general, 85 percent of the supply comes from the Tuolumne River through Hetch Hetchy Reservoir and the remaining 15 percent comes from the local watersheds through the San Antonio, Calaveras, Crystal Springs, Pilarcitos and San Andreas Reservoirs. The adopted WSIP retains this mix of water supply for all year types.

WSIP Dry Year Water Supply Projects

The WSIP authorized the SFPUC to undertake a number of water supply projects to meet dry-year demands with no greater than 20 percent system-wide rationing in any one year. Those projects include the following:

- **Calaveras Dam Replacement Project**

  Calaveras Dam is located near a seismically active fault zone and was determined to be seismically vulnerable. To address this vulnerability, the SFPUC constructed a new dam of equal height downstream of the existing dam. Construction on the project occurred between 2011 and July 2019. The SFPUC began impounding water behind the new dam in accordance with California Division of Safety of Dams (DSOD) guidance in the winter of 2018/2019.

- **Alameda Creek Recapture Project**

  As a part of the regulatory requirements for future operations of Calaveras Reservoir, the SFPUC must implement bypass and instream flow schedules for Alameda Creek. The Alameda Creek Recapture Project will recapture a portion of the water system yield lost due to the instream flow releases at Calaveras Reservoir or bypassed around the Alameda Creek Diversion Dam and return this yield to the RWS through facilities in the Sunol Valley. Water that naturally infiltrates from Alameda Creek will be recaptured into an existing quarry pond known as SMP (Surface Mining Permit)-24 Pond F2. The project will be designed to allow the recaptured water to be pumped to the Sunol Valley Water Treatment Plant or to San Antonio Reservoir. Construction of this project will occur from spring 2021 to fall 2022.

- **Lower Crystal Springs Dam Improvements**

  The Lower Crystal Springs Dam (LCSD) Improvements were substantially completed in November 2011. The joint San Mateo County/SFPUC Bridge Replacement Project to replace the bridge across the dam was completed in January 2019. A WSIP follow up project to modify the LCSD Stilling Basin for fish habitat and upgrade the fish water release and other valves started in April 2019. While the main improvements to the dam have been completed, environmental permitting issues for reservoir operation remain significant. While the reservoir elevation was lowered due to DSOD restrictions, the habitat for the Fountain Thistle, an endangered plant, followed the lowered reservoir elevation. Raising the reservoir elevation now requires that new plant populations be restored incrementally before the reservoir elevation is raised. The result is that it may be several years before pre-project water storage volumes can be restored.

- **Regional Groundwater Storage and Recovery Project**

  The Groundwater Storage and Recovery (GSR) Project is a strategic partnership between SFPUC and three San Mateo County agencies – the California Water Service Company (serving South San Francisco and Colma), the City of Daly City, and the City

of San Bruno – to conjunctively operate the south Westside Groundwater Basin. The project sustainably manages groundwater and surface water resources in a way that provides supplies during times of drought. During years of normal or heavy rainfall, the project would provide additional surface water to the partner agencies in San Mateo County in lieu of groundwater pumping. Over time, reduced pumping creates water storage through natural recharge of up to 20 billion gallons of new water supply available during dry years.

The project's Final Environmental Impact Report was certified in August 2014, and the project also received Commission approval that month. Phase 1 of this project consists of construction of thirteen well sites and is over 99 percent complete. Phase 2 of this project consists of completing construction of the well station at the South San Francisco Main site and some carryover work that has not been completed from Phase 1. Phase 2 design work began in December 2019.

- **2 mgd Dry-year Water Transfer**

  In 2012, the dry-year transfer was proposed between the Modesto Irrigation District and the SFPUC. Negotiations were terminated because an agreement could not be reached. Subsequently, the SFPUC had discussions with the Oakdale Irrigation District for a one-year transfer agreement with the SFPUC for 2 mgd (2,240 acre-feet). No progress towards agreement on a transfer was made in 2019, but the irrigation districts recognize SFPUC's continued interest and SFPUC will continue to pursue transfers.

In order to achieve its target of meeting at least 80 percent of its customer demand during droughts with a system demand of 265 mgd, the SFPUC must successfully implement the dry-year water supply projects included in the WSIP.

Furthermore, the permitting obligations for the Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements include a combined commitment of 12.8 mgd for instream flows on average. When this is reduced for an assumed Alameda Creek Recapture Project recovery of 9.3 mgd, the net loss of water supply is 3.5 mgd.

Alternative Water Supply Planning Program

The SFPUC is increasing and accelerating its efforts to acquire additional water supplies and explore other projects that would increase overall water supply resilience through the Alternative Water Supply Planning Program. The drivers for the program include: (1) the adoption of the Bay-Delta Plan Amendment and the resulting potential limitations to RWS supply during dry years, (2) the net supply shortfall following the implementation of WSIP, (3) San Francisco's perpetual obligation to supply 184 MGD to the Wholesale Customers, (4) adopted Level of Service Goals to limit rationing to no more than 20 percent system-wide during droughts, and (5) the potential need to identify water supplies that would be required to offer permanent status to interruptible customers. Developing additional supplies through this program would reduce water supply shortfalls and reduce rationing associated with such shortfalls. The planning priorities guiding the framework of the Alternative Water Supply Planning Program are as follows:

1. Offset instream flow needs and meet regulatory requirements
2. Meet existing obligations to existing permanent customers
3. Make interruptible customers permanent
4. Meet increased demands of existing and interruptible customers

In conjunction with these planning priorities, the SFPUC considers how the program fits within the LOS Goals and Objectives related to water supply and sustainability when considering new water supply opportunities. The key LOS Goals and Objectives relevant to this effort can be summarized as:

- Meet dry-year delivery needs while limiting rationing to a maximum of 20 percent system-wide reduction in water service during extended droughts;
- Diversify water supply options during non-drought and drought periods;
- Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers;
- Meet, at a minimum, all current and anticipated legal requirements for protection of fish and wildlife habitat;
- Maintain operational flexibility (although this LOS Goal was not intended explicitly for the addition of new supplies, it is applicate here).

Together, the planning priorities and LOS Goals and Objectives provide a lens through which the SFPUC considers water supply options and opportunities to meet all foreseeable water supply needs.

In addition to the Daly City Recycled Water Expansion project[4], which was a potential project identified in the 2015 UWMP and had committed funding at that time, the SFPUC has taken action to fund the study of potential additional water supply projects. Capital projects under consideration to develop additional water supplies include surface water storage expansion, recycled water expansion, water transfers, desalination, and potable reuse. A more detailed list and descriptions of these efforts are provided below.

The capital projects that are under consideration would be costly and are still in the early feasibility or conceptual planning stages. Because these water supply projects would take 10 to 30 years to implement, and because required environmental permitting negotiations may reduce the amount of water that can be developed, the yield from these projects are not currently incorporated into SFPUC's supply projections. State and federal grants and other financing opportunities would be pursued for eligible projects, to the extent feasible, to offset costs borne by ratepayers.

- **Daly City Recycled Water Expansion** (Regional, Normal- and Dry-Year Supply)

  This project can produce up to 3 mgd of tertiary recycled water during the irrigation season (~7 months). On an average annual basis, this is equivalent to 1.25 mgd or 1,400 acre-feet per year. The project is envisioned to provide recycled water to 13 cemeteries and other smaller irrigation customers, offsetting existing groundwater pumping from the South Westside Groundwater Basin; this will free up groundwater, enhancing the reliability of the Basin. The project is a regional partnership between the SFPUC and Daly City. The irrigation customers are located largely within California Water Service's (Cal Water's) service area. RWS customers will benefit from the increased reliability of the South Westside Basin for additional drinking water supply during droughts. In this way, this project supports the GSR Project, which is under construction.

[4] While this potential project was identified in the 2015 UWMP, it has since been approved by Daly City following environmental review and has a higher likelihood of being implemented.

- **ACWD-USD Purified Water Partnership** (Regional, Normal- and Dry-Year Supply)

  This project could provide a new purified water supply utilizing Union Sanitary District's (USD) treated wastewater. Purified water produced by advanced water treatment at USD could be transmitted to the Quarry Lakes Groundwater Recharge Area to supplement recharge into the Niles Cone Groundwater Basin or put to other uses in Alameda County Water District's (ACWD) service area. With the additional water supply to ACWD, an in-lieu exchange with the SFPUC would result in more water left in the RWS. Additional water supply could also be directly transmitted to the SFPUC through a new intertie between ACWD and the SFPUC.

- **Crystal Springs Purified Water** (Regional, Normal- and Dry-Year Supply)

  The Crystal Springs Purified Water (PREP) Project is a purified water project that could provide 6-12 mgd of water supply through reservoir water augmentation at Crystal Springs Reservoir, which is a facility of the RWS. Treated wastewater from Silicon Valley Clean Water (SVCW) and/or the City of San Mateo would go through an advanced water treatment plant to produce purified water that meets state and federal drinking water quality standards. The purified water would then be transmitted 10-20 miles (depending on the alignment) to Crystal Springs Reservoir, blended with regional surface water supplies and treated again at Harry Tracy Water Treatment Plant. Project partners include the SFPUC, BAWSCA, SVCW, CalWater, Redwood City, Foster City, and the City of San Mateo. Partner agencies are contributing financial and staff resources towards the work effort.

- **Los Vaqueros Reservoir Expansion** (Regional, Dry Year Supply)

  The Los Vaqueros Reservoir Expansion (LVE) Project is a storage project that will enlarge the existing reservoir located in northeastern Contra Costa County from 160,000 acre-feet to 275,000 acre-feet. While the existing reservoir is owned and operated by the Contra Costa Water District (CCWD), the expansion will have regional benefits and will be managed by a Joint Powers Authority (JPA) that will be set up prior to construction. Meanwhile, CCWD is leading the planning, design and environmental review efforts. CCWD's Board certified the EIS/EIR and approved the LVE Project on May 13, 2020. The additional storage capacity from the LVE Project would provide a dry year water supply benefit to the SFPUC. BAWSCA is working in concert with the SFPUC to support their work effort on the LVE project.
    - **Conveyance Alternatives:** The SFPUC is considering two main pathways to move water from storage in a prospective LVE Project to the SFPUC's service area, either directly to RWS facilities or indirectly via an exchange with partner agencies. The SFPUC is evaluating potential alignments for conveyance.
    - **Bay Area Regional Reliability Shared Water Access Program (BARR SWAP):** As part of the BARR Partnership, a consortium of 8 Bay Area water utilities (including ACWD, BAWSCA, CCWD, EBMUD, Marin Municipal Water District (MMWD), SFPUC, Valley Water, and Zone 7 Water Agency) are exploring opportunities to move water across the region as efficiently as possible, particularly during times of drought and emergencies. The BARR agencies are proposing two separate pilot projects in 2020-2021 through the Shared Water Access Program (SWAP) to test conveyance pathways and identify potential hurdles to better prepare for sharing water during a future drought or emergency. A strategy report identifying opportunities and considerations will accompany these pilot transfers and will be completed in 2021.

- **Bay Area Brackish Water Desalination** (Regional, Normal- and Dry-Year Supply)

  The Bay Area Brackish Water Desalination (Regional Desalination) Project is a partnership between CCWD, the SFPUC, Valley Water, and Zone 7 Water Agency. East Bay Municipal Utilities District (EBMUD) and ACWD may also participate in the project. The project could provide a new drinking water supply to the region by treating brackish water from CCWD's existing Mallard Slough intake in Contra Costa County. While this project has independent utility as a water supply project, for the current planning effort the SFPUC is considering it as a source of supply for storage in LVE. While the allocations remain to be determined among partners, the SFPUC is considering a water supply benefit of between 5 and 15 mgd during drought conditions when combined with storage at LVE.

- **Calaveras Reservoir Expansion** (Regional, Dry Year Supply)

  Calaveras Reservoir would be expanded to create 289,000 AF additional capacity to store excess Regional Water System supplies or other source water in wet and normal years. In addition to reservoir enlargement, the project would involve infrastructure to pump water to the reservoir, such as pump stations and transmission facilities.

- **Groundwater Banking**

  Groundwater banking in the Modesto Irrigation District (MID) and Turlock Irrigation District (TID) service areas could be used to provide some additional water supply to meet instream releases in dry years reducing water supply impacts to the SFPUC service area. For example, additional surface water could be provided to irrigators in wet years, which would offset the use of groundwater, thereby allowing the groundwater to remain in the basin rather than be consumptively used. The groundwater that remains in the basin can then be used in a subsequent dry year for irrigation, freeing up surface water that would have otherwise been delivered to irrigators to meet instream flow requirements.

  A feasibility study of this option is included in the proposed Tuolumne River Voluntary Agreement. Progress on this potential water supply option will depend on the negotiations of the Voluntary Agreement.

- **Inter-Basin Collaborations**

  Inter-Basin Collaborations could provide net water supply benefits in dry years by sharing responsibility for in-stream flows in the San Joaquin River and Delta more broadly among several tributary reservoir systems. One mechanism by which this could be accomplished would be to establish a partnership between interests on the Tuolumne River and those on the Stanislaus River, which would allow responsibility for streamflow to be assigned variably based on the annual hydrology.

  As is the case with Groundwater Banking, feasibility of this option is included in the proposed Tuolumne River Voluntary Agreement.

If all the projects identified through the current planning process can be implemented, there would still be a supply shortfall to meet projected needs. Furthermore, each of the supply options being considered has its own inherent challenges and uncertainties that may affect the SFPUC's ability to implement it.

Given the limited availability of water supply alternatives - unless the supply risks are significantly reduced or our needs change significantly - the SFPUC will continue to plan,

develop and implement all project opportunities that can help bridge the anticipated water supply gaps during droughts. In 2019, the SFPUC completed a survey among water and wastewater agencies within the service area to identify additional opportunities for purified water. Such opportunities remain limited, but the SFPUC continues to pursue all possibilities.

Projected SFPUC Regional Water System Supply Reliability

The SFPUC will provide tables presenting the projected RWS supply reliability under normal, single dry year, and multiple dry year scenarios.

Climate Change

The issue of climate change has become an important factor in water resources planning in the State, and is frequently considered in urban water management planning processes, though the extent and precise effects of climate change remain uncertain. There is convincing evidence that increasing concentrations of greenhouse gasses have caused and will continue to cause a rise in temperatures around the world, which will result in a wide range of changes in climate patterns. Moreover, observational data show that a warming trend occurred during the latter part of the 20th century and virtually all projections indicate this will continue through the 21st century. These changes will have a direct effect on water resources in California, and numerous studies have been conducted to determine the potential impacts to water resources. Based on these studies, climate change could result in the following types of water resource impacts, including impacts on the watersheds in the Bay Area:

- Reductions in the average annual snowpack due to a rise in the snowline and a shallower snowpack in the low and medium elevation zones, such as in the Tuolumne River basin, and a shift in snowmelt runoff to earlier in the year;
- Changes in the timing, annual average, intensity and variability of precipitation, and an increased amount of precipitation falling as rain rather than snow;
- Long-term changes in watershed vegetation and increased incidence of wildfires that could affect water quality and quantity;
- Sea level rise and an increase in saltwater intrusion;
- Increased water temperatures with accompanying potential adverse effects on some fisheries and water quality;
- Increases in evaporation and concomitant increased irrigation need; and
- Changes in urban and agricultural water demand.

Both the SFPUC and BAWSCA participated in the 2020 update of the Bay Area Integrated Regional Water Management Plan (BAIRWMP), which includes an assessment of the potential climate change vulnerabilities of the region's water resources and identifies climate change adaptation strategies. In addition, the SFPUC continues to study the effect of climate change on the Regional Water System (RWS). These works are summarized below.

Bay Area Integrated Regional Water Management Plan

Climate change adaptation continues to be an overarching theme for the 2019 BAIRWMP update. As stated in the BAIRWMP, identification of watershed characteristics that could

potentially be vulnerable to future climate change is the first step in assessing vulnerabilities of water resources in the Bay Area Region (Region). Vulnerability is defined as the degree to which a system is exposed to, susceptible to, and able to cope with or adjust to, the adverse effects of climate change. A vulnerability assessment was conducted in accordance with the Department of Water Resources' (DWR's) *Climate Change Handbook for Regional Water Planning* and using the most current science available for the Region. The vulnerability assessment, summarized in the table below, provides the main water planning categories applicable to the Region and a general overview of the qualitative assessment of each category with respect to anticipated climate change impacts.

Summary of BAIRWMP Climate Change Vulnerability Assessment

Vulnerability Areas	General Overview of Vulnerabilities
Water Demand	**Urban and Agricultural Water Demand** – Changes to hydrology in the Region as a result of climate change could lead to changes in total water demand and use patterns. Increased irrigation (outdoor landscape or agricultural) is anticipated to occur with temperature rise, increased evaporative losses due to warmer temperature, and a longer growing season. Water treatment and distribution systems are most vulnerable to increases in maximum day demand.
Water Supply	**Imported Water** – Imported water derived from the Sierra Nevada sources and Delta diversions provide 66 percent of the water resources available to the Region. Potential impacts on the availability of these sources resulting from climate change directly affect the amount of imported water supply delivered to the Region. **Regional Surface Water** – Although future projections suggest that small changes in total annual precipitation over the Region will not change much, there may be changes to when precipitation occurs with reductions in the spring and more intense rainfall in the winter. **Regional Groundwater** – Changes in local hydrology could affect natural recharge to the local groundwater aquifers and the quantity of groundwater that could be pumped sustainably over the long-term in some areas. Decreased inflow from more flashy or more intense runoff, increased evaporative losses and warmer and shorter winter seasons can alter natural recharge of groundwater. Salinity intrusion into coastal groundwater aquifers due to sea-level rise could interfere with local groundwater uses. Furthermore, additional reductions in imported water supplies would lead to less imported water available for managed recharge of local groundwater basins and potentially more groundwater pumping in lieu of imported water availability.
Water Quality	**Imported Water** – For sources derived from the Delta, sea-level rise could result in increases in chloride and bromide (a disinfection by-product (DBP) precursor that is also a component of sea water),

Vulnerability Areas	General Overview of Vulnerabilities
	potentially requiring changes in treatment for drinking water. Increased temperature could result in an increase in algal blooms, taste and odor events, and a general increase in DBP formation **Regional Surface Water** – Increased temperature could result in lower dissolved oxygen in streams and prolong thermocline stratification in lakes and reservoirs forming anoxic bottom conditions and algal blooms. Decrease in annual precipitation could result in higher concentrations of contaminants in streams during droughts or in association with flushing rain events. Increased wildfire risk and flashier or more intense storms could increase turbidity loads for water treatment. **Regional Groundwater** – Sea-level rise could result in increases in chlorides and bromide for some coastal groundwater basins in the Region. Water quality changes in imported water used for recharge could also impact groundwater quality.
Sea-Level Rise	Sea-level rise is additive to tidal range, storm surges, stream flows, and wind waves, which together will increase the potential for higher total water levels, overtopping, and erosion. Much of the bay shoreline is comprised of low-lying diked baylands which are already vulnerable to flooding. In addition to rising mean sea level, continued subsidence due to tectonic activity will increase the rate of relative sea-level rise. As sea-level rise increases, both the frequency and consequences of coastal storm events, and the cost of damage to the built and natural environment, will increase. Existing coastal armoring (including levees, breakwaters, and other structures) is likely to be insufficient to protect against projected sea-level rise. Crest elevations of structures will have to be raised or structures relocated to reduce hazards from higher total water levels and larger waves.
Flooding	Climate change projections are not sensitive enough to assess localized flooding, but the general expectation is that more intense storms would occur thereby leading to more frequent, longer and deeper flooding. Changes to precipitation regimes may increase flooding. Elevated Bay elevations due to sea-level rise will increase backwater effects exacerbating the effect of fluvial floods and storm drain backwater flooding.

Vulnerability Areas	General Overview of Vulnerabilities
Ecosystem and Habitat	Changes in the seasonal patterns of temperature, precipitation, and fire due to climate change can dramatically alter ecosystems that provide habitats for California's native species. These impacts can result in species loss, increased invasive species ranges, loss of ecosystem functions, and changes in vegetation growing ranges. Reduced rain and changes in the seasonal distribution of rainfall may alter timing of low flows in streams and rivers, which in turn would have consequences for aquatic ecosystems. Changes in rainfall patterns and air temperature may affect water temperatures, potentially affecting coldwater aquatic species. Bay Area ecosystems and habitat provide important ecosystem services, such as: carbon storage, enhanced water supply and quality, flood protection, food and fiber production. Climate change is expected to substantially change several of these services. The region provides substantial aquatic and habitat-related recreational opportunities, including: fishing, wildlife viewing, and wine industry tourism (a significant asset to the region) that may be at risk due to climate change effects.
Hydropower	Currently, several agencies in the Region produce or rely on hydropower produced outside of the Region for a portion of their power needs. As the hydropower is produced in the Sierra, there may be changes in the future in the timing and amount of energy produced due to changes in the timing and amount of runoff as a result of climate change. Some hydropower is also produced within the region and could also be affected by changes in the timing and amount of runoff.

Source: 2019 Bay Area Integrated Regional Water Management Plan (BAIRWMP), Table 16-3.

SFPUC Climate Change Studies

The SFPUC views assessment of the effects of climate change as an ongoing project requiring regular updating to reflect improvements in climate science, atmospheric/ocean modeling, and human response to the threat of greenhouse gas emissions. Climate change research by the SFPUC began in 2009 and continues to be refined. In its 2012 report "Sensitivity of Upper Tuolumne River Flow to Climate Change Scenarios," the SFPUC assessed the sensitivity of runoff into Hetch Hetchy Reservoir to a range of changes in temperature and precipitation due to climate change. Key conclusions from the report include the following:

- With differing increases in temperature alone, the median annual runoff at Hetch Hetchy would decrease by 0.7-2.1% from present-day conditions by 2040 and by 2.6-10.2% from

present-day by 2100. Adding differing decreases in precipitation on top of temperature increases, the median annual runoff at Hetch Hetchy would decrease by 7.6-8.6% from present-day conditions by 2040 and by 24.7-29.4% from present-day conditions by 2100.

- In critically dry years, these reductions in annual runoff at Hetch Hetchy would be significantly greater, with runoff decreasing up to 46.5% from present day conditions by 2100 utilizing the same climate change scenarios.
- In addition to the total change in runoff, there will be a shift in the annual distribution of runoff. Winter and early spring runoff would increase and late spring and summer runoff would decrease.
- Under all scenarios, snow accumulation would be reduced and snow would melt earlier in the spring, with significant reductions in maximum peak snow water equivalent under most scenarios.

Currently, the SFPUC is conducting a comprehensive assessment of the potential effects of climate change on water supply using a wide range of plausible increases in temperature and changes in precipitation to address the wide uncertainty in climate projections over the planning horizon 2020 to 2070. There are many uncertain factors such as climate change, changing regulations, water quality, growth and economic cycles that may create vulnerabilities for the Regional Water System's ability to meet levels of service. The uncertainties associated with the degree to which these factors will occur and how much risk they present to the water system is difficult to predict, but nonetheless they need to be considered in SFPUC planning. To address this planning challenge, the project uses a vulnerability-based planning approach to explore a range of future conditions to identify vulnerabilities, assess the risks associated with these vulnerabilities that could lead to developing an adaptation plan that is flexible and robust to a wide range of future outcomes.

Common Language for BAWSCA Member Agencies'

2020 UWMP Updates

BAWSCA

Description of BAWSCA

BAWSCA provides regional water reliability planning and conservation programming for the benefit of its 26 member agencies that purchase wholesale water supplies from the San Francisco Public Utilities Commission (SFPUC). Collectively, the BAWSCA member agencies deliver water to over 1.8 million residents and nearly 40,000 commercial, industrial and institutional accounts in Alameda, San Mateo and Santa Clara Counties.

BAWSCA also represents the collective interests of these wholesale water customers on all significant technical, financial, and policy matters related to the operation and improvement of the SFPUC's Regional Water System (RWS).

BAWSCA's role in the development of the 2020 Urban Water Management Plan (UWMP) updates is to work with its member agencies and the SFPUC to seek consistency among UWMP documents.

Regional Water Demand and Conservation Projections

In June 2020, BAWSCA completed the Regional Water Demand and Conservation Projections Report (Demand Study).[1] The goal of the Demand Study was to develop transparent, defensible, and uniform demand and conservation savings projections for each Wholesale Customer using a common methodology to support both regional and individual agency planning efforts and compliance with the new statewide water efficiency targets required by Assembly Bill (AB) 1668 and Senate Bill (SB) 606.

Through the Demand Study process, BAWSCA and the Wholesale Customers (1) quantified the total average-year water demand for each BAWSCA member agency through 2045, (2) quantified passive and active conservation water savings potential for each individual Wholesale Customer through 2045, and (3) identified 24 conservation programs with high water savings potential and/or member agency interest. Implementation of these conservation measures, along with passive conservation, is anticipated to yield an additional 37.3 MGD of water savings by 2045. Based on the revised water demand projections, the identified water conservation savings, increased development and use of other local supplies by the Wholesale Customers, and other actions, the collective purchases of the BAWSCA member agencies from the SFPUC are projected to stay below 184 MGD through 2045.

As part of the Demand Study, each Wholesale Customer was provided with a demand model that can be used to support ongoing demand and conservation planning efforts, including UWMP preparation.

[1] Phase III Final Report: http://bawsca.org/uploads/pdf/BAWSCA_Regional_Water_Demand_and_Conservation%20Projections%20Report_Final.pdf

Long-Term Reliable Water Supply Strategy

BAWSCA's Long-Term Reliable Water Supply Strategy (Strategy), completed in February 2015, quantified the water supply reliability needs of the BAWSCA member agencies through 2040, identified the water supply management projects and/or programs (projects) that could be developed to meet those needs, and prepared an implementation plan for the Strategy's recommendations.

When the 2015 Demand Study concluded it was determined that while there is no longer a regional normal year supply shortfall, there was a regional drought year supply shortfall of up to 43 MGD. In addition, key findings from the Strategy's project evaluation analysis included:

- Water transfers represent a high priority element of the Strategy.
- Desalination potentially provides substantial yield, but its high effective costs and intensive permitting requirements make it a less attractive drought year supply alternative.
- Other potential regional projects provide tangible, though limited, benefit in reducing dry-year shortfalls given the small average yields in drought years.

Since 2015, BAWSCA has completed a comprehensive update of demand projections and engaged in significant efforts to improve regional reliability and reduce the dry-year water supply shortfall.

Water Transfers. BAWSCA successfully facilitated two transfers of portions of Individual Supply Guarantee (ISG) between BAWSCA agencies in 2017 and 2018. Such transfers benefit all BAWSCA agencies by maximizing use of existing supplies. BAWSCA is currently working on an amendment to the Water Supply Agreement between the SFPUC and BAWSCA agencies to establish a mechanism by which member agencies that have an ISG may participate in expedited transfers of a portion of ISG and a portion of a Minimum Annual Purchase Requirement. In 2019, BAWSCA participated in a pilot water transfer that, while ultimately unsuccessful, surfaced important lessons learned and produced interagency agreements that will serve as a foundation for future transfers. BAWSCA is currently engaged in the Bay Area Regional Reliability Partnership[2] (BARR), a partnership among eight Bay Area water utilities (including the SFPUC, Alameda County Water District, BAWSCA, Contra Costa Water District, Santa Clara Valley Water District) to identify opportunities to move water across the region as efficiently as possible, particularly during times of drought and emergencies.

Regional Projects. Since 2015, BAWSCA has coordinated with local and State agencies on regional projects with potential dry-year water supply benefits for BAWSCA's agencies. These efforts include storage projects, indirect/direct water reuse projects, and studies to evaluate the capacity and potential for various conveyance systems to bring new supplies to the region.

BAWSCA continues to implement the Strategy recommendations in coordination with BAWSCA member agencies. Strategy implementation will be adaptively managed to account for changing conditions and to ensure that the goals of the Strategy are met in an efficient and cost-effective manner. On an annual basis, BAWSCA will reevaluate Strategy recommendations and results in conjunction with development of the BAWSCA's FY 2021-22 Work Plan. In this way, actions can be modified to accommodate changing conditions and new developments.

[2] https://www.bayareareliability.com/

Making Conservation a Way of Life Strategic Plan

Following the 2014-2016 drought, the State of California (State) developed the "Making Water Conservation a California Way of Life" framework to address the long-term water use efficiency requirements called for in executive orders issued by Governor Brown. In May of 2018, AB 1668 and SB 606 (collectively referred to as the efficiency legislation) went into effect, which built upon the executive orders implementing new urban water use objectives for urban retail water suppliers.

BAWSCA led its member agencies in a multi-year effort to develop and implement a strategy to meet these new legislative requirements. BAWSCA's Making Conservation a Way of Life Strategic Plan (Strategic Plan) provided a detailed roadmap for member agencies to improve water efficiency. BAWSCA implementing the following elements of the Strategic Plan:

- Conducted an assessment of the agencies' current practices and water industry best practices for three components of the efficiency legislation that, based on a preliminary review, present the greatest level of uncertainty and potential risk to the BAWSCA agencies. The three components were:
    1. Development of outdoor water use budgets in a manner that incorporates landscape area, local climate, and new satellite imagery data.
    2. Commercial, Industrial, and Institutional water use performance measures.
    3. Water loss requirements.
- Organized an Advanced Metering Infrastructure symposium to enable information exchange, including case studies, implementation strategies, and data analysis techniques.
- Initiated a regional CII audit pilot program, which BAWSCA aims to complete in 2021.[3]
- Implemented a regional program for water loss control to help BAWSCA agencies comply with regulatory requirements and implement cost-effective water loss interventions.
- Engaged with the SFPUC to audit meter testing and calibration practices for SFPUC's meters at BAWSCA agency turnouts.

Finally, BAWSCA's Demand Study developed water demand and conservation projections through 2045 for each BAWSCA agency. These projects are designed to provide valuable insights on long-term water demand patterns and conservation savings potential to support regional efforts, such as implementation of BAWSCA's Long-Term Reliable Water Supply Strategy.

[3] Efforts on the CII audit pilot program stalled in March 2020 due to the COVID 19 pandemic and related shelter-in-place orders.

Tier Two Drought Allocations

The Wholesale Customers have negotiated and adopted the Tier Two Plan, referenced above, which allocates the collective Wholesale Customer share from the Tier One Plan among each of the 26 Wholesale Customers. These Tier Two allocations are based on a formula that takes into account multiple factors for each Wholesale Customer including:

- Individual Supply Guarantee;
- Seasonal use of all available water supplies; and
- Residential per capita use.

The water made available to the Wholesale Customers collectively will be allocated among them in proportion to each Wholesale Customer's Allocation Basis, expressed in millions of gallons per day (mgd), which in turn is the weighted average of two components. The first component is the Wholesale Customer's Individual Supply Guarantee, as stated in the WSA, and is fixed. The second component, the Base/Seasonal Component, is variable and is calculated using the monthly water use for three consecutive years prior to the onset of the drought for each of the Wholesale Customers for all available water supplies. The second component is accorded twice the weight of the first, fixed component in calculating the Allocation Basis. Minor adjustments to the Allocation Basis are then made to ensure a minimum cutback level, a maximum cutback level, and a sufficient supply for certain Wholesale Customers.

The Allocation Basis is used in a fraction, as numerator, over the sum of all Wholesale Customers' Allocation Bases to determine each Wholesale Customer's Allocation Factor. The final shortage allocation for each Wholesale Customer is determined by multiplying the amount of water available to the Wholesale Customers' collectively under the Tier One Plan, by the Wholesale Customer's Allocation Factor.

The Tier Two Plan requires that the Allocation Factors be calculated by BAWSCA each year in preparation for a potential water shortage emergency. As the Wholesale Customers change their water use characteristics (e.g., increases or decreases in SFPUC purchases and use of other water sources, changes in monthly water use patterns, or changes in residential per capita water use), the Allocation Factor for each Wholesale Customer will also change. However, for long-term planning purposes, each Wholesale Customer shall use as its Allocation Factor, the value identified in the Tier Two Plan when adopted.

Per WSA Section 3.11, the Tier One and Tier Two Plans will be used to allocate water from the Regional Water System between Retail and Wholesale Customers during system-wide shortages of 20% or less. For Regional Water System shortages in excess of 20%, San Francisco shall (a) follow the Tier 1 Shortage Plan allocations up to the 20% reduction, (b) meet and discuss how to implement incremental reductions above 20% with the Wholesale Customers, and (c) make a final determination of allocations above the 20% reduction. After the SFPUC has made the final allocation decision, the Wholesale Customers shall be free to challenge the allocation on any applicable legal or equitable basis. For purposes of the 2020 UWMPs, for San Francisco Regional Water System (RWS) shortages in excess of 20%, the allocations among the Wholesale Customers is assumed to be equivalent among them and to equal the drought cutback to Wholesale Customer by the SFPUC.

The Tier Two Plan, which initially expired in 2018, has been extended by the BAWSCA Board of Directors every year since for one additional calendar year. In November 2020, the BAWSCA Board voted to extend the Tier Two Plan through the end of 2021.

SFPUC's Efforts to Develop of Alternative Water Supplies

With the adoption of the Bay-Delta Plan Phase 1 (Bay-Delta Plan) by the State Water Resources Control Board in December of 2018, coupled with the uncertainties associated with litigation and the development of Voluntary Agreements that, if successful, would provide an alternative to the 40% unimpaired flow requirement that is required by the Bay-Delta Plan, BAWSCA redoubled its efforts to ensure that the SFPUC took necessary action to develop alternative water supplies such that they would be in place to fill any potential gap in supply by implementation of the Bay-Delta Plan and that the SFPUC would be able to meet its legal and contractual obligations to its Wholesale Customers.

In 2019, BAWSCA held numerous meetings with the SFPUC encouraging them to develop a division within their organization whose chief mission was to spearhead alternative water supply development. On June 25, 2019, BAWSCA provided a written and oral statement to the Commissioners urging the SFPUC to focus on developing new sources of supply in a manner similar to how it addressed the implementation of the Water System Improvement Program (WSIP). BAWSCA urged that a new water supply program was called for, with clear objectives, persistent focus, a dedicated team, adequate funding, and a plan for successful execution. The SFPUC Commission supported BAWSCA's recommendation and directed staff to undertake such an approach.

In early 2020, the SFPUC began implementation of the Alternative Water Supply Planning Program (AWSP), a program designed to investigate and plan for new water supplies to address future long-term water supply reliability challenges and vulnerabilities on the RWS.

Included in the AWSP is a suite of diverse, non-traditional supply projects that, to a great degree, leverage regional partnerships and are designed to meet the water supply needs of the SFPUC Retail and Wholesale Customers through 2045. As of the most recent Alternative Water Supply Planning Quarterly Update, SFPUC has budgeted $264 million over the next ten years to fund water supply projects. BAWSCA is heavily engaged with the SFPUC on its AWSS efforts.

BAWSCA Conservation Programs

BAWSCA manages a Regional Water Conservation Program comprised of several programs and initiatives that support and augment member agencies' and customers' efforts to use water more efficiently. These efforts extend limited water supplies that are available to meet both current and future water needs; increase drought reliability of the existing water system; and save money for both the member agencies and their customers.

The implementation of the Regional Water Conservation Program builds upon both the Water Conservation Implementation Plan (WCIP, completed in September 2009) and the Regional Demand and Conservation Projections Project (Demand Study, completed in June of 2020). These efforts include both Core Programs (implemented regionally throughout the BAWSCA service area) and Subscription Programs (funded by individual member agencies that elect to participate and implement them within their respective service areas).

BAWSCA's Core Conservation Programs include organizing classes open to the public on topics such as water efficient landscape education and water-wise gardening, assistance related to automated metering infrastructure, and other associated programs that work to promote smart water use and practices. BAWSCA's Subscription Programs include numerous rebate programs, educational programs that can be offered to area schools, technical assistance to member agencies in evaluating water loss, and programs to train and certify contractors employed to install water efficient landscape. In total, BAWSCA offers 22 programs to its member agencies and that number continues to grow over time.

Each fiscal year, BAWSCA prepares an Annual Water Conservation Report that documents how all of BAWSCA's 26 member agencies have benefitted from the Core Conservation Programs. Additionally, the report highlights how all 26 member agencies participate in one or more of the Subscription Programs offered by BAWSCA, such as rebates, water loss management and large landscape audits. The Demand Study indicates that through a combination of active and passive conservation, 37.3 MGD will be conserved by BAWSCA's member agencies by 2045.
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7. Additional language requested by the Member Agencies

SFPUC's Decision to use With Bay-Delta Plan Scenario in UWMP Submittal Tables

The adoption of the Bay-Delta Plan Amendment may significantly impact the supply available from the RWS. SFPUC recognizes that the Bay-Delta Plan Amendment has been adopted and that, given that it is now state law, we must plan for a future in which it is fully implemented. SFPUC also acknowledges that the plan is not self-implementing and therefore does not automatically go into effect. SFPUC is currently pursuing a voluntary agreement as well as a lawsuit which would limit implementation of the Plan. With both of these processes occurring on an unknown timeline, SFPUC does not know at this time when the Bay-Delta Plan Amendment is likely to go into effect. As a result, it makes sense to conduct future supply modeling for a scenario that doesn't include implementation of the Bay-Delta Plan Amendment, as that represents a potential supply reliability scenario.

Because of the uncertainty surrounding implementation of the Bay-Delta Plan Amendment, the SFPUC conducted water service reliability assessment that includes: (1) a scenario in which the Bay-Delta Plan Amendment is fully implemented in 2023, and (2) a scenario that considers the SFPUC system's current situation without the Bay-Delta Plan Amendment. The two scenarios provide a bookend for the possible future scenarios regarding RWS supplies. The standardized tables associated with the SFPUC's UWMP contain the future scenario that assumes implementation of the Bay-Delta Plan Amendment starting in 2023.

Bay-Delta Plan Implementation Starting Year

Because of the uncertainty surrounding implementation of the Bay-Delta Plan Amendment, the water service reliability assessment presented in the SFPUC's draft UWMP looks at two future supply scenarios, both with and without implementation of the Bay-Delta Plan Amendment. Although the SWRCB has stated it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, given the current level of uncertainty, it is assumed for the purposes of the SFPUC's draft UWMP that the Bay-Delta Plan Amendment will be fully implemented starting in 2023.

SFPUC's Decision to Present Both Modeling Results in its UWMP

A key input for the HHLSM model is the anticipated level of demand on the RWS. Supply modeling results presented in the text of the SFPUC's UWMP reflect an input of projected demands on the RWS consisting of (1) projected retail demands on the RWS (total retail demands minus local groundwater and recycled water supplies), and (2) projected Wholesale Customer purchases. The SFPUC has a Level of Service objective of meeting average annual water demand of 265 mgd from the SFPUC watersheds for retail and Wholesale Customers during non-drought years, as well as a contractual obligation to supply 184 mgd to the Wholesale Customers. Therefore, the SFPUC has also conducted modeling based on a demand of 265 mgd in order to facilitate planning that supports meeting this Level of Service goal and their contractual obligations.

APPENDIX H
LETTERS FROM MPWD TO BAWSCA AND SFPUC

CITY OF MENLO PARK

March 3, 2017

Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
Cal/EPA Headquarters
1001 "I" Street, 24th Floor
Sacramento, CA 95814-0100
commentletters@waterboards.ca.gov

Re: Comment Letter – 2016 Bay-Delta Plan Amendment & SED

Dear Ms. Townsend:

We are submitting the following comments regarding the *Recirculated Draft Substitute Environmental Document in Support of Potential Changes to the Water Quality Control Plan for the San Francisco Bay-Sacramento/San Joaquin Delta Estuary: San Joaquin River Flows and Southern Delta Water Quality* (SED). In addition, we would like to incorporate by reference separate comments submitted by the Bay Area Water Supply and Conservation Agency (BAWSCA) and the San Francisco Public Utilities Commission (SFPUC) that provide more detail of the SED proposal's impact on our Menlo Park Municipal Water District (MPMWD) service area and the region.

Under the SED, the State Water Resources Control Board (SWRCB) proposes substantial changes to flow objectives for the Tuolumne River. These changes are anticipated to result in significantly reduced surface water available for diversions, thereby causing significant, potentially unavoidable impacts to water supply and the environment. Below we provide relevant information that the SWRCB must consider in conducting its analysis of the SED's impacts:

- As a wholesale customer of SFPUC that purchases 100% of its potable water supply from the San Francisco Regional Water System, water supply available to the MPMWD under the SED proposal could be reduced more than 50% under drought conditions for multiple consecutive years.

- MPMWD has made significant strides in water conservation in the past 10 years. Total water use decreased 31.5% from 3.25 million gallons per day (MGD) to 2.23 MGD.

- Based on our 2015 Urban Water Management Plan, a 50% cut to water supply would force MPMWD to take a number of significant actions including developing water budgets for all water accounts and notifying account holders, and not approving new potable water connections, new temporary meters or permanent meters, except under special circumstances.

- MPMWD serves water to 3,600 residential customers and over 250 businesses and other non-residential customers. Potential consequences of the SED proposal include health and safety concerns due to lack of potable supplies, major job losses, slower economic growth and delayed community development in our service area.

- Since outdoor use represents a relatively small proportion of our commercial, industrial, and institutional account water demand, commercial, industrial, and institutional customers generally have fewer opportunities to reduce water use without changing their operations or incurring significant economic impacts.

- MPMWD relies 100% on SFPUC water. MPMWD's only other emergency supply is via interconnections with adjacent water agencies. However, these adjacent water agencies also rely primarily on SFPUC water, so a 50% cut to SFPUC water would be detrimental to our system's ability to provide water to our customers.

In the light of these aforementioned impacts as well as those articulated in the BAWSCA and SFPUC comment letters incorporated here by reference, the MPMWD requests that environmental and economic impacts of any shortage on the San Francisco Regional Water System, and the associated lost jobs and delayed development, be fully and adequately analyzed as part of the SWRCB's proposed flow alternatives. Such full and adequate analysis should be given at least equal weight with all other elements of the SWRCB's subsequent deliberations and decision making.

Last, the Governor has indicated his strong support for negotiated voluntary agreements to resolve these issues. We request that the SWRCB provide adequate time for voluntary agreements to be reached amongst the stakeholders prior to any action on the SED. Please give this settlement process a chance for success instead of expediting implementation of the current proposal. We share BAWSCA's commitment to continue working closely with the diverse interests and stakeholders to develop that shared solution.

If you have any questions about this letter, please do not hesitate to contact me by phone at (650) 330-6725 or by email at jicmurphy@menlopark.org.

Sincerely,

Justin Murphy
Public Works Director

CITY OF MENLO PARK

May 27, 2021

Bay Area Water Supply and Conservation Agency (BAWSCA)
Nicole Sandkulla, CEO / General Manager
155 Bovet Rd, Suite 650
San Mateo, CA 94402

Subject: BAWSCA Methodology for Cutbacks Greater than 20 Percent for the 2020 Urban Water Management Plan

Dear Ms. Sandkulla,

As we prepare our Urban Water Management Plan, we appreciate BAWSCA's support and assistance in clarifying the San Francisco Public Utility Commission's (SFPUC) Regional Water System (RWS) supply reliability data, obtaining and creating Urban Water Management Plans (UWMP) common language, and developing a methodology that the BAWSCA agencies can use for cutbacks greater than 20 percent.

As stated in your February 18, 2021 memorandum, because there is no method for allocating supplies for cutbacks greater than 20 percent, BAWSCA recommended "*when the average Wholesale Customers' RWS shortages are greater than 20 percent, an equal percent reduction will be applied across all agencies.*" With the close deadline for agencies to adopt and submit their UWMPs to the Department of Water Resources by July 1, we appreciate that BAWSCA could quickly develop a methodology that the Wholesale Customers could use in their respective UWMPs.

We have included BAWSCA's equal percent reductions for cutbacks greater than 20 percent in our 2020 UWMP for planning purposes, however, we must go on record that we are not in agreement with this methodology. We understand that the Wholesale Customers will begin discussing and negotiating new Tier 2 calculations later this year, a process that could take upwards of 18 months, and we look forward to be part of that process.

As you are aware, SFPUC's supply reliability data does not meet their contractual obligation (also known as level of service goals) to supply Wholesale Customers with not more than a 20 percent cutback (WSA Section 3.11C4). We know that BAWSCA, in its role of administering the contract on behalf of the Wholesale Customers, will continue to prioritize SFPUC's need to meet its contractual obligations and urge them to expedite water supply projects in order to meet the total 184 million gallons per day (MGD) supply guarantee to all of the Wholesale customers, including MPMW's individual supply guarantee of 4.456 MGD.

We appreciate BAWSCA's diligence and perseverance in administering the contract on behalf of the Wholesale Customers and ensuring that SFPUC meets its contractual obligations, specifically their level of service goals.

Sincerely,

Nicole Nagaya

Nicole Nagaya
Public Works Director

cc: Nira Doherty, City Attorney
Christopher Lamm, Assistant Public Works Director
Pam Lowe, Senior Civil Engineer

CITY OF MENLO PARK

May 27, 2021

San Francisco Public Utilities Commission
Paula Kehoe, Director of Water Resources
525 Golden Gate Avenue, 13th Floor
San Francisco, CA 94102

RE: SFPUC Supply Reliability for the 2020 Urban Water Management Plan

Dear Ms. Kehoe,

As we prepare our Urban Water Management Plan, we appreciate the water supply reliability data and common language provided by the San Francisco Public Utilities Commission (SFPUC) to the Bay Area Water Supply and Conservation Agency (BAWSCA) for the Wholesale Customers on memorandums dated January 22, 2021, March 19, 2021, and March 30, 2021.

The supply reliability data with the Bay-Delta Plan does not meet SFPUC's contractual obligation (also known as level of service goals) to supply Wholesale Customers with not more than a 20 percent cutback. Section 3.11C4 of the 2019 Water Supply Agreement states that "*San Francisco will use its best efforts to identify potential sources of dry year water supplies and establish the contractual and other means to access and deliver those supplies in sufficient quantity to meet a goal of not more than 20 percent system-wide shortage in any year of the design drought.*"

SFPUC needs to meet its contractual obligations and we urge you to expedite the Alternative Water Supply Project in order to meet the total 184 million gallons per day (MGD) supply guarantee to all of the Wholesale customers, including MPMW's individual supply guarantee of 4.456 MGD.

Sincerely,

Nicole Nagaya

Nicole Nagaya
Public Works Director

cc: Nira Doherty, City Attorney
Christopher Lamm, Assistant Public Works Director
Pam Lowe, Senior Civil Engineer

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CITY OF MENLO PARK

June 7, 2021

San Francisco Public Utilities Commission
Paula Kehoe, Director of Water Resources
525 Golden Gate Avenue, 13th Floor
San Francisco, CA 94102

RE: Request to Rerun Water Supply Reliability Model

Dear Ms. Kehoe,

We understand that SFPUC's climate change study, the *Long Term Vulnerability Assessment and Adaptation Plan for the SFPUC Water Enterprise* completed in partnership with the Water Research Foundation, will be released in the summer of 2021 and can be used to help frame the issue of climate change impacts on the water supplies delivered via the San Francisco Regional Water System, including but not limited to the Tuolumne River.

On May 25, our City Council adopted a resolution adopting our 2020 Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan. If the climate change study provides merit to study a shorter Drought Period, we request that SFPUC prepare an appendix with updated supply reliability that we can consider including in our UWMP.

Thank you for considering this request.

Sincerely,

DocuSigned by:
Drew Combs
52C1D491348F4A3...

Drew Combs
Mayor

cc: Vice Mayor Betsy Nash
City Councilmember Jen Wolosin
City Councilmember Ray Mueller
City Councilmember Cecilia Taylor
Starla Jerome-Robinson, City Manager
Nira Doherty, City Attorney

APPENDIX I
SFPUC REGIONAL WATER SYSTEM SUPPLY RELIABILITY AND BAWSCA TIER 2 DROUGHT IMPLEMENTATION SCENARIOS

February 18, 2021

TO: BAWSCA Member Agencies

FROM: Danielle McPherson, Senior Water Resources Specialist
Tom Francis, Water Resources Manager

SUBJECT: San Francisco Regional Water System Supply Reliability for 2020 Urban Water Management Plans

The purpose of this memorandum is to provide updated drought allocations among the Member Agencies under the various scenarios provided in the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS) Supply Reliability Letter dated January 22, 2021 and transmitted to the Member Agencies via email on January 25th ("Supply Reliability Letter", Attachment A). As presented and discussed at the February 12th BAWSCA Urban Water Management Plan (UWMP) Workshop, the Tier 2 Drought Allocation Plan was not designed for RWS shortages greater than 20 percent. As a result, the Tier 2 allocation tables shared with the Supply Reliability Letter showed unexpected and wide-ranging results between Member Agencies that should not be used for UWMP purposes.

As provided for in the 2018 Amended and Restated Water Supply Agreement (WSA), the SFPUC will honor new Tier 2 allocations agreed upon by all Member Agencies if an RWS shortage greater than 20 percent is declared. However, at this time, there is no method for allocating supplies under such significant cutbacks. Additionally, the time it would take to negotiate a modified Tier 2 plan to address those significant cutbacks would be extensive and greater than the timeline required for BAWSCA to provide your agency with numbers for input into your 2020 UWMP submittals.

For these reasons, BAWSCA is recommending that for the purpose of the 2020 UWMP updates, allocation of wholesale RWS supplies should be as follows:

1. When the average Wholesale Customers' RWS shortages are 10 percent or less, an equal percent reduction will be applied across all agencies. This is consistent with the existing Tier 2 requirement of a minimum 10 percent cutback in any Tier 2 application scenario.
2. When average Wholesale Customers' shortages are between 10 and 20 percent, the Tier 2 Drought Allocation Plan will be applied.
3. When the average Wholesale Customers' RWS shortages are greater than 20 percent, an equal percent reduction will be applied across all agencies.

Attachment B "Updated 2020 UWMP Drought Cutbacks" provides further detail, including recommended wholesale RWS allocation tables, for use in your agency's 2020 UWMP.

BAWSCA recognizes that this is not an ideal situation or method for allocation of available drought supplies. In the event of actual RWS shortages greater than 20 percent, the Member Agencies would have the opportunity to negotiate and agree upon a more nuanced and equitable approach. Such an approach would likely consider basic health and safety needs, the

water needs to support critical institutions such as hospitals, and minimizing economic impacts on individual communities and the region.

Enclosed: Attachment A: Supply Reliability Letter
Attachment B: Updated 2020 UWMP Drought Cutbacks

cc: Nicole Sandkulla
Allison Schutte

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

525 Golden Gate Avenue, 13th Floor
San Francisco, CA 94102
T 415.554.3155
F 415.554.3161
TTY 415.554.3488

January 22, 2021

Danielle McPherson
Senior Water Resources Specialist
Bay Area Water Supply and Conservation Agency
155 Bovet Road, Suite 650
San Mateo, CA 94402

Dear Ms. McPherson,

Attached please find the information you requested on the Regional Water System's supply reliability for use in the Wholesale Customer's 2020 Urban Water Management Plan (UWMP) updates. The SFPUC has assessed the water supply reliability under the following planning scenarios:

- Projected supply reliability for year 2020 through 2045
- Projected single dry year and multiple dry year reliability for base year 2020, both with and without implementation of the Bay-Delta Plan Amendment
- Projected single dry year and multiple dry year reliability for base year 2025, both with and without implementation of the Bay-Delta Plan Amendment

The tables presented below assume full implementation of the Bay-Delta Plan Amendment will begin in 2023. All tables assume that the wholesale customers will purchase 184 mgd from the RWS through 2045. Assumptions about the status of the dry-year water supply projects included in the Water Supply Improvement Program (WSIP) are provided below in the table 'WSIP Project Assumptions'. The tables reflect instream flow requirements at San Mateo and Alameda Creeks, as described in the common language provided to BAWSCA separately.

Concerning allocation of supply during dry years, the Water Shortage Allocation Plan (WSAP) was utilized to allocate shortages between the SFPUC and the Wholesale Customers collectively. The WSAP implements a method for allocating water between the SFPUC retail customers and wholesale customers collectively which has been adopted by the Wholesale Customers per the July 2009 Water Supply Agreement between the City and County of

London N. Breed
Mayor

Sophie Maxwell
President

Anson Moran
Vice President

Tim Paulson
Commissioner

Ed Harrington
Commissioner

Michael Carlin
Acting
General Manager

San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County. The WSAP, also known as the Tier One Plan, was amended in the 2018 Amended and Restated Water Supply Agreement. The wholesale customers have adopted the Tier Two Plan, the second component of the WSAP, which allocates the collective wholesale customer share among each of the 26 wholesale customers.

Compared to the reliability projections that were provided previously for the 2015 UWMP update, the biggest difference in projected future deliveries is caused by the implementation of the Bay-Delta Plan Amendment. Given the uncertainty about the implementation of the Amendment (described further in the common language provided to BAWSCA), tables are included to show future projected supplies both with and without the Bay-Delta Plan Amendment.

It is our understanding that you will pass this information on to the Wholesale Customers. If you have any questions or need additional information, please do not hesitate to contact Sarah Triolo, at striolo@sfwater.org or (628) 230 0802.

Sincerely,

Paula Kehoe
Director of Water Resources

Table 1: WSIP Project Assumptions

	2020	2025 and Beyond
Calaveras Dam Replacement Project	Calaveras Reservoir partially refilled at spring 2020 level of 63,900 AF	Calaveras Reservoir fully refilled
Lower Crystal Springs Dam Improvements	Crystal Springs storage not restored	
Regional Groundwater Storage and Recovery (GSR) Project	GSR account partially filled at spring 2020 level of 23,500 AF; GSR recovery rate of 6.2 mgd	GSR account fully filled; GSR recovery rate of 6.2 mgd
Alameda Creek Recapture Project	Project not built	Project built
Dry-year Transfers	Not in effect	

Table 2: Projected Wholesale Supply from Regional Water System [For Table 6-9]:

Year	2020	2025	2030	2035	2040	2045
RWS Supply (mgd)	265	265	265	265	265	265
Wholesale Supply (mgd)	184	184	184	184	184	184

Table 3: Basis of Water Supply Data [For Table 7-1], 2020 Infrastructure Conditions With Bay Delta Plan

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2020	265	100%	184	
Single dry year		238.5	90%	157.5	• At 10% shortage, wholesale allocation is 64%, or 152.6 mgd • Retail allocation is 36%, or 85.9 mgd • Retail allocations above 81 mgd are re-allocated to Wholesale Customers, per the 2018 WSA • 4.9 mgd added to wholesale allocation, bringing it to 157.5 mgd
Consecutive 1st Dry year		238.5	90%	157.5	• Same as above
Consecutive 2nd Dry year		212	80%	132.5	• At a 20% shortage, wholesale allocation is 62.5%, or 132.5 mgd • Retail allocation is 37.5%, or 79.5 mgd
Consecutive 3rd Dry year[1]		119.25	45%	74.5	• WSA does not define percentage split above a 20% shortage level • Assume same split as for a 20% shortage level, i.e. Wholesale Customers receive 62.5%
Consecutive 4th Dry year		119.25	45%	74.5	• Same as above
Consecutive 5th Dry year		119.25	45%	74.5	• Same as above

[1] Assuming this year represents 2023, when Bay Delta Plan Amendment would come into effect.

Table 4: Basis of Water Supply Data [For Table 7-1], 2020 Infrastructure Conditions Without Bay Delta Plan

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2020	265	100%	184	
Single dry year		238.5	90%	157.5	• At 10% shortage, wholesale allocation is 64%, or 152.6 mgd • Retail allocation is 36%, or 85.9 mgd • Retail allocations above 81 mgd are re-allocated to Wholesale Customers, per the 2018 WSA • 4.9 mgd added to wholesale allocation, bringing it to 157.5 mgd
Consecutive 1st Dry year		238.5	90%	157.5	• Same as above
Consecutive 2nd Dry year		212	80%	132.5	• At a 20% shortage, wholesale allocation is 62.5%, or 132.5 mgd • Retail allocation is 37.5%, or 79.5 mgd
Consecutive 3rd Dry year		212	80%	132.5	• Same as above
Consecutive 4th Dry year		212	80%	132.5	• Same as above
Consecutive 5th Dry year		212	80%	132.5	• Same as above

Table 5: Basis of Water Supply Data [For Table 7-1], 2025 Infrastructure With Bay Delta Plan

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2025	265	100%	184	
Single dry year		132.5	50%	82.8	• WSA does not define percentage split above a 20% shortage level • Assume same split as for a 20% shortage level, i.e. Wholesale Customers receive 62.5%
Consecutive 1st Dry year		132.5	50%	82.8	• Same as above
Consecutive 2nd Dry year		119.25	45%	74.5	• Same as above
Consecutive 3rd Dry year		119.25	45%	74.5	• Same as above
Consecutive 4th Dry year		119.25	45%	74.5	• Same as above
Consecutive 5th Dry year		119.25	45%	74.5	• Same as above

Table 6: Basis of Water Supply Data [For Table 7-1], 2025 Infrastructure Without Bay Delta Plan

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2025	265	100%	184	
Single dry year		238.5	90%	157.5	• At 10% shortage, wholesale allocation is 64% • Retail allocation is 36%, or 85.9 mgd; retail allocations above 81 mgd are re-allocated to Wholesaler Customers, per the 2018 WSA • 4.9 mgd added to wholesale allocation, bringing it to 157.5 mgd
Consecutive 1st Dry year		238.5	90%	157.5	• Same as above
Consecutive 2nd Dry year		238.5	90%	157.5	• Same as above
Consecutive 3rd Dry year		238.5	90%	157.5	• Same as above
Consecutive 4th Dry year		212	80%	132.5	• At a 20% shortage, wholesale allocation is 62.5%, or 132.5 mgd • Retail allocation is 37.5%, or 79.5 mgd
Consecutive 5th Dry year		212	80%	132.5	• Same as above

Table 7: Projected Multiple Dry Years Wholesale Supply from RWS [For Table 7-4], With Bay Delta Plan

	2025	2030	2035	2040	2045
First year	82.8	82.8	82.8	82.8	82.8
Second year	74.5	74.5	74.5	74.5	74.5
Third year	74.5	74.5	74.5	74.5	74.5
Fourth year	74.5	74.5	74.5	74.5	74.5
Fifth year	74.5	74.5	74.5	74.5	74.5

Table 8: Projected Multiple Dry Years Wholesale Supply from RWS [For Table 7-4], Without Bay Delta Plan

	2025	2030	2035	2040	2045
First year	157.5	157.5	157.5	157.5	157.5
Second year	157.5	157.5	157.5	157.5	157.5
Third year	157.5	157.5	157.5	157.5	157.5
Fourth year	132.5	132.5	132.5	132.5	132.5
Fifth year	132.5	132.5	132.5	132.5	132.5

Table 9: Projected Regional Water System Supply for 5-Year Drought Risk Assessment [For Table 7-5], With Bay Delta Plan. This table assumes Bay Delta Plan comes into effect in 2023.

Year	2021	2022	2023	2024	2025
RWS Supply (mgd)	238.5	212	119.25	119.25	119.25
Wholesale Supply (mgd)	157.5	132.5	74.5	74.5	74.5

Table 10: Projected Regional Water System Supply for 5-Year Drought Risk Assessment [For Table 7-5], Without Bay Delta Plan

Year	2021	2022	2023	2024	2025
RWS Supply (mgd)	238.5	212	212	212	212
Wholesale Supply (mgd)	157.5	132.5	132.5	132.5	132.5

Attachment B: Updated 2020 UWMP Drought Cutbacks

The January 22, 2021, SFPUC Regional Water System (RWS) Supply Reliability Letter (Supply Reliability Letter) provides RWS supplies available to the Wholesale Customers under two scenarios: (1) With Bay-Delta Plan, and (2) Without Bay-Delta Plan. Your agency must choose which scenario to use for your agency's 2020 UWMP submittal tables. However, you may discuss both scenarios in the body of your agency's UWMP. The purpose of this attachment is to provide further detail about your agency's allocation of total RWS supplies available to the Wholesale Customers under both scenarios.

Data Sources for Projected RWS Purchases

Supply allocations are based on projected RWS purchases provided to BAWSCA by the Member Agencies. Following the completion of the Demand Study in June 2020, BAWSCA used the results to develop a table for each Member Agency listing possible supplies and total demand for 2025, 2030, 2035, 2040, and 2045. BAWSCA populated the tables with total demand after passive conservation and entered active conservation, as calculated in the agencies' DSS Model, as a source of supply. Multi-source agencies were asked to complete the table with supply projections, including from the RWS, to meet total demand. Single-source agencies were offered the opportunity to review the tables upon request. Because active conservation was treated as a source of supply, projected RWS purchases are after passive and active conservation.[1]

Water Management Representatives (WMRs) received a draft copy of all projected wholesale RWS purchase requests as part of the January 7, 2021 WMR meeting agenda packet and meeting slides. Agencies were asked to notify BAWSCA if changes were necessary regarding their purchase requests prior to BAWSCA sending those purchase requests to the SFPUC. Purchase requests were transmitted to the SFPUC via a letter dated January 15, 2021 for use in their 2020 UWMP efforts.

Note that the projected RWS purchases used by BAWSCA for fiscal years 2020-21 and for 2021-22 were provided to Christina Tang, BAWSCA's Finance Manager, by each Member Agency in January 2021. This annual reporting is part of the SFPUC's wholesale rate setting process. Member Agencies have provided BAWSCA with these projected purchases annually for the past 10 years.

UWMP Tables 7-1 and 7-5

UWMP Table 7-1 requests supply reliability for a normal year, a single dry year, and multiple (five) dry years. Tables 3, 4, 5, and 6 provided in the Supply Reliability Letter will help your agency complete UWMP Table 7-1. The Drought Risk Assessment (DRA) in UWMP Table 7-5 also requests a five-year drought sequence but specifies years 2021 through 2025. Supply Reliability Letter Tables 9 and 10 will help your agency complete UWMP Table 7-5.

The Supply Reliability Letter provides four scenarios to select from for completing UWMP Table 7-1. The Supply Reliability Letter Tables 3 (with Bay-Delta Plan) and 4 (without Bay-Delta Plan) use 2020 as the base year. Depending on which scenario you choose, these will be the basis for your agency's five-year DRA (UWMP Table 7-5). The Supply Reliability Letter Tables 5 (with Bay-Delta Plan) and 6 (without Bay-Delta Plan) use 2025 as the base year. Depending on which scenario you choose, these will be the basis for UWMP Tables 7-2 through 7-4.

[1] Projected RWS purchases are after conservation, except for Mountain View.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Total RWS supplies available to the Wholesale Customers in the first through fifth consecutive dry years in Supply Reliability Letter Table 3 align with those in Table 9 of the same letter. Similarly, Supply Reliability Letter Table 4 aligns with Table 10 of the same letter.

Table A below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Tables 7-1and 7-5.

Table A: Wholesale Customer Drought Cutbacks Based on a Single Dry Year and Multiple Dry Years (Base Year 2020)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
(1)	Projected SF RWS Wholesale Purchases	132.2 MGD	138.6 MGD	140.8 MGD	142.5 MGD	144.3 MGD	146.0 MGD
(2)	Supply Available to the Wholesale Customers	Percent Cutback on Wholesale RWS Purchases					
		2020	**2021**	**2022**	**2023**	**2024**	**2025**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
(4)	132.5 MGD	0.0%	-4.4%	-5.9%	-7.0%	-8.2%	-9.3%
(5)	82.8 MGD	-37.4%	-40.3%	-41.2%	-41.9%	-42.6%	-43.3%
(6)	74.5 MGD	-43.7%	-46.3%	-47.1%	-47.7%	-48.4%	-49.0%

Table A, column (a), rows 3 through 6 lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative actual wholesale RWS purchases for 2020 and projected purchases for 2021 through 2025. Projected RWS purchases for years 2021 and 2022 were provided to Christina Tang, BAWSCA's Finance Manager, by the Member Agencies in January. Projected RWS purchases for 2025 were provided to BAWSCA by the Member Agencies as described previously in this memo. Projected wholesale RWS purchases for 2023 and 2024 were derived assuming a linear change between 2022 and 2025.

Table B below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Table 7-1.

Table B: Wholesale Customer Drought Cutbacks Based on a Single Dry Year and Multiple Dry Years (Base Year 2025)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
(1)	Projected SF RWS Wholesale Purchases	146.0 MGD	146.4 MGD	146.8 MGD	147.1 MGD	147.5 MGD	147.9 MGD
(2)	Supply Available to the Wholesale Customers	Percent Cutback on Wholesale RWS Purchases					
		2025	**2026**	**2027**	**2028**	**2029**	**2030**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
(4)	132.5 MGD	-9.2%	-9.5%	-9.7%	-9.9%	-10.2%	-10.4%
(5)	82.8 MGD	-43.3%	-43.4%	-43.6%	-43.7%	-43.9%	-44.0%
(6)	74.5 MGD	-49.0%	-49.1%	-49.3%	-49.4%	-49.5%	-49.6%

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table B, column (a), rows 3 through 6 lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative projected wholesale RWS purchases for 2025 through 2030. Projected wholesale RWS purchases for years 2025 and 2030 were provided to BAWSCA by the Member Agencies as described previously in this memo. Projected wholesale RWS purchases for 2026 through 2029 were derived assuming a linear change between 2025 and 2030.

To complete UWMP Tables 7-1 and 7-5, reference tables in the Supply Reliability Letter to identify total RWS supplies available to the Wholesale Customers and apply the percent cutback in the corresponding year of the drought sequence using Tables A and B. For example, in Supply Reliability Letter Table 3, in the 5th consecutive year of a drought, the volume available to the Wholesale Customers is 74.5 MGD. To calculate RWS supplies available to your agency in 2025 using table A, locate the row with 74.5 MGD on the table – row 6 – and the column for 2025 – column (g). Then apply the percent cutback to your agency's RWS demand in 2025.

A list of purchase projections by agency are provided in Tables C, D, E, and F. The table also indicates the percent cutback that should be applied based on total RWS supplies available to the Wholesale Customers. Tables C and E use Scenario 1: With Bay-Delta Plan. Tables D and F use Scenario 2: Without Bay-Delta Plan. Tables C and D use 2020 as the base year and Tables E and F use 2025 as the base year.

BAWSCA understands that agencies are updating projected demands for their 2020 UWMPs and that projected RWS purchases may change from what was previously provided. Additionally, BAWSCA recognizes that not all Member Agencies will choose the same scenario for their UWMP supply reliability tables. For both reasons, projected RWS purchases in each Member Agency's 2020 UWMP may not add up to total Wholesale demands in the SFPUC's 2020 UWMP. This is consistent with direction given by the Department of Water Resources, which encourages suppliers use the UWMP tables to represent what they believe to be the most likely supply reliability scenario and to characterize the five-consecutive year drought in a manner that is best suited for understanding and managing their water service reliability and individual agency level of risk tolerance.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table C: Scenario 1: With Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2020)

	2020 (184 MGD)		**2021** (157.5 MGD)		**2022** (132.5 MGD)		**2023** (74.5 MGD)		**2024** (74.5 MGD)		**2025** (74.5 MGD)	
Agency	Actual Purchases	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.87	0.0%	9.44	0.0%	9.46	-5.9%	8.87	-47.7%	8.27	-48.4%	7.68	-49.0%
Brisbane/GVMID	0.64	0.0%	0.62	0.0%	0.65	-5.9%	0.73	-47.7%	0.81	-48.4%	0.89	-49.0%
Burlingame	3.48	0.0%	3.34	0.0%	3.35	-5.9%	3.67	-47.7%	4.00	-48.4%	4.33	-49.0%
Coastside	1.02	0.0%	1.54	0.0%	1.23	-5.9%	1.29	-47.7%	1.34	-48.4%	1.40	-49.0%
CalWater Total	29.00	0.0%	29.66	0.0%	29.81	-5.9%	29.87	-47.7%	29.93	-48.4%	29.99	-49.0%
Daly City	3.97	0.0%	4.00	0.0%	4.01	-5.9%	3.86	-47.7%	3.72	-48.4%	3.57	-49.0%
East Palo Alto	1.57	0.0%	1.63	0.0%	1.69	-5.9%	1.75	-47.7%	1.81	-48.4%	1.88	-49.0%
Estero	4.34	0.0%	4.48	0.0%	4.51	-5.9%	4.36	-47.7%	4.22	-48.4%	4.07	-49.0%
Hayward	13.92	0.0%	14.47	0.0%	15.12	-5.9%	16.03	-47.7%	16.94	-48.4%	17.86	-49.0%
Hillsborough	2.62	0.0%	2.95	0.0%	3.05	-5.9%	3.12	-47.7%	3.19	-48.4%	3.26	-49.0%
Menlo Park	2.96	0.0%	2.92	0.0%	2.93	-5.9%	3.14	-47.7%	3.35	-48.4%	3.55	-49.0%
Mid-Peninsula	2.66	0.0%	2.65	0.0%	2.80	-5.9%	2.82	-47.7%	2.84	-48.4%	2.86	-49.0%
Millbrae	1.90	0.0%	1.95	0.0%	2.15	-5.9%	2.19	-47.7%	2.24	-48.4%	2.29	-49.0%
Milpitas	5.92	0.0%	5.88	0.0%	5.34	-5.9%	5.76	-47.7%	6.17	-48.4%	6.59	-49.0%
Mountain View	7.67	0.0%	7.80	0.0%	8.05	-5.9%	8.23	-47.7%	8.42	-48.4%	8.60	-49.0%
North Coast	2.37	0.0%	2.58	0.0%	2.66	-5.9%	2.56	-47.7%	2.45	-48.4%	2.34	-49.0%
Palo Alto	9.75	0.0%	9.44	0.0%	9.66	-5.9%	9.79	-47.7%	9.93	-48.4%	10.06	-49.0%
Purissima Hills	1.75	0.0%	1.97	0.0%	2.02	-5.9%	2.04	-47.7%	2.06	-48.4%	2.09	-49.0%
Redwood City	8.76	0.0%	8.72	0.0%	9.07	-5.9%	8.86	-47.7%	8.66	-48.4%	8.46	-49.0%
San Bruno	0.95	0.0%	3.39	0.0%	3.40	-5.9%	3.35	-47.7%	3.29	-48.4%	3.24	-49.0%
San José	4.26	0.0%	4.31	0.0%	4.51	-5.9%	4.51	-47.7%	4.50	-48.4%	4.50	-49.0%
Santa Clara	3.27	0.0%	3.29	0.0%	3.50	-5.9%	3.83	-47.7%	4.17	-48.4%	4.50	-49.0%
Stanford	1.43	0.0%	1.40	0.0%	1.54	-5.9%	1.70	-47.7%	1.85	-48.4%	2.01	-49.0%
Sunnyvale	9.33	0.0%	9.35	0.0%	9.45	-5.9%	9.35	-47.7%	9.26	-48.4%	9.16	-49.0%
Westborough	0.82	0.0%	0.84	0.0%	0.81	-5.9%	0.83	-47.7%	0.84	-48.4%	0.86	-49.0%
Wholesale Total	**132.2**	**132.2†**	**138.6**	**138.6†**	**140.8**	**132.5†**	**142.5**	**74.5†**	**144.3**	**74.5†**	**146.0**	**74.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table D: Scenario 2: Without Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2020)

	2020 (184 MGD)		**2021** (157.5 MGD)		**2022** (132.5 MGD)		**2023** (132.5 MGD)		**2024** (132.5 MGD)		**2025** (132.5 MGD)	
Agency	Actual Purchases	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.87	0.0%	9.44	0.0%	9.46	-5.9%	8.87	-7.0%	8.27	-8.2%	7.68	-9.2%
Brisbane/GVMID	0.64	0.0%	0.62	0.0%	0.65	-5.9%	0.73	-7.0%	0.81	-8.2%	0.89	-9.2%
Burlingame	3.48	0.0%	3.34	0.0%	3.35	-5.9%	3.67	-7.0%	4.00	-8.2%	4.33	-9.2%
Coastside	1.02	0.0%	1.54	0.0%	1.23	-5.9%	1.29	-7.0%	1.34	-8.2%	1.40	-9.2%
CalWater Total	29.00	0.0%	29.66	0.0%	29.81	-5.9%	29.87	-7.0%	29.93	-8.2%	29.99	-9.2%
Daly City	3.97	0.0%	4.00	0.0%	4.01	-5.9%	3.86	-7.0%	3.72	-8.2%	3.57	-9.2%
East Palo Alto	1.57	0.0%	1.63	0.0%	1.69	-5.9%	1.75	-7.0%	1.81	-8.2%	1.88	-9.2%
Estero	4.34	0.0%	4.48	0.0%	4.51	-5.9%	4.36	-7.0%	4.22	-8.2%	4.07	-9.2%
Hayward	13.92	0.0%	14.47	0.0%	15.12	-5.9%	16.03	-7.0%	16.94	-8.2%	17.86	-9.2%
Hillsborough	2.62	0.0%	2.95	0.0%	3.05	-5.9%	3.12	-7.0%	3.19	-8.2%	3.26	-9.2%
Menlo Park	2.96	0.0%	2.92	0.0%	2.93	-5.9%	3.14	-7.0%	3.35	-8.2%	3.55	-9.2%
Mid-Peninsula	2.66	0.0%	2.65	0.0%	2.80	-5.9%	2.82	-7.0%	2.84	-8.2%	2.86	-9.2%
Millbrae	1.90	0.0%	1.95	0.0%	2.15	-5.9%	2.19	-7.0%	2.24	-8.2%	2.29	-9.2%
Milpitas	5.92	0.0%	5.88	0.0%	5.34	-5.9%	5.76	-7.0%	6.17	-8.2%	6.59	-9.2%
Mountain View	7.67	0.0%	7.80	0.0%	8.05	-5.9%	8.23	-7.0%	8.42	-8.2%	8.60	-9.2%
North Coast	2.37	0.0%	2.58	0.0%	2.66	-5.9%	2.56	-7.0%	2.45	-8.2%	2.34	-9.2%
Palo Alto	9.75	0.0%	9.44	0.0%	9.66	-5.9%	9.79	-7.0%	9.93	-8.2%	10.06	-9.2%
Purissima Hills	1.75	0.0%	1.97	0.0%	2.02	-5.9%	2.04	-7.0%	2.06	-8.2%	2.09	-9.2%
Redwood City	8.76	0.0%	8.72	0.0%	9.07	-5.9%	8.86	-7.0%	8.66	-8.2%	8.46	-9.2%
San Bruno	0.95	0.0%	3.39	0.0%	3.40	-5.9%	3.35	-7.0%	3.29	-8.2%	3.24	-9.2%
San José	4.26	0.0%	4.31	0.0%	4.51	-5.9%	4.51	-7.0%	4.50	-8.2%	4.50	-9.2%
Santa Clara	3.27	0.0%	3.29	0.0%	3.50	-5.9%	3.83	-7.0%	4.17	-8.2%	4.50	-9.2%
Stanford	1.43	0.0%	1.40	0.0%	1.54	-5.9%	1.70	-7.0%	1.85	-8.2%	2.01	-9.2%
Sunnyvale	9.33	0.0%	9.35	0.0%	9.45	-5.9%	9.35	-7.0%	9.26	-8.2%	9.16	-9.2%
Westborough	0.82	0.0%	0.84	0.0%	0.81	-5.9%	0.83	-7.0%	0.84	-8.2%	0.86	-9.2%
Wholesale Total	**132.2**	**132.2†**	**138.6**	**138.6†**	**140.8**	**132.5†**	**142.5**	**132.5†**	**144.3**	**132.5†**	**146.0**	**132.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table E: Scenario 1: With Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2025)

	2025 (184 MGD)		**2026** (82.8 MGD)		**2027** (74.5 MGD)		**2028** (74.5 MGD)		**2029** (74.5 MGD)		**2030** (74.5 MGD)	
Agency	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.68	0%	7.68	-43.4%	7.68	-49.3%	7.68	-49.4%	7.68	-49.5%	7.68	-49.6%
Brisbane/GVMID	0.89	0%	0.89	-43.4%	0.89	-49.3%	0.89	-49.4%	0.89	-49.5%	0.89	-49.6%
Burlingame	4.33	0%	4.34	-43.4%	4.35	-49.3%	4.37	-49.4%	4.38	-49.5%	4.40	-49.6%
Coastside	1.40	0%	1.40	-43.4%	1.39	-49.3%	1.39	-49.4%	1.38	-49.5%	1.38	-49.6%
CalWater Total	29.99	0%	29.94	-43.4%	29.89	-49.3%	29.84	-49.4%	29.79	-49.5%	29.74	-49.6%
Daly City	3.57	0%	3.56	-43.4%	3.55	-49.3%	3.54	-49.4%	3.53	-49.5%	3.52	-49.6%
East Palo Alto	1.88	0%	1.89	-43.4%	1.91	-49.3%	1.92	-49.4%	1.93	-49.5%	1.95	-49.6%
Estero	4.07	0%	4.08	-43.4%	4.08	-49.3%	4.09	-49.4%	4.10	-49.5%	4.11	-49.6%
Hayward	17.86	0%	18.02	-43.4%	18.19	-49.3%	18.35	-49.4%	18.52	-49.5%	18.68	-49.6%
Hillsborough	3.26	0%	3.26	-43.4%	3.26	-49.3%	3.26	-49.4%	3.26	-49.5%	3.25	-49.6%
Menlo Park	3.55	0%	3.58	-43.4%	3.60	-49.3%	3.63	-49.4%	3.66	-49.5%	3.68	-49.6%
Mid-Peninsula	2.86	0%	2.85	-43.4%	2.85	-49.3%	2.85	-49.4%	2.84	-49.5%	2.84	-49.6%
Millbrae	2.29	0%	2.33	-43.4%	2.37	-49.3%	2.41	-49.4%	2.46	-49.5%	2.50	-49.6%
Milpitas	6.59	0%	6.62	-43.4%	6.65	-49.3%	6.68	-49.4%	6.72	-49.5%	6.75	-49.6%
Mountain View	8.60	0%	8.66	-43.4%	8.72	-49.3%	8.78	-49.4%	8.84	-49.5%	8.90	-49.6%
North Coast	2.34	0%	2.34	-43.4%	2.33	-49.3%	2.33	-49.4%	2.33	-49.5%	2.33	-49.6%
Palo Alto	10.06	0%	10.08	-43.4%	10.10	-49.3%	10.12	-49.4%	10.13	-49.5%	10.15	-49.6%
Purissima Hills	2.09	0%	2.09	-43.4%	2.09	-49.3%	2.09	-49.4%	2.09	-49.5%	2.09	-49.6%
Redwood City	8.46	0%	8.46	-43.4%	8.47	-49.3%	8.48	-49.4%	8.49	-49.5%	8.49	-49.6%
San Bruno	3.24	0%	3.23	-43.4%	3.23	-49.3%	3.22	-49.4%	3.22	-49.5%	3.22	-49.6%
San José	4.50	0%	4.50	-43.4%	4.50	-49.3%	4.50	-49.4%	4.50	-49.5%	4.50	-49.6%
Santa Clara	4.50	0%	4.50	-43.4%	4.50	-49.3%	4.50	-49.4%	4.50	-49.5%	4.50	-49.6%
Stanford	2.01	0%	2.04	-43.4%	2.08	-49.3%	2.11	-49.4%	2.15	-49.5%	2.18	-49.6%
Sunnyvale	9.16	0%	9.19	-43.4%	9.22	-49.3%	9.24	-49.4%	9.27	-49.5%	9.30	-49.6%
Westborough	0.86	0%	0.86	-43.4%	0.86	-49.3%	0.86	-49.4%	0.85	-49.5%	0.85	-49.6%
Wholesale Total	**146.0**	**146.0†**	**146.4**	**82.8†**	**146.8**	**74.5†**	**147.1**	**74.5†**	**147.5**	**74.5†**	**147.9**	**74.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table F: Scenario 2: Without Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2025)

	2025 (184 MGD)		**2026** (157.5 MGD)		**2027** (157.5 MGD)		**2028** (157.5 MGD)		**2029** (132.5 MGD)		**2030** (132.5 MGD)	
Agency	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.68	0.0%	7.68	0.0%	7.68	0.0%	7.68	0.0%	7.68	-10.2%	7.68	-10.4%
Brisbane/GVMID	0.89	0.0%	0.89	0.0%	0.89	0.0%	0.89	0.0%	0.89	-10.2%	0.89	-10.4%
Burlingame	4.33	0.0%	4.34	0.0%	4.35	0.0%	4.37	0.0%	4.38	-10.2%	4.40	-10.4%
Coastside	1.40	0.0%	1.40	0.0%	1.39	0.0%	1.39	0.0%	1.38	-10.2%	1.38	-10.4%
CalWater Total	29.99	0.0%	29.94	0.0%	29.89	0.0%	29.84	0.0%	29.79	-10.2%	29.74	-10.4%
Daly City	3.57	0.0%	3.56	0.0%	3.55	0.0%	3.54	0.0%	3.53	-10.2%	3.52	-10.4%
East Palo Alto	1.88	0.0%	1.89	0.0%	1.91	0.0%	1.92	0.0%	1.93	-10.2%	1.95	-10.4%
Estero	4.07	0.0%	4.08	0.0%	4.08	0.0%	4.09	0.0%	4.10	-10.2%	4.11	-10.4%
Hayward	17.86	0.0%	18.02	0.0%	18.19	0.0%	18.35	0.0%	18.52	-10.2%	18.68	-10.4%
Hillsborough	3.26	0.0%	3.26	0.0%	3.26	0.0%	3.26	0.0%	3.26	-10.2%	3.25	-10.4%
Menlo Park	3.55	0.0%	3.58	0.0%	3.60	0.0%	3.63	0.0%	3.66	-10.2%	3.68	-10.4%
Mid-Peninsula	2.86	0.0%	2.85	0.0%	2.85	0.0%	2.85	0.0%	2.84	-10.2%	2.84	-10.4%
Millbrae	2.29	0.0%	2.33	0.0%	2.37	0.0%	2.41	0.0%	2.46	-10.2%	2.50	-10.4%
Milpitas	6.59	0.0%	6.62	0.0%	6.65	0.0%	6.68	0.0%	6.72	-10.2%	6.75	-10.4%
Mountain View	8.60	0.0%	8.66	0.0%	8.72	0.0%	8.78	0.0%	8.84	-10.2%	8.90	-10.4%
North Coast	2.34	0.0%	2.34	0.0%	2.33	0.0%	2.33	0.0%	2.33	-10.2%	2.33	-10.4%
Palo Alto	10.06	0.0%	10.08	0.0%	10.10	0.0%	10.12	0.0%	10.13	-10.2%	10.15	-10.4%
Purissima Hills	2.09	0.0%	2.09	0.0%	2.09	0.0%	2.09	0.0%	2.09	-10.2%	2.09	-10.4%
Redwood City	8.46	0.0%	8.46	0.0%	8.47	0.0%	8.48	0.0%	8.49	-10.2%	8.49	-10.4%
San Bruno	3.24	0.0%	3.23	0.0%	3.23	0.0%	3.22	0.0%	3.22	-10.2%	3.22	-10.4%
San José	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	-10.2%	4.50	-10.4%
Santa Clara	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	-10.2%	4.50	-10.4%
Stanford	2.01	0.0%	2.04	0.0%	2.08	0.0%	2.11	0.0%	2.15	-10.2%	2.18	-10.4%
Sunnyvale	9.16	0.0%	9.19	0.0%	9.22	0.0%	9.24	0.0%	9.27	-10.2%	9.30	-10.4%
Westborough	0.86	0.0%	0.86	0.0%	0.86	0.0%	0.86	0.0%	0.85	-10.2%	0.85	-10.4%
Wholesale Total	**146.0**	**146.0†**	**146.4**	**146.4†**	**146.8**	**146.8†**	**147.1**	**147.1†**	**147.5**	**132.5†**	**147.9**	**132.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

UWMP Table 7-4

Supply Reliability Letter Tables 7 and 8 will help your agency complete UWMP Table 7-4. Table G below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Table 7-4. The table assumes (1) the Tier 2 Plan will be used to allocate supplies available to the Wholesale Customers when average Wholesale Customers' RWS shortages are greater than 10 and up to 20 percent, and (2) an equal percent reduction will be shared across all Wholesale Customers when average Wholesale Customers' RWS shortages are 10 percent or less or greater than 20 percent.

Table G: Drought Cutbacks Based on Projected Demands Under All Water Supply Availability Conditions

	(a)	(b)	(c)	(d)	(e)	(f)
(1)	Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
(2)	Supply Available to the Wholesale Customers	% Cutback on Wholesale RWS Purchases				
		2025	**2030**	**2035**	**2040**	**2045**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	-3.2%
(4)	132.5 MGD	-9.3%	-10.4%	Tier 2 Avg. -14%*	Tier 2 Avg. -16%*	Tier 2 Avg. -19%*
(5)	82.8 MGD	-43.3%	-44.0%	-45.5%	-47.0%	-49.1%
(6)	74.5 MGD	-49.0%	-49.6%	-51.0%	-52.3%	-54.2%

* Calculated average. Individual agency cutbacks are calculated in Table H.

Table G, column (a) lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative projected wholesale RWS purchases for 2025, 2030, 2035, 2040, and 2045.

Tables H, I, J and K provide additional detail by agency for each of the four supply availability conditions listed in Table G. To complete UWMP Table 7-4, reference Table 7 or 8 (depending on which Bay-Delta Plan scenario you choose) in the Supply Reliability Letter to identify total RWS supplies available to the Wholesale Customers and apply the percent cutback in the corresponding year using Table G or input the volumetric drought allocation using Tables H, I, J and K below.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table H: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 157.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2030**	**2040**	**2045**
ACWD	7.68	7.68	7.68	7.68	8.82
Burlingame	0.89	0.89	0.88	0.89	0.87
Burlingame	4.33	4.40	4.47	4.58	4.54
Coastside	1.40	1.38	1.36	1.33	1.28
CalWater Total	29.99	29.74	29.81	30.27	29.71
Daly City	3.57	3.52	3.49	3.46	3.32
East Palo Alto	1.88	1.95	2.10	2.49	2.80
Estero	4.07	4.11	4.18	4.23	4.24
Hayward	17.86	18.68	19.75	20.82	21.43
Hillsborough	3.26	3.25	3.26	3.26	3.15
Menlo Park	3.55	3.68	3.87	4.06	4.15
Mid-Peninsula	2.86	2.84	2.88	2.89	2.83
Millbrae	2.29	2.50	2.45	2.82	3.10
Milpitas	6.59	6.75	7.03	7.27	7.29
Mountain View	8.60	8.90	9.20	9.51	9.61
North Coast	2.34	2.33	2.34	2.34	2.27
Palo Alto	10.06	10.15	10.28	10.51	10.44
Purissima Hills	2.09	2.09	2.12	2.13	2.08
Redwood City	8.46	8.49	8.64	8.74	8.62
San Bruno	3.24	3.22	3.20	3.20	3.11
San José	4.50	4.50	4.50	4.50	4.35
Santa Clara	4.50	4.50	4.50	4.50	4.35
Stanford	2.01	2.18	2.35	2.53	2.61
Sunnyvale	9.16	9.30	10.70	11.44	11.71
Westborough	0.86	0.85	0.85	0.84	0.82
Wholesale Total	**146.0**	**147.9**	**151.9**	**156.3**	**157.5**

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table I: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 132.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2030**	**2040**	**2045**
ACWD	6.97	6.88	6.91	6.91	8.20
Burlingame	0.81	0.79	0.73	0.73	0.72
Burlingame	3.93	3.94	3.96	3.89	3.80
Coastside	1.27	1.24	1.22	1.20	1.19
CalWater Total	27.21	26.65	26.46	25.69	24.69
Daly City	3.24	3.15	3.04	3.01	2.98
East Palo Alto	1.70	1.75	1.97	2.30	2.62
Estero	3.69	3.68	3.76	3.87	3.77
Hayward	16.20	16.74	17.32	17.69	18.07
Hillsborough	2.96	2.92	2.90	2.75	2.56
Menlo Park	3.22	3.30	3.37	3.33	3.26
Mid-Peninsula	2.59	2.54	2.59	2.62	2.54
Millbrae	2.07	2.24	2.16	2.32	2.45
Milpitas	5.98	6.05	6.25	6.31	6.35
Mountain View	7.80	7.97	8.28	8.49	8.34
North Coast	2.12	2.09	2.11	2.11	2.11
Palo Alto	9.13	9.09	9.26	9.46	9.71
Purissima Hills	1.89	1.87	1.42	1.38	1.32
Redwood City	7.67	7.61	7.89	7.70	7.49
San Bruno	2.94	2.88	2.56	2.51	2.45
San José	4.08	4.03	3.03	2.91	2.76
Santa Clara	4.08	4.03	3.03	2.91	2.76
Stanford	1.82	1.95	2.06	2.13	2.16
Sunnyvale	8.31	8.33	9.46	9.51	9.43
Westborough	0.78	0.76	0.76	0.76	0.76
Wholesale Total	**132.5**	**132.5**	**132.5**	**132.5**	**132.5**

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table J: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 82.8 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2030**	**2040**	**2045**
ACWD	4.36	4.30	4.19	4.07	4.64
Burlingame	0.51	0.50	0.48	0.47	0.45
Burlingame	2.45	2.46	2.44	2.43	2.39
Coastside	0.79	0.77	0.74	0.71	0.68
CalWater Total	17.00	16.65	16.25	16.03	15.62
Daly City	2.02	1.97	1.90	1.83	1.75
East Palo Alto	1.06	1.09	1.14	1.32	1.47
Estero	2.31	2.30	2.28	2.24	2.23
Hayward	10.13	10.46	10.77	11.03	11.26
Hillsborough	1.85	1.82	1.78	1.73	1.66
Menlo Park	2.01	2.06	2.11	2.15	2.18
Mid-Peninsula	1.62	1.59	1.57	1.53	1.49
Millbrae	1.30	1.40	1.34	1.49	1.63
Milpitas	3.74	3.78	3.83	3.85	3.83
Mountain View	4.88	4.98	5.01	5.04	5.05
North Coast	1.33	1.30	1.28	1.24	1.19
Palo Alto	5.71	5.68	5.61	5.57	5.49
Purissima Hills	1.18	1.17	1.15	1.13	1.10
Redwood City	4.80	4.76	4.71	4.63	4.53
San Bruno	1.83	1.80	1.75	1.70	1.63
San José	2.55	2.52	2.45	2.38	2.29
Santa Clara	2.55	2.52	2.45	2.38	2.29
Stanford	1.14	1.22	1.28	1.34	1.37
Sunnyvale	5.19	5.21	5.83	6.06	6.16
Westborough	0.49	0.48	0.46	0.45	0.43
Wholesale Total	**82.8**	**82.8**	**82.8**	**82.8**	**82.8**

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table K: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 74.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2030**	**2040**	**2045**
ACWD	3.92	3.87	3.77	3.66	4.17
Burlingame	0.46	0.45	0.43	0.42	0.41
Burlingame	2.21	2.21	2.19	2.18	2.15
Coastside	0.71	0.70	0.67	0.64	0.61
CalWater Total	15.30	14.98	14.62	14.43	14.05
Daly City	1.82	1.77	1.71	1.65	1.57
East Palo Alto	0.96	0.98	1.03	1.19	1.32
Estero	2.08	2.07	2.05	2.02	2.00
Hayward	9.11	9.41	9.69	9.92	10.14
Hillsborough	1.66	1.64	1.60	1.55	1.49
Menlo Park	1.81	1.86	1.90	1.94	1.96
Mid-Peninsula	1.46	1.43	1.41	1.38	1.34
Millbrae	1.17	1.26	1.20	1.34	1.47
Milpitas	3.36	3.40	3.45	3.47	3.45
Mountain View	4.39	4.48	4.51	4.53	4.54
North Coast	1.19	1.17	1.15	1.12	1.07
Palo Alto	5.14	5.11	5.04	5.01	4.94
Purissima Hills	1.06	1.05	1.04	1.02	0.99
Redwood City	4.31	4.28	4.24	4.17	4.08
San Bruno	1.65	1.62	1.57	1.53	1.47
San José	2.30	2.27	2.21	2.14	2.06
Santa Clara	2.30	2.27	2.21	2.14	2.06
Stanford	1.03	1.10	1.15	1.21	1.24
Sunnyvale	4.67	4.69	5.25	5.45	5.54
Westborough	0.44	0.43	0.41	0.40	0.39
Wholesale Total	**74.5**	**74.5**	**74.5**	**74.5**	**74.5**

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

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March 30, 2021

Danielle McPherson
Senior Water Resources Specialist
Bay Area Water Supply and Conservation Agency
155 Bovet Road, Suite 650
San Mateo, CA 94402

Dear Ms. McPherson,

Attached please find additional supply reliability modeling results conducted by the SFPUC. The SFPUC has conducted additional supply reliability modeling under the following planning scenarios:

- Projected supply reliability for years 2020 through 2045, assuming that demand is equivalent to the sum of the projected retail demands on the Regional Water System (RWS) and Wholesale Customer purchase request projections provided to SFPUC by BAWSCA on January 21st (see Table 1 below).
- Under the above demand conditions, projected supply reliability for scenarios both with and without implementation of the Bay-Delta Plan Amendment starting in 2023.

The SFPUC will be using this supply modeling in the text of its draft UWMP and moving the original modeling results into an appendix.

Table 1: Retail and Wholesale RWS Demand Assumptions Used for Additional Supply Reliability Modeling (mgd)

	2020	2025	2030	2035	2040	2045
Retail	66.5	67.2	67.5	68.6	70.5	73.7
Wholesale[1, 2]	132.1	146.0	147.9	151.9	156.3	162.8
Total	**198.6**	**213.2**	**215.4**	**220.5**	**226.8**	**236.5**

[1] Wholesale purchase request projections provided to the SFPUC by BAWSCA on January 21st, 2021
[2] Includes demands for Cities of San Jose and Santa Clara

Please note the following about the information presented in the attached tables:

London N. Breed
Mayor
Sophie Maxwell
President
Anson Moran
Vice President
Tim Paulson
Commissioner
Ed Harrington
Commissioner
Michael Carlin
Acting
General Manager

- Assumptions about infrastructure conditions remain the same as what was provided in our January 22nd letter.
- The Tier 1 allocations were applied to the RWS supplies to determine the wholesale supply, as was also described in the January 22nd letter; for any system-wide shortage above 20%, the Tier 1 split for a 20% shortage was applied.
- The SFPUC water supply planning methodology, including simulation of an 8.5-year design drought, is used to develop these estimates of water supply available from the RWS for five dry years. In each demand scenario for 2020 through 2045, the RWS deliveries are estimated using the standard SFPUC procedure, which includes adding increased levels of rationing as needed to balance the demands on the RWS system with available water supply. Some simulations may have increased levels of rationing in the final years of the design drought sequence, which can influence the comparison of results in the first five years of the sequence.
- Tables 7 and 8 in the attached document provide RWS and wholesale supply availability for the five-year drought risk assessment from 2021 to 2025. SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. Therefore, the supply projections for 2021 to 2025 are based on meeting 2020 levels of demand. However, in years when the Bay-Delta Plan Amendment is not in effect, sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests assuming that they are between the 2020 and 2025 projected levels. This is not reflected in Tables 7 and 8 because SFPUC did not want to make assumptions about the growth of purchase requests between 2020 and 2025.

In our draft UWMP, we acknowledge that we have a Level of Service objective of meeting average annual water demand of 265 mgd from the SFPUC watersheds for retail and Wholesale Customers during non-drought years, as well as a contractual obligation to supply 184 mgd to the Wholesale Customers. Therefore, we will still include the results of our modeling based on a demand of 265 mgd in order to facilitate planning that supports meeting this Level of Service objective and our contractual obligations. The results of this modeling will be in an appendix to the draft UWMP. As will be shown in this appendix, in a normal year the SFPUC can provide up to 265 mgd of supply from the RWS. The RWS supply projections shown in the attached tables are more accurately characterized as supplies that will be used to meet projected retail and Wholesale Customer demands.

It is our understanding that you will pass this information on to the Wholesale Customers. If you have any questions or need additional information, please do not hesitate to contact Sarah Triolo, at striolo@sfwater.org or (628) 230 0802.

Sincerely,

Paula Kehoe
Director of Water Resources

Table 2: Projected Total RWS Supply Utilized and Portion of RWS Supply Utilized by Wholesale Customers in Normal Years [For Table 6-9]:

Year	2020	2025	2030	2035	2040	2045
RWS Supply Utilized (mgd)	198.6	213.2	215.4	220.5	226.8	236.5
RWS Supply Utilized by Wholesale Customers[a] (mgd)	132.1	146.0	147.9	151.9	156.3	162.8

[a] RWS supply utilized by Wholesale Customers is equivalent to purchase request projections provided to SFPUC by BAWSCA on January 21, 2021, and includes Cities of San Jose and Santa Clara.

Basis of Water Supply Data: With Bay-Delta Plan Amendment

Table 3a: Basis of Water Supply Data [For Table 7-1], Base Year 2020, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2020	198.6	100%	132.1	
Single dry year		198.6	100%	132.1	
Consecutive 1st Dry year		198.6	100%	132.1	
Consecutive 2nd Dry year		198.6	100%	132.1	
Consecutive 3rd Dry year[1]		119.2	60%	74.5	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 4th Dry year		119.2	60%	74.5	• Same as above
Consecutive 5th Dry year		119.2	60%	74.5	• Same as above

[1] Assuming this year represents 2023, when Bay Delta Plan Amendment would come into effect.

Table 3b: Basis of Water Supply Data [For Table 7-1], Base Year 2025, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2025	213.2	100%	146.0	
Single dry year		149.2	70%	93.3	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		149.2	70%	93.3	• Same as above
Consecutive 2nd Dry year		127.9	60%	80.0	• Same as above
Consecutive 3rd Dry year		127.9	60%	80.0	• Same as above
Consecutive 4th Dry year		127.9	60%	80.0	• Same as above
Consecutive 5th Dry year		127.9	60%	80.0	• Same as above

Table 3c: Basis of Water Supply Data [For Table 7-1], Base Year 2030, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2030	215.4	100%	147.9	
Single dry year		150.8	70%	94.2	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		150.8	70%	94.2	• Same as above
Consecutive 2nd Dry year		129.2	60%	80.8	• Same as above
Consecutive 3rd Dry year		129.2	60%	80.8	• Same as above
Consecutive 4th Dry year		129.2	60%	80.8	• Same as above
Consecutive 5th Dry year		129.2	60%	80.8	• Same as above

Table 3d: Basis of Water Supply Data [For Table 7-1], Base Year 2035, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2035	220.5	100%	151.9	
Single dry year		154.4	70%	96.5	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		154.4	70%	96.5	• Same as above
Consecutive 2nd Dry year		132.3	60%	82.7	• Same as above
Consecutive 3rd Dry year		132.3	60%	82.7	• Same as above
Consecutive 4th Dry year		132.3	60%	82.7	• Same as above
Consecutive 5th Dry year		121.3	55%	75.8	• Same as above

Table 3e: Basis of Water Supply Data [For Table 7-1], Base Year 2040, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2040	226.8	100%	156.3	
Single dry year		158.8	70%	99.2	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		158.8	70%	99.2	• Same as above
Consecutive 2nd Dry year		136.1	60%	85.1	• Same as above
Consecutive 3rd Dry year		136.1	60%	85.1	• Same as above
Consecutive 4th Dry year		120.2	53%	75.1	• Same as above
Consecutive 5th Dry year		120.2	53%	75.1	• Same as above

Table 3f: Basis of Water Supply Data [For Table 7-1], Base Year 2045, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2045	236.5	100%	162.8	
Single dry year		141.9	60%	88.7	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		141.9	60%	88.7	• Same as above
Consecutive 2nd Dry year		141.9	60%	88.7	• Same as above
Consecutive 3rd Dry year		141.9	60%	88.7	• Same as above
Consecutive 4th Dry year		120.6	51%	75.4	• Same as above
Consecutive 5th Dry year		120.6	51%	75.4	• Same as above

Table 3g: Projected RWS Supply Availability [Alternative to Table 7-1], Years 2020-2045, With Bay-Delta Plan Amendment

Year	2020	2025	2030	2035	2040	2045
Average year	100%	100%	100%	100%	100%	100%
Single dry year	100%	70%	70%	70%	70%	60%
Consecutive 1st Dry year	100%	70%	70%	70%	70%	60%
Consecutive 2nd Dry year	100%	60%	60%	60%	60%	60%
Consecutive 3rd Dry year[1]	60%	60%	60%	60%	60%	60%
Consecutive 4th Dry year	60%	60%	60%	60%	53%	51%
Consecutive 5th Dry year	60%	60%	60%	55%	53%	51%

[1] Assuming that at base year 2020, this year represents 2023, when Bay Delta Plan Amendment would come into effect.

Basis of Water Supply Data: Without Bay-Delta Plan Amendment

Table 4a: Basis of Water Supply Data [For Table 7-1], Base Year 2020, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2020	198.6	100%	132.1	
Single dry year		198.6	100%	132.1	
Consecutive 1st Dry year		198.6	100%	132.1	
Consecutive 2nd Dry year		198.6	100%	132.1	
Consecutive 3rd Dry year		198.6	100%	132.1	
Consecutive 4th Dry year		198.6	100%	132.1	
Consecutive 5th Dry year		198.6	100%	132.1	

Table 4b: Basis of Water Supply Data [For Table 7-1], Base Year 2025, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2025	213.2	100%	146.0	
Single dry year		213.2	100%	146.0	
Consecutive 1st Dry year		213.2	100%	146.0	
Consecutive 2nd Dry year		213.2	100%	146.0	
Consecutive 3rd Dry year		213.2	100%	146.0	
Consecutive 4th Dry year		213.2	100%	146.0	
Consecutive 5th Dry year		213.2	100%	146.0	

Table 4c: Basis of Water Supply Data [For Table 7-1], Base Year 2030, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2030	215.4	100%	147.9	
Single dry year		215.4	100%	147.9	
Consecutive 1st Dry year		215.4	100%	147.9	
Consecutive 2nd Dry year		215.4	100%	147.9	
Consecutive 3rd Dry year		215.4	100%	147.9	
Consecutive 4th Dry year		215.4	100%	147.9	
Consecutive 5th Dry year		215.4	100%	147.9	

Table 4d: Basis of Water Supply Data [For Table 7-1], Base Year 2035, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2035	220.5	100%	151.9	
Single dry year		220.5	100%	151.9	
Consecutive 1st Dry year		220.5	100%	151.9	
Consecutive 2nd Dry year		220.5	100%	151.9	
Consecutive 3rd Dry year		220.5	100%	151.9	
Consecutive 4th Dry year		220.5	100%	151.9	
Consecutive 5th Dry year		220.5	100%	151.9	

Table 4e: Basis of Water Supply Data [For Table 7-1], Base Year 2040, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2040	226.8	100%	156.3	
Single dry year		226.8	100%	156.3	
Consecutive 1st Dry year		226.8	100%	156.3	
Consecutive 2nd Dry year		226.8	100%	156.3	
Consecutive 3rd Dry year		226.8	100%	156.3	
Consecutive 4th Dry year		226.8	100%	156.3	
Consecutive 5th Dry year		226.8	100%	156.3	

Table 4f: Basis of Water Supply Data [For Table 7-1], Base Year 2045, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2045	236.5	100%	162.8	
Single dry year		236.5	100%	162.8	
Consecutive 1st Dry year		236.5	100%	162.8	
Consecutive 2nd Dry year		236.5	100%	162.8	
Consecutive 3rd Dry year		236.5	100%	162.8	
Consecutive 4th Dry year		212.8	90%	139.1	• At a 10% shortage level, the wholesale allocation is 64% of available supply • The retail allocation is 36% of supply, which resulted in a positive allocation to retail of 2.9 mgd, which was re-allocated to the Wholesale Customers
Consecutive 5th Dry year		212.8	90%	139.1	• Same as above

Table 4g: Projected RWS Supply [Alternative to Table 7-1], Years 2020-2045, Without Bay-Delta Plan Amendment

Year	2020	2025	2030	2035	2040	2045
Average year	100%	100%	100%	100%	100%	100%
Single dry year	100%	100%	100%	100%	100%	100%
Consecutive 1st Dry year	100%	100%	100%	100%	100%	100%
Consecutive 2nd Dry year	100%	100%	100%	100%	100%	100%
Consecutive 3rd Dry year	100%	100%	100%	100%	100%	100%
Consecutive 4th Dry year	100%	100%	100%	100%	100%	90%
Consecutive 5th Dry year	100%	100%	100%	100%	100%	90%

Supply Projections for Consecutive Five Dry Year Sequences

Table 5: Projected Multiple Dry Years Wholesale Supply from RWS [For Table 7-4], With Bay-Delta Plan Amendment

	2025	2030	2035	2040	2045
First year	93.3	94.2	96.5	99.2	88.7
Second year	80.0	80.8	82.7	85.1	88.7
Third year	80.0	80.8	82.7	85.1	88.7
Fourth year	80.0	80.8	82.7	75.1	75.4
Fifth year	80.0	80.8	75.8	75.1	75.4

Table 6: Projected Multiple Dry Years Wholesale Supply from RWS [For Table 7-4], Without Bay-Delta Plan Amendment

	2025	2030	2035	2040	2045
First year	146.0	147.9	151.9	156.3	162.8
Second year	146.0	147.9	151.9	156.3	162.8
Third year	146.0	147.9	151.9	156.3	162.8
Fourth year	146.0	147.9	151.9	156.3	139.1
Fifth year	146.0	147.9	151.9	156.3	139.1

Table 7: Projected Regional Water System Supply for 5-Year Drought Risk Assessment [For Table 7-5], With Bay-Delta Plan Amendment. This table assumes Bay Delta Plan comes into effect in 2023.

Year	2021	2022	2023	2024	2025
RWS Supply (mgd)	198.6	198.6	119.2	119.2	119.2
Wholesale Supply (mgd)	132.1	132.1	74.5	74.5	74.5

Table 8: Projected Regional Water System Supply for 5-Year Drought Risk Assessment [For Table 7-5], Without Bay Delta Plan

Year	2021	2022	2023	2024	2025
RWS Supply (mgd)	198.6	198.6	198.6	198.6	198.6
Wholesale Supply (mgd)	132.1	132.1	132.1	132.1	132.1

Section 1: Basis for Calculations. Projected Wholesale RWS Purchases Through 2045

Table A: Wholesale RWS Actual Purchases in 2020 and Projected Purchases for 2025, 2030, 2035, 2040, and 2045 (mgd)[a]

Agency	2020 Actual	Projected Wholesale RWS Purchases 2025	2030	2035	2040	2045
ACWD	7.87	7.68	7.68	7.68	7.68	9.11
Brisbane/GVMID	0.64	0.89	0.89	0.88	0.89	0.89
Burlingame	3.48	4.33	4.40	4.47	4.58	4.69
Coastside	1.02	1.40	1.38	1.36	1.33	1.33
CalWater Total	29.00	29.99	29.74	29.81	30.27	30.70
Daly City	3.97	3.57	3.52	3.49	3.46	3.43
East Palo Alto	1.57	1.88	1.95	2.10	2.49	2.89
Estero	4.34	4.07	4.11	4.18	4.23	4.38
Hayward	13.92	17.86	18.68	19.75	20.82	22.14
Hillsborough	2.62	3.26	3.25	3.26	3.26	3.26
Menlo Park	2.96	3.55	3.68	3.87	4.06	4.29
Mid-Peninsula	2.66	2.86	2.84	2.88	2.89	2.93
Millbrae	1.90	2.29	2.50	2.45	2.82	3.20
Milpitas	5.92	6.59	6.75	7.03	7.27	7.53
Mountain View	7.67	8.60	8.90	9.20	9.51	9.93
North Coast	2.37	2.34	2.33	2.34	2.34	2.34
Palo Alto	9.75	10.06	10.15	10.28	10.51	10.79
Purissima Hills	1.75	2.09	2.09	2.12	2.13	2.15
Redwood City	8.76	8.46	8.49	8.64	8.74	8.90
San Bruno	0.95	3.24	3.22	3.20	3.20	3.21
San Jose	4.26	4.50	4.50	4.50	4.50	4.50
Santa Clara	3.27	4.50	4.50	4.50	4.50	4.50
Stanford	1.43	2.01	2.18	2.35	2.53	2.70
Sunnyvale	9.33	9.16	9.30	10.70	11.44	12.10
Westborough	0.82	0.86	0.85	0.85	0.84	0.84
Total	**132.22**	**146.01**	**147.87**	**151.90**	**156.31**	**162.76**

[a] Wholesale RWS purchase projections for 2025, 2030, 2035, 2040, and 2045 were provided to BAWSCA between July 2020 and January 2021 by the Member Agencies following the completion of the June 2020 Demand Study.

Table B: Basis for the 5-Year Drought Risk Assessment Wholesale RWS Actual Purchases in 2020 and 2021-2025 Projected Purchases (mgd)

Agency	2020 Actual	Projected and Estimated Wholesale RWS Purchases 2021[b]	2022[b]	2023[c]	2024[c]	2025[c]
ACWD	7.87	9.44	9.46	9.46	9.46	9.46
Brisbane/GVMID	0.64	0.62	0.65	0.65	0.65	0.65
Burlingame	3.48	3.34	3.35	3.35	3.35	3.35
Coastside	1.02	1.54	1.23	1.23	1.23	1.23
CalWater Total	29.00	29.66	29.81	29.81	29.81	29.81
Daly City	3.97	4.00	4.01	4.01	4.01	4.01
East Palo Alto	1.57	1.63	1.69	1.69	1.69	1.69
Estero	4.34	4.48	4.51	4.51	4.51	4.51
Hayward	13.92	14.47	15.12	15.12	15.12	15.12
Hillsborough	2.62	2.95	3.05	3.05	3.05	3.05
Menlo Park	2.96	2.92	2.93	2.93	2.93	2.93
Mid-Peninsula	2.66	2.65	2.80	2.80	2.80	2.80
Millbrae	1.90	1.95	2.15	2.15	2.15	2.15
Milpitas	5.92	5.88	5.34	5.34	5.34	5.34
Mountain View	7.67	7.80	8.05	8.05	8.05	8.05
North Coast	2.37	2.58	2.66	2.66	2.66	2.66
Palo Alto	9.75	9.44	9.66	9.66	9.66	9.66
Purissima Hills	1.75	1.97	2.02	2.02	2.02	2.02
Redwood City	8.76	8.72	9.07	9.07	9.07	9.07
San Bruno	0.95	3.39	3.40	3.40	3.40	3.40
San Jose	4.26	4.31	4.51	4.51	4.51	4.51
Santa Clara	3.27	3.29	3.50	3.50	3.50	3.50
Stanford	1.43	1.40	1.54	1.54	1.54	1.54
Sunnyvale	9.33	9.35	9.45	9.45	9.45	9.45
Westborough	0.82	0.84	0.81	0.81	0.81	0.81
Total	**132.22**	**138.61**	**140.77**	**140.77**	**140.77**	**140.77**

[b] Wholesale RWS purchase projections for 2021 and 2022 were provided to Christina Tang, BAWSCA's Finance Manager, by the Member Agencies in January 2021.

[c] The SFPUC's supply reliability tables assume the Bay-Delta Plan takes effect in 2023. In the event of a shortage, the Tier 2 Plan specifies that each agencies' Allocation Factor would be calculated once at the onset of a shortage based on the previous year's use and remains the same until the shortage condition is over. Therefore, for the purpose of drought allocations for the 5-year Drought Risk Assessment, wholesale RWS demand is assumed to remain static from 2022 through the drought sequence.

Section 2: Drought Allocations *With* Bay-Delta Plan

Table C: RWS Supply Available to the Wholesale Customers (Combined Tables 3a-3f from the SFPUC's March 30th letter) *With* Bay-Delta Plan (mgd)

	2020[e]	2025	2030	2035	2040	2045
Projected Purchases[d]	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 1st Dry Year	138.6	93.3	94.2	96.5	99.2	88.7
Consecutive 2nd Dry Year	140.8	80.0	80.8	82.7	85.1	88.7
Consecutive 3rd Dry Year	74.5	80.0	80.8	82.7	85.1	88.7
Consecutive 4th Dry Year	74.5	80.0	80.8	82.7	75.1	75.4
Consecutive 5th Dry Year	74.5	80.0	80.8	75.8	75.1	75.4

[d] Values for 2020 are actual purchases. This row aligns with what is labeled as an "Average Year" in Tables 3a-3f in the SFPUC's March 30th letter. However, these values do not represent an average year and instead are actual purchases for 2020 or projected purchases for 2025 through 2045.

[e] In years when the Bay-Delta Plan is not in effect, sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests assuming that they are between the 2020 and 2025 projected levels. As such, RWS supply available to the Wholesale Customers in the 1st and 2nd consecutive dry years under base year 2020 is equal to the cumulative projected wholesale RWS purchases for 2021 and 2022, respectively.

Table D: Wholesale RWS Demand (Combined Totals from Tables A and B) (mgd)[f]

	2020	2025	2030	2035	2040	2045
Projected Purchases[d]	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 1st Dry Year	138.6	146.0	147.9	151.9	156.3	162.8
Consecutive 2nd Dry Year	140.8	146.0	147.9	151.9	156.3	162.8
Consecutive 3rd Dry Year	140.8	146.0	147.9	151.9	156.3	162.8
Consecutive 4th Dry Year	140.8	146.0	147.9	151.9	156.3	162.8
Consecutive 5th Dry Year	140.8	146.0	147.9	151.9	156.3	162.8

[f] The SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. Additionally, the Tier 2 Plan calculates each agencies' Allocation Factor once at the onset of a drought and it remains the same until the shortage condition is over. When system-wide shortages are projected, wholesale RWS demand is assumed to be static for the remainder of the drought sequence.

Table E: Percent Cutback to the Wholesale Customers *With* Bay-Delta Plan[g]

	2020	2025	2030	2035	2040	2045
Projected Purchases[d]	0%	0%	0%	0%	0%	0%
Consecutive 1st Dry Year	0%	36%	36%	36%	37%	46%
Consecutive 2nd Dry Year	0%	45%	45%	46%	46%	46%
Consecutive 3rd Dry Year	47%	45%	45%	46%	46%	46%
Consecutive 4th Dry Year	47%	45%	45%	46%	52%	54%
Consecutive 5th Dry Year	47%	45%	45%	50%	52%	54%

[g] Agencies that wish to use new or different projected RWS purchases may use the percent cutbacks listed in this table to determine their drought allocation.

Table F1: Basis of Water Supply Data [For Tables 7-1 and 7-5], Base Year 2020, *With* Bay-Delta Plan (mgd)

Year Consecutive Dry Year	2020 Actual	2021 1st	2022 2nd	2023 3rd	2024 4th	2025 5th
Wholesale RWS Demand	132.2	138.6	140.8	140.8	140.8	140.8
Wholesale RWS Supply Available	132.2	138.6	140.8	74.5	74.5	74.5
Percent Cutback	0%	0%	0%	47%	47%	47%

Table F2: Individual Agency Drought Allocations [For Tables 7-1 and 7-5], Base Year 2020, *With* Bay-Delta Plan (mgd)

	2020	Wholesale RWS Drought Allocations				
Agency	Actual	2021	2022	2023	2024	2025
ACWD	7.87	9.44	9.46	5.01	5.01	5.01
Brisbane/GVMID	0.64	0.62	0.65	0.34	0.34	0.34
Burlingame	3.48	3.34	3.35	1.77	1.77	1.77
Coastside	1.02	1.54	1.23	0.65	0.65	0.65
CalWater Total	29.00	29.66	29.81	15.78	15.78	15.78
Daly City	3.97	4.00	4.01	2.12	2.12	2.12
East Palo Alto	1.57	1.63	1.69	0.89	0.89	0.89
Estero	4.34	4.48	4.51	2.39	2.39	2.39
Hayward	13.92	14.47	15.12	8.00	8.00	8.00
Hillsborough	2.62	2.95	3.05	1.61	1.61	1.61
Menlo Park	2.96	2.92	2.93	1.55	1.55	1.55
Mid-Peninsula	2.66	2.65	2.80	1.48	1.48	1.48
Millbrae	1.90	1.95	2.15	1.14	1.14	1.14
Milpitas	5.92	5.88	5.34	2.83	2.83	2.83
Mountain View	7.67	7.80	8.05	4.26	4.26	4.26
North Coast	2.37	2.58	2.66	1.41	1.41	1.41
Palo Alto	9.75	9.44	9.66	5.11	5.11	5.11
Purissima Hills	1.75	1.97	2.02	1.07	1.07	1.07
Redwood City	8.76	8.72	9.07	4.80	4.80	4.80
San Bruno	0.95	3.39	3.40	1.80	1.80	1.80
San Jose	4.26	4.31	4.51	2.39	2.39	2.39
Santa Clara	3.27	3.29	3.50	1.85	1.85	1.85
Stanford	1.43	1.40	1.54	0.82	0.82	0.82
Sunnyvale	9.33	9.35	9.45	5.00	5.00	5.00
Westborough	0.82	0.84	0.81	0.43	0.43	0.43
Total	**132.2**	**138.6**	**140.8**	**74.5**	**74.5**	**74.5**

Table G1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2025, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	146.0	146.0	146.0	146.0	146.0
Wholesale RWS Supply Available	93.3	80.0	80.0	80.0	80.0
Percent Cutback	36%	45%	45%	45%	45%

Table G2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2025, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.91	4.21	4.21	4.21	4.21
Brisbane/GVMID	0.57	0.49	0.49	0.49	0.49
Burlingame	2.76	2.37	2.37	2.37	2.37
Coastside	0.89	0.77	0.77	0.77	0.77
CalWater Total	19.16	16.43	16.43	16.43	16.43
Daly City	2.28	1.96	1.96	1.96	1.96
East Palo Alto	1.20	1.03	1.03	1.03	1.03
Estero	2.60	2.23	2.23	2.23	2.23
Hayward	11.41	9.78	9.78	9.78	9.78
Hillsborough	2.08	1.79	1.79	1.79	1.79
Menlo Park	2.27	1.95	1.95	1.95	1.95
Mid-Peninsula	1.83	1.57	1.57	1.57	1.57
Millbrae	1.46	1.25	1.25	1.25	1.25
Milpitas	4.21	3.61	3.61	3.61	3.61
Mountain View	5.49	4.71	4.71	4.71	4.71
North Coast	1.49	1.28	1.28	1.28	1.28
Palo Alto	6.43	5.51	5.51	5.51	5.51
Purissima Hills	1.33	1.14	1.14	1.14	1.14
Redwood City	5.40	4.63	4.63	4.63	4.63
San Bruno	2.07	1.77	1.77	1.77	1.77
San Jose	2.88	2.47	2.47	2.47	2.47
Santa Clara	2.88	2.47	2.47	2.47	2.47
Stanford	1.28	1.10	1.10	1.10	1.10
Sunnyvale	5.85	5.02	5.02	5.02	5.02
Westborough	0.55	0.47	0.47	0.47	0.47
Total	**93.3**	**80.0**	**80.0**	**80.0**	**80.0**

Table H1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2030, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	147.9	147.9	147.9	147.9	147.9
Wholesale RWS Supply Available	94.2	80.8	80.8	80.8	80.8
Percent Cutback	36%	45%	45%	45%	45%

Table H2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2030, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.89	4.20	4.20	4.20	4.20
Brisbane/GVMID	0.56	0.48	0.48	0.48	0.48
Burlingame	2.80	2.40	2.40	2.40	2.40
Coastside	0.88	0.75	0.75	0.75	0.75
CalWater Total	18.94	16.25	16.25	16.25	16.25
Daly City	2.24	1.92	1.92	1.92	1.92
East Palo Alto	1.24	1.07	1.07	1.07	1.07
Estero	2.62	2.24	2.24	2.24	2.24
Hayward	11.90	10.21	10.21	10.21	10.21
Hillsborough	2.07	1.78	1.78	1.78	1.78
Menlo Park	2.35	2.01	2.01	2.01	2.01
Mid-Peninsula	1.81	1.55	1.55	1.55	1.55
Millbrae	1.59	1.37	1.37	1.37	1.37
Milpitas	4.30	3.69	3.69	3.69	3.69
Mountain View	5.67	4.86	4.86	4.86	4.86
North Coast	1.48	1.27	1.27	1.27	1.27
Palo Alto	6.47	5.55	5.55	5.55	5.55
Purissima Hills	1.33	1.14	1.14	1.14	1.14
Redwood City	5.41	4.64	4.64	4.64	4.64
San Bruno	2.05	1.76	1.76	1.76	1.76
San Jose	2.87	2.46	2.46	2.46	2.46
Santa Clara	2.87	2.46	2.46	2.46	2.46
Stanford	1.39	1.19	1.19	1.19	1.19
Sunnyvale	5.92	5.08	5.08	5.08	5.08
Westborough	0.54	0.47	0.47	0.47	0.47
Total	**94.2**	**80.8**	**80.8**	**80.8**	**80.8**

Table I1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2035, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	151.9	151.9	151.9	151.9	151.9
Wholesale RWS Supply Available	96.5	82.7	82.7	82.7	75.8
Percent Cutback	36%	46%	46%	46%	50%

Table I2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2035, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.88	4.18	4.18	4.18	3.83
Brisbane/GVMID	0.56	0.48	0.48	0.48	0.44
Burlingame	2.84	2.44	2.44	2.44	2.23
Coastside	0.86	0.74	0.74	0.74	0.68
CalWater Total	18.94	16.23	16.23	16.23	14.88
Daly City	2.22	1.90	1.90	1.90	1.74
East Palo Alto	1.33	1.14	1.14	1.14	1.05
Estero	2.66	2.28	2.28	2.28	2.09
Hayward	12.55	10.75	10.75	10.75	9.86
Hillsborough	2.07	1.78	1.78	1.78	1.63
Menlo Park	2.46	2.10	2.10	2.10	1.93
Mid-Peninsula	1.83	1.57	1.57	1.57	1.44
Millbrae	1.56	1.34	1.34	1.34	1.22
Milpitas	4.47	3.83	3.83	3.83	3.51
Mountain View	5.84	5.01	5.01	5.01	4.59
North Coast	1.49	1.27	1.27	1.27	1.17
Palo Alto	6.53	5.60	5.60	5.60	5.13
Purissima Hills	1.34	1.15	1.15	1.15	1.06
Redwood City	5.49	4.70	4.70	4.70	4.31
San Bruno	2.03	1.74	1.74	1.74	1.60
San Jose	2.86	2.45	2.45	2.45	2.25
Santa Clara	2.86	2.45	2.45	2.45	2.25
Stanford	1.49	1.28	1.28	1.28	1.17
Sunnyvale	6.80	5.83	5.83	5.83	5.34
Westborough	0.54	0.46	0.46	0.46	0.42
Total	**96.5**	**82.7**	**82.7**	**82.7**	**75.8**

Table J1: Basis of Water Supply Data [For Table 7-1 and 7-4], Base Year 2040, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	156.3	156.3	156.3	156.3	156.3
Wholesale RWS Supply Available	99.2	85.1	85.1	75.1	75.1
Percent Cutback	37%	46%	46%	52%	52%

Table J2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2040, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.87	4.18	4.18	3.69	3.69
Brisbane/GVMID	0.56	0.48	0.48	0.43	0.43
Burlingame	2.91	2.49	2.49	2.20	2.20
Coastside	0.85	0.73	0.73	0.64	0.64
CalWater Total	19.21	16.48	16.48	14.54	14.54
Daly City	2.20	1.88	1.88	1.66	1.66
East Palo Alto	1.58	1.36	1.36	1.20	1.20
Estero	2.69	2.30	2.30	2.03	2.03
Hayward	13.21	11.34	11.34	10.00	10.00
Hillsborough	2.07	1.78	1.78	1.57	1.57
Menlo Park	2.58	2.21	2.21	1.95	1.95
Mid-Peninsula	1.84	1.58	1.58	1.39	1.39
Millbrae	1.79	1.53	1.53	1.35	1.35
Milpitas	4.62	3.96	3.96	3.49	3.49
Mountain View	6.03	5.18	5.18	4.57	4.57
North Coast	1.49	1.27	1.27	1.12	1.12
Palo Alto	6.67	5.72	5.72	5.05	5.05
Purissima Hills	1.35	1.16	1.16	1.03	1.03
Redwood City	5.55	4.76	4.76	4.20	4.20
San Bruno	2.03	1.74	1.74	1.54	1.54
San Jose	2.86	2.45	2.45	2.16	2.16
Santa Clara	2.86	2.45	2.45	2.16	2.16
Stanford	1.61	1.38	1.38	1.22	1.22
Sunnyvale	7.26	6.23	6.23	5.49	5.49
Westborough	0.54	0.46	0.46	0.41	0.41
Total	**99.2**	**85.1**	**85.1**	**75.1**	**75.1**

Table K1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2045, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	162.8	162.8	162.8	162.8	162.8
Wholesale RWS Supply Available	88.7	88.7	88.7	75.4	75.4
Percent Cutback	46%	46%	46%	54%	54%

Table K2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2045, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.97	4.97	4.97	4.22	4.22
Brisbane/GVMID	0.49	0.49	0.49	0.41	0.41
Burlingame	2.56	2.56	2.56	2.17	2.17
Coastside	0.72	0.72	0.72	0.61	0.61
CalWater Total	16.73	16.73	16.73	14.22	14.22
Daly City	1.87	1.87	1.87	1.59	1.59
East Palo Alto	1.58	1.58	1.58	1.34	1.34
Estero	2.39	2.39	2.39	2.03	2.03
Hayward	12.07	12.07	12.07	10.26	10.26
Hillsborough	1.78	1.78	1.78	1.51	1.51
Menlo Park	2.34	2.34	2.34	1.99	1.99
Mid-Peninsula	1.59	1.59	1.59	1.36	1.36
Millbrae	1.74	1.74	1.74	1.48	1.48
Milpitas	4.11	4.11	4.11	3.49	3.49
Mountain View	5.41	5.41	5.41	4.60	4.60
North Coast	1.28	1.28	1.28	1.09	1.09
Palo Alto	5.88	5.88	5.88	5.00	5.00
Purissima Hills	1.17	1.17	1.17	1.00	1.00
Redwood City	4.85	4.85	4.85	4.12	4.12
San Bruno	1.75	1.75	1.75	1.49	1.49
San Jose	2.45	2.45	2.45	2.08	2.08
Santa Clara	2.45	2.45	2.45	2.08	2.08
Stanford	1.47	1.47	1.47	1.25	1.25
Sunnyvale	6.59	6.59	6.59	5.61	5.61
Westborough	0.46	0.46	0.46	0.39	0.39
Total	**88.7**	**88.7**	**88.7**	**75.4**	**75.4**

Section 3: Drought Allocations *Without* Bay-Delta Plan

Table L: RWS Supply Available to the Wholesale Customers (Combined Tables 4a-4f from the SFPUC's March 30th letter) *Without* Bay-Delta Plan (mgd)[h]

	2020	2025	2030	2035	2040	2045
Projected Purchases[i]	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 1st Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 2nd Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 3rd Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 4th Dry Year	132.2	146.0	147.9	151.9	156.3	139.1
Consecutive 5th Dry Year	132.2	146.0	147.9	151.9	156.3	139.1

[h] The SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. However, the SFPUC has indicated that sufficient supplies are available to meet wholesale RWS demand so long as they reasonably stay within 2020 and 2040 levels. The SFPUC's modeling does not indicate cutbacks will be required till the 4th and 5th consecutive dry year at 2045 levels.

[i] Values for 2020 are actual purchases. This row aligns with what is labeled as an "Average Year" in Tables 4a-4f in the SFPUC's March 30th letter. However, these values do not represent an average year and instead are actual purchases for 2020 or projected purchases for 2025 through 2045.

Table M: Wholesale RWS Demand (Combined Totals from Tables A and B) (mgd)

	2020	2025	2030	2035	2040	2045
Projected Purchases[i]	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 1st Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 2nd Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 3rd Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 4th Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 5th Dry Year	132.2	146.0	147.9	151.9	156.3	162.8

Table N: Percent Cutback to the Wholesale Customers *Without* Bay-Delta Plan

	2020	2025	2030	2035	2040	2045
Projected Purchases[i]	0%	0%	0%	0%	0%	0%
Consecutive 1st Dry Year	0%	0%	0%	0%	0%	0%
Consecutive 2nd Dry Year	0%	0%	0%	0%	0%	0%
Consecutive 3rd Dry Year	0%	0%	0%	0%	0%	0%
Consecutive 4th Dry Year	0%	0%	0%	0%	0%	15%
Consecutive 5th Dry Year	0%	0%	0%	0%	0%	15%

Table O1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2045, *Without* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	162.8	162.8	162.8	162.8	162.8
Wholesale RWS Supply Available	162.8	162.8	162.8	139.1	139.1
Percent Cutback	0%	0%	0%	Tier 2 Plan	Tier 2 Plan

Table O2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2045, *Without* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations					Tier 2 Drought Cutback
Consecutive Dry Year	1st	2nd	3rd	4th	5th	
ACWD	9.11	9.11	9.11	8.20	8.20	10.0%
Brisbane/GVMID	0.89	0.89	0.89	0.74	0.74	16.8%
Burlingame	4.69	4.69	4.69	4.02	4.02	14.3%
Coastside	1.33	1.33	1.33	1.19	1.19	10.0%
CalWater Total	30.70	30.70	30.70	26.73	26.73	12.9%
Daly City	3.43	3.43	3.43	3.01	3.01	12.4%
East Palo Alto	2.89	2.89	2.89	2.68	2.68	7.3%
Estero	4.38	4.38	4.38	3.94	3.94	10.0%
Hayward	22.14	22.14	22.14	18.67	18.67	15.7%
Hillsborough	3.26	3.26	3.26	2.93	2.93	10.2%
Menlo Park	4.29	4.29	4.29	3.58	3.58	16.5%
Mid-Peninsula	2.93	2.93	2.93	2.63	2.63	10.0%
Millbrae	3.20	3.20	3.20	2.54	2.54	20.7%
Milpitas	7.53	7.53	7.53	6.55	6.55	13.1%
Mountain View	9.93	9.93	9.93	8.91	8.91	10.3%
North Coast	2.34	2.34	2.34	2.11	2.11	10.0%
Palo Alto	10.79	10.79	10.79	9.71	9.71	10.0%
Purissima Hills	2.15	2.15	2.15	1.41	1.41	34.5%
Redwood City	8.90	8.90	8.90	7.92	7.92	11.1%
San Bruno	3.21	3.21	3.21	2.60	2.60	19.1%
San Jose	4.50	4.50	4.50	2.95	2.95	34.5%
Santa Clara	4.50	4.50	4.50	2.95	2.95	34.5%
Stanford	2.70	2.70	2.70	2.27	2.27	16.0%
Sunnyvale	12.10	12.10	12.10	10.11	10.11	16.5%
Westborough	0.84	0.84	0.84	0.76	0.76	10.0%
Total	**162.8**	**162.8**	**162.8**	**139.1**	**139.1**	

Attachment B: Updated 2020 UWMP Drought Cutbacks

The January 22, 2021, SFPUC Regional Water System (RWS) Supply Reliability Letter (Supply Reliability Letter) provides RWS supplies available to the Wholesale Customers under two scenarios: (1) With Bay-Delta Plan, and (2) Without Bay-Delta Plan. Your agency must choose which scenario to use for your agency's 2020 UWMP submittal tables. However, you may discuss both scenarios in the body of your agency's UWMP. The purpose of this attachment is to provide further detail about your agency's allocation of total RWS supplies available to the Wholesale Customers under both scenarios.

Data Sources for Projected RWS Purchases

Supply allocations are based on projected RWS purchases provided to BAWSCA by the Member Agencies. Following the completion of the Demand Study in June 2020, BAWSCA used the results to develop a table for each Member Agency listing possible supplies and total demand for 2025, 2030, 2035, 2040, and 2045. BAWSCA populated the tables with total demand after passive conservation and entered active conservation, as calculated in the agencies' DSS Model, as a source of supply. Multi-source agencies were asked to complete the table with supply projections, including from the RWS, to meet total demand. Single-source agencies were offered the opportunity to review the tables upon request. Because active conservation was treated as a source of supply, projected RWS purchases are after passive and active conservation.

Water Management Representatives (WMRs) received a draft copy of all projected wholesale RWS purchase requests as part of the January 7, 2021 WMR meeting agenda packet and meeting slides. Agencies were asked to notify BAWSCA if changes were necessary regarding their purchase requests prior to BAWSCA sending those purchase requests to the SFPUC. Purchase requests were transmitted to the SFPUC via a letter dated January 15, 2021 for use in their 2020 UWMP efforts.

Note that the projected RWS purchases used by BAWSCA for fiscal years 2020-21 and for 2021-22 were provided to Christina Tang, BAWSCA's Finance Manager, by each Member Agency in January 2021. This annual reporting is part of the SFPUC's wholesale rate setting process. Member Agencies have provided BAWSCA with these projected purchases annually for the past 10 years.

UWMP Tables 7-1 and 7-5

UWMP Table 7-1 requests supply reliability for a normal year, a single dry year, and multiple (five) dry years. Tables 3, 4, 5, and 6 provided in the Supply Reliability Letter will help your agency complete UWMP Table 7-1. The Drought Risk Assessment (DRA) in UWMP Table 7-5 also requests a five-year drought sequence but specifies years 2021 through 2025. Supply Reliability Letter Tables 9 and 10 will help your agency complete UWMP Table 7-5.

The Supply Reliability Letter provides four tables for completing UWMP Table 7-1. The Supply Reliability Letter Tables 3 (with Bay-Delta Plan) and 4 (without Bay-Delta Plan) use 2020 as the base year. Depending on which scenario you choose, these will be the basis for your agency's five-year DRA (UWMP Table 7-5). The Supply Reliability Letter Tables 5 (with Bay-Delta Plan) and 6 (without Bay-Delta Plan) use 2025 as the base year. Depending on which scenario you choose, these will be the basis for UWMP Tables 7-2 through 7-4. Your agency may submit multiple UWMP Tables 7-1 with different base years (see Figure 1 below).

Attachment B: Updated 2020 UWMP Drought Cutbacks

Figure 1: Footnote from Draft UWMP Table 7-1

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a Supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.

Total RWS supplies available to the Wholesale Customers in the first through fifth consecutive dry years in Supply Reliability Letter Table 3 align with those in Table 9 of the same letter. Similarly, Supply Reliability Letter Table 4 aligns with Table 10 of the same letter.

Table A below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Tables 7-1and 7-5.

Table A: Wholesale Customer Drought Cutbacks Based on a Single Dry Year and Multiple Dry Years (Base Year 2020)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
(1)	Projected SF RWS Wholesale Purchases	132.2 MGD	138.6 MGD	140.8 MGD	140.8 MGD	140.8 MGD	140.8 MGD
(2)	Supply Available to the Wholesale Customers	Percent Cutback on Wholesale RWS Purchases					
		2020	**2021**	**2022**	**2023**	**2024**	**2025**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
(4)	132.5 MGD	0.0%	-4.4%	-5.9%	-5.9%	-5.9%	-5.9%
(5)	82.8 MGD	-37.4%	-40.3%	-41.2%	-41.2%	-41.2%	-41.2%
(6)	74.5 MGD	-43.7%	-46.3%	-47.1%	-47.1%	-47.1%	-47.1%

Table A, column (a), rows 3 through 6 lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative actual wholesale RWS purchases for 2020. In years when the Bay-Delta Plan is not in effect, sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests assuming that they are between the 2020 and 2025 projected levels. As such, RWS supply available to the Wholesale Customers in the 2021 and 2022 is equal to the cumulative projected wholesale RWS.. Projected RWS purchases for years 2021 and 2022 were provided to Christina Tang, BAWSCA's Finance Manager, by the Member Agencies in January 2021. The SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. Additionally, the Tier 2 Plan calculates each agencies' Allocation Factor once at the onset of a drought and it remains the same until the shortage condition is over. Therefore, wholesale RWS demand in 2023 through 2025 is assumed to be static based on the 2022 projected demand.

Table B below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Table 7-1.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table B: Wholesale Customer Drought Cutbacks Based on a Single Dry Year and Multiple Dry Years (Base Year 2025)

	(a)	(b)	(c)	(d)	(e)	(f)
(1)	Projected SF RWS Wholesale Purchases	146.0 MGD	146.0 MGD	146.0 MGD	146.0 MGD	146.0 MGD
(2)	Supply Available to the Wholesale Customers	Percent Cutback on Wholesale RWS Purchases				
		2025	**2026**	**2027**	**2028**	**2029**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	0.0%
(4)	132.5 MGD	-9.2%	-9.2%	-9.2%	-9.2%	-9.2%
(5)	82.8 MGD	-43.3%	-43.3%	-43.3%	-43.3%	-43.3%
(6)	74.5 MGD	-49.0%	-49.0%	-49.0%	-49.0%	-49.0%

Table B, column (a), rows 3 through 6 lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative projected wholesale RWS purchases for 2025 through 2029. The SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. Additionally, the Tier 2 Plan calculates each agencies' Allocation Factor once at the onset of a drought and it remains the same until the shortage condition is over. Therefore, wholesale RWS demand is assumed to be static between 2025 and 2029 based on the 2025 projected demand.

To complete UWMP Tables 7-1 and 7-5, reference tables in the Supply Reliability Letter to identify total RWS supplies available to the Wholesale Customers and apply the percent cutback in the corresponding year of the drought sequence using Tables A and B. For example, in Supply Reliability Letter Table 3, in the 5th consecutive year of a drought, the volume available to the Wholesale Customers is 74.5 MGD. To calculate RWS supplies available to your agency in 2025 using table A, locate the row with 74.5 MGD on the table – row 6 – and the column for 2025 – column (g). Then apply the percent cutback to your agency's RWS demand in 2025.

A list of purchase projections by agency are provided in Tables C, D, E, and F. The table also indicates the percent cutback that should be applied based on total RWS supplies available to the Wholesale Customers. Tables C and E use Scenario 1: With Bay-Delta Plan. Tables D and F use Scenario 2: Without Bay-Delta Plan. Tables C and D use 2020 as the base year and Tables E and F use 2025 as the base year.

BAWSCA understands that agencies are updating projected demands for their 2020 UWMPs and that projected RWS purchases may change from what was previously provided. Additionally, BAWSCA recognizes that not all Member Agencies will choose the same scenario for their UWMP supply reliability tables. For both reasons, projected RWS purchases in each Member Agency's 2020 UWMP may not add up to total Wholesale demands in the SFPUC's 2020 UWMP. This is consistent with direction given by the Department of Water Resources, which encourages suppliers use the UWMP tables to represent what they believe to be the most likely supply reliability scenario and to characterize the five-consecutive year drought in a manner that is best suited for understanding and managing their water service reliability and individual agency level of risk tolerance.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table C: Scenario 1: <u>With</u> Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2020)

	2020 (184 MGD)		**2021** (157.5 MGD)		**2022** (132.5 MGD)		**2023** (74.5 MGD)		**2024** (74.5 MGD)		**2025** (74.5 MGD)	
Agency	Actual Purchases	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.87	0.0%	9.44	0.0%	9.46	-5.9%	9.46	-47%	9.46	-47%	9.46	-47%
Brisbane/GVMID	0.64	0.0%	0.62	0.0%	0.65	-5.9%	0.65	-47%	0.65	-47%	0.65	-47%
Burlingame	3.48	0.0%	3.34	0.0%	3.35	-5.9%	3.35	-47%	3.35	-47%	3.35	-47%
Coastside	1.02	0.0%	1.54	0.0%	1.23	-5.9%	1.23	-47%	1.23	-47%	1.23	-47%
CalWater Total	29.00	0.0%	29.66	0.0%	29.81	-5.9%	29.81	-47%	29.81	-47%	29.81	-47%
Daly City	3.97	0.0%	4.00	0.0%	4.01	-5.9%	4.01	-47%	4.01	-47%	4.01	-47%
East Palo Alto	1.57	0.0%	1.63	0.0%	1.69	-5.9%	1.69	-47%	1.69	-47%	1.69	-47%
Estero	4.34	0.0%	4.48	0.0%	4.51	-5.9%	4.51	-47%	4.51	-47%	4.51	-47%
Hayward	13.92	0.0%	14.47	0.0%	15.12	-5.9%	15.12	-47%	15.12	-47%	15.12	-47%
Hillsborough	2.62	0.0%	2.95	0.0%	3.05	-5.9%	3.05	-47%	3.05	-47%	3.05	-47%
Menlo Park	2.96	0.0%	2.92	0.0%	2.93	-5.9%	2.93	-47%	2.93	-47%	2.93	-47%
Mid-Peninsula	2.66	0.0%	2.65	0.0%	2.80	-5.9%	2.80	-47%	2.80	-47%	2.80	-47%
Millbrae	1.90	0.0%	1.95	0.0%	2.15	-5.9%	2.15	-47%	2.15	-47%	2.15	-47%
Milpitas	5.92	0.0%	5.88	0.0%	5.34	-5.9%	5.34	-47%	5.34	-47%	5.34	-47%
Mountain View	7.67	0.0%	7.80	0.0%	8.05	-5.9%	8.05	-47%	8.05	-47%	8.05	-47%
North Coast	2.37	0.0%	2.58	0.0%	2.66	-5.9%	2.66	-47%	2.66	-47%	2.66	-47%
Palo Alto	9.75	0.0%	9.44	0.0%	9.66	-5.9%	9.66	-47%	9.66	-47%	9.66	-47%
Purissima Hills	1.75	0.0%	1.97	0.0%	2.02	-5.9%	2.02	-47%	2.02	-47%	2.02	-47%
Redwood City	8.76	0.0%	8.72	0.0%	9.07	-5.9%	9.07	-47%	9.07	-47%	9.07	-47%
San Bruno	0.95	0.0%	3.39	0.0%	3.40	-5.9%	3.40	-47%	3.40	-47%	3.40	-47%
San José	4.26	0.0%	4.31	0.0%	4.51	-5.9%	4.51	-47%	4.51	-47%	4.51	-47%
Santa Clara	3.27	0.0%	3.29	0.0%	3.50	-5.9%	3.50	-47%	3.50	-47%	3.50	-47%
Stanford	1.43	0.0%	1.40	0.0%	1.54	-5.9%	1.54	-47%	1.54	-47%	1.54	-47%
Sunnyvale	9.33	0.0%	9.35	0.0%	9.45	-5.9%	9.45	-47%	9.45	-47%	9.45	-47%
Westborough	0.82	0.0%	0.84	0.0%	0.81	-5.9%	0.81	-47%	0.81	-47%	0.81	-47%
Wholesale Total	**132.2**	**132.2†**	**138.6**	**138.6†**	**140.8**	**132.5†**	**140.8**	**74.5†**	**140.8**	**74.5†**	**140.8**	**74.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table D: Scenario 2: Without Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2020)

	2020 (184 MGD)		**2021** (157.5 MGD)		**2022** (132.5 MGD)		**2023** (132.5 MGD)		**2024** (132.5 MGD)		**2025** (132.5 MGD)	
Agency	Actual Purchases	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.87	0.0%	9.44	0.0%	9.46	-5.9%	9.46	-5.9%	9.46	-5.9%	9.46	-5.9%
Brisbane/GVMID	0.64	0.0%	0.62	0.0%	0.65	-5.9%	0.65	-5.9%	0.65	-5.9%	0.65	-5.9%
Burlingame	3.48	0.0%	3.34	0.0%	3.35	-5.9%	3.35	-5.9%	3.35	-5.9%	3.35	-5.9%
Coastside	1.02	0.0%	1.54	0.0%	1.23	-5.9%	1.23	-5.9%	1.23	-5.9%	1.23	-5.9%
CalWater Total	29.00	0.0%	29.66	0.0%	29.81	-5.9%	29.81	-5.9%	29.81	-5.9%	29.81	-5.9%
Daly City	3.97	0.0%	4.00	0.0%	4.01	-5.9%	4.01	-5.9%	4.01	-5.9%	4.01	-5.9%
East Palo Alto	1.57	0.0%	1.63	0.0%	1.69	-5.9%	1.69	-5.9%	1.69	-5.9%	1.69	-5.9%
Estero	4.34	0.0%	4.48	0.0%	4.51	-5.9%	4.51	-5.9%	4.51	-5.9%	4.51	-5.9%
Hayward	13.92	0.0%	14.47	0.0%	15.12	-5.9%	15.12	-5.9%	15.12	-5.9%	15.12	-5.9%
Hillsborough	2.62	0.0%	2.95	0.0%	3.05	-5.9%	3.05	-5.9%	3.05	-5.9%	3.05	-5.9%
Menlo Park	2.96	0.0%	2.92	0.0%	2.93	-5.9%	2.93	-5.9%	2.93	-5.9%	2.93	-5.9%
Mid-Peninsula	2.66	0.0%	2.65	0.0%	2.80	-5.9%	2.80	-5.9%	2.80	-5.9%	2.80	-5.9%
Millbrae	1.90	0.0%	1.95	0.0%	2.15	-5.9%	2.15	-5.9%	2.15	-5.9%	2.15	-5.9%
Milpitas	5.92	0.0%	5.88	0.0%	5.34	-5.9%	5.34	-5.9%	5.34	-5.9%	5.34	-5.9%
Mountain View	7.67	0.0%	7.80	0.0%	8.05	-5.9%	8.05	-5.9%	8.05	-5.9%	8.05	-5.9%
North Coast	2.37	0.0%	2.58	0.0%	2.66	-5.9%	2.66	-5.9%	2.66	-5.9%	2.66	-5.9%
Palo Alto	9.75	0.0%	9.44	0.0%	9.66	-5.9%	9.66	-5.9%	9.66	-5.9%	9.66	-5.9%
Purissima Hills	1.75	0.0%	1.97	0.0%	2.02	-5.9%	2.02	-5.9%	2.02	-5.9%	2.02	-5.9%
Redwood City	8.76	0.0%	8.72	0.0%	9.07	-5.9%	9.07	-5.9%	9.07	-5.9%	9.07	-5.9%
San Bruno	0.95	0.0%	3.39	0.0%	3.40	-5.9%	3.40	-5.9%	3.40	-5.9%	3.40	-5.9%
San José	4.26	0.0%	4.31	0.0%	4.51	-5.9%	4.51	-5.9%	4.51	-5.9%	4.51	-5.9%
Santa Clara	3.27	0.0%	3.29	0.0%	3.50	-5.9%	3.50	-5.9%	3.50	-5.9%	3.50	-5.9%
Stanford	1.43	0.0%	1.40	0.0%	1.54	-5.9%	1.54	-5.9%	1.54	-5.9%	1.54	-5.9%
Sunnyvale	9.33	0.0%	9.35	0.0%	9.45	-5.9%	9.45	-5.9%	9.45	-5.9%	9.45	-5.9%
Westborough	0.82	0.0%	0.84	0.0%	0.81	-5.9%	0.81	-5.9%	0.81	-5.9%	0.81	-5.9%
Wholesale Total	**132.2**	**132.2†**	**138.6**	**138.6†**	**140.8**	**132.5†**	**140.8**	**132.5†**	**140.8**	**132.5†**	**140.8**	**132.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table E: Scenario 1: With Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2025)

	2025 (184 MGD)		**2026** (82.8 MGD)		**2027** (74.5 MGD)		**2028** (74.5 MGD)		**2029** (74.5 MGD)	
Agency	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.68	0%	7.68	-43.3%	7.68	-49%	7.68	-49%	7.68	-49%
Brisbane/GVMID	0.89	0%	0.89	-43.3%	0.89	-49%	0.89	-49%	0.89	-49%
Burlingame	4.33	0%	4.33	-43.3%	4.33	-49%	4.33	-49%	4.33	-49%
Coastside	1.40	0%	1.40	-43.3%	1.40	-49%	1.40	-49%	1.40	-49%
CalWater Total	29.99	0%	29.99	-43.3%	29.99	-49%	29.99	-49%	29.99	-49%
Daly City	3.57	0%	3.57	-43.3%	3.57	-49%	3.57	-49%	3.57	-49%
East Palo Alto	1.88	0%	1.88	-43.3%	1.88	-49%	1.88	-49%	1.88	-49%
Estero	4.07	0%	4.07	-43.3%	4.07	-49%	4.07	-49%	4.07	-49%
Hayward	17.86	0%	17.86	-43.3%	17.86	-49%	17.86	-49%	17.86	-49%
Hillsborough	3.26	0%	3.26	-43.3%	3.26	-49%	3.26	-49%	3.26	-49%
Menlo Park	3.55	0%	3.55	-43.3%	3.55	-49%	3.55	-49%	3.55	-49%
Mid-Peninsula	2.86	0%	2.86	-43.3%	2.86	-49%	2.86	-49%	2.86	-49%
Millbrae	2.29	0%	2.29	-43.3%	2.29	-49%	2.29	-49%	2.29	-49%
Milpitas	6.59	0%	6.59	-43.3%	6.59	-49%	6.59	-49%	6.59	-49%
Mountain View	8.60	0%	8.60	-43.3%	8.60	-49%	8.60	-49%	8.60	-49%
North Coast	2.34	0%	2.34	-43.3%	2.34	-49%	2.34	-49%	2.34	-49%
Palo Alto	10.06	0%	10.06	-43.3%	10.06	-49%	10.06	-49%	10.06	-49%
Purissima Hills	2.09	0%	2.09	-43.3%	2.09	-49%	2.09	-49%	2.09	-49%
Redwood City	8.46	0%	8.46	-43.3%	8.46	-49%	8.46	-49%	8.46	-49%
San Bruno	3.24	0%	3.24	-43.3%	3.24	-49%	3.24	-49%	3.24	-49%
San José	4.50	0%	4.50	-43.3%	4.50	-49%	4.50	-49%	4.50	-49%
Santa Clara	4.50	0%	4.50	-43.3%	4.50	-49%	4.50	-49%	4.50	-49%
Stanford	2.01	0%	2.01	-43.3%	2.01	-49%	2.01	-49%	2.01	-49%
Sunnyvale	9.16	0%	9.16	-43.3%	9.16	-49%	9.16	-49%	9.16	-49%
Westborough	0.86	0%	0.86	-43.3%	0.86	-49%	0.86	-49%	0.86	-49%
Wholesale Total	**146.0**	**146.0†**	**146.0**	**82.8†**	**146.0**	**74.5†**	**146.0**	**74.5†**	**146.0**	**74.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table F: Scenario 2: Without Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2025)

	2025 (184 MGD)		**2026** (157.5 MGD)		**2027** (157.5 MGD)		**2028** (157.5 MGD)		**2029** (132.5 MGD)	
Agency	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.68	0.0%	7.68	0.0%	7.68	0.0%	7.68	0.0%	7.68	-9.2%
Brisbane/GVMID	0.89	0.0%	0.89	0.0%	0.89	0.0%	0.89	0.0%	0.89	-9.2%
Burlingame	4.33	0.0%	4.33	0.0%	4.33	0.0%	4.33	0.0%	4.33	-9.2%
Coastside	1.40	0.0%	1.40	0.0%	1.40	0.0%	1.40	0.0%	1.40	-9.2%
CalWater Total	29.99	0.0%	29.99	0.0%	29.99	0.0%	29.99	0.0%	29.99	-9.2%
Daly City	3.57	0.0%	3.57	0.0%	3.57	0.0%	3.57	0.0%	3.57	-9.2%
East Palo Alto	1.88	0.0%	1.88	0.0%	1.88	0.0%	1.88	0.0%	1.88	-9.2%
Estero	4.07	0.0%	4.07	0.0%	4.07	0.0%	4.07	0.0%	4.07	-9.2%
Hayward	17.86	0.0%	17.86	0.0%	17.86	0.0%	17.86	0.0%	17.86	-9.2%
Hillsborough	3.26	0.0%	3.26	0.0%	3.26	0.0%	3.26	0.0%	3.26	-9.2%
Menlo Park	3.55	0.0%	3.55	0.0%	3.55	0.0%	3.55	0.0%	3.55	-9.2%
Mid-Peninsula	2.86	0.0%	2.86	0.0%	2.86	0.0%	2.86	0.0%	2.86	-9.2%
Millbrae	2.29	0.0%	2.29	0.0%	2.29	0.0%	2.29	0.0%	2.29	-9.2%
Milpitas	6.59	0.0%	6.59	0.0%	6.59	0.0%	6.59	0.0%	6.59	-9.2%
Mountain View	8.60	0.0%	8.60	0.0%	8.60	0.0%	8.60	0.0%	8.60	-9.2%
North Coast	2.34	0.0%	2.34	0.0%	2.34	0.0%	2.34	0.0%	2.34	-9.2%
Palo Alto	10.06	0.0%	10.06	0.0%	10.06	0.0%	10.06	0.0%	10.06	-9.2%
Purissima Hills	2.09	0.0%	2.09	0.0%	2.09	0.0%	2.09	0.0%	2.09	-9.2%
Redwood City	8.46	0.0%	8.46	0.0%	8.46	0.0%	8.46	0.0%	8.46	-9.2%
San Bruno	3.24	0.0%	3.24	0.0%	3.24	0.0%	3.24	0.0%	3.24	-9.2%
San José	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	-9.2%
Santa Clara	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	-9.2%
Stanford	2.01	0.0%	2.01	0.0%	2.01	0.0%	2.01	0.0%	2.01	-9.2%
Sunnyvale	9.16	0.0%	9.16	0.0%	9.16	0.0%	9.16	0.0%	9.16	-9.2%
Westborough	0.86	0.0%	0.86	0.0%	0.86	0.0%	0.86	0.0%	0.86	-9.2%
Wholesale Total	**146.0**	**146.0†**	**146.0**	**146.4†**	**146.0**	**146.8†**	**146.0**	**147.1†**	**146.0**	**132.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

UWMP Table 7-4

Supply Reliability Letter Tables 7 and 8 will help your agency complete UWMP Table 7-4. Table G below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Table 7-4. The table assumes (1) the Tier 2 Plan will be used to allocate supplies available to the Wholesale Customers when average Wholesale Customers' RWS shortages are greater than 10 and up to 20 percent, and (2) an equal percent reduction will be shared across all Wholesale Customers when average Wholesale Customers' RWS shortages are 10 percent or less or greater than 20 percent.

Table G: Drought Cutbacks Based on Projected Demands Under All Water Supply Availability Conditions

	(a)	(b)	(c)	(d)	(e)	(f)
(1)	Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
(2)	Supply Available to the Wholesale Customers	% Cutback on Wholesale RWS Purchases				
		2025	**2030**	**2035**	**2040**	**2045**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	-3.2%
(4)	132.5 MGD	-9.3%	-10.4%	Tier 2 Avg. -14%*	Tier 2 Avg. -16%*	Tier 2 Avg. -19%*
(5)	82.8 MGD	-43.3%	-44.0%	-45.5%	-47.0%	-49.1%
(6)	74.5 MGD	-49.0%	-49.6%	-51.0%	-52.3%	-54.2%

* Calculated average. Individual agency cutbacks are calculated in Table H.

Table G, column (a) lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative projected wholesale RWS purchases for 2025, 2030, 2035, 2040, and 2045.

Tables H, I, J and K provide additional detail by agency for each of the four supply availability conditions listed in Table G. To complete UWMP Table 7-4, reference Table 7 or 8 (depending on which Bay-Delta Plan scenario you choose) in the Supply Reliability Letter to identify total RWS supplies available to the Wholesale Customers and apply the percent cutback in the corresponding year using Table G or input the volumetric drought allocation using Tables H, I, J and K below.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table H: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 157.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2035**	**2040**	**2045**
ACWD	7.68	7.68	7.68	7.68	8.82
Brisbane/GVMID	0.89	0.89	0.88	0.89	0.87
Burlingame	4.33	4.40	4.47	4.58	4.54
Coastside	1.40	1.38	1.36	1.33	1.28
CalWater Total	29.99	29.74	29.81	30.27	29.71
Daly City	3.57	3.52	3.49	3.46	3.32
East Palo Alto	1.88	1.95	2.10	2.49	2.80
Estero	4.07	4.11	4.18	4.23	4.24
Hayward	17.86	18.68	19.75	20.82	21.43
Hillsborough	3.26	3.25	3.26	3.26	3.15
Menlo Park	3.55	3.68	3.87	4.06	4.15
Mid-Peninsula	2.86	2.84	2.88	2.89	2.83
Millbrae	2.29	2.50	2.45	2.82	3.10
Milpitas	6.59	6.75	7.03	7.27	7.29
Mountain View	8.60	8.90	9.20	9.51	9.61
North Coast	2.34	2.33	2.34	2.34	2.27
Palo Alto	10.06	10.15	10.28	10.51	10.44
Purissima Hills	2.09	2.09	2.12	2.13	2.08
Redwood City	8.46	8.49	8.64	8.74	8.62
San Bruno	3.24	3.22	3.20	3.20	3.11
San José	4.50	4.50	4.50	4.50	4.35
Santa Clara	4.50	4.50	4.50	4.50	4.35
Stanford	2.01	2.18	2.35	2.53	2.61
Sunnyvale	9.16	9.30	10.70	11.44	11.71
Westborough	0.86	0.85	0.85	0.84	0.82
Wholesale Total	**146.0**	**147.9**	**151.9**	**156.3**	**157.5**

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table I: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 132.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2035**	**2040**	**2045**
ACWD	6.97	6.88	6.91	6.91	8.20
Brisbane/GVMID	0.81	0.79	0.73	0.73	0.72
Burlingame	3.93	3.94	3.96	3.89	3.80
Coastside	1.27	1.24	1.22	1.20	1.19
CalWater Total	27.21	26.65	26.46	25.69	24.69
Daly City	3.24	3.15	3.04	3.01	2.98
East Palo Alto	1.70	1.75	1.97	2.30	2.62
Estero	3.69	3.68	3.76	3.87	3.77
Hayward	16.20	16.74	17.32	17.69	18.07
Hillsborough	2.96	2.92	2.90	2.75	2.56
Menlo Park	3.22	3.30	3.37	3.33	3.26
Mid-Peninsula	2.59	2.54	2.59	2.62	2.54
Millbrae	2.07	2.24	2.16	2.32	2.45
Milpitas	5.98	6.05	6.25	6.31	6.35
Mountain View	7.80	7.97	8.28	8.49	8.34
North Coast	2.12	2.09	2.11	2.11	2.11
Palo Alto	9.13	9.09	9.26	9.46	9.71
Purissima Hills	1.89	1.87	1.42	1.38	1.32
Redwood City	7.67	7.61	7.89	7.70	7.49
San Bruno	2.94	2.88	2.56	2.51	2.45
San José	4.08	4.03	3.03	2.91	2.76
Santa Clara	4.08	4.03	3.03	2.91	2.76
Stanford	1.82	1.95	2.06	2.13	2.16
Sunnyvale	8.31	8.33	9.46	9.51	9.43
Westborough	0.78	0.76	0.76	0.76	0.76
Wholesale Total	**132.5**	**132.5**	**132.5**	**132.5**	**132.5**

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table J: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 82.8 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2035**	**2040**	**2045**
ACWD	4.36	4.30	4.19	4.07	4.64
Brisbane/GVMID	0.51	0.50	0.48	0.47	0.45
Burlingame	2.45	2.46	2.44	2.43	2.39
Coastside	0.79	0.77	0.74	0.71	0.68
CalWater Total	17.00	16.65	16.25	16.03	15.62
Daly City	2.02	1.97	1.90	1.83	1.75
East Palo Alto	1.06	1.09	1.14	1.32	1.47
Estero	2.31	2.30	2.28	2.24	2.23
Hayward	10.13	10.46	10.77	11.03	11.26
Hillsborough	1.85	1.82	1.78	1.73	1.66
Menlo Park	2.01	2.06	2.11	2.15	2.18
Mid-Peninsula	1.62	1.59	1.57	1.53	1.49
Millbrae	1.30	1.40	1.34	1.49	1.63
Milpitas	3.74	3.78	3.83	3.85	3.83
Mountain View	4.88	4.98	5.01	5.04	5.05
North Coast	1.33	1.30	1.28	1.24	1.19
Palo Alto	5.71	5.68	5.61	5.57	5.49
Purissima Hills	1.18	1.17	1.15	1.13	1.10
Redwood City	4.80	4.76	4.71	4.63	4.53
San Bruno	1.83	1.80	1.75	1.70	1.63
San José	2.55	2.52	2.45	2.38	2.29
Santa Clara	2.55	2.52	2.45	2.38	2.29
Stanford	1.14	1.22	1.28	1.34	1.37
Sunnyvale	5.19	5.21	5.83	6.06	6.16
Westborough	0.49	0.48	0.46	0.45	0.43
Wholesale Total	**82.8**	**82.8**	**82.8**	**82.8**	**82.8**

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table K: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 74.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2035**	**2040**	**2045**
ACWD	3.92	3.87	3.77	3.66	4.17
Brisbane/GVMID	0.46	0.45	0.43	0.42	0.41
Burlingame	2.21	2.21	2.19	2.18	2.15
Coastside	0.71	0.70	0.67	0.64	0.61
CalWater Total	15.30	14.98	14.62	14.43	14.05
Daly City	1.82	1.77	1.71	1.65	1.57
East Palo Alto	0.96	0.98	1.03	1.19	1.32
Estero	2.08	2.07	2.05	2.02	2.00
Hayward	9.11	9.41	9.69	9.92	10.14
Hillsborough	1.66	1.64	1.60	1.55	1.49
Menlo Park	1.81	1.86	1.90	1.94	1.96
Mid-Peninsula	1.46	1.43	1.41	1.38	1.34
Millbrae	1.17	1.26	1.20	1.34	1.47
Milpitas	3.36	3.40	3.45	3.47	3.45
Mountain View	4.39	4.48	4.51	4.53	4.54
North Coast	1.19	1.17	1.15	1.12	1.07
Palo Alto	5.14	5.11	5.04	5.01	4.94
Purissima Hills	1.06	1.05	1.04	1.02	0.99
Redwood City	4.31	4.28	4.24	4.17	4.08
San Bruno	1.65	1.62	1.57	1.53	1.47
San José	2.30	2.27	2.21	2.14	2.06
Santa Clara	2.30	2.27	2.21	2.14	2.06
Stanford	1.03	1.10	1.15	1.21	1.24
Sunnyvale	4.67	4.69	5.25	5.45	5.54
Westborough	0.44	0.43	0.41	0.40	0.39
Wholesale Total	**74.5**	**74.5**	**74.5**	**74.5**	**74.5**

APPENDIX J
26 MARCH 2021 SFPUC COMMISSION SPECIAL MEETING – WATER WORKSHOP NUMBER 3 WATER SUPPLY PLANNING SCENARIOS SFPUC STAFF PRESENTATION MATERIALS

Hetch Hetchy Regional Water System

Operated by the San Francisco Public Utilities Commission

Water Workshop Number 3
Water Supply Planning Scenarios

March 26, 2021

Introduction

- Ten water supply planning scenarios were run using our HHLSM system modeling tool and the Regional Water System Supply and Demand Worksheet.
- For each scenario the ultimate result is either a surplus or deficit of supply, and each scenario produces different results, demonstrating the effect of the choices that are made.
- The assumptions and results for each scenario will be displayed in this presentation.
- The presentation concludes with a summary table of the bottom-line results for all the scenarios.

The Ten Scenarios

I. Previous Demand Estimates
II. Current Conditions
III. Tuolumne River Voluntary Agreement
IV. Bay-Delta Plan
V. Bay-Delta Plan with Alternative Water Supply Projects
VI. Bay-Delta Plan with Alternative Water Supply Projects and Modified Rationing Policy
VII. Bay-Delta Plan with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought
VIII. Water Quality Certification (401) with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought
IX. NGO scenario 1: Current system, 198 mgd constant demand, Bay-Delta Plan flows
X. NGO Scenario 2: Current system, 223 mgd constant demand, 7 ½ year design drought, Bay-Delta Plan flows

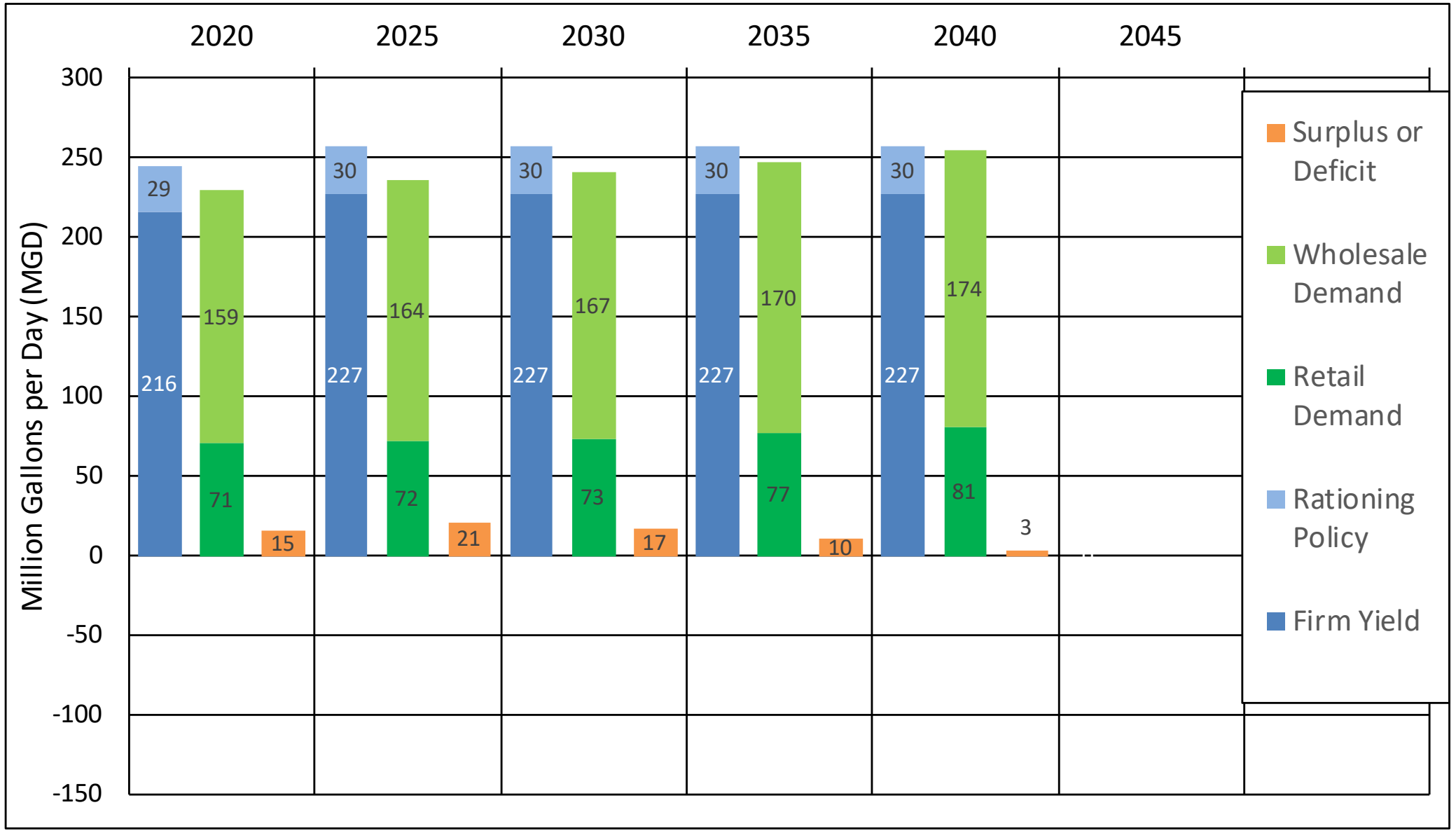
I. Prior Demand Estimates

- Includes retail demand projections from the 2015 Urban Water Management Plan
- Includes 2015 purchase projections from wholesale customers
- Includes current side agreement on flows in the lower Tuolumne River
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	2020	2025	2030	2035	2040	2045
Total Yield:	245	257	257	257	257	NA
RWS Demand:	230	236	241	247	255	NA
Lower Tuolumne Contribution:	NA	NA	NA	NA	NA	NA
Surplus or Deficit:	15	21	17	10	3	NA

I. Prior Demand Estimates



II. Current Conditions

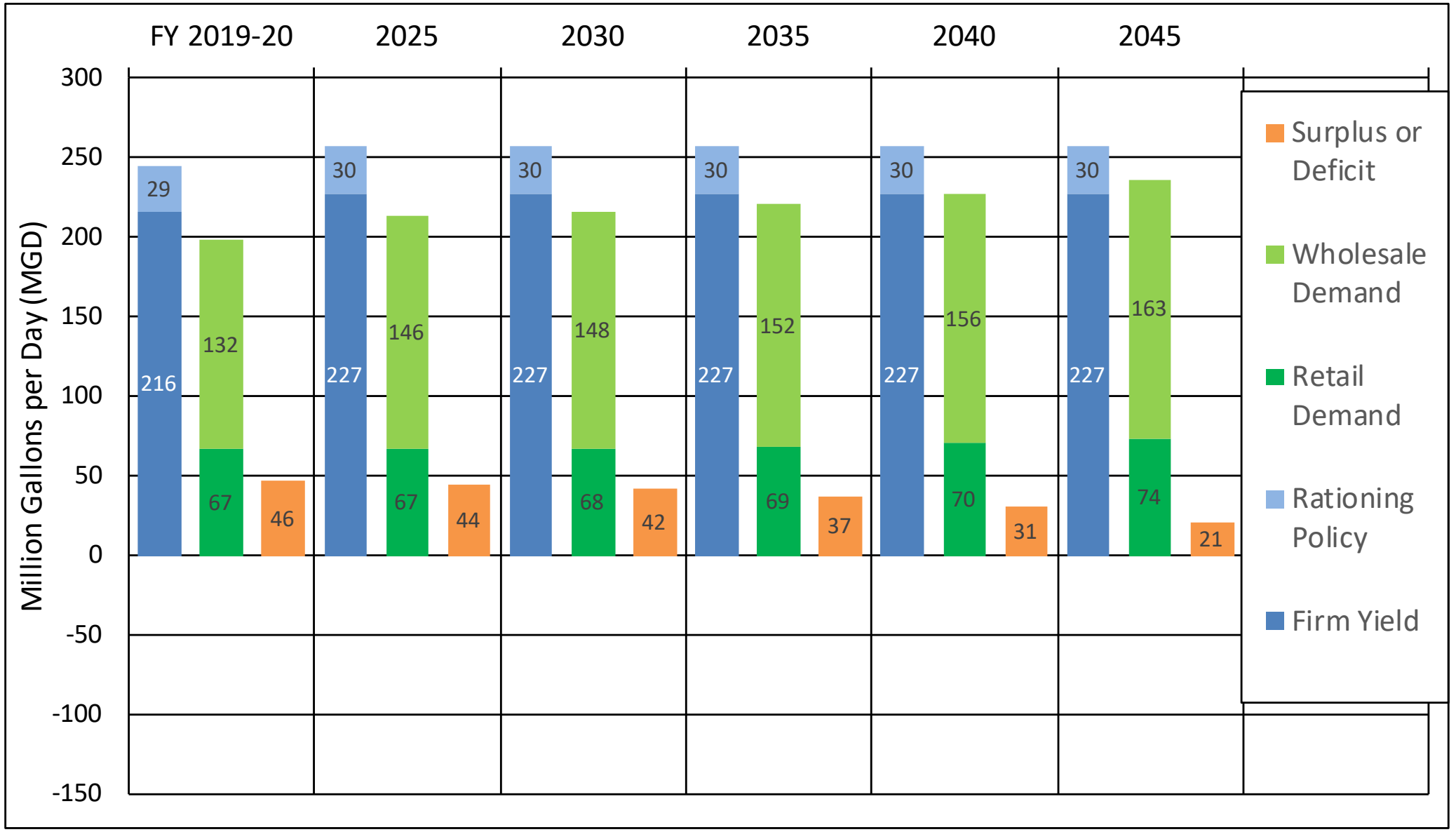
- Includes updated demand projections for anticipated development in retail service area*
- Includes most recent purchase projections from wholesale customers*
- Includes a total of 9 MGD for San Jose and Santa Clara*
- Includes the 1995 side agreement on flows in the lower Tuolumne River
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	245	257	257	257	257	257
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	NA	NA	NA	NA	NA
Surplus or Deficit:	46	44	42	37	31	21

* Base Conditions in later slides

II. Current Conditions



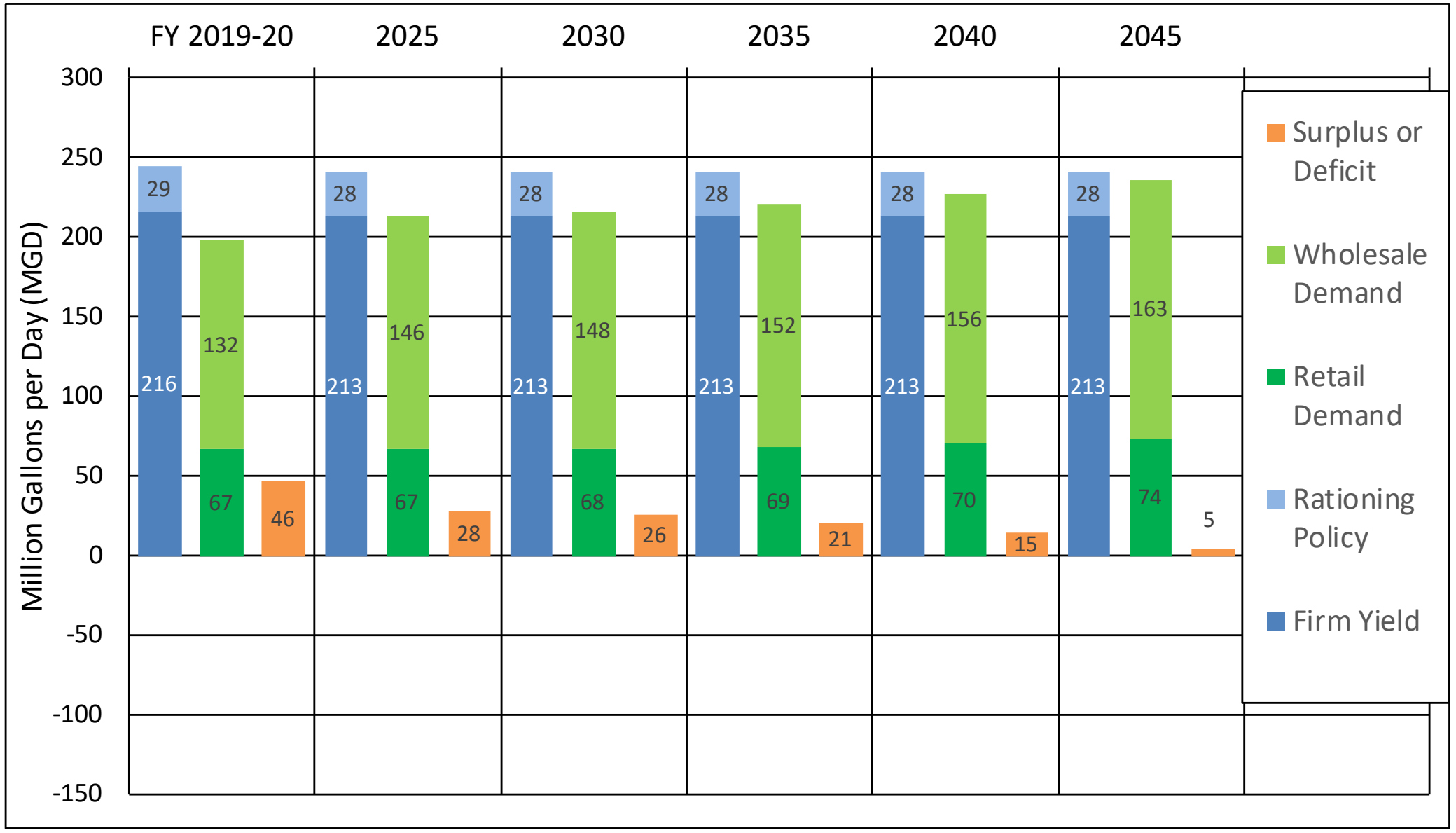
III. Tuolumne River Voluntary Agreement

- Base Conditions
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy
- Includes SFPUC contribution to the TRVA, displayed in the graph as a reduction in Firm Yield
- SFPUC contributions are calculated according to the 4th Agreement and assumes continuation of the 1995 side agreement.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	245	241	241	241	241	241
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	14	14	14	14	14
Surplus or Deficit:	46	28	26	21	15	5

III. Tuolumne River Voluntary Agreement



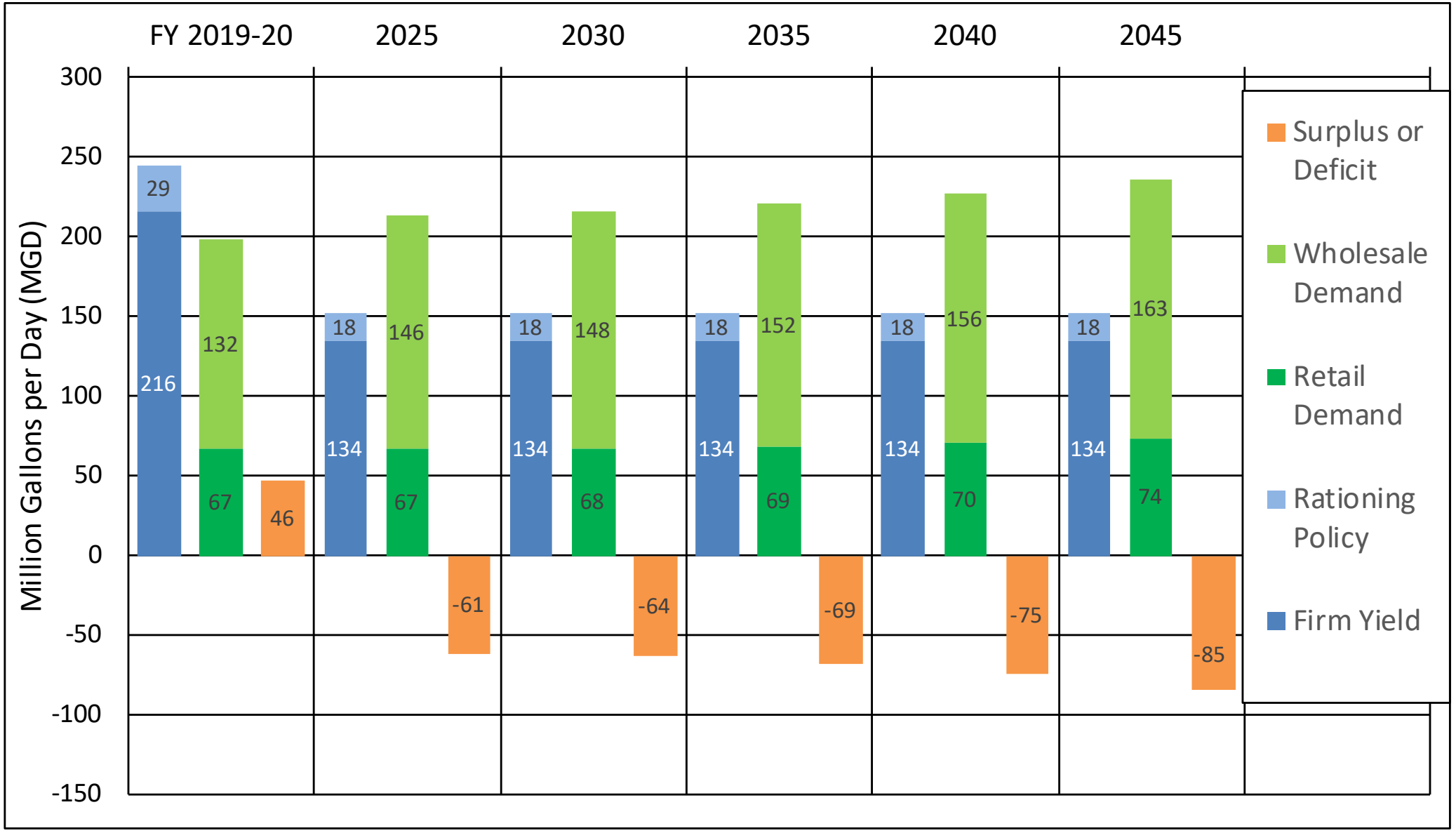
IV. Bay-Delta Plan

- Base Conditions
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy
- Includes SFPUC contribution to the Bay-Delta Plan displayed in the graph as a reduction in Firm Yield, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	245	152	152	152	152	152
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	93	93	93	93	93
Surplus or Deficit:	46	-61	-64	-69	-75	-85

IV. Bay-Delta Plan



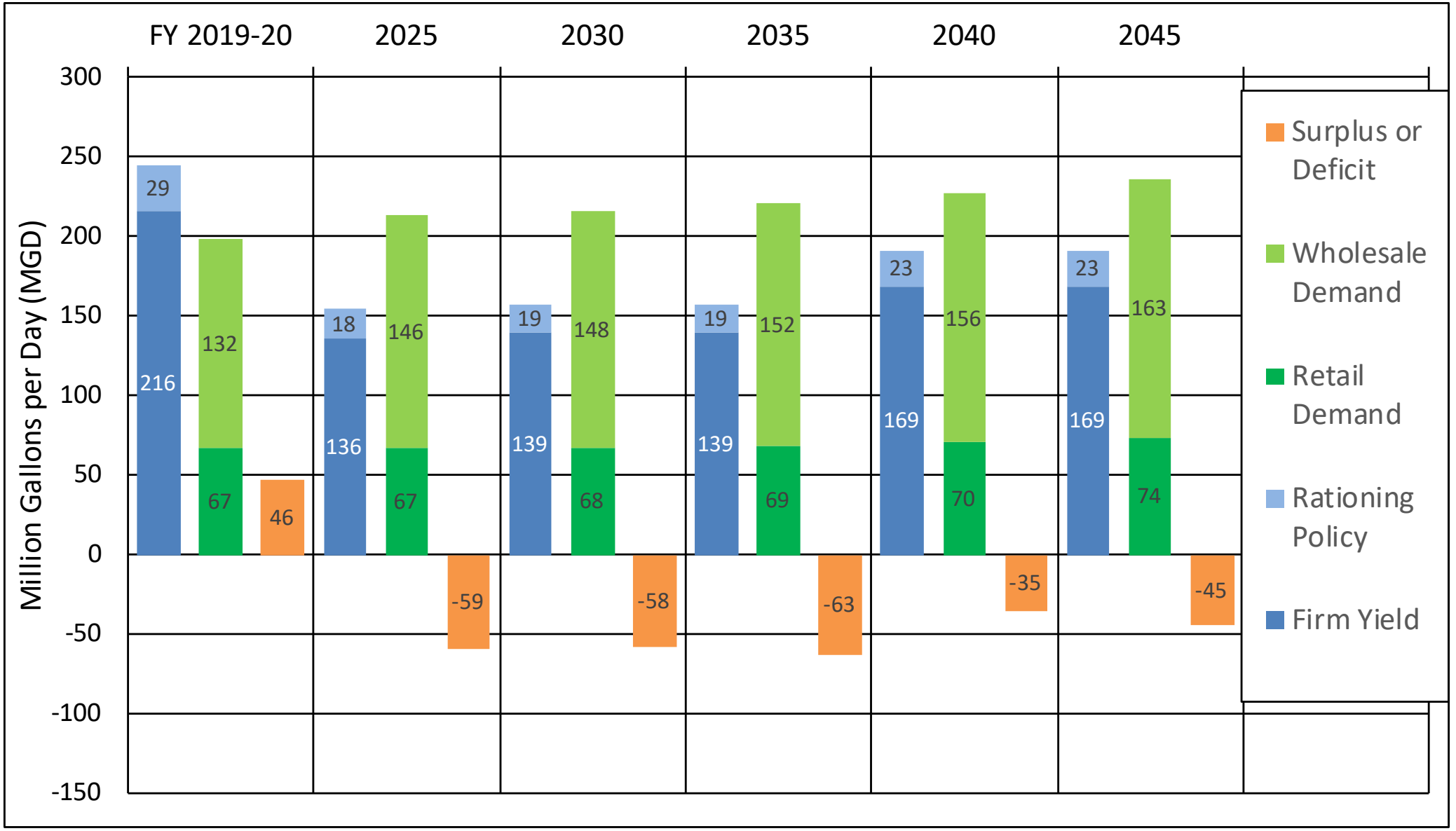
V. Bay-Delta Plan with Alternative Water Supply Projects

- Base Conditions
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy
- Includes SFPUC contribution to the Bay-Delta Plan displayed in the graph as a reduction in Firm Yield, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and continuation of the 1995 side agreement.
- Includes a total of 35 MGD of new water supply projects, which are assumed to be added between 2025 and 2040. The firm yield from the new projects is shown separately in the table to demonstrate the estimated development of the projects over time. The new project yield is also included in the Total Yield shown in the table.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	245	154	158	158	192	192
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	93	93	93	93	93
Alternative Water Supply Projects:	NA	2	5	5	35	35
Surplus or Deficit:	46	-59	-58	-63	-35	-45

V. Bay-Delta Plan with Alternative Water Supply Projects



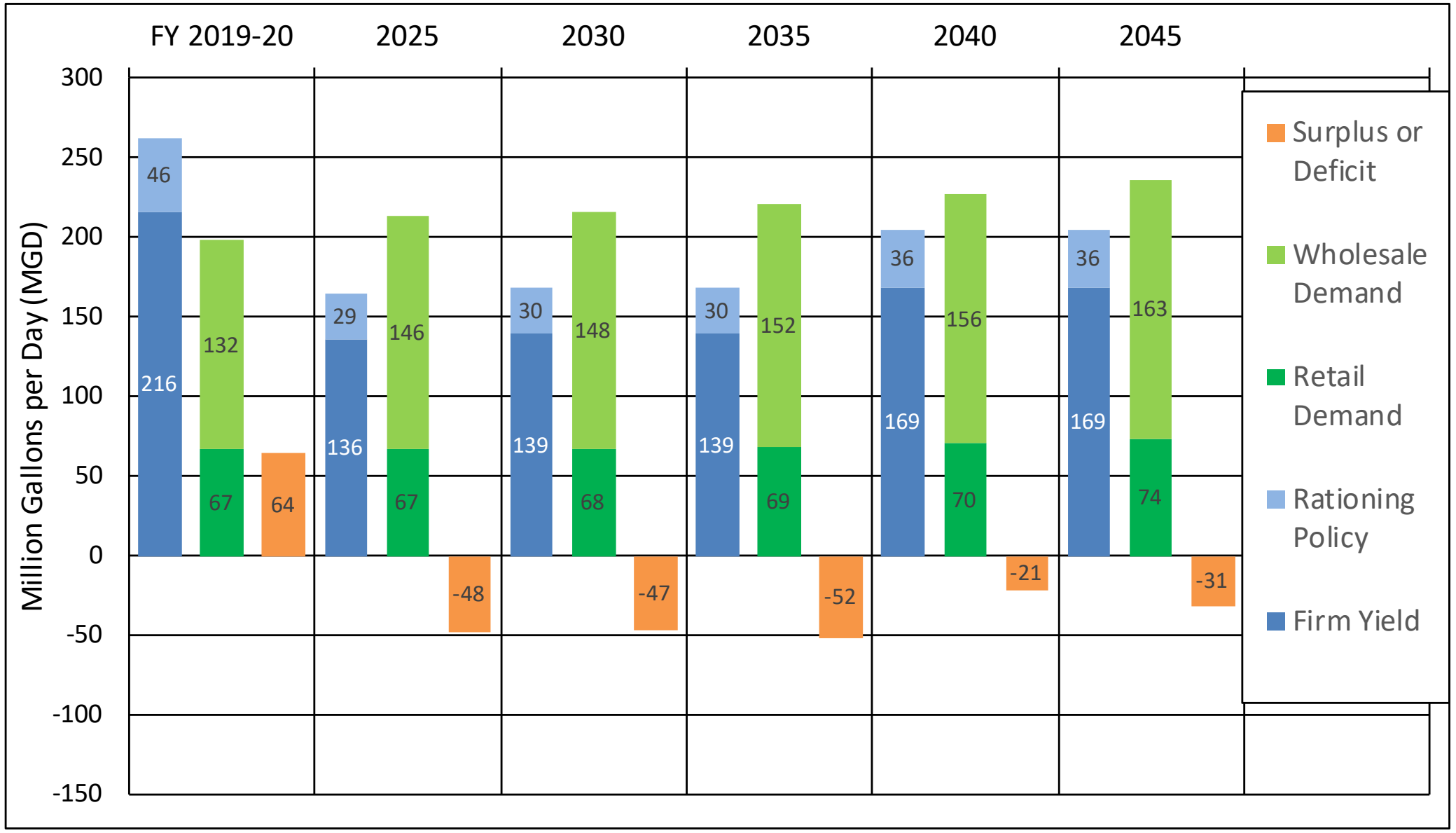
VI. Bay-Delta Plan with Alternative Water Supply Projects and Modified Rationing Policy

- Base Conditions
- Yield values are based on the 8.5-year design drought
- Includes SFPUC contribution to the Bay-Delta Plan displayed in the graph as a reduction in Firm Yield, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.
- Includes a total of 35 MGD of new water supply projects, as described on slide 12 for scenario V
- Includes 7.5 years of rationing at 20% in the 8.5-year design drought sequence

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	262	165	169	169	205	205
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	93	93	93	93	93
Surplus or Deficit:	64	-48	-47	-52	-21	-31

VI. Bay-Delta Plan with Alternative Water Supply Projects and Modified Rationing Policy



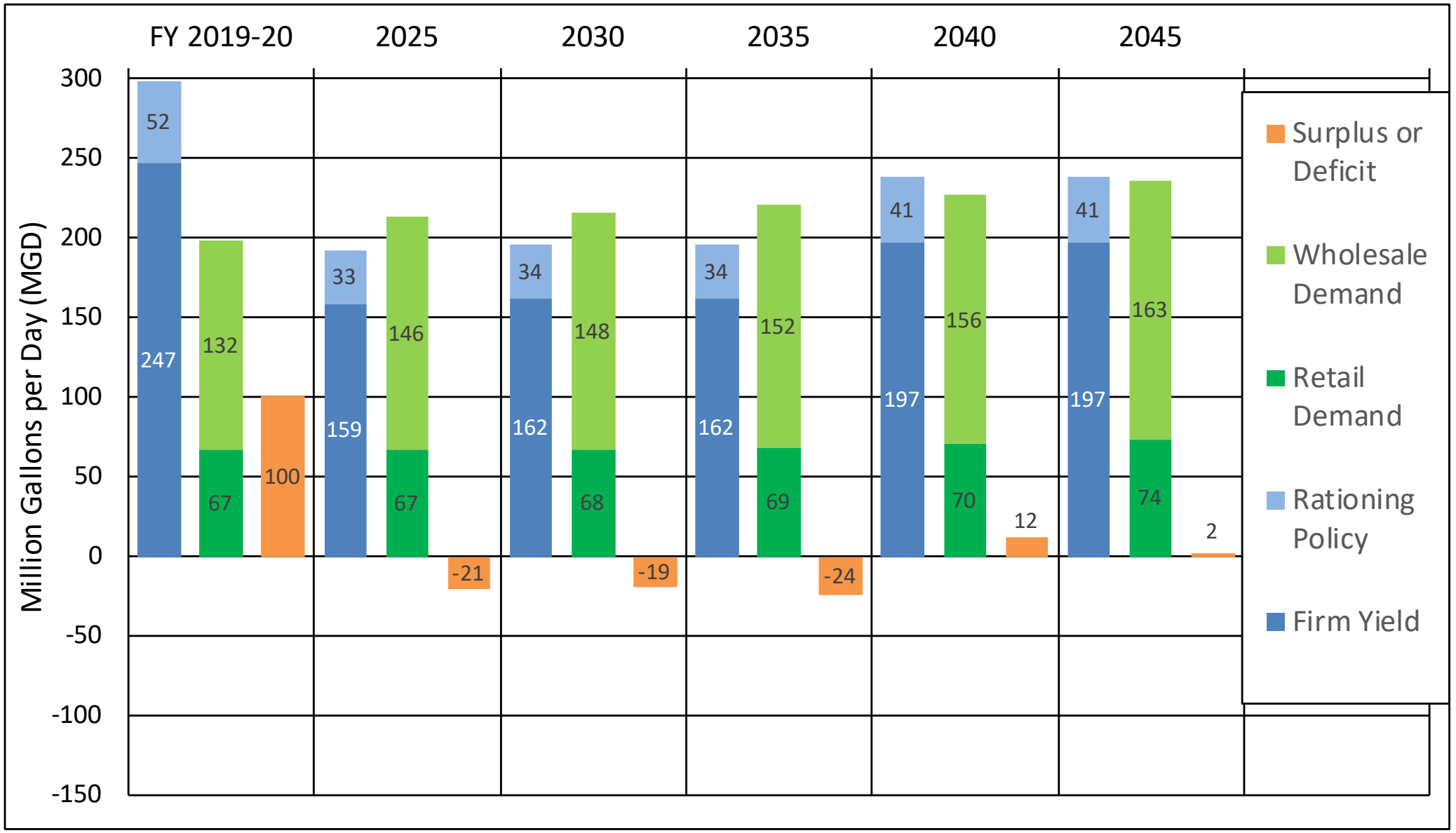
VII. Bay-Delta Plan with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought

- Base Conditions
- Includes SFPUC contribution to the Bay-Delta Plan displayed in the graph as a reduction in Firm Yield, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.
- Includes a total of 35 MGD of new water supply projects, as described on slide 12 for scenario V
- Yield values are estimated using a 7.5-year design drought
- Includes 6.5 years of rationing at 20% in the 7.5-year design drought sequence.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	299	192	196	196	238	238
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	101	101	101	101	101
Surplus or Deficit:	100	-21	-19	-24	12	2

VII. Bay-Delta Plan with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought



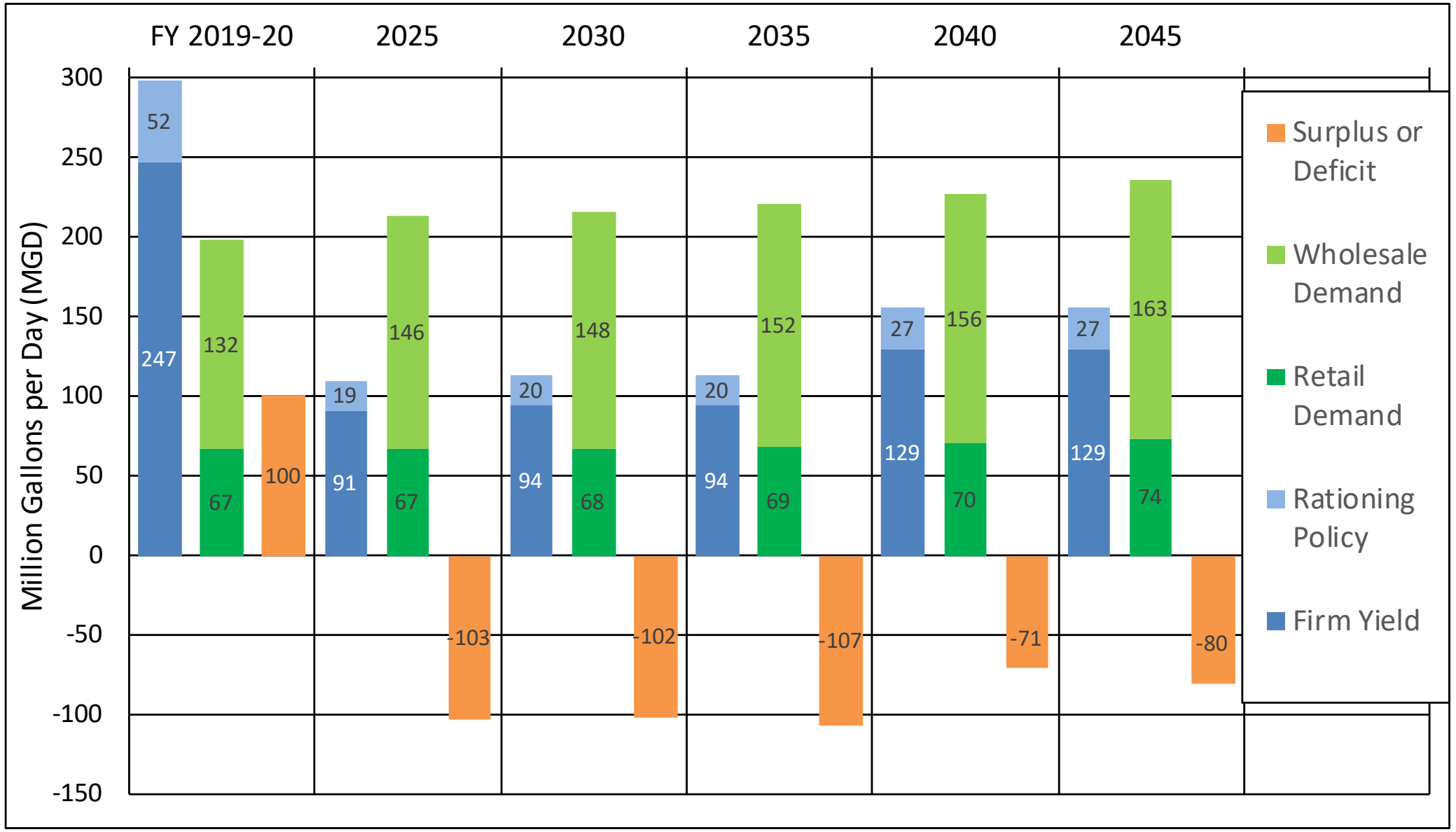
VIII. Water Quality Certification (401) with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought

- Base Conditions
- Includes SFPUC contribution to the Section 401 water quality certification on the FERC license displayed in the graph as a reduction in Firm Yield.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.
- Includes a total of 35 MGD of new water supply projects, as described on slide 12 for scenario V
- Yield values are estimated using a 7.5-year design drought
- Includes 6.5 years of rationing at 20% in the 7.5-year design drought sequence.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	299	110	114	114	156	156
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	169	169	169	169	169
Surplus or Deficit:	100	-103	-102	-107	-71	-80

VIII. Water Quality Certification (401) with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought



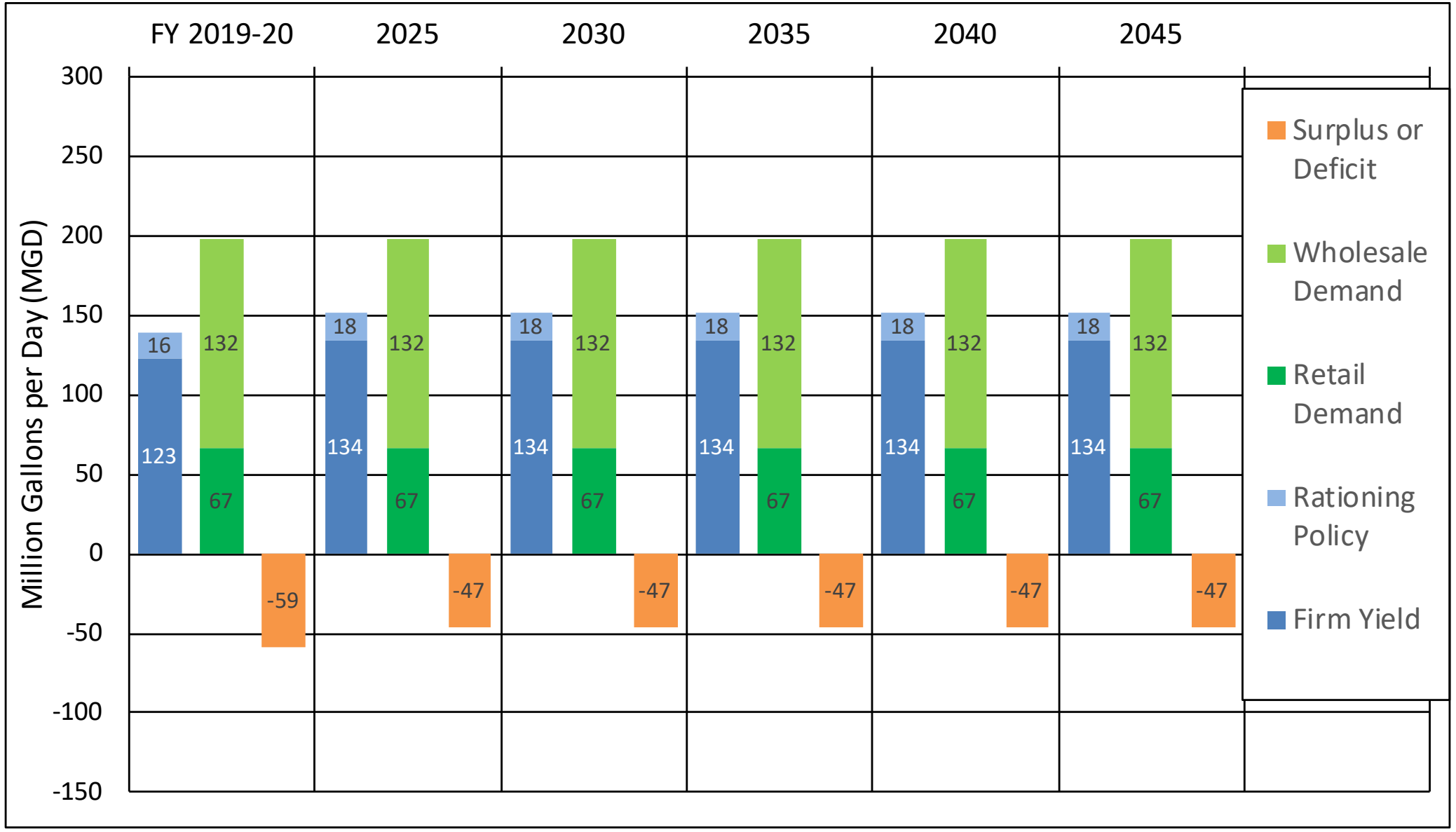
IX. NGO scenario 1: Current system, 198 mgd constant demand, Bay-Delta Plan flows

- Assumes that retail and wholesale demand on the RWS remain at the current level of approximately 198 MGD, and that SFPUC contributions to the Bay-Delta Plan are being made now
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy
- Includes SFPUC contribution to the Bay-Delta Plan, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	139	152	152	152	152	152
RWS Demand:	198	198	198	198	198	198
Lower Tuolumne Contribution:	93	93	93	93	93	93
Surplus or Deficit:	-59	-47	-47	-47	-47	-47

IX. NGO scenario 1: Current system, 198 mgd constant demand, Bay-Delta Plan flows



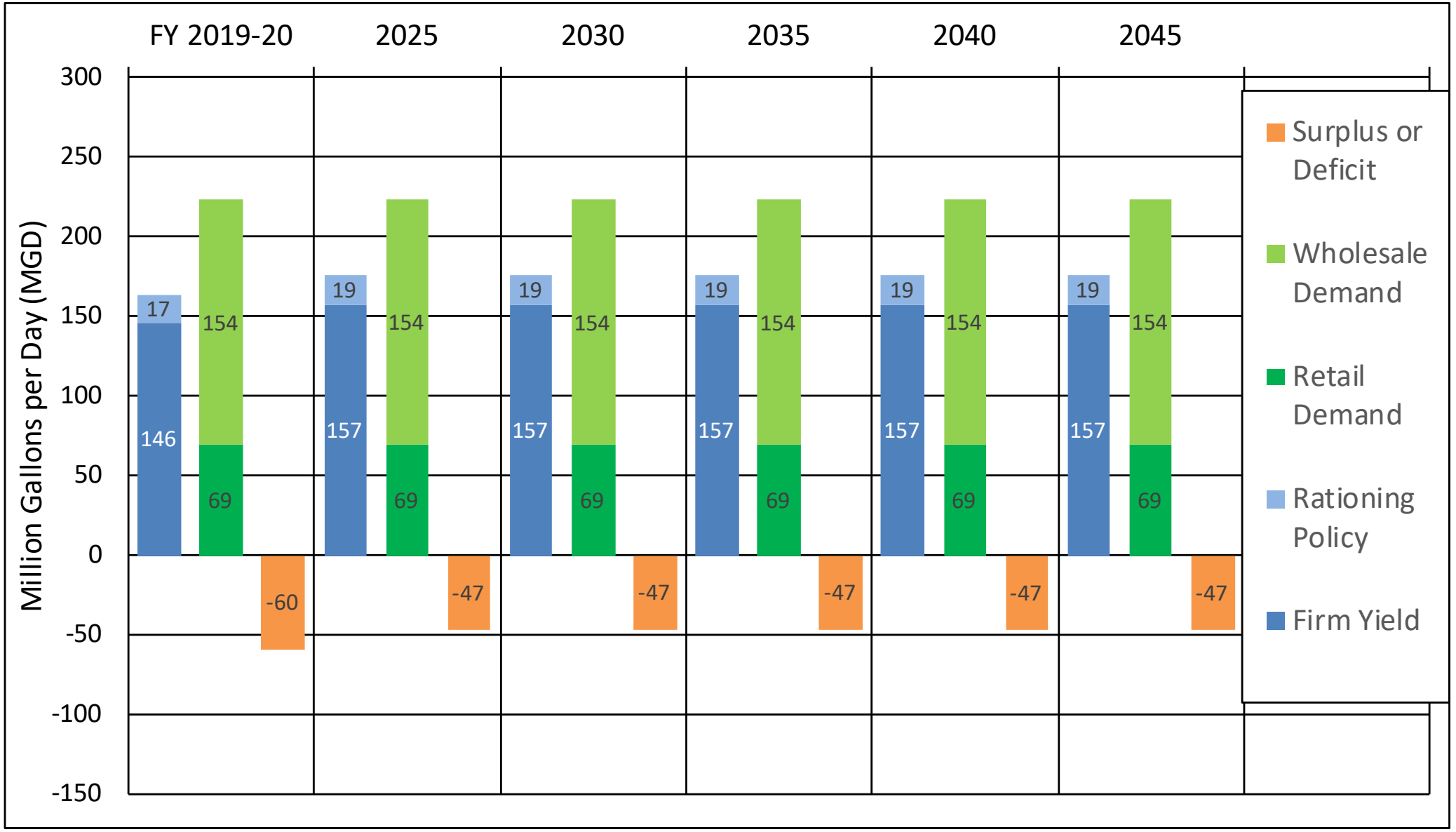
X. NGO scenario 2: Current system, 223 mgd constant demand, 7½ year design drought, Bay-Delta Plan flows

- Includes an assumed demand of 223 MGD for the SFPUC service area in all years
- Includes a total of 9 MGD for San Jose and Santa Clara
- Includes SFPUC contribution to the Bay-Delta Plan, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year. Assumes this contribution begins now.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.
- Yield values are estimated using a 7.5-year design drought and a truncated version of the adopted WSIP rationing policy

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	163	176	176	176	176	176
RWS Demand:	223	223	223	223	223	223
Lower Tuolumne Contribution:	101	101	101	101	101	101
Surplus or Deficit:	-59	-47	-47	-47	-47	-47

X. NGO scenario 2: Current system, 223 mgd constant demand, 7½ year design drought, Bay-Delta Plan flows



SCENARIO SURPLUSES OR DEFICITS						
SCENARIOS	**FY19-20**	**2025**	**2030**	**2035**	**2040**	**2045**
I. Previous Demand Estimates	15	21	17	10	3	NA
II. Current Conditions	46	44	42	37	31	21
III. Tuolumne River Voluntary Agreement	46	28	26	21	15	5
IV. Bay-Delta Plan	46	-61	-64	-69	-75	-85
V. Bay-Delta Plan with Alternative Water Supply Projects	46	-59	-58	-63	-35	-45
VI. Bay-Delta Plan with Alternative Water Supply Projects and Modified Rationing Policy	64	-48	-47	-52	-21	-31
VII. Bay-Delta Plan with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design	100	-21	-19	-24	12	2
VIII. Water Quality Certification (401) with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought	100	-103	-102	-107	-71	-80
IX. NGO scenario 1: Current system and 198 mgd constant demand and Bay-Delta Plan flows	-59	-47	-47	-47	-47	-47
X. NGO Scenario 2: Current system, 223 mgd constant demand, 7 ½ year design drought and Bay-Delta Plan	-60	-47	-47	-47	-47	-47

APPENDIX K
WATER SHORTAGE CONTINGENCY PLAN

Water Shortage Contingency Plan
2020 Update

Menlo Park Municipal Water

June 2021

TABLE OF CONTENTS

1. INTRODUCTION 4
2. WATER SUPPLY RELIABILITY ANALYSIS 6
3. PRIOR DROUGHT ACTIONS 8
4. ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES 10
5. WATER SHORTAGE LEVELS 11
6. SHORTAGE RESPONSE ACTIONS 13
6.1 Demand Reduction Methods 13
6.2 Supply Augmentation 13
6.3 Operational Changes 22
6.4 Prohibitions on End Uses 22
6.5 Defining Water Features 22
6.6 Shortage Response Action Effectiveness 22
6.7 Catastrophic Supply Interruption 28
7. SEISMIC RISK ASSESSMENT 32
8. COMMUNICATION PROTOCOLS 33
8.1 Water Shortage Declaration and Termination Procedures 33
9. COMPLIANCE AND ENFORCEMENT 35
10. LEGAL AUTHORITIES 37
11. FINANCIAL CONSEQUENCES OF WSCP 38
12. MONITORING AND REPORTING 39
13. WSCP REFINEMENT PROCEDURES 40
14. PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY 41
REFERENCES 42

TABLES

Table 5-1 Water Shortage Contingency Plan Levels (DWR Table 8-1)
Table 6-1 Demand Reduction Actions (DWR Table 8-2)
Table 6-2 Supply Augmentation and Other Actions (DWR Table 8-3)
Table 6-3 Baseline Residential Per Capita Water Demand
Table 6-4 Baseline Water Use Profile
Table 6-5 Preparation Actions for Catastrophes
Table 6-6 Activation Action in Response to Supply Interruptions
Table 9-1 Enforcement of Water Use Restrictions and Prohibitions
Table 9-2 Charges for Installation or Removal of Flow Restricting Devices

ATTACHMENTS

Attachment 1. Section 7.35 of City of Menlo Park's Municipal Code
Attachment 2. Annual Water Supply and Demand Assessment Procedures
Attachment 3. Drought Response Tool Quantitative Assessment
Attachment 4. SFPUC Emergency Preparedness Procedures
Attachment 5. Water Shortage Contingency Plan Resolutions

1. INTRODUCTION

☑ ***CWC § 10640***

(a) Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

(b) Every urban water supplier required to prepare a water shortage contingency plan shall prepare a water shortage contingency plan pursuant to Section 10632. The supplier shall likewise periodically review the water shortage contingency plan as required by paragraph (10) of subdivision (a) of Section 10632 and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

Menlo Park Municipal Water's (MPMW's) Water Shortage Contingency Plan (WSCP) is developed to serve as a flexible framework of planned response measures to mitigate future water supply shortages. This WSCP builds upon and supersedes the WSCP that was presented in the 2015 Urban Water Management Plan (UWMP).

The WSCP includes the stages of response to a water shortage caused by drought or by supply interruptions caused by infrastructure failure, regulatory mandate, or catastrophic human-caused or natural events. The primary objective of the WSCP is to ensure that MPMW has in place the necessary resources and management responses needed to protect health and human safety, minimize economic disruption, and preserve environmental and community assets during water supply shortages and interruptions. The WSCP also includes procedures to conduct an annual assessment of water supply and demand in order to determine whether water shortage conditions are likely to exist in the forthcoming year, and to proactively begin the process of implementing WSCP stages of action, as appropriate.

This WSCP has been prepared in accordance with California Water Code (CWC) § 10640 and CWC § 10632 of the UWMP Act. Text from the UWMP Act has been included in grey text boxes with italicized font at beginning of relevant sections of this WSCP. The information presented in the respective WSCP sections and the associated text and tables are collectively intended to fulfill the requirements of that sub-section of the UWMP Act.

MPMW has authority within Section 7.35 of City of Menlo Park's (City's) Municipal Code to require water rationing and conservation and to enforce penalties. Municipal Code Section 7.35 is included as Attachment 1 of this WSCP.

MPMW developed this WSCP based on the following guiding principle:

> *Eliminate water waste, prioritize the reduction of non-essential water uses, and preserve water uses that are essential to the health, safety, welfare, and economic vitality of MPMW's customers during periods of water shortage.*

Practically, this principle guides MPMW to ask for a shared contribution from all of its customers towards meeting water reduction goals during periods of water shortage. It further directs MPMW to focus its water conservation efforts on reducing discretionary water uses such as outdoor irrigation, while attempting to minimize economic and other impacts to its residential and commercial customers.

MPMW also adopted a Water Service Priority Policy by Resolution No. 6187, in compliance with requirements of Government Code Section 65589.7. The Water Service Priority Policy prioritizes water service to proposed developments that include units for lower income households.

2. WATER SUPPLY RELIABILITY ANALYSIS

☑ ***CWC § 10632 (a) (1)*** *The analysis of water supply reliability conducted pursuant to Section 10635.*

This section provides a summary of MPMW's water supply reliability analysis in Chapter 7 of MPMW's 2020 UWMP, recognizing that the WSCP is intended to be a standalone document that can be adopted and amended independently.

MPMW relies on the San Francisco Public Utilities Commission Regional Water System (SFPUC RWS) for all of its potable water supply. In accordance with the SFPUC's perpetual obligation to MPMW's Supply Assurance, MPMW has an Individual Supply Guarantee (ISG) of 4.456 million gallons per day (MGD), or 1,630 million gallons (MG) per year. MPMW also uses recycled water for non-potable uses. Recycled water is currently supply 2% of MPMW's total demand and is anticipated to supply 8% of MPMW's total demand by 2040. The recycled water supply is expected to be 100% reliable in all year types.

MPMW's supply reliability relies largely on the reliability of the SFPUC RWS. The SFPUC has committed to, among other things, meeting the retail and wholesale customers' average annual water demand during non–drought years and meeting dry-year delivery needs while limiting rationing to a maximum 20% system-wide reduction in water service during extended droughts. However, several potential constraints have been identified on the future supply availability of the SFPUC RWS. One of the key factors is the adoption of the 2018 Bay-Delta Plan Amendment. If the Bay-Delta Plan Amendment is implemented, the SFPUC is anticipated to have sufficient supplies to meet the projected water demands in normal years but would experience significant supply shortages in single dry years or multiple dry years.

Based on the current allocation methodology[1] and SFPUC dry year cutbacks, MPMW is anticipated to experience up to 422 MG (28%) supply shortfall in single dry years by 2040 and up to 652 MG (44%) supply shortfall in multiple dry years by 2040.

However, numerous uncertainties remain in the implementation of the Bay-Delta Plan Amendment and the allocation of the available supply between the wholesale customers. The resultant actual supply reliability and the frequency of supply shortfalls for MPMW cannot be known currently. MPMW has placed high priority on working with SFPUC and the Bay Area Water Supply and Conservation Agency (BAWSCA) to better refine the estimates of RWS supply reliability and may revise its UWMP accordingly. The SFPUC and BAWSCA have also been taking various actions to improve the reliability of the RWS supply,

[1] The SFPUC and the wholesale customers have negotiated and adopted a plan to allocate the RWS supply during system-wide shortages of 20% or less. To address the instances where the supply shortfalls are projected to be greater than 20%, BAWSCA has developed a revised methodology to allocate the RWS supply. This allocation method is intended to serve as the preliminary basis for the 2020 UWMP supply reliability analysis and does not in any way imply an agreement by BAWSCA member agencies as to the exact allocation methodology. Details on the SFPUC RWS supply reliability are provided by the SFPUC and the BAWSCA and are documented in Sections 7.1 through 7.3 as well as Appendix H of the 2020 UWMP.

including implementing a number of dry year water supply projects, exploring alternative water supplies, and implementing Long-Term Reliable Water Supply Strategy recommendations.

As part of the supply reliability analysis, MPMW has conducted a Drought Risk Assessment (DRA), which evaluates the effects on available water supply sources of an assumed five-year drought commencing the year after the assessment is completed (i.e., from 2021 through 2025). Prior to the assumed implementation of the Bay-Delta Plan Amendment in 2023, MPMW's supply is expected to be sufficient to meet demands during the first two consecutive dry years (i.e., 2021 and 2022). However, based on the current allocation methodology and SFPUC dry year cutbacks, MPMW is expected to experience significant shortfalls in subsequent years of the assumed drought through 2025. The largest shortfall is estimated to be 587 MG in 2025.

MPMW has developed this WSCP to address water shortage conditions resulting from any cause (e.g., droughts, impacted distribution system infrastructure, regulatory-imposed shortage restrictions, etc.). The WSCP identifies a variety of actions that MPMW will implement to reduce demands and further ensure supply reliability at various levels of water shortage.

3. PRIOR DROUGHT ACTIONS

MPMW has historically developed different strategies for reducing water demand during water shortages. MPMW's actions in response to the recent severe drought that occurred in California between 2014 and 2017 are discussed below.

On 1 April 2015, Governor Brown issued the fourth in a series of Executive Orders regarding actions necessary to address California's severe drought conditions. Executive Order B-29-15 directed the State Water Resources Control Board (SWRCB) to impose the first ever mandatory restrictions on urban water suppliers to achieve a statewide 25% reduction in potable urban water usage through February 2016. The Executive Order also requires commercial, industrial, and institutional (CII) users to implement water efficiency measures, prohibits irrigation with potable water of ornamental turf in public street medians, and prohibits irrigation with potable water outside newly constructed homes and buildings that is not delivered by drip or microspray systems, along with numerous other directives.

On 5 May 2015, the SWRCB adopted Resolution 2015-0032 that mandates minimum actions by water suppliers and their customers to conserve water supplies into 2016 and assigns a mandatory water conservation savings goal to each water supplier based on their residential gallons per capita per day (R-GPCD) water use. The Office of Administrative Law approved the regulations and modified the CWC on 18 May 2015. On 2 February 2016, the SWRCB voted to extend the emergency regulations until October 2016 with some modifications. On 9 May 2016, the Governor issued Executive Order B-37-16, which directed the SWRCB to extend the emergency regulations through the end of January 2017 as well as make certain water use restrictions permanent. On 18 May 2016, the SWRCB adopted Resolution 2016-0029 that adjusts the water conservation savings goal and replaces the February 2016 emergency regulation. The SWRCB is expected to take separate action to make some of the requirements of the regulations permanent in response to the Executive Order.

The mandatory conservation standards included in CWC § 865(c) ranged from 8% for suppliers with an R-GPCD below 65 R-GPCD, up to 36% for suppliers with an R GPCD of greater than 215 GPCD. As with previous emergency drought regulations adopted by the SWRCB in 2014, the new water conservation regulation was primarily intended to reduce outdoor urban water use. Based on the SWRCB's Regulatory Framework Tier 4 residential per capita use of 88.6 GPCD , MPMW was required to reduce water use by 16% relative to its 2013 water use.

Prior to the 2015 SWRCB Resolution, the City Council had already declared Stage 2 of the 2014 WSCP to respond to 2014 SWRCB actions. Stage 2 of the 2014 WSCP called for an up to 20% water reduction and included prohibitions that targeted water waste and discretionary outdoor uses. This stage of action remained in place to meet the 2015 SRWCB mandated reduction target.

During the June 2015 through February 2016 compliance period, the City surpassed its water use reduction target of 16% with a cumulative saving of 38% relative to its 2013 use. The reductions were largely due to high savings (up to a 50% reduction in total demand) during the summer and fall months, likely corresponding to large cutbacks in irrigation water use.

The 2014 WSCP was updated as part of the 2015 UWMP. In June 2016, the City adopted its 2015 UWMP and associated WSCP update. In April 2017, the Governor Brown ended the drought State of Emergency. On 2 May 2017, Resolution 6383 revoked the City's drought declaration and enacted Stage 1 of its 2015

WSCP, which is a no-drought stage that maintains prohibitions to prevent water waste per State regulations.

4. ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

☑ ***CWC § 10632 (a) (2)***

The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:

(A) The written decision-making process that an urban water supplier will use each year to determine its water supply reliability.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

(iii) Existing infrastructure capabilities and plausible constraints.

(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of water supply.

☑ ***CWC § 10632.1***

An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.

☑ ***CWC § 10632.2***

An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan, as identified in subdivision (a) of Section 10632, or reasonable alternative actions, provided that descriptions of the alternative actions are submitted with the annual water shortage assessment report pursuant to Section 10632.1. Nothing in this section prohibits an urban water supplier from taking actions not specified in its water shortage contingency plan, if needed, without having to formally amend its urban water management plan or water shortage contingency plan.

On an annual basis, MPMW will conduct an Annual Supply-Demand Assessment (Annual Assessment) to identify whether there is likely to be a water shortage condition in the following year. Because MPMW's sole source of potable water supply is from the SFPUC RWS, the evaluation of MPMW supplies for a particular year will be based on information provided by the SFPUC or BAWSCA. MPMW will conduct the Annual Assessment as part of a coordinated effort lead by BAWSCA. The procedure used by BAWSCA in conducting an Annual Assessment is outlined in Attachment 2 of this WSCP.

5. WATER SHORTAGE LEVELS

☑ ***CWC § 10632 (a) (3)***

(A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.

(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross-reference relating its existing categories to the six standard water shortage levels.

Consistent with the requirements of CWC § 10632(a)(3), this WSCP is based on the six water shortage levels (also referred to as "stages") shown in Table 5-1. These shortage stages are intended to address shortages caused by any condition, including catastrophic interruption of water supplies. Table 5-1 summarizes the water supply reductions and supply conditions associated with each stage of action.

Table 5-1 Water Shortage Contingency Plan Levels (DWR Table 8-1)

Shortage Level	Percent Shortage Range	Shortage Response Actions
No-Drought	N/A	• Includes water waste prohibitions effective at all times.
1	Up to 10%	• Declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use of up to 10% due to water supply shortages or an emergency. • Includes implementation of mandatory restrictions on end uses (see Table 6-1) as well as agency actions (see Table 6-2).
2	Up to 20%	• Declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use from 10% to 20% due to water supply shortages or emergency. • Includes implementation of mandatory restrictions on end uses (see Table 6-1) as well as agency actions (see Table 6-2).

Shortage Level	Percent Shortage Range	Shortage Response Actions
3	Up to 30%	• Declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use from 20% to 30% due to water supply shortages or emergency. • Includes implementation of mandatory restrictions on end uses (see Table 6-1) as well as agency actions (see Table 6-2).
4	Up to 40%	• Declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use from 30% to 40% due to water supply shortages or emergency. • Includes implementation of mandatory restrictions on end uses (see Table 6-1) as well as agency actions (see Table 6-2).
5	Up to 50%	• Declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use from 40% to 50% due to water supply shortages or emergency. • Includes implementation of mandatory restrictions on end uses and water use budgets for customers (see Table 6-1), as well as agency actions and groundwater supply augmentation (see Table 6-2).
6	>50%	• Declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use greater than 50% due to water supply shortages or emergency. • Includes implementation of mandatory restrictions on end uses and water use budgets for customers (see Table 6-1), as well as agency actions and groundwater supply augmentation (see Table 6-2).

6. SHORTAGE RESPONSE ACTIONS

☑ ***CWC § 10632 (a) (4)***

Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

☑ ***CWC § 10632 (b)***

For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

This section describes the response actions MPMW will take to deal with the shortages associated with each of the six stages enumerated in Section 5.

6.1 Demand Reduction Methods

As discussed above and shown in Table 6-1, the WSCP lists the demand reduction methods that MPMW will implement during each stage of action to reduce MPMW's water consumption and encourage reduction in water use by its customers. The monthly and cumulative annual water savings impacts associated with each restriction, prohibition and consumption reduction method were quantitatively estimated using the Drought Response Tool (DRT) for each stage of action, see Attachment 3.

A main focus of MPMW's planned demand reduction measures is to increase public outreach and keep customers informed of the water shortage emergency and actions they can take to reduce consumption. The public outreach efforts that MPMW will implement to respond to a water shortage are described in Section 8.

6.2 Supply Augmentation

As shown in Table 6-2, the City will utilize its emergency supply well(s) as supply augmentation during Stages 5 and 6. MPMW has constructed one emergency groundwater well (the Corporation Yard Well) which can produce up to 1,500 gallons per minute (gpm) of supply to the Lower Zone. An additional one or two emergency wells are being considered to achieve another 1,500 gpm of supply capacity (for a total of 3,000 gpm). Water supply from the emergency supply well(s) is currently not considered in MPMW's

planning for normal or dry year supply. The well(s) will provide augmented supply for MPMW in the event of significant water shortage due to severe drought conditions, an earthquake, or other emergency.

According to the Corporation Yard Well's Initial Study/Mitigation Negative Declaration (IS/MND) document (Infrastructure Engineering Corporation, 2016), operating the well at 900 gpm over a 30-day failure on the SFPUC RWS will supply 119 acre-feet (AF) of water. The IS/NMD has estimated that the well could provide 1,900 AF over the course of a year without a significant impact to the groundwater basin.

Table 6-2 also includes other actions that the City will take, including coordination with other agencies, implementing drought surcharge, increasing water waste patrols, etc.

Table 6-1 Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
No Drought	Other	--	1. Hoses must be equipped with a shut-off valve for washing vehicles, sidewalks, walkways, or buildings. 2. Ornamental fountains shall use only re-circulated or recycled water. 3. Potable water shall not be applied in any manner to any driveway, sidewalk, or other hard surface except when necessary to address immediate health or safety concerns. 4. Potable water shall not be used to water outdoor landscapes in a manner that causes more than incidental runoff onto non-irrigated areas, walkways, roadways, parking lots, or other hard surfaces. 5. Potable water cannot be applied to outdoor landscapes during and up to 48 hours after measurable rainfall. 6. Potable water shall not be used to irrigate ornamental turf on public street medians. 7. Hotels and motels shall provide guests an option whether to launder towels and linens daily. Hotels and motels shall prominently display notice of this option in each bathroom using clear and easily understood language. 8. Restaurants and other food service operations shall serve water to customers only upon request during a period for which the Governor has issued a proclamation of a state of emergency. 9. Broken or defective plumbing and irrigation systems must be repaired or replaced within a reasonable period. 10. Recreational water features shall be covered when not in use. 11. Single-pass cooling systems on new construction shall not be allowed. 12. Other measures as may be approved by the State Water Resources Control Board or City Council Resolution.	Yes

Table 6-1 Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
1	Other	5%	1. Continue with "no drought" restrictions and prohibitions except where superseded by more stringent requirements. 2. Newly constructed homes and buildings must irrigate with drip or microspray only. 3. Other measures as may be approved by City Council Resolution.	Yes
2	Other	15%	1. Continue with Stage 1 restrictions and prohibitions except where superseded by more stringent requirements. 2. Irrigating outdoor ornamental landscapes or turf with potable water is limited to no more than two (2) days per week on a schedule established by the Director and posted on the City's website, except for hand watering. Water customers may be granted an exception upon review and approval of a Drought Response Plan by the Public Works Director pursuant to such policies and procedures as may be established by the Public Works Director provided that such plan results in an equivalent or greater reduction in water use. 3. Hand watering must be with a continuously monitored hose fitted with an automatic shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use or monitored. 4. Other measures as may be approved by City Council Resolution.	Yes
3	Other	25%	1. Continue with Stage 2 restrictions and prohibitions except where superseded by more stringent requirements. 2. Permits for construction of new pools shall include a requirement that MPMW water shall not be used to fill new pools. 3. Vehicles may only be washed at vehicle washing facilities using recycled or recirculating water. 4. Other measures as may be approved by City Council Resolution.	Yes

Table 6-1 Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
4	Other	35%	1. Continue with Stage 3 restrictions and prohibitions except where superseded by more stringent requirements. 2. Irrigating outdoor ornamental landscapes or turf with potable water is limited to no more than one (1) day per week on a schedule established by the Director and posted on the City's website, except for hand watering. Water customers may be granted an exception upon review and approval of a Drought Response Plan by the Public Works Director pursuant to such policies and procedures as may be established by the Public Works Director provided that such plan results in an equivalent or greater reduction in water use. 3. Potable water shall not be used for construction or dust control. 4. Potable water shall not be used for commercial vehicles that provide street washing, sweeping, or cleaning. 5. Other measures as may be approved by City Council Resolution.	Yes
5	Other	45%	1. Continue with Stage 4 restrictions and prohibitions except where superseded by more stringent requirements. 2. Water use shall not exceed water budgets established for each customer. 3. Hand watering outdoor ornamental landscapes is only allowed between designated hours, as determined by the Public Works Director. 4. Turf irrigation is prohibited at all times, including artificial turf. 5. Existing irrigation systems shall not be expanded. 6. Other measures as may be approved by City Council Resolution.	Yes
6	Other	55%	1. Continue with Stage 5 restrictions and prohibitions except where superseded by more stringent requirements. 2. Hand watering outdoor ornamental landscapes is prohibited at all times. 3. Other measures as may be approved by City Council Resolution.	Yes

Table 6-1 Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
NOTES: (a) The percentages listed in this table are the cumulative savings for each shortage level with implementation of corresponding supply augmentation and other agency actions in Table 6-2. Detailed saving estimates based on end use, response action, and implementation rates can be found in Attachment 3.				

Table 6-2 Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference
1	Other	5%	1. Initiate public outreach to inform customers that there is a water shortage emergency. 2. Implement Stage 1 drought surcharge.
2	Other	15%	1. Continue with actions and measures from Stage 1. 2. Increase public outreach for added restrictions and prohibitions, and to provide information regarding fines or penalties for non-compliance. 3. Coordinate with BAWSCA, SFPUC, and other Menlo Park water agencies (California Water Service, O'Connor Cooperative Water Tract, East Palo Alto, Palo Alto Park Mutual Water Company). 4. Evaluate if participation in BAWSCA's subscription water conservation programs can be increased. 5. Train City staff and billing contractor customer service representatives how to respond to customer calls, reports and complaints. 6. Evaluate options to capture water during routine flushing of water mains. 7. Implement Stage 2 drought surcharge.
3	Other	25%	1. Continue with actions and measures from Stage 2. 2. Increase public outreach for added restrictions and prohibitions, and to provide information how to report water waste to the City. 3. Increase public outreach to the top 10% water users in each customer category. 4. Coordinate with Police code enforcement to investigate water waste reports. 5. Request cooperation from Menlo Park Fire District to reduce fire training water use. 6. Implement Stage 3 drought surcharge.

Table 6-2 Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference
4	Other	35%	1. Continue with actions and measures from Stage 3. 2. Increase public outreach for added restrictions and prohibitions. 3. Increase public outreach to the top 20% water users in each customer category. 4. Evaluate staff resources. May include hiring temporary staff or training additional City staff to assist with customer service and enforcement. 5. Reevaluate routine flushing of water mains except when necessary to address immediate health or safety concerns. 6. Consider increasing fines for multiple violations. 7. Implement Stage 4 drought surcharge.
5	Other	45%	1. Continue with actions and measures from Stage 4. 2. Increase public outreach for added restrictions and prohibitions. 3. Increase public outreach to the top 30% water users in each customer category. 4. Implement water waste patrols and increase enforcement. 5. Halt installations of new potable water meters (temporary or permanent) or meter upgrades except if a valid, unexpired building permit has been issued for the project; or the project is necessary to protect the public's health, safety, and welfare. 6. Halt issuing statements of immediate ability to serve or provide potable water service. 7. Consider increasing fines for multiple violations. 8. Develop water budgets for all accounts. 9. Use emergency groundwater well(s). 10. Implement Stage 5 drought surcharge.

Table 6-2 Supply Augmentation and Other Actions (DWR Table 8-3)

Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap? (a)	Additional Explanation or Reference
6	Other	55%	1. Continue with actions and measures from Stage 5. 2. Increase public outreach for added restrictions and prohibitions. 3. Increase public outreach to the top 40% water users in each customer category. 4. Halt installations of new potable water meters (temporary or permanent) even if a valid, unexpired building permit has been issued for the project. 5. Consider increasing fines for multiple violations. 6. Increase water budget reduction requirements. 7. Implement other short-term emergency actions from the Emergency Response Plan. 8. Implement Stage 6 drought surcharge.
NOTES: (a) The percentages listed in this table are the cumulative savings for each shortage level with implementation of corresponding demand reduction actions in Table 6-1. Detailed saving estimates based on end use, response action, and implementation rates can be found in Attachment 3.			

6.3 Operational Changes

The WSCP lists the operational changes that MPMW will implement during each stage of action including measures to: (1) reduce system losses through a reduction in line flushing and fire training exercises, (2) increase enforcement and patrols, (3) develop water budgets, and in certain conditions, (4) implement a moratorium on new services.

6.4 Prohibitions on End Uses

MPMW has the authority to restrict or prohibit specific water use practices during water shortages (Municipal Code Section 7.35). Restrictions and prohibitions associated with each stage of action are presented in Table 6-1. As discussed above, these responses focus on the reduction of non-essential water uses such as ornamental landscape irrigation, and preserve water uses that are essential to the health, safety, welfare, and economic vitality of MPMW's customers.

In addition, several mandatory prohibitions are enforced at all times as part of the Non-Drought Stage to eliminate water waste, which include each of the prohibitions on end uses that are anticipated to be mandated by the SWRCB in response to Executive Order B-37-16. Prohibitions in subsequent stages go beyond the SWRCB requirements and become increasingly restrictive.

6.5 Defining Water Features

☑ ***CWC § 10632 (b)***

For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

As required by CWC § 10632, MPMW distinguishes between "decorative water features" such as ponds, lakes, and fountains that are artificially supplied with water and "recreational water features" such as swimming pools and spas. Prohibitions on water use for decorative water features are listed separately from those for recreational water features (see Table 6-1).

6.6 Shortage Response Action Effectiveness

In order to evaluate and ensure that effective actions will be implemented with the proper level of intensity, MPMW employed the DRT, an Excel spreadsheet model developed by EKI Environment and Water, Inc. The DRT model calculates monthly savings anticipated by implementing each stage of action as detailed below.

6.6.1 Baseline Water Use Profile

Using the DRT, MPMW developed a baseline water use profile that reflected usage patterns within MPMW's service area by major water use sector during 2019 and was used to guide development of the WSCP. Key findings from this analysis are presented below.

Residential Per Capita Demand

As shown in Table 6-3 and associated chart, MPMW's baseline R-GPCD demand in 2019 was approximately 62 R-GPCD. This R-GPCD is close to the BAWSCA-wide average of 61 R-GPCD but is significantly less than the statewide average of 85 R-GPCD.

Estimated Proportion of Outdoor Water Use

As shown in Table 6-4 and the associated charts, outdoor water use, which can generally be considered as a "discretionary water use", was estimated to be approximately 46% of MPMW's total consumption during this baseline time period (2019). Notably, dedicated irrigation meters accounted for approximately 26% of the total estimated irrigation demand, indicating that approximately 74% of outdoor water use is not metered with a separate meter, and is therefore more difficult to track and directly target.

The DRT estimates indoor water use to be equivalent to the lowest monthly water use for each sector, accounting for the number of days in each month. Outdoor water use for each sector was estimated to be the difference between the total water use and the estimated indoor water use. If MPMW customers tend to irrigate more heavily during winter months, an underestimation of the proportion of outdoor water use would occur.

The proportion of outdoor water use within residential and commercial sectors is estimated to be 41%. This indicates that there is the potential to achieve significant water savings across these sectors (e.g., up to WSCP Stage 4), simply by focusing on outdoor uses. If the proportion of outdoor water use is being underestimated by the DRT method, then even more substantial savings may be achieved through targeting outdoor water use. As further shown in Table 6-4 and the associated charts, the seasonal variation in baseline water use reflects increased irrigation demands during the summer and fall months. Therefore, the greatest potential for reductions in non-essential water use is expected during these months.

Table 6-3 Baseline Residential Per Capita Water Demand

	Baseline Residential Per Capita Water Demand (R-GPCD)
MPMW (a)	62
BAWSCA Agencies (b)	61
Statewide Average (c)	85

NOTES:
(a) MPMW R-GPCD calculated using 2019 metering data.
(b) Average BAWSCA R-GPCD calculated from data provided in BAWSCA Annual Survey FY 2018-19 (BAWSCA, 2020).
(c) State-wide R-GPCD for 2019 obtained from data provided at California State Water Resources Control Board Water Conservation Portal - Conservation Reporting, http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/conservation_reporting.shtml, accessed March 2021.

Chart 6-3 Baseline Residential Per Capita Water Demand

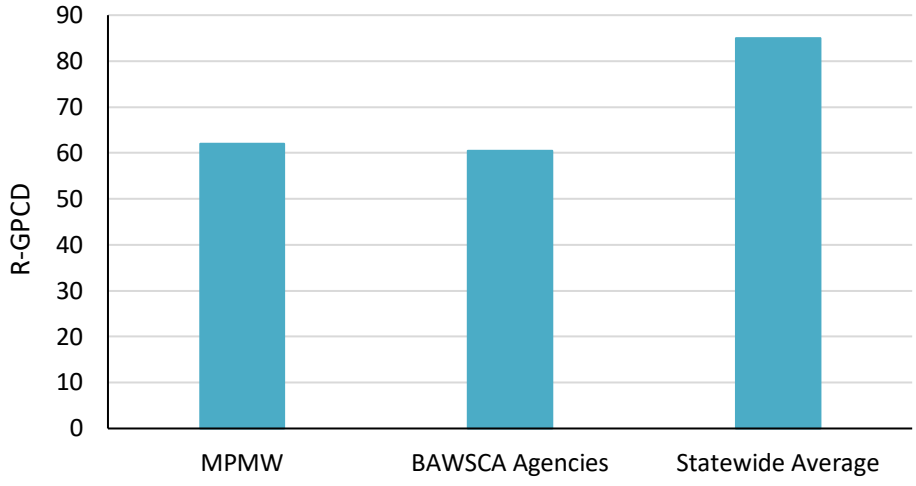


Table 6-4 Baseline Water Use Profile

Sector	End-Use	Baseline (2019) Water Use													Annual % of Total by Sector
		January	February	March	April	May	June	July	August	September	October	November	December	Annual	
Residential	Indoor	21	19	21	20	21	20	21	21	20	21	20	21	242	59%
	Outdoor	1	0	1	9	17	22	26	25	22	25	13	4	165	41%
	Subtotal Residential	*21*	*19*	*22*	*28*	*37*	*42*	*47*	*46*	*42*	*45*	*33*	*25*	*406*	-
CII	Indoor	23	21	23	22	23	22	23	23	22	23	22	23	268	59%
	Outdoor	0	0	5	15	17	22	31	30	26	27	11	2	186	41%
	Subtotal CII	*23*	*21*	*28*	*37*	*40*	*44*	*53*	*52*	*48*	*50*	*33*	*24*	*454*	-
Dedicated Irrigation	Outdoor	2	1	2	8	13	17	20	19	15	13	8	3	122	100%
Non-Revenue	Non-Revenue	6	6	3	-1	4	14	4	6	6	-3	6	0	50	100%
Total	Indoor	43	39	43	42	43	42	43	43	42	43	42	43	510	49%
	Outdoor	3	1	8	31	47	61	77	74	64	65	32	9	473	46%
	Non-Revenue	6	6	3	-1	4	14	4	6	6	-3	6	0	50	4.9%
	Total	**52**	**47**	**55**	**72**	**95**	**117**	**125**	**123**	**111**	**106**	**80**	**52**	**1,033**	-

NOTES:
(a) Volumes are in units of MG.
(b) Baseline water use from MPMW's monthly metering data for each sector.
(c) Indoor water use was estimated to be the lowest monthly water use for each sector, accounting for the number of days in each month. Outdoor water use for each sector was estimated to be the difference between the total water use and the estimated indoor water use.

Chart 6-4A Baseline Year Annual Water Use by Sector and End Use

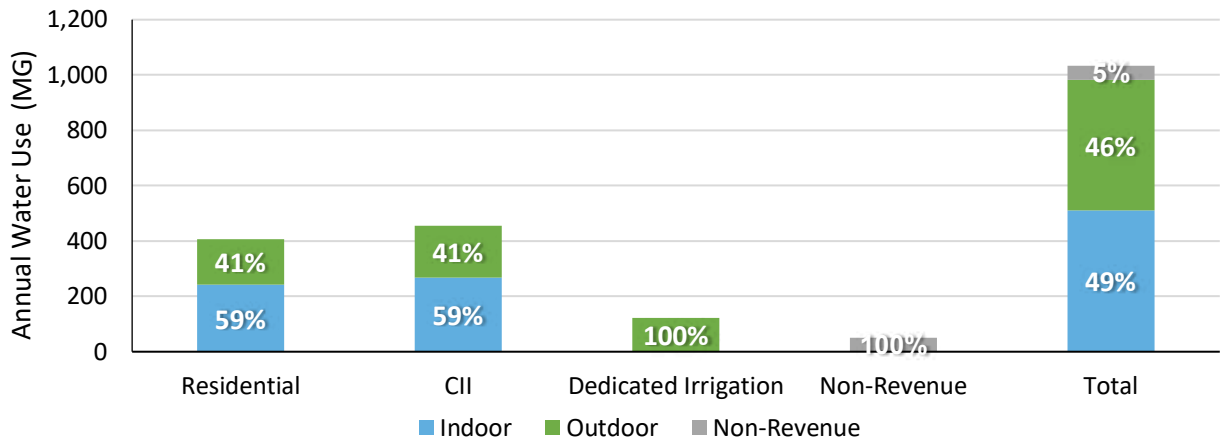
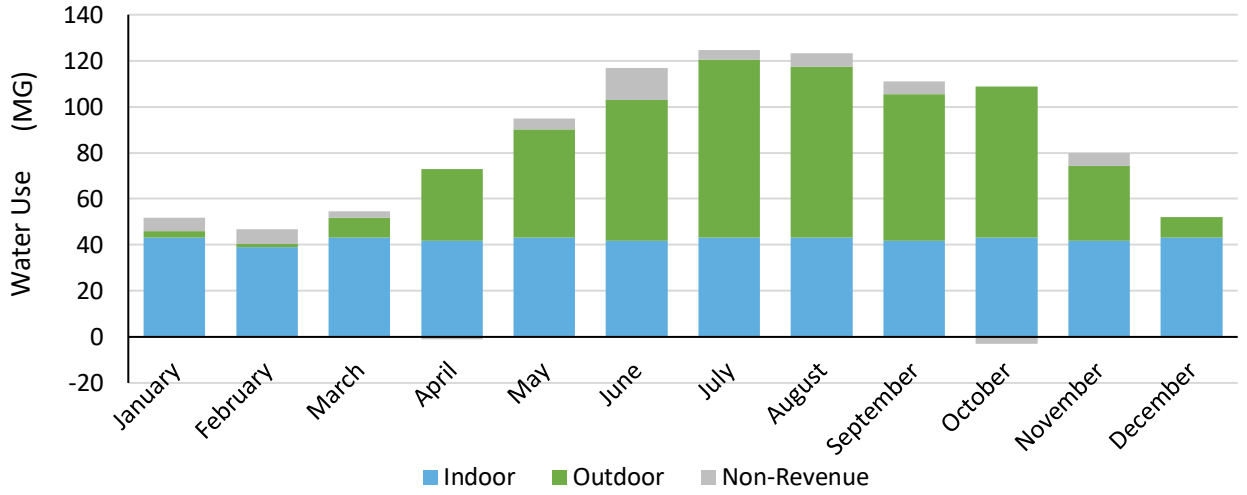


Chart 6-4B Baseline Year Monthly Indoor vs. Outdoor Water Use



6.6.2 Shortage Response Action Effectiveness

The DRT provides a quantitative framework that allows MPMW to systematically estimate the monthly and cumulative annual demand reductions expected to result from particular combinations of drought response actions and associated implementation rates. Data inputs to the DRT include total production, class-specific water use, population, and assumptions regarding the split between indoor and outdoor water use for each customer class.

For each drought response action, the user specifies:

- The customer class(es) and end use(s) that are affected;
- The percent savings for that end use for each account that implements the action. These are based on evaluations reported in the literature, or where such studies are not available, on best estimates based on MPMW's experience; and
- The percentage of accounts assumed to implement the action, which is presumed to be the result of the intensity level of MPMW's program implementation, including but not limited to, marketing and enforcement activities.

An additional critical DRT user input is a set of constraints on demand reductions to ensure that usage levels do not endanger health and safety or result in unacceptable economic impacts. The DRT will not permit estimated usage reductions to violate these constraints, regardless of the demand reduction actions selected. The constraints are:

- A minimum residential indoor per capita daily usage of 25 gallons,
- A maximum residential outdoor usage reduction of 100%,
- A maximum CII indoor usage reduction of 30%, and
- A maximum CII outdoor usage reduction of 100%.

Based on the foregoing data, the DRT model calculates the resulting monthly savings. MPMW adjusted the combination of actions and implementation levels to achieve the targeted savings levels at each of the six stages of action.

For each of the stages of action, the modeling targeted the mid-range of the required demand reduction range, ergo:

- 5% for Stage 1,
- 15% for Stage 2,
- 25% for Stage 3,
- 35% for Stage 4,
- 45% for Stage 5, and
- 55% for Stage 6.

MPMW's shortage response actions are summarized in Table 6-1 and Table 6-2. Key DRT inputs and outputs for each of the stages of action are reproduced in Attachment 3, including the water shortage reduction actions, savings assumptions, and implementation rates that are required for MPMW to achieve the required annual demand reductions for each of the six stages of action. At each stage, there are two types of demand-reduction actions identified:

- Restrictions on customer water usage; and
- Consumption reduction actions by MPMW to encourage decreased water usage.

Many actions are implemented across a number of stages, some at increasing implementation levels. Therefore the actions in Table 6-1 and Table 6-2 are listed as a row under the first stage at which they are implemented. The percentages shown in the tables represent savings of the end uses.

6.7 Catastrophic Supply Interruption

Catastrophic supply interruptions may be caused by a regional power outage, an earthquake, or other disaster. MPMW benefits from two levels of emergency planning: planning by SFPUC and its own emergency planning work. In the event of a catastrophic supply interruption, the response procedures that MPMW would follow are described in:

- SFPUC Emergency Operations Plan (EOP);
- San Mateo County's Operational Area EOP Potable Water Procurement and Distribution Annex;
- City of Menlo Park's EOP; and
- MPMW's Emergency Response Plan (ERP).

Actions described in the SFPUC EOP focus on maintaining flow within, and from, the SFPUC RWS pipelines. SFPUC's emergency preparedness procedures are described in detail in Attachment 4. City of Menlo Park's EOP was written in coordination with the County of San Mateo's Operational Area EOP Potable Water Procurement and Distribution Annex (County of San Mateo, 2004). Together, these EOPs provide the framework for responding to major emergencies or disasters associated with natural disasters, technological incidents, and national security/terrorism emergencies. Sections of these EOPs outline specific strategies to prepare for, mitigate, respond to, and recover from an emergency or disaster that affects the water utilities that serve the population within San Mateo County and the City, in particular.

MPMW's emergency planning efforts particular to its water distribution system are summarized below.

6.7.1 MPMW Emergency Response Plan

In accordance with the Emergency Services Act, MPMW has developed an ERP. This ERP guides response to unpredicted catastrophic events that might impact water delivery including regional power outages, earthquakes or other disasters. The ERP outlines standard operating procedures for all levels of emergency, from minor accidents to major disasters. Table 6-5 summarizes actions included in the ERP for specific catastrophic effects. MPMW's most recent ERP is dated 2016 and is being updated as required per Section 2013 of America's Water Infrastructure Act of 2018.

A water supply interruption may result in a partial or full interruption potable supply for MPMW and adjacent water suppliers. Therefore, the City plans for four levels of action triggers that depends on the severity and duration of a supply interruption. Table 6-6 summarizes MPMW's actions under each water supply action trigger.

In the seismic evaluation for MPMW, there was a recommendation to install saltwater standpipes at regular intervals, along its San Francisco Bay Frontage, to allow for additional firefighting capacity. MPMW

has not pursued the recommendation at this time, because the Menlo Park Fire District has not identified this area as in need of additional fire protection. MPMW will re-evaluate this recommendation if substantial land use changes are proposed for this area.

Additionally, as discussed in Sections 6.2 and 6.7 of the 2020 UWMP, MPMW has constructed one emergency groundwater well (the Corporation Yard Well) which can produce up to 1,500 gpm of emergency/backup supply to the Lower Zone. Reservoir storage and an additional one or two emergency wells are being considered to achieve additional storage and another 1,500 gpm of supply capacity (for a total of 3,000 gpm). As the emergency storage and groundwater well(s) comes on-line, MPMW will add important redundancy and flexibility to its system and will have additional ability to manage catastrophic short-term interruptions in service.

Table 6-5 Preparation Actions for Catastrophes[2]

Possible Catastrophe	Summary of Actions
Earthquake	• Shut-off isolation valves and use of spare piping for ruptured mains • Storage supplies for service interruption • Portable and emergency generators available for facilities • Procedures for assessing water quality, notifying public, and disinfecting system
Flooding	• Portable and emergency generators available for facilities • Storage supplies for service interruption • Procedures for assessing water quality, notifying public, and disinfecting system
Toxic Spills (interrupts Agency Supply)	• Use of local groundwater • Procedures for assessing water quality, notifying public and disinfecting system
Fire	• Storage supplies for fire flows • Mutual aid plans and responders identified • Portable and emergency generators available for facilities
Power outage or grid failure	• Portable and emergency generators available for facilities
Severe Winter Storms	• Portable and emergency generators available for facilities
Hot Weather	• Portable and emergency generators available for facilities

[2] With completion of MPMW's Corporation Yard Well, MPMW may use groundwater supplies from the Corporation Yard Well depending on the impact to water supplies.

Table 6-6 Activation Action in Response to Supply Interruptions

Response Category	Sample Activation Triggers	Potential Activation Actions[⊙]
Level 0	• Changes in SFPUC wholesale water blends due to seasonal changes or plant maintenance • No loss in water supply	• None
Level 1	• Possible partial or full shutdown of SFPUC water supply source • Potential turnout threat	• Fill reservoirs and standby • Activate security monitoring of critical facilities (see ***Appendix 1***) • Mandatory rationing • Contact bottled water companies • Open water distribution points on reservoirs • Request assistance through WARN agreement
Level 2	• Complete loss of SFPUC supply (lasting < 24 hours*)	• Notify customers • Operate reservoirs • Close turnout(s) • Turn on pump stations • Open 4 key isolation valves • Mandatory rationing • Contact bottled water companies • Open water distribution points on reservoirs • Request assistance through WARN agreement
Level 3 (possible EOC activation)	• Complete loss of SFPUC supply (lasting > 24 hours*)	• Notify customers • Turn on wells • Open interties • Open remaining isolation valves • Mandatory rationing • Contact bottled water companies • Open water distribution points on reservoirs • Request assistance through WARN agreement

✶ The 24-hour period is an estimate only. The actual time period shall be the length of time that the City can supply reservoir water.

7. SEISMIC RISK ASSESSMENT

☑ ***CWC § 10632.5***

(a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

Ballantyne Consulting completed a Seismic Vulnerability Assessment for MPMW's water distribution system in July 2017. The report was incorporated into the MPMW 2018 Water Master Plan.[3]

In addition, as part of MPMW's Sand Hill Reservoir #2 Roof Replacement Project, Beyaz & Patel, Inc. (2019) performed a structural and seismic evaluation of Reservoir #2 and developed structural and seismic design criteria for the project. Construction of the Reservoir #2 Roof Replacement project is anticipated to start in fall 2021 and be completed by fall 2022.

[3] MPMW's 2018 Water Master Plan can be accessed at https://www.menlopark.org/watersystemmasterplan.

8. COMMUNICATION PROTOCOLS

☑ ***CWC § 10632 (a) (5)***

Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications.

Each stage of the WSCP is implemented with a formal declaration by the City Council upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use due to a water supply shortage or emergency. Procedures for water shortage declaration and termination are detailed below in Section 8.1.

Even before formal declaration of a water shortage, a public information program will be activated to provide customers with as much advance notice as possible. Following declaration of a shortage, MPMW's customers would need to be provided notice of water shortage rules and regulations via a variety of media and communications methods.

Coordination between MPMW and with other public agencies can begin prior to formal declaration of a water shortage and can be accomplished through regular meetings, e-mail group updates, and presentations. In a regional water shortage scenario, MPMW would use the public outreach resources and materials provided by BAWSCA and/or the SFPUC. In addition to these materials, MPMW may develop its own materials to communicate with customers, such as a dedicated customer service hotline, and expand its normal public outreach to support its water conservation efforts (see Chapter 9 of the 2020 UWMP). Communication and public outreach actions to be taken by MPMW under each shortage level are detailed in Table 6-2.

As discussed in Chapter 9 of the 2020 UWMP, the City has several staff members that jointly share the responsibility for water conservation. Staff time dedicated to water conservation and enforcement action will increase with the severity of a supply shortage. Additional duties may be assigned to current employees or hiring of temporary staff may be considered to meet staffing needs during extreme water shortages.

8.1 Water Shortage Declaration and Termination Procedures

The provisions of each water shortage stage of action are triggered upon the City Council's determination that a Governing Authority has required MPMW to achieve a voluntary or mandatory reduction in water use because of water shortage conditions.

The stage of action will become effective after the City Council declares a particular stage of action and MPMW has notified its customers of this determination. Once effective, the provisions of a water shortage stage of action will stay in effect until: (1) the City Council declares a different stage of

action; or (2) the City Council determines that the water shortfall condition no longer exists and MPMW has notified its customers of this determination.

After the termination of the water shortage conditions, MPMW will oversee any remaining termination and WSCP review activities. These activities could include:

- Publicize gratitude for the community's cooperation.
- Restore water utility operations, organization, and services to pre-event levels.
- Document the event and response and compile applicable records for future reference.
- Collect cost accounting information, assess revenue losses and financial impact, and review deferred projects or programs.
- Debrief staff to review effectiveness of actions, to identify the lessons learned, and to enhance response and recovery efforts in the future.
- Update the WSCP, as needed.

9. COMPLIANCE AND ENFORCEMENT

☑ ***CWC § 10632 (a) (6)*** *For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.*

Enforcement of MPMW's water use restrictions and prohibitions focuses on soliciting cooperation from water customers who are unaware of the restrictions or have failed to comply with the provisions of the City's Water Conservation Ordinance (City Municipal Code Title 7, Chapter 7.35) and this WSCP. If discussions with the customer are unsuccessful in obtaining compliance, MPMW is authorized to issue penalties to customers that violate the restrictions and prohibitions. The City's current compliance and enforcement procedures are adopted in City Resolution No. 6383.

Table 9-1 describes the penalties, charges, and other enforcement actions that MPMW is authorized to take after each violation of the WSCP. The City takes progressively increasing actions associated with more egregious levels of violations. Actions range from a warning after the first violation, up to a $500 fine and discontinuance of water service after the sixth violation. As shown in Table 9-2, customers will incur additional charges for installation and removal of flow restricting devices and disconnection and reconnection of service if MPMW deems these actions necessary. Customers may contest a fine by submitting a written appeal to the Public Works Director within thirty (30) days of the fine.

Additionally, as shown in Table 6-2, MPMW will facilitate compliance with the WSCP by employing increasing levels of customer service, public outreach, and water-waste patrols with increasing shortage levels.

The City employees and members of the public may report water waste complaints through the City's website at www.menlopark.org/waterwaste. Staff is available to provide information and respond to complaints. Staff may also seek assistance from other City Departments in responding to complaints and enforcing water use restrictions.

Table 9-1 Enforcement of Water Use Restrictions and Prohibitions

Violation	Enforcement Action or Penalty
1st	Warning Only. Educate customer on proper water conservation practices
2nd	$50 fine
3rd	$100 fine
4th	$200 fine and review by the Public Works Director (or his or her designee) to determine if a flow restricting device should be installed
5th	$500 fine, and review by the Public Works Director (or his or her designee) to determine if water service should be discontinued
6th	$500 fine and water service shall be discontinued

References:

(1) City of Menlo Park, Resolution No. 6383, Resolution of the City Council of the City of Menlo Park Adopting a Water Conservation Plan, 2 May 2017.

Table 9-2 Charges for Installation or Removal of Flow Restricting Devices and Disconnection or Reconnection of Service

Meter Size	Installation Cost	Removal Cost
Charges for Installation or Removal of Flow Restricting Devices		
5/8" to 2"	$155.00	$155.00
3" or larger	Actual Cost	Actual Cost
Charges for Disconnecting and Reconnecting Service		
All sizes	$155.00	$155.00

References:

(1) City of Menlo Park, Resolution No. 6383, Resolution of the City Council of the City of Menlo Park Adopting a Water Conservation Plan, 2 May 2017.

10. LEGAL AUTHORITIES

☑ ***CWC § 10632 (a) (7)***

(A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

☑ ***CWC § 10632.3***

It is the intent of the Legislature that, upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the board defer to implementation of locally adopted water shortage contingency plans to the extent practicable.

As discussed above, MPMW has authority within Section 7.35 of the City's Municipal Code to require water rationing and conservation and to enforce penalties. Municipal Code Section 7.35 is included as Attachment 1 of this WSCP. The City's current WSCP stage and water waste prohibitions in effect were adopted in 2017 in Resolution 6383. An adopted water shortage contingency resolution corresponding to this 2021 WSCP update is included as Attachment 5.

MPMW shall declare a water shortage emergency in accordance with Water Code Chapter 3 (commencing with Section 350) of Division 1. MPMW shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency. A list of contacts for other water suppliers within the City of Menlo Park, and the County of San Mateo is provided below:

California Water Service, Bear Gulch District	(650) 561-9709
O'Connor Tract Co-operative Water	(650) 321-2723
Palo Alto Park Mutual Water Company	(650) 322-6903
San Mateo County Environmental Health	(650) 372-6200

MPMW is a member of BAWSCA and anticipates coordinating with other Member Agencies via BAWSCA during a water shortage or emergency on the SFPUC RWS.

11. FINANCIAL CONSEQUENCES OF WSCP

☑ ***CWC § 10632 (a) (8)***

A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

In the event of a drought, if MPMW anticipates significant loss in revenue due to decreased consumption, MPMW may increase its water rates so that customers are charged for the actual cost of providing water during a shortage. These rates will be specified in MPMW's water rate schedule, as approved by the City Council and in accordance with Proposition 218 requirements.

Black & Veatch Management Consulting prepared a Water Rate Study for MPMW in March 2021 (Black & Veatch Management Consulting, 2021). The study includes an analysis of projected revenue and expenditure impacts resulting from implementation of the 2020 WSCP during periods of water shortage. To promote financial stability during water supply shortages, the 2021 Water Rate Study includes drought surcharge rates designed to compensate for lost revenue due to decreased volumetric water sales and additional expenses related to implementation of the WSCP. The City approved the five-year water rates including the drought surcharge rates on May 11, 2021. The drought surcharge rates are levied on all usage temporarily until MPMW determines that water supply conditions have returned to normal and drought-related expenditures and lost revenue have been recovered[4].

As shown in Table 6-2, the City will enforce a drought surcharge rate in each water shortage level. The City's drought surcharge rate prohibits excessive water use pursuant to CWC §365 et seq. The cost of compliance with CWC §365 et seq. has been considered in the development of the drought rate schedule in the 2021 Water Rate Study.

In addition, MPMW manages an emergency reserve fund to address the potential financial impacts of a severe drought. The City may also defer expense on capital improvement projects during a severe drought.

[4] Current City of Menlo Park five-year water rate structure including drought surcharge rate located online at https://www.menlopark.org/waterrates.

12. MONITORING AND REPORTING

☑ ***CWC § 10632 (a) (9)*** *For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.*

MPMW monitors water use through analysis of wholesale water purchases and customer meter readings. MPMW reads meters installed on each of its supply turnouts to monitor wholesale water purchases, and SFPUC's AMI Eye On Water portal provides real-time turnout meter reads. In addition, each customer account is metered. Some non-residential and multi-family customers also have separate irrigation meters to monitor water use for landscape irrigation separately from indoor uses. The City's Water Efficient Landscaping Ordinance (February 2016) requires non-residential projects to install a separate irrigation meter if landscaped areas meet specific size thresholds.

MPMW contracts to have all meters read on a monthly basis. During a supply shortage, MPMW will continue to monitor water use on this schedule to determine the effectiveness of the customer response to the implementation of this WSCP. Monthly water meter readings also allow MPMW to document atypically high water use and notify individual customers to resolve the cause of the high water use.

In addition, MPMW is planning to install advanced metering infrastructure (AMI) over the next two fiscal years. Implementation of AMI will allow MPMW to automate meter reading and provide real-time water use data to MPMW staff and customers that can be used to aggressively target leaks and atypically high water use during normal years and periods of water shortage.

Pursuant to California Code of Regulations (CCR) Title 23 §991, MPMW reports monthly water use and production to the SWRCB[5]. Effective October 1, 2020, during a governor declared drought emergency or when an urban water supplier invokes a water shortage level to respond to a drought greater than 10%, each supplier is required to submit an expanded report that contains the supplier's actions and statistics in achieving planning reductions.

[5] Water supplier monthly reports can be accessed at https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/conservation_reporting.html

13. WSCP REFINEMENT PROCEDURES

☑ ***CWC § 10632 (a) (10)*** *Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.*

The WSCP is implemented as an adaptive management plan. MPMW will evaluate the need to revise its WSCP every year after performing its Annual Assessment. The evaluation will consider effectiveness of WSCP actions and any anticipated water supply shortages assessed by the Annual Assessment. If the WSCP is revised, the City Council will adopt a new resolution adopting the revised WSCP, and if necessary, declare a water shortage level to implement.

14. PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY

☑ ***CWC § 10632 (c)*** *The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.*

MPMW informed the public and the appropriate agencies of: (1) its intent to prepare a WSCP, (2) where the WSCP was available for public review, and (3) when the public hearing regarding the WSCP would be held. All notifications were completed in compliance with the stipulations of Section 6066 of the Government Code.

A copy of the adopted 2020 WSCP including any amendments will be provided to the Department of Water Resources (DWR), the California State Library, San Mateo County, and SFPUC within 30 days of the adoption. An electronic copy of the adopted 2020 WSCP will be submitted to the DWR using the DWR online submittal tool.

A copy of the adopted 2020 WSCP will be available for public review in the City Hall during normal business hours and on MPMW website within 30 days after filing the plan with DWR.

REFERENCES

BAWSCA, 2020. *Bay Area Water Supply and Conservation Agency Annual Survey FY 2018-19*, March 2020.

Beyaz & Patel, Inc., 2019. *Preliminary Design Report for Sand Hill Reservoir #2 Roof Replacement Project*, April 2019.

Black & Veatch Management Consulting, 2021. *City of Menlo Park Water Rate Study 2021*, March 2021.

County of San Mateo, 2004. *San Mateo County/Operational Area Emergency Operations Plan, Potable Water Procurement and Distribution Annex, 3rd Edition*, July 2004.

Infrastructure Engineering Corporation, 2016. *Corporation Yard Emergency Back-Up Water Supply Well No. 1 Initial Study/Mitigated Negative Declaration*, April 2016.

ATTACHMENT 1
SECTION 7.35 OF CITY OF MENLO PARK'S MUNICIPAL CODE

Chapter 7.35
WATER CONSERVATION

Sections:

7.35.010 Purpose.

7.35.020 Water conservation.

7.35.030 Penalty.

7.35.010 Purpose.

The purpose of this chapter is to promote water conservation and provide the city with the flexibility to respond to a drought emergency whether it be emergency regulations adopted by the State Water Board, or drought-related actions imposed by the San Francisco public utilities commission. (Ord. 1011 § 4 (part), 2014: Ord. 1010 § 4 (part), 2014).

7.35.020 Water conservation.

Upon the adoption of emergency water conservation regulations by the State Water Board and within the timelines prescribed by the State Water Board, or drought-related actions imposed by the San Francisco public utilities commission, the city council of the city of Menlo Park shall adopt by resolution a water conservation plan that mandates those water conservation measures. (Ord. 1011 § 4 (part), 2014: Ord. 1010 § 4 (part), 2014).

7.35.030 Penalty.

Any violations of the water conservation plan shall be an infraction or enforced as provided in the resolution adopted pursuant to Section 7.35.020. (Ord. 1011 § 4 (part), 2014: Ord. 1010 § 4 (part), 2014).

The Menlo Park Municipal Code is current through Ordinance 1074, passed January 12, 2021.

Disclaimer: The city clerk's office has the official version of the Menlo Park Municipal Code. Users should contact the city clerk's office for ordinances passed subsequent to the ordinance cited above.

City Website: https://www.menlopark.org/
City Telephone: (650) 330-6620

Code Publishing Company

ATTACHMENT 2
ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

Each year the SFPUC evaluates the amount of total water storage expected to occur throughout the RWS and compares it to expected demands. This annual Water Supply and Demand Assessment (WSDA) is described in the subsections below, which are organized by the sequential steps the SFPUC takes to conduct the assessment each year and reference the relevant California Water Code requirements for a WSDA.[1]

The SFPUC's annual WSDA is a robust planning system that considers a range of input factors unique to the SFPUC's water supplies and system configuration while also providing the flexibility to consider new factors. Traditional surface water supplies from the SFPUC's up country, East Bay, and Peninsula reservoirs are the backbone of the water supply, but the SFPUC extends and protects those supplies in many additional ways by: (1) partnering with the community to help save water through robust conservation programs; (2) minimizing the need for additional water to serve new developments through an onsite water reuse program; (3) recycling wastewater resources to deliver water for large non-potable uses; (4) utilizing local groundwater supplies to supplement surface water supplies; (5) investigating new, alternative water supply options such as purified water and desalination; and (6) investing in innovations that allow for creative solutions to meet diverse needs. These efforts help the SFPUC conserve water and diversify supplies to reduce likelihood of a water shortage condition.

1.1 DEMAND ASSESSMENT [WATER CODE SECTION 10632(A)(2)(B)(I)]

To calculate unconstrained customer demand for the purpose of an annual WSDA, the SFPUC collects information on both the retail and wholesale system demands. Retail customer demand is estimated based on the best available information to date, and typically includes the previous year's demands as well as consideration of current demand use patterns or other conditions impacting demands, such as weather and growth. Each year, in February, the SFPUC receives from BAWSCA a report of estimated Wholesale Customer demand for the upcoming year. BAWSCA typically estimates unconstrained demands for the Wholesale Customers by using total water purchased by those customers in the prior year along with other relevant information. Relatively small demands from the two additional wholesale customers not part of the WSA are estimated based on the best available information to date, and typically includes the previous year's demands as well as consideration of current demand use patterns or other conditions impacting demands, such as weather and growth.

1.2 SUPPLY ASSESSMENT [WATER CODE SECTIONS 10632(A)(2)(B)(II) AND 10632(A)(2)(B)(V)]

The RWS collects water from the Tuolumne River watershed in the Sierra Nevada and from local reservoirs in the Alameda and Peninsula watersheds. The RWS draws an average of 85 percent of its supply from the Tuolumne River watershed. This water feeds into an aqueduct system delivering water 167 miles by gravity to Bay Area reservoirs and customers. The remaining RWS supply is drawn from local surface waters in the Alameda and Peninsula watersheds. The split between these resources varies from year to year depending on the water year hydrology and operational circumstances.

To project and evaluate water supply conditions, the SFPUC uses measurements of precipitation and snowpack in the watersheds above Hetch Hetchy, Cherry, and Eleanor Reservoirs. Snowpack conditions are evaluated regularly by the Cooperative Snow Survey (conducted by the SFPUC in partnership with state and federal agencies) beginning in late January of each year. The SFPUC also estimates snowpack conditions using information from airborne snow observatory (ASO) and other sources. The SFPUC maintains a hydrologic model

[1] California Water Code section 10632(a)(1) requires "*the analysis of water supply reliability conducted pursuant to Section 10635."* Additional information about the SFPUC's water supply reliability analysis can be found in Chapter 7 of the SFPUC's 2020 UWMP.

of the watersheds that uses this information to project expected runoff for the coming year. This process also includes a statistical analysis of additional expected precipitation. In addition to projected runoff, the determination of projected available water supply also takes into account stored water throughout the RWS, water acquired by the SFPUC from non-SFPUC sources, inactive storage, reservoir losses, and allowances for carryover storage.

Additionally, the SFPUC accounts for groundwater provided by the San Francisco Groundwater Supply Project for the in-City retail system and recycled water provided for irrigation at Harding Park, Fleming and Sharp Park Golf Courses.

The RWS relies on precipitation and snowmelt captured and stored in its reservoirs. During droughts, water supply deliveries can exceed inflows, such that water stored in previous years is relied upon to meet demands. Because of the importance of carry-over storage, the SFPUC constantly monitors and evaluates water supply conditions in the RWS. Look-ahead forecasts are updated as a year's hydrology and operations change. Generally, in early winter of any year, SFPUC staff can begin providing a forecast of water supply conditions for the upcoming year based on known and anticipated winter and spring precipitation and snowpack. The predictive power of this forecast improves greatly through the spring. The annual precipitation, snowmelt, and carry-over storage together constitute the SFPUC's reservoir storage condition. Using data for each of these factors, the SFPUC can determine whether the reservoir system will be capable of serving full deliveries to its customers. Section 1.3 describes the system modeling SFPUC conducts

Table 0-1 shows the availability of RWS supplies for retail customers and Wholesale Customers in normal years. Table 0-2 shows the current and projected RWS supply needs to meet retail and wholesale demands based on information and projections presented in the SFPUC's 2020 UWMP.

The SFPUC sells water to 26 of its 28 wholesale customers under the terms of the 25-year contract known as the Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County (WSA) and associated individual water sales contracts with each Wholesale Customer. The WSA carries forward the SFPUC's "Supply Assurance" of 184 million gallons per day (mgd) to the Wholesale Customers. The SFPUC has agreed to deliver water to the Wholesale Customers up to the amount of the Supply Assurance, and this agreement is perpetual and survives the expiration of the WSA. The Supply Assurance is, however, subject to reduction due to water shortage, drought, scheduled RWS maintenance activities, and emergencies. The WSA also describes the temporary limitation on water sales established by the Phased Water System Improvement Plan (WSIP) in 2008. This "Interim Supply Limitation" (ISL) limits water sales from the RWS to an average annual amount of 265 mgd. The WSA allocations the ISL between the SFPUC's retail customers and Wholesale Customers as follows:

- Wholesale supply allocation: 184 mgd
- Retail supply allocation: 81 mgd[2]

Table 0-1. Regional Water System Supply Availability in Normal Years (mgd)

RWS Supply Allocation	Actual	Projected				
	2020	2025	2030	2035	2040	2045
Retail Customers[a, b]	81	81	81	81	81	81
Wholesale Customers[c, d]	184	184	184	184	184	184

[2] Groveland CSD is considered a retail customer of the SFPUC. Thus, RWS supplies to Groveland CSD are accounted for in the retail supply allocation of 81 mgd.

Total RWS Supplies	265	265	265	265	265	265

a Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if these alternative supplies are not available, up to 81 mgd of RWS supply could be used in normal years.

b Groveland CSD is reported as a wholesale customer for the purposes of this 2020 UWMP, but it is considered a retail customer of the SFPUC solely for purposes of allocating RWS supplies between retail and Wholesale Customers. Its demands would be met by the retail supply allocation of 81 mgd.

c Projected Wholesale Customer deliveries are limited to 184 mgd, including the demands of the Cities of San Jose and Santa Clara, which are supplied on a temporary and interruptible basis, with their total supply not exceeding 9 mgd assuming supply is available (decision to be made by end of 2028).

d Cordilleras MWC is not a party to the WSA, and it is not included in the wholesale supply allocation of 184 mgd. The demands of Cordilleras MWC are minor (projected to be less than 0.01 mgd) and are anticipated to be met with RWS supplies through 2045.

Table 0-2. Regional Water System Supply Utilized in Normal Years (mgd)

RWS Supply Allocation	Actual	Projected				
	2020	2025	2030	2035	2040	2045
Retail Customers[a, b]	66.5	67.2	67.5	68.6	70.5	73.7
Wholesale Customers[c, d]	132.1	146.0	147.9	151.9	156.3	162.8
Total RWS Supplies	198.6	213.2	215.4	220.5	226.8	236.5

a Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if these alternative supplies are not available, up to 81 mgd of RWS supply could be used in normal years.

b Groveland CSD is reported as a wholesale customer for the purposes of this 2020 UWMP, but it is considered a retail customer of the SFPUC solely for purposes of allocating RWS supplies between retail and Wholesale Customers. Its demands would be met by the retail supply allocation of 81 mgd.

c Projected Wholesale Customer deliveries are limited to 184 mgd, including the demands of the Cities of San Jose and Santa Clara, which are supplied on a temporary and interruptible basis, with their total supply not exceeding 9 mgd assuming supply is available (decision to be made by end of 2028).

d Cordilleras MWC is not a party to the WSA, and it is not included in the wholesale supply allocation of 184 mgd. The demands of Cordilleras MWC are minor (projected to be less than 0.01 mgd) and are anticipated to be met with RWS supplies through 2045.

1.3 INFRASTRUCTURE CONSIDERATIONS [WATER CODE SECTION 10632(A)(2)(B)(III)]

On an ongoing basis, the SFPUC's Hetch Hetchy Water and Power, Water Supply and Treatment Division, and Hydrology and Water Systems group conduct analyses of the RWS that incorporate planned facility outages and multiple levels of projected system demands to evaluate and plan for potential water delivery constraints. These groups meet quarterly to share plans and coordinate how facility outages, changes in service area demand, wet or dry weather, and other variables shape the operating plans each year. Facility outages due to maintenance or upgrades are coordinated in an adaptive manner to respond to changes as they occur. For new water supplies or new capital projects related to supply distribution, impacts on the system are evaluated extensively prior to initiation of any changes. Results from these modeling efforts are considered in the annual WSDA.

1.4 SYSTEM MODELING [WATER CODE SECTION 10632(A)(2)(B)(IV)]

To proactively plan for conditions that would result in a shortage of water supplies, the SFPUC models conditions using a hypothetical drought that is more severe than what the RWS has historically experienced. This drought sequence is referred to as the "design drought" and serves as the basis for planning and modeling of future scenarios. The design drought consists of an 8.5-year sequence of dry conditions.

In applying its water supply planning methodology, the SFPUC performs an initial model simulation of the system for the design drought sequence and then reviews the ability of the system to deliver water to the service area through the entire design drought sequence. If the projected water supply runs out before the end of the design drought sequence in the initial model run, system-wide water supply rationing is added and the scenario is re-run. This process continues iteratively until a model simulation of the system is achieved in which the water supply in storage at the end of the design drought sequence is brought to the system "dead pool," where no additional storage is available for delivery (currently simulated as 96,775 acre-feet). Drawing system storage down to the dead pool without going below it indicates that water supply delivery, including the adjusted amount of rationing, is maintained through the design drought sequence.

Estimated rationing levels and corresponding storage threshold values can then be used to simulate the operation of the system through the historical record of hydrology, or to evaluate system water supply conditions during an ongoing drought. While the design drought sequence does not occur in the historical hydrology, the rationing and storage threshold values that are adjusted to allow a system configuration to maintain water delivery through the design drought sequence can be used to evaluate system performance in the historical record, or as a comparison for real-time system conditions. Through use of this planning method, the SFPUC can simulate a response to declining water supply in storage that is appropriate for the system conditions being evaluated.

The SFPUC plans its water deliveries using indicators for water supply rationing that are developed through analysis with the design drought sequence. As a result, the SFPUC system operations are designed to provide sufficient carry-over water in SFPUC reservoirs to continue delivering water, although at reduced levels, during multiple-year droughts.

1.5 DECISION-MAKING PROCESS [WATER CODE SECTION 10632(A)(2)(A)]

Regardless of the expectation of shortage conditions, as part of the normal course of business, the SFPUC provides a water supply condition update to its executive team every two weeks throughout the year. The SFPUC also provides water supply estimates to its Wholesale Customers on a monthly basis beginning February 1. A Wholesale Customer Annual Meeting is held in the last week of February at which the SFPUC makes a presentation on current water supply conditions and forecasts. The last snow survey of the season typically occurs within the first week of April, followed by a runoff forecast to determine total system storage expected as of July 1. By the middle of April, the SFPUC sends a formal letter to the Wholesale Customers summarizing the water supply availability for the coming year.

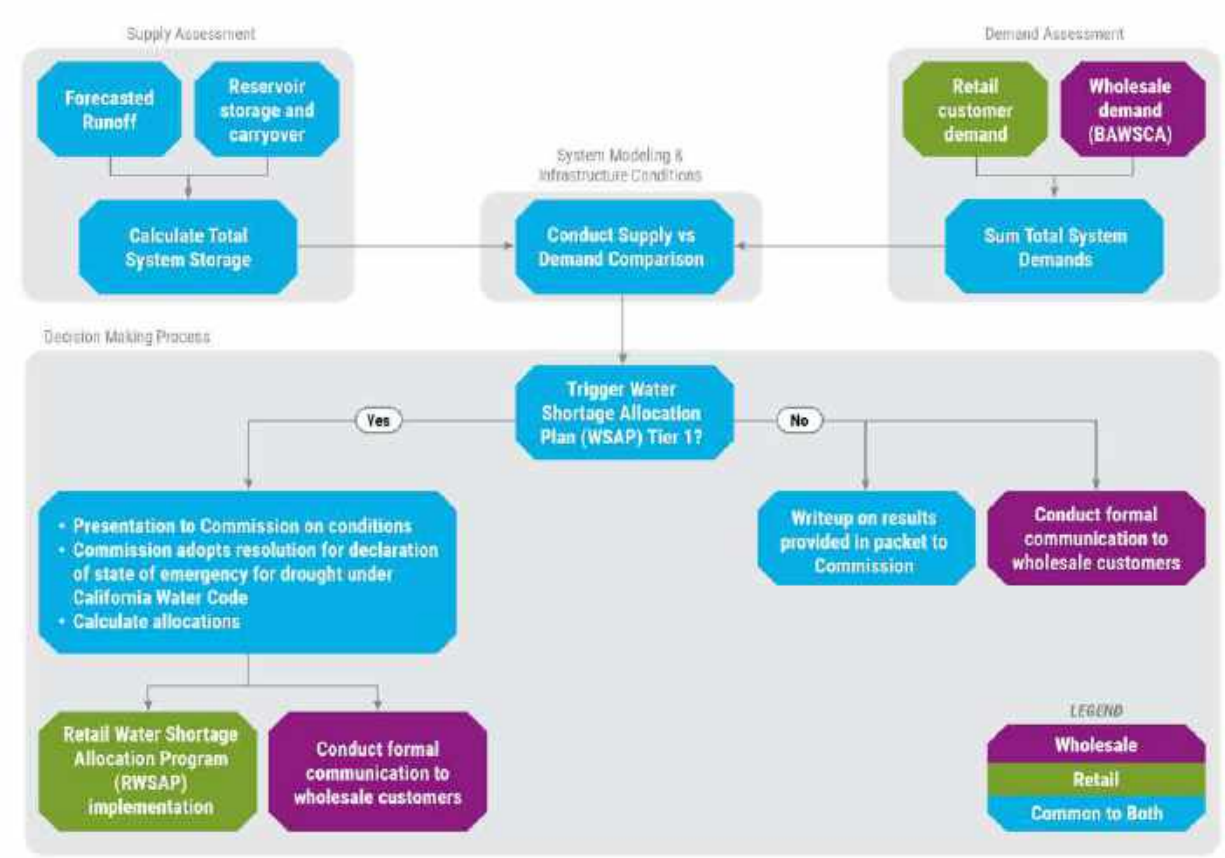
If the RWS appears incapable of meeting system-wide demand due to drought, the SFPUC is expected to declare a water shortage by March 31 of that drought year. The General Manager, or designee, is responsible for declaring such a shortage. A presentation would be made to the Commission as part of the General Manager's report, showing conditions of precipitation to date, snowpack, and storage levels with more information as necessary depending on the particulars of the supply forecast. Depending on the level of shortage, the Commission may adopt a resolution declaring a water shortage emergency under the California Water Code, or lesser actions such as a call for voluntary conservation efforts.

Prior to the initiation of any water delivery reductions to its retail customers, whether it be initial implementation of delivery reductions or implementing a different water shortage level, the SFPUC will outline a drought response plan to address the following: the water supply situation; proposed water use reduction objectives; alternatives to water use reductions; methods to calculate water use allocations and adjustments; compliance methodology and enforcement measures; and budget considerations. Details on the expected allocation program are described further in Section **Error! Reference source not found.**. This drought response plan will be presented

at a regularly scheduled SFPUC Commission meeting and advertised in accordance with the requirements of Section 6066 of the California Government Code.

The overall WSDA process is described visually in the flowchart presented in Figure 0-1.

Figure 0-1: Water Supply and Demand Assessment Process



ATTACHMENT 3
DROUGHT RESPONSE TOOL QUANTITATIVE ASSESSMENT

Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Menlo Park Municipal Water

Enter Agency Information	
Agency Name	Menlo Park Municipal Water
Total Population Served	17,780
Number of Residential Accounts	3,577
Number of Commercial, Industrial, and Institutional (CII) Accounts	462
Number of Dedicated Irrigation Accounts	142
Baseline Year(s)	2019
Percentage of Residential Indoor Use During Minimum Month (%)	100%
Percentage of CII Indoor Use During Minimum Month (%)	100%
Comments	

Navigation	
USER'S GUIDE	Download and read the guide before using this Tool
1 - HOME	Enter agency information
2 - INPUT BASELINE YEAR WATER USE	Enter Baseline Year production and use
3 - BASELINE YEAR WATER USE	Review and confirm entered information
4 - DROUGHT RESPONSE ACTIONS	Select Drought Response Actions and input estimated water savings and implementation rates.
5 - ESTIMATED WATER SAVINGS	Review estimated water production and compare estimated savings to conservation target.
6 - DROUGHT RESPONSE TRACKING	Track production and water savings against the conservation target.

Drought Response Tool
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Drought Response Tool

1 - Home

Menlo Park Municipal Water

For questions about this tool or for additional information, contact:

Anona Dutton, P.G., C.Hg.
adutton@ekiconsult.com
(650) 292-9100

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2 - Input Baseline Year (2019) Water Use

Menlo Park Municipal Water

Input Baseline Year (2019) Production and Water Use

Units: (mg)

Select the units to input monthly production and use data. Enter the total monthly potable water production for the Baseline Year. Next, enter monthly water use data by sector for the Baseline Year. If you bill on a bi-monthly basis, divide your billing data between the months that the billing cycle includes. If your single-family and multi-family accounts are tracked separately, enter the combined water use for both sectors in the Residential Water Use column. If your commercial, industrial, and institutional (CII) accounts are tracked separately, enter the combined water use for each sector in the CII Water Use column. Your non-revenue water use is calculated by subtracting your monthly residential, CII, and dedicated irrigation water uses from your monthly production. Your monthly residential gallons per capita per day (R-GPCD) is calculated by dividing your monthly residential water use by your population entered in Worksheet 1 - Home.

Date	Total Production (mg)	Residential Water Use (mg)	CII Water Use (mg)	Dedicated Irrigation Water Use (mg)	Non-Revenue Water Use (mg)	Total R-GPCD	Comments
January	52	21	23	2	6	39	
February	47	19	21	1	6	37	
March	55	22	28	2	3	39	
April	72	28	37	8	-1	53	
May	95	37	40	13	4	67	
June	117	42	44	17	14	79	
July	125	47	53	20	4	85	
August	123	46	52	19	6	83	
September	111	42	48	15	6	79	
October	106	45	50	13	-3	82	
November	80	33	33	8	6	61	
December	52	25	24	3	0	45	

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3 - Baseline Year (2019) Water Use Profile

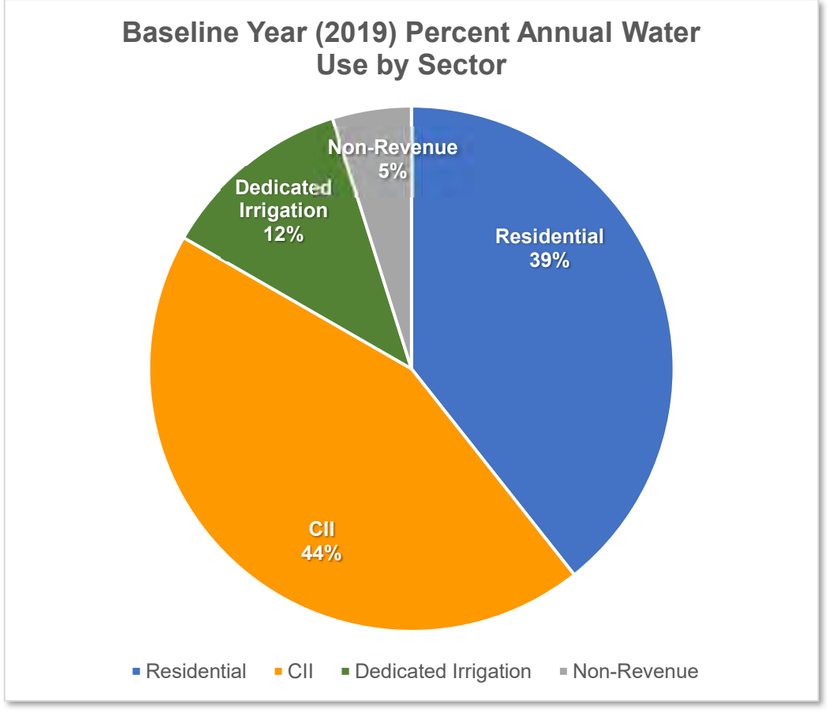
Menlo Park Municipal Water

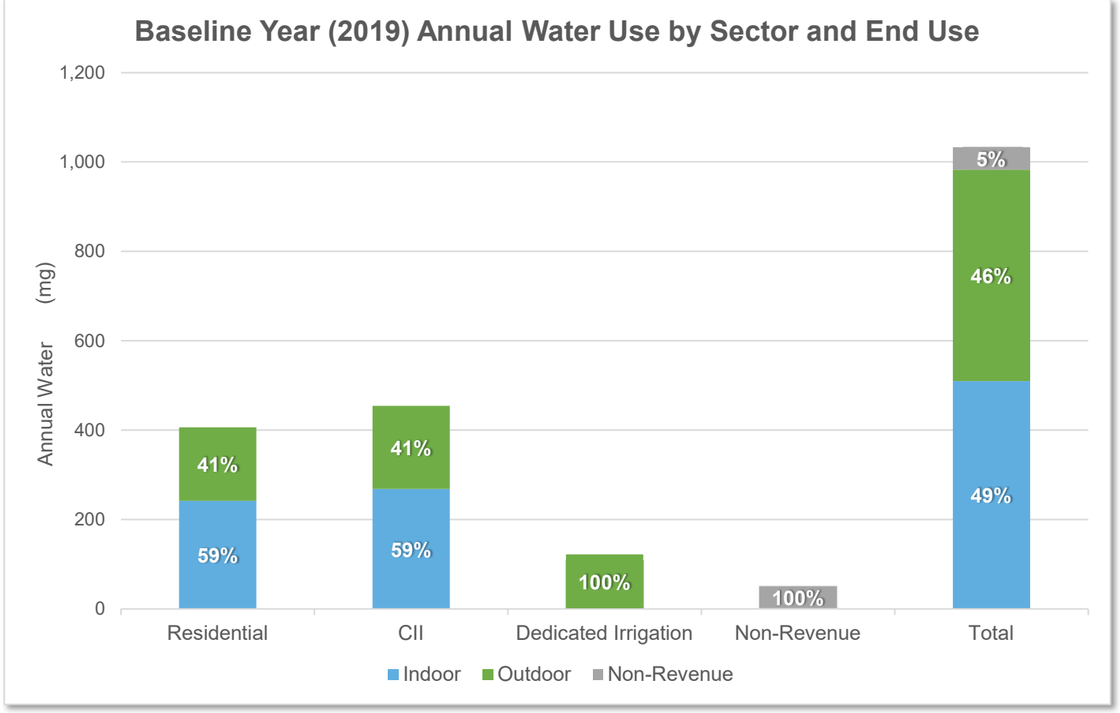
Baseline Year (2019) Annual Water Use Summary

Units: (mg)

A summary of your Baseline Year water use by sector and major end use category is shown below. Select the units in which your production and use data are displayed.

Water Use	Total Production (mg)	Water Use (mg)				Comments
		Residential	CII	Dedicated Irrigation	Non-Revenue	
Total	1,033	406	454	122	50	
Total Indoor	510	242	268	--	--	
Total Outdoor	473	165	186	122	--	
Total Non-Revenue	50	--	--	--	50	
Total Indoor %	49%	59%	59%	0%	--	
Total Outdoor %	46%	41%	41%	100%	--	
Total Non-Revenue %	5%	--	--	--	100%	





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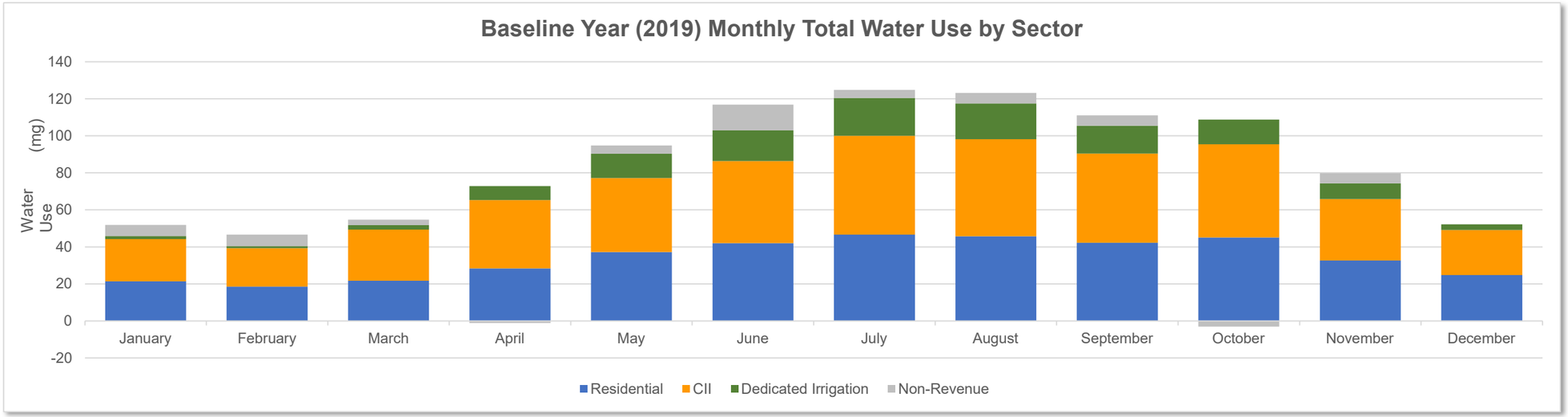
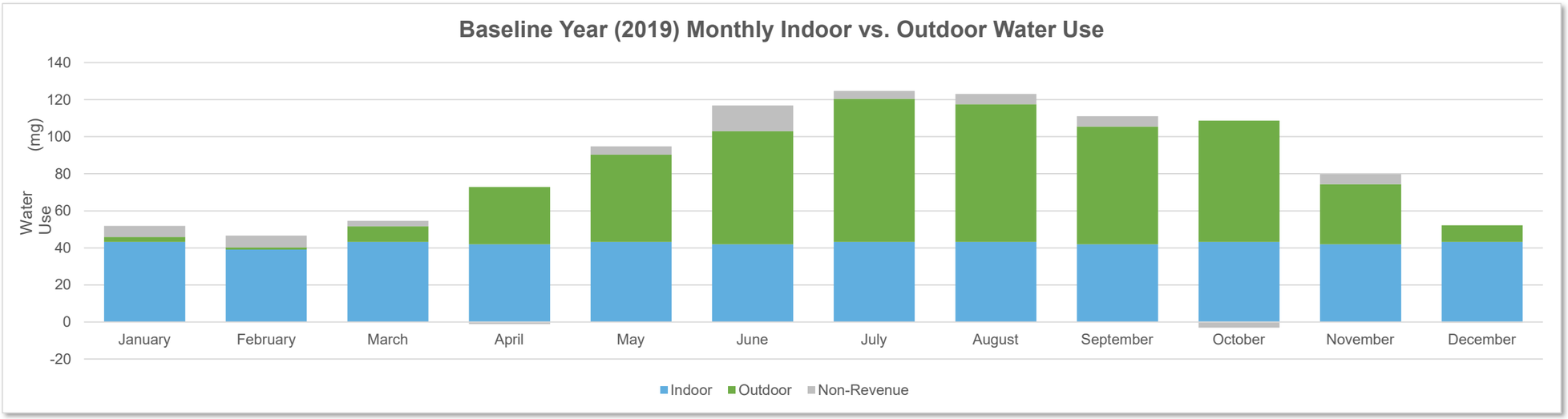
3 - Baseline Year (2019) Water Use Profile

Menlo Park Municipal Water





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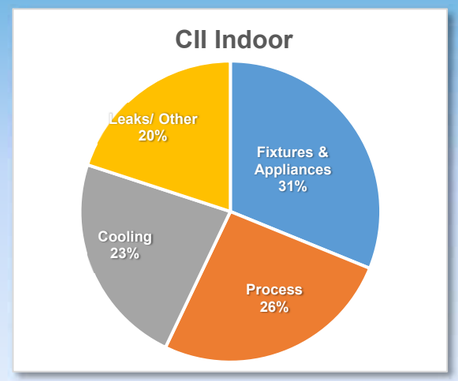
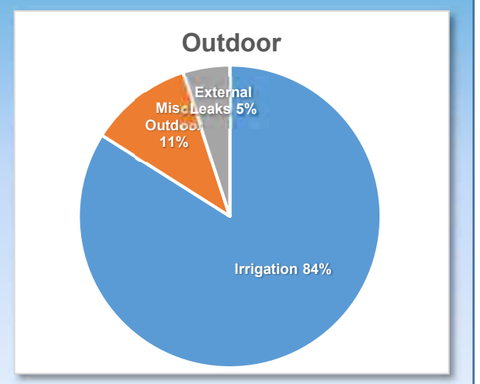
4 - Drought Response Actions - Stage 1

Menlo Park Municipal Water

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	25	R-GPCD
Maximum Residential Outdoor Savings	100%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	30%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	100%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	100%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	**64%**	of Total Baseline Production

Assumed Proportion of Water Use by End Uses and Sector





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4 - Drought Response Actions - Stage 1

Menlo Park Municipal Water

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**35%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☑	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☐	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☐	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☑	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☐			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☐			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--

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4 - Drought Response Actions - Stage 1

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	0.5%	50%	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☐		50%	--	--
Water Efficiency Workshops, Public Events	All	☐	0.5%	25%	EBMUD, 2011	--
Water Bill Inserts	All	☑	0.5%	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☐	100%		--	--
Home or Mobile Water Use Reports	All	☐	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☐	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☐	45%	50%	DWR, 2015	Target 50% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☑	**1%**	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☐			--	--
Move to Monthly Metering / Billing	All	☐	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☐			--	--
Establish Drought Hotline	All	☐			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☐	30%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	50%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Require Repair of all Leaks within 24 hours	External Leaks	☑	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☐	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☐	75%	50%	--	--

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4 - Drought Response Actions - Stage 1

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Residential**						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☐	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	50%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☐	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Require Pool Covers	Misc. Outdoor	☑	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☐	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All Residential Uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All Residential Uses	☐	20%	50%	--	--
► **CII**						
Conduct CII Surveys Targeting High Water Users	All CII uses	☐	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	50%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☐		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☑	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☐	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☐	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All CII uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All CII uses	☐	20%	50%	--	--
Establish Water Budget - 30% Reduction	All CII uses	☐	30%	50%	--	--

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4 - Drought Response Actions - Stage 1

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

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5 - Estimated Water Savings - Stage 1

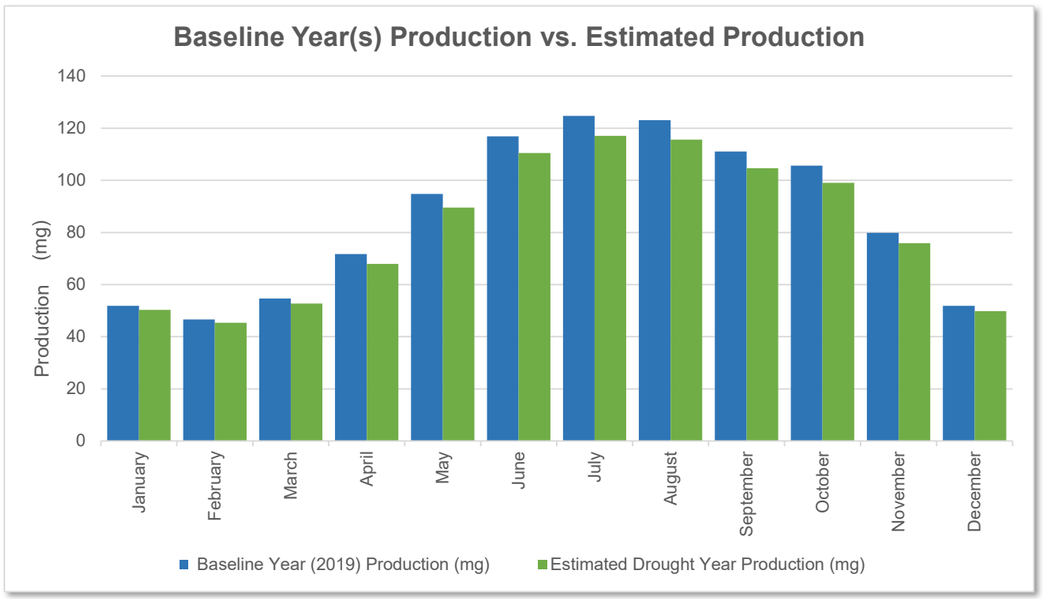
Menlo Park Municipal Water

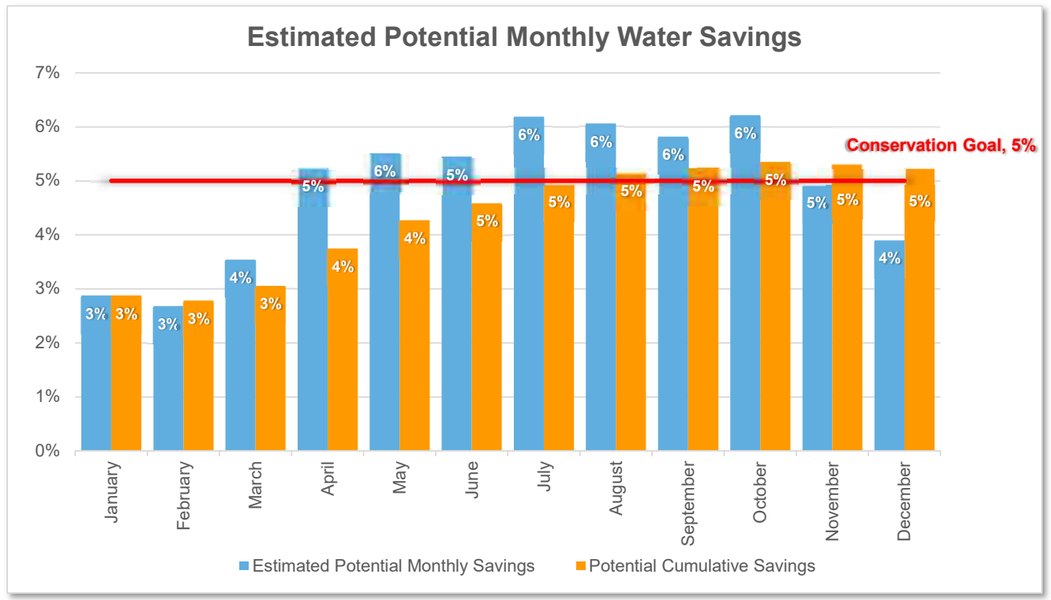
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
January	52	50	3%	3%	5%	
February	47	45	3%	3%	5%	
March	55	53	4%	3%	5%	
April	72	68	5%	4%	5%	
May	95	90	6%	4%	5%	
June	117	111	5%	5%	5%	
July	125	117	6%	5%	5%	
August	123	116	6%	5%	5%	
September	111	105	6%	5%	5%	
October	106	99	6%	5%	5%	
November	80	76	5%	5%	5%	
December	52	50	4%	5%	5%	





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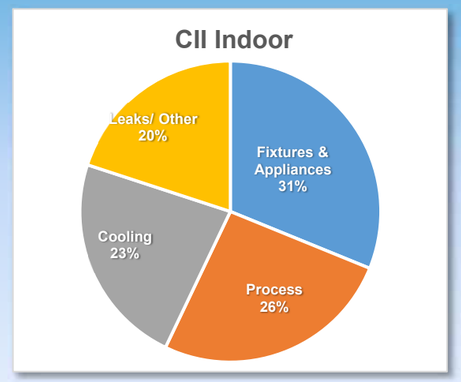
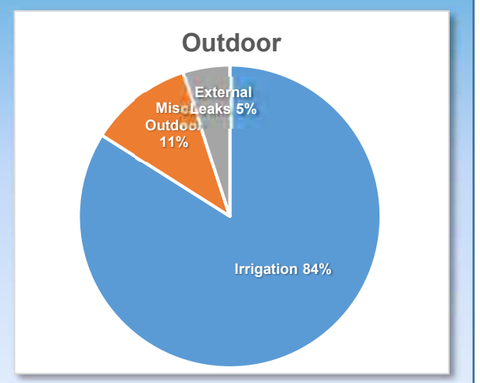
4 - Drought Response Actions - Stage 2

Menlo Park Municipal Water

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	25	R-GPCD
Maximum Residential Outdoor Savings	100%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	30%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	100%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	100%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	**64%**	of Total Baseline Production

Assumed Proportion of Water Use by End Uses and Sector





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4 - Drought Response Actions - Stage 2

Menlo Park Municipal Water

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**55%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☑	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☐	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☐	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☑	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☐			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☐			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--

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4 - Drought Response Actions - Stage 2

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	0.5%	**55%**	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☑		50%	--	--
Water Efficiency Workshops, Public Events	All	☐	0.5%	25%	EBMUD, 2011	--
Water Bill Inserts	All	☑	0.5%	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☐	100%		--	--
Home or Mobile Water Use Reports	All	☑	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☐	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☑	45%	**30%**	DWR, 2015	Target 30% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☑	**2%**	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☐			--	--
Move to Monthly Metering / Billing	All	☐	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☐			--	--
Establish Drought Hotline	All	☑			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☐	30%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	38%	50%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Require Repair of all Leaks within 24 hours	External Leaks	☑	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☐	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☐	75%	50%	--	--

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4 - Drought Response Actions - Stage 2

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Residential**						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☐	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	38%	50%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☐	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Require Pool Covers	Misc. Outdoor	☑	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☐	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All Residential Uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All Residential Uses	☐	20%	50%	--	--
► **CII**						
Conduct CII Surveys Targeting High Water Users	All CII uses	☐	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	38%	50%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☐		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☑	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☐	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☐	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All CII uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All CII uses	☐	20%	50%	--	--
Establish Water Budget - 30% Reduction	All CII uses	☐	30%	50%	--	--

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4 - Drought Response Actions - Stage 2

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

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5 - Estimated Water Savings - Stage 2

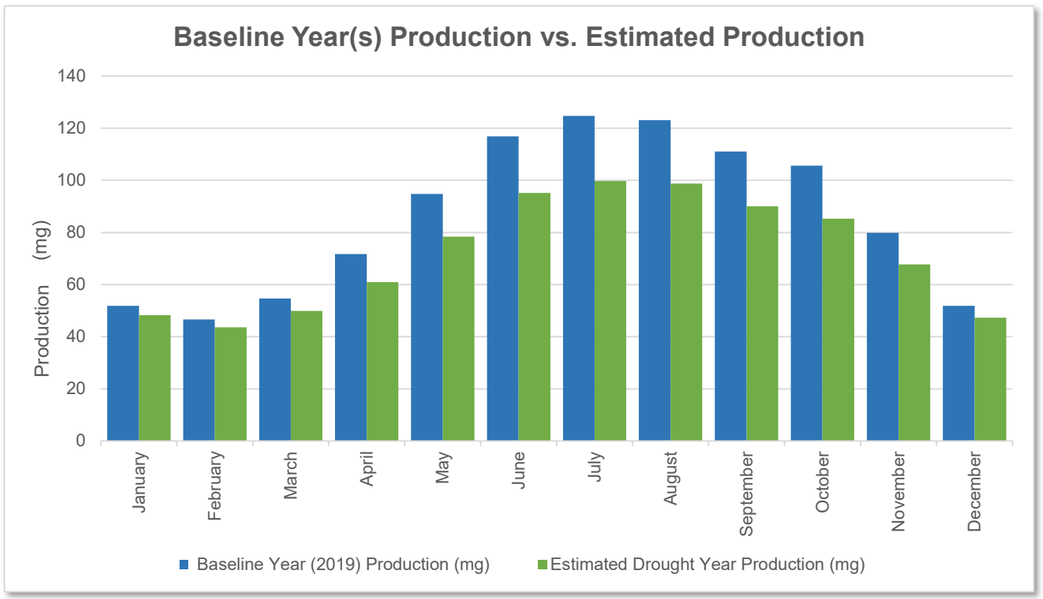
Menlo Park Municipal Water

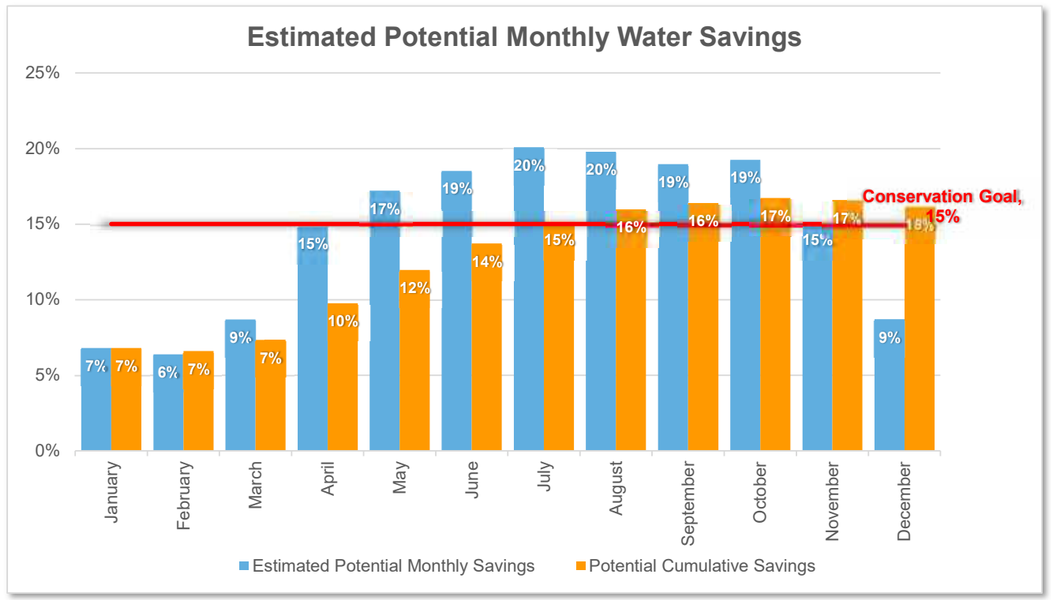
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
January	52	48	7%	7%	15%	
February	47	44	6%	7%	15%	
March	55	50	9%	7%	15%	
April	72	61	15%	10%	15%	
May	95	78	17%	12%	15%	
June	117	95	19%	14%	15%	
July	125	100	20%	15%	15%	
August	123	99	20%	16%	15%	
September	111	90	19%	16%	15%	
October	106	85	19%	17%	15%	
November	80	68	15%	17%	15%	
December	52	47	9%	16%	15%	





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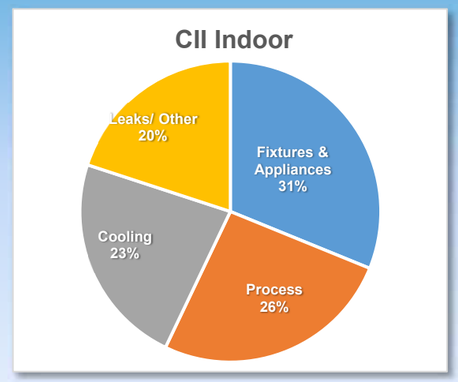
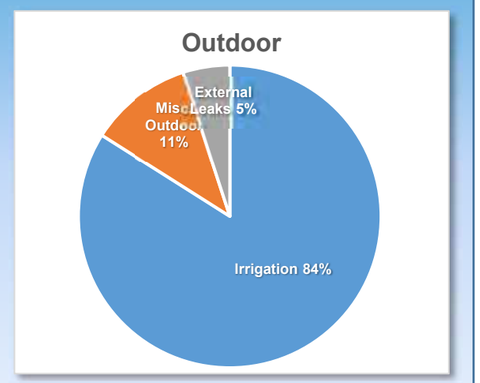
4 - Drought Response Actions - Stage 3

Menlo Park Municipal Water

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	25	R-GPCD
Maximum Residential Outdoor Savings	100%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	30%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	100%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	100%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	**64%**	of Total Baseline Production

Assumed Proportion of Water Use by End Uses and Sector





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4 - Drought Response Actions - Stage 3

Menlo Park Municipal Water

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**70%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☑	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☐	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☐	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☑	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☐			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☐			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--

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4 - Drought Response Actions - Stage 3

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	0.5%	**65%**	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☑		50%	--	--
Water Efficiency Workshops, Public Events	All	☑	0.5%	**30%**	EBMUD, 2011	--
Water Bill Inserts	All	☑	0.5%	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☐	100%		--	--
Home or Mobile Water Use Reports	All	☑	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☐	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☑	45%	**30%**	DWR, 2015	Target 30% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☑	**4%**	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☐			--	--
Move to Monthly Metering / Billing	All	☐	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☑			--	--
Establish Drought Hotline	All	☑			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☑	30%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	38%	**75%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Require Repair of all Leaks within 24 hours	External Leaks	☑	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☐	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☐	75%	50%	--	--

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4 - Drought Response Actions - Stage 3

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Residential**						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☑	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	38%	**75%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Require Pool Covers	Misc. Outdoor	☑	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☑	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All Residential Uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All Residential Uses	☐	20%	50%	--	--
► **CII**						
Conduct CII Surveys Targeting High Water Users	All CII uses	☑	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	38%	**75%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☐		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☑	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☐	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All CII uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All CII uses	☐	20%	50%	--	--
Establish Water Budget - 30% Reduction	All CII uses	☐	30%	50%	--	--

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4 - Drought Response Actions - Stage 3

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

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5 - Estimated Water Savings - Stage 3

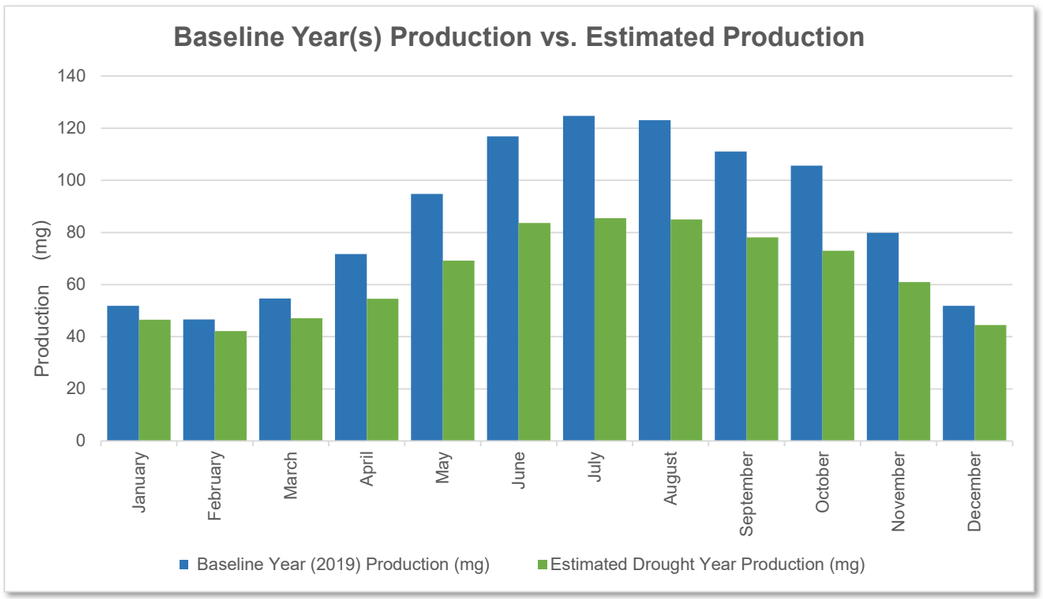
Menlo Park Municipal Water

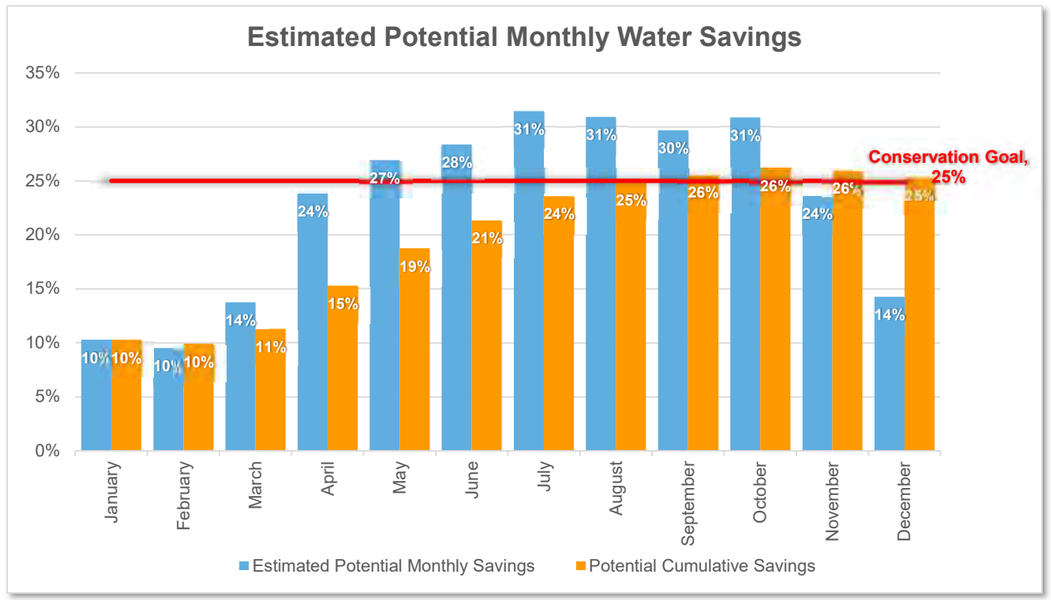
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
January	52	46	10%	10%	25%	
February	47	42	10%	10%	25%	
March	55	47	14%	11%	25%	
April	72	55	24%	15%	25%	
May	95	69	27%	19%	25%	
June	117	84	28%	21%	25%	
July	125	85	31%	24%	25%	
August	123	85	31%	25%	25%	
September	111	78	30%	26%	25%	
October	106	73	31%	26%	25%	
November	80	61	24%	26%	25%	
December	52	44	14%	25%	25%	





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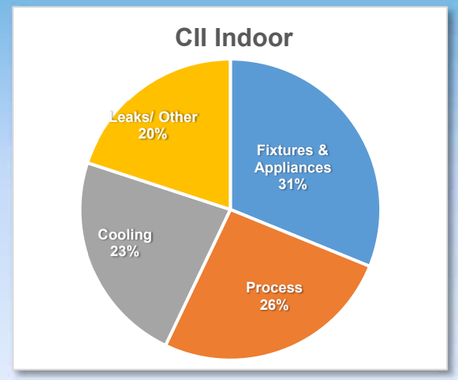
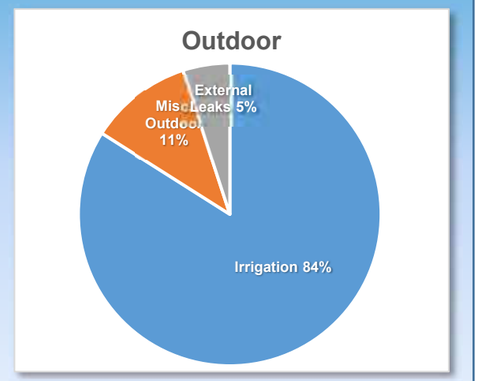
4 - Drought Response Actions - Stage 4

Menlo Park Municipal Water

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	25	R-GPCD
Maximum Residential Outdoor Savings	100%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	30%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	100%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	100%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	**64%**	of Total Baseline Production

Assumed Proportion of Water Use by End Uses and Sector





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4 - Drought Response Actions - Stage 4

Menlo Park Municipal Water

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**70%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☑	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☐	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☐	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☑	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☐			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☐			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--

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4 - Drought Response Actions - Stage 4

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	0.5%	**65%**	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☑		50%	--	--
Water Efficiency Workshops, Public Events	All	☑	0.5%	**30%**	EBMUD, 2011	--
Water Bill Inserts	All	☑	0.5%	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☐	100%		--	--
Home or Mobile Water Use Reports	All	☑	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☑	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☑	45%	**30%**	DWR, 2015	Target 30% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☑	5%	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☐			--	--
Move to Monthly Metering / Billing	All	☐	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☑			--	--
Establish Drought Hotline	All	☑			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☑	30%	**20%**	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	**60%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	**60%**		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Require Repair of all Leaks within 24 hours	External Leaks	☑	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☐	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☐	75%	50%	--	--

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4 - Drought Response Actions - Stage 4

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Residential**						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☑	10%	**20%**	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	**60%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	**60%**		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Require Pool Covers	Misc. Outdoor	☑	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☑	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All Residential Uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All Residential Uses	☐	20%	50%	--	--
► **CII**						
Conduct CII Surveys Targeting High Water Users	All CII uses	☑	10%	**20%**	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	**60%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	**60%**		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☐		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☑	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☐	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All CII uses	☐	10%	50%	--	--
Establish Water Budget - 20% Reduction	All CII uses	☐	20%	50%	--	--
Establish Water Budget - 30% Reduction	All CII uses	☐	30%	50%	--	--

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4 - Drought Response Actions - Stage 4

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

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5 - Estimated Water Savings - Stage 4

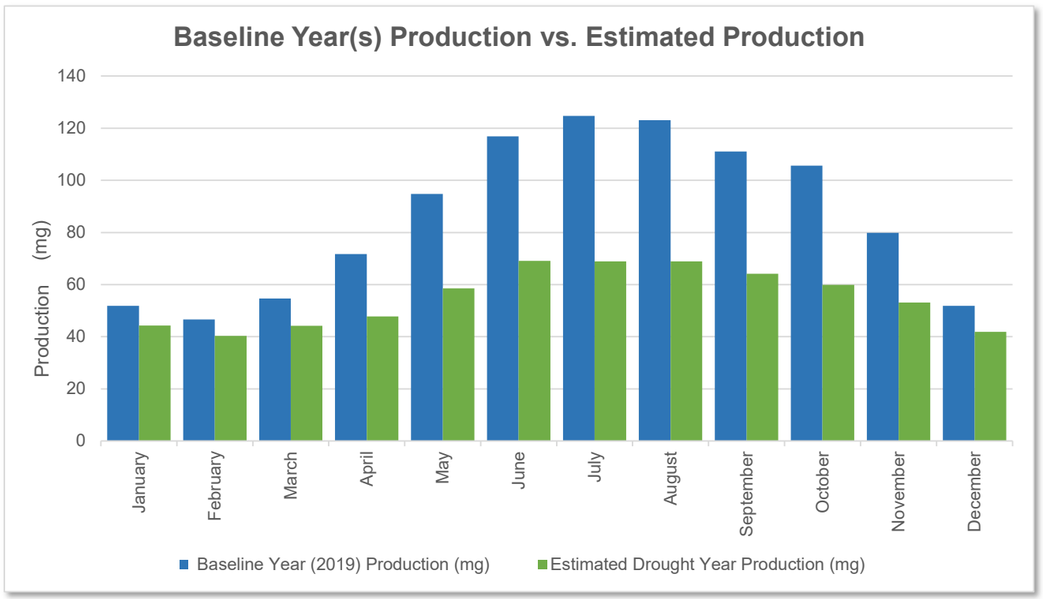
Menlo Park Municipal Water

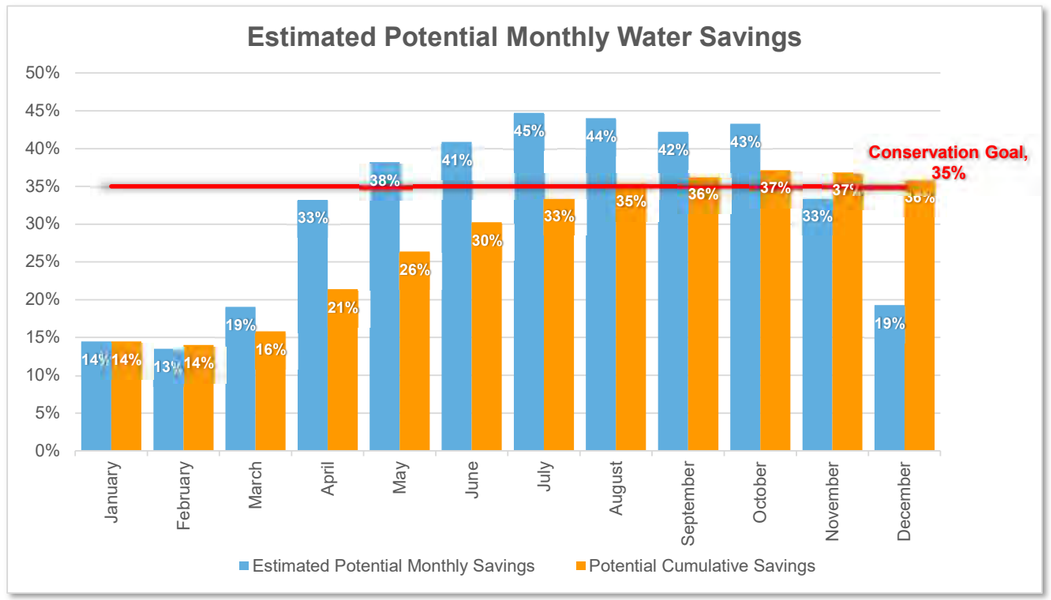
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
January	52	44	14%	14%	35%	
February	47	40	13%	14%	35%	
March	55	44	19%	16%	35%	
April	72	48	33%	21%	35%	
May	95	59	38%	26%	35%	
June	117	69	41%	30%	35%	
July	125	69	45%	33%	35%	
August	123	69	44%	35%	35%	
September	111	64	42%	36%	35%	
October	106	60	43%	37%	35%	
November	80	53	33%	37%	35%	
December	52	42	19%	36%	35%	





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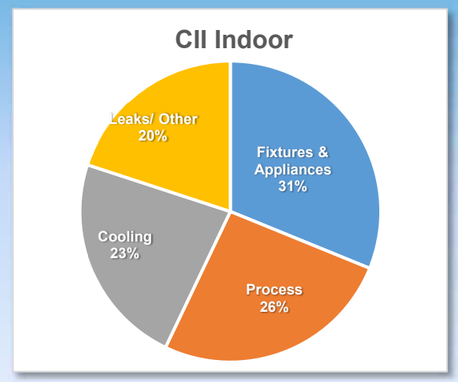
Drought Response Tool

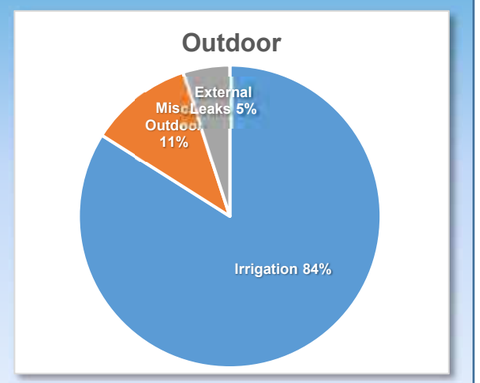
4 - Drought Response Actions - Stage 5

Menlo Park Municipal Water

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	25	R-GPCD
Maximum Residential Outdoor Savings	100%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	30%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	100%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	100%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	**64%**	of Total Baseline Production

Assumed Proportion of Water Use by End Uses and Sector





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4 - Drought Response Actions - Stage 5

Menlo Park Municipal Water

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**70%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☑	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☐	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☐	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☑	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☐			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☐			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--

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4 - Drought Response Actions - Stage 5

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	0.5%	**70%**	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☑		50%	--	--
Water Efficiency Workshops, Public Events	All	☑	0.5%	**30%**	EBMUD, 2011	--
Water Bill Inserts	All	☑	0.5%	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☐	100%		--	--
Home or Mobile Water Use Reports	All	☑	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☑	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☑	45%	**30%**	DWR, 2015	Target 30% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☑	5%	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☑			--	--
Move to Monthly Metering / Billing	All	☐	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☑			--	--
Establish Drought Hotline	All	☑			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☑	30%	**30%**	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	**60%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	**70%**		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Require Repair of all Leaks within 24 hours	External Leaks	☑	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☑	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☐	75%	**55%**	--	--

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4 - Drought Response Actions - Stage 5

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Residential**						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☑	10%	**30%**	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	**60%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	**70%**		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Require Pool Covers	Misc. Outdoor	☑	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☑	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All Residential Uses	☑	10%	50%	--	--
Establish Water Budget - 25% Reduction	All Residential Uses	☐	25%	55%	--	--
► **CII**						
Conduct CII Surveys Targeting High Water Users	All CII uses	☑	10%	**30%**	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	60%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	**70%**		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☐		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☑	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☐	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All CII uses	☑	10%	50%	--	--
Establish Water Budget - 25% Reduction	All CII uses	☐	25%	60%	--	--
Establish Water Budget - 35% Reduction	All CII uses	☐	35%	55%	--	--

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4 - Drought Response Actions - Stage 5

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

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5 - Estimated Water Savings - Stage 5

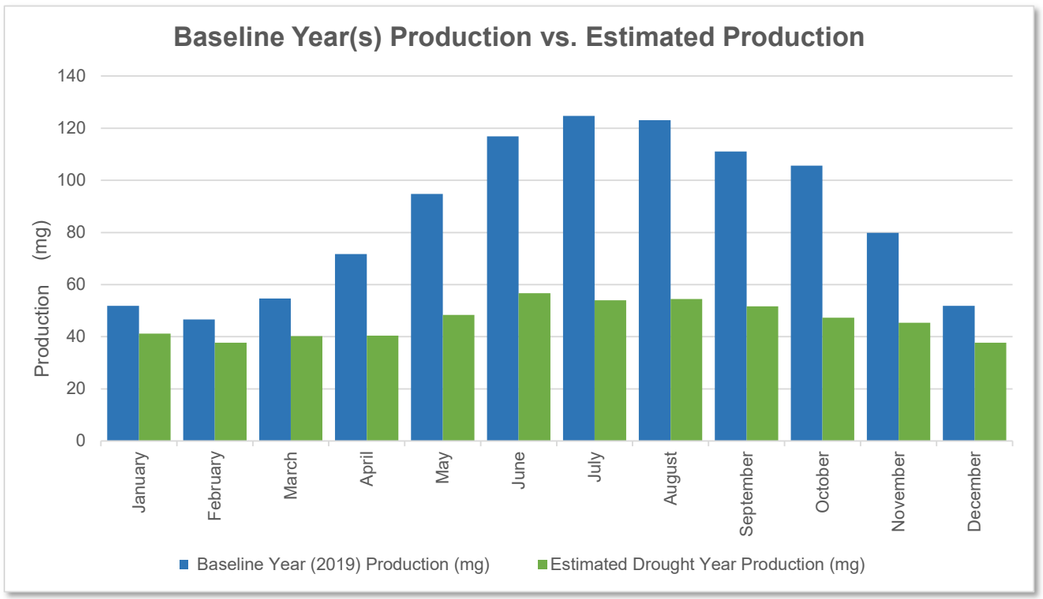
Menlo Park Municipal Water

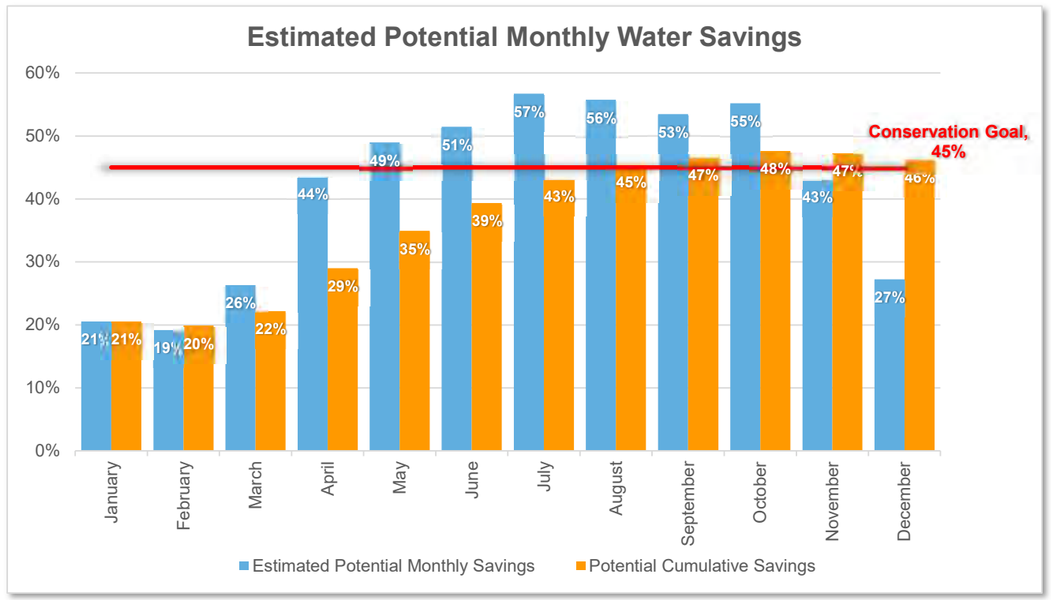
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
January	52	41	21%	21%	45%	
February	47	38	19%	20%	45%	
March	55	40	26%	22%	45%	
April	72	40	44%	29%	45%	
May	95	48	49%	35%	45%	
June	117	57	51%	39%	45%	
July	125	54	57%	43%	45%	
August	123	54	56%	45%	45%	
September	111	52	53%	47%	45%	
October	106	47	55%	48%	45%	
November	80	45	43%	47%	45%	
December	52	38	27%	46%	45%	





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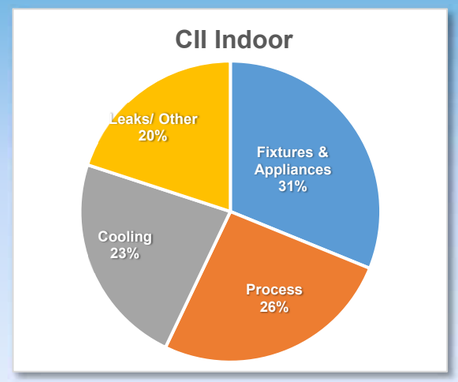
Drought Response Tool

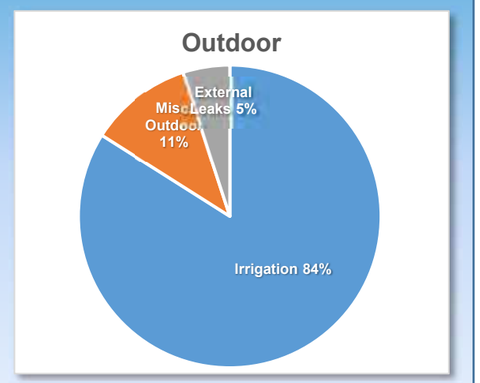
4 - Drought Response Actions - Stage 6

Menlo Park Municipal Water

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	25	R-GPCD
Maximum Residential Outdoor Savings	100%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	30%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	100%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	100%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	**64%**	of Total Baseline Production

Assumed Proportion of Water Use by End Uses and Sector





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4 - Drought Response Actions - Stage 6

Menlo Park Municipal Water

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**70%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☑	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☐	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☐	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☑	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☐			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☐			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☑	0.5%	50%	EBMUD, 2011	--

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4 - Drought Response Actions - Stage 6

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	0.5%	**70%**	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☑		50%	--	--
Water Efficiency Workshops, Public Events	All	☑	0.5%	**30%**	EBMUD, 2011	--
Water Bill Inserts	All	☑	0.5%	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☐	100%		--	--
Home or Mobile Water Use Reports	All	☑	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☑	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☑	45%	**30%**	DWR, 2015	Target 30% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☑	5%	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☑			--	--
Move to Monthly Metering / Billing	All	☐	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☑			--	--
Establish Drought Hotline	All	☑			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☑	30%	**40%**	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	**60%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	**70%**		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Require Repair of all Leaks within 24 hours	External Leaks	☑	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☐	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☑	75%	50%	--	--

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4 - Drought Response Actions - Stage 6

Menlo Park Municipal Water

Drought Response Actions						
Action Description	**End Use(s)**	**Implement Program**	**End Use Savings (%)**	**Implementation Rate**	**Source of Default Savings Estimate**	**Source of Default Implementation Rate**
► **Agency Drought Actions / Restrictions**						
► **Residential**						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☑	10%	**40%**	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	**60%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	**70%**		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Require Pool Covers	Misc. Outdoor	☑	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☑	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All Residential Uses	☐	10%	50%	--	--
Establish Water Budget - 25% Reduction	All Residential Uses	☑	**25%**	50%	--	--
► **CII**						
Conduct CII Surveys Targeting High Water Users	All CII uses	☑	10%	**40%**	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	**60%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	**70%**		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☐		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☑	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☑	100%	5%	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☐	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All CII uses	☐	10%	50%	--	--
Establish Water Budget - 25% Reduction	All CII uses	☐	25%	60%	--	--
Establish Water Budget - 35% Reduction	All CII uses	☑	**35%**	50%	--	--

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4 - Drought Response Actions - Stage 6

Menlo Park Municipal Water

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

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5 - Estimated Water Savings - Stage 6

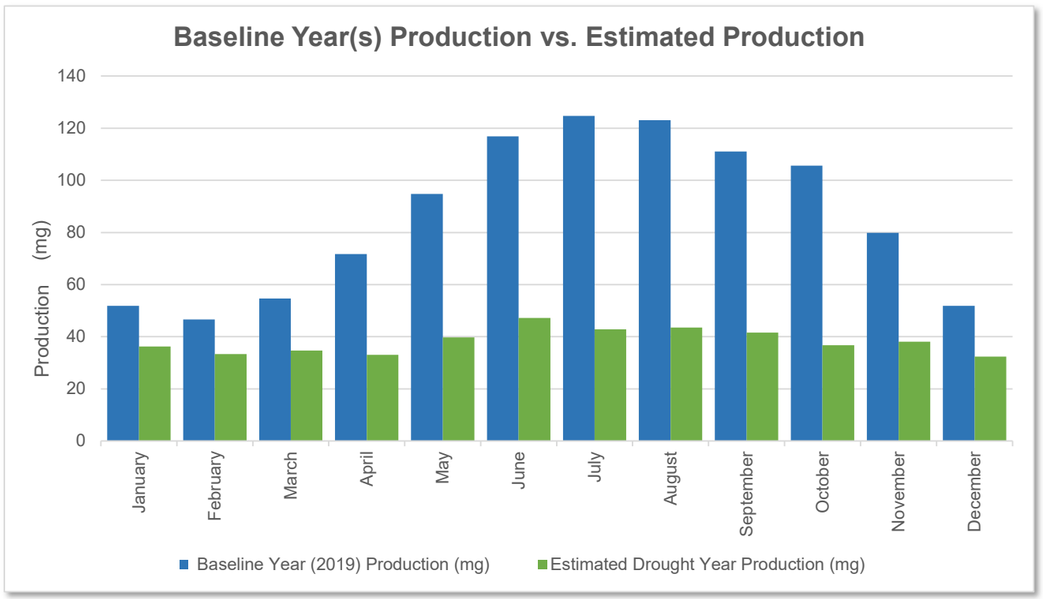
Menlo Park Municipal Water

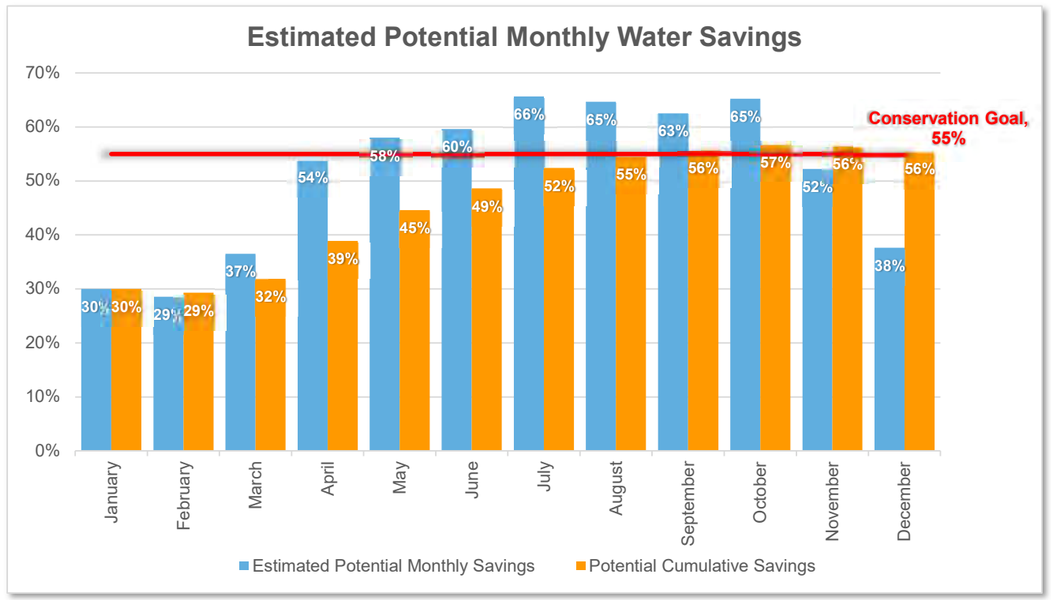
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
January	52	36	30%	30%	55%	
February	47	33	29%	29%	55%	
March	55	35	37%	32%	55%	
April	72	33	54%	39%	55%	
May	95	40	58%	45%	55%	
June	117	47	60%	49%	55%	
July	125	43	66%	52%	55%	
August	123	43	65%	55%	55%	
September	111	42	63%	56%	55%	
October	106	37	65%	57%	55%	
November	80	38	52%	56%	55%	
December	52	32	38%	56%	55%	





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ATTACHMENT 4
SFPUC EMERGENCY PREPAREDNESS PROCEDURES

PREPARATION FOR CATASTROPHIC SUPPLY INTERRUPTION

The SFPUC maintains various planning documents which collectively address its emergency preparedness and planned response in the event of a catastrophic interruption of water supplies due to power outages, earthquakes, or other disasters. These plans are described in sections 1.1 (Emergency Preparedness Plans), 1.2 (Emergency Drinking Water Planning), and 1.3 (Power Outage Preparedness and Response) below. Section 1.4 addresses the seismic risk assessment and mitigation plan required by California Water Code Section 10632.5.(a). Should a catastrophic interruption occur, the SFPUC will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency (California Government Code, California Emergency Services Act Article 2, Section 8558).

1.1 EMERGENCY PREPAREDNESS PLANS

Following the 1989 Loma Prieta Earthquake, the SFPUC created a departmental Emergency Operations Plan (EOP). The SFPUC EOP was originally released in 1992 and has been updated as necessary ever since. Most recently, the SFPUC developed a Water System Emergency Response Plan (Water ERP) to comply with the America's Water Infrastructure Act (AWIA) passed in 2018. The Water ERP acts as a unifying document, integrating and referencing common components of SFPUC plans and programs that have been developed to date. The Water ERP is intended to address water transmission and distribution systems and identify the Enterprises, Divisions, and Bureaus with direct roles and responsibilities. The Water ERP integrates directly into, and functions as an annex to, the SFPUC Emergency Operations Plan (EOP). The SFPUC EOP addresses a broad range of potential emergency situations that may affect the SFPUC and supplements the City's Emergency Response Plan, which was prepared by the Department of Emergency Management and most recently updated in 2017. Specifically, the purpose of the SFPUC EOP is to describe its emergency management organization, roles and responsibilities, and emergency policies and procedures.

In addition, SFPUC divisions and bureaus each have their own Division Emergency Operations Plans (DEOP) (in alignment with the SFPUC EOP), which detail that entity's specific emergency management organization, roles and responsibilities, and emergency policies and procedures. The SFPUC tests its DEOPs on a regular basis by conducting emergency exercises. Through these exercises, the SFPUC learns how well the plans and procedures will or will not work in response to an emergency. DEOP improvements are based on the results of these exercises and real-world event response and evaluation. The SFPUC also has an emergency response training plan that is based on federal, State, and local standards and exercise and incident improvement plans. SFPUC employees have emergency training requirements that are based on their emergency response roles.

The SFPUC EOP functions as a front end for the SFPUC's DEOPs, covering emergency response at the Department level; while each DEOP covers Division-specific information on the Division's emergency organization and response procedures specific to Division responsibilities, assets, technical scope, and operations. The types of events affecting SFPUC that may require emergency plans include but are not limited to:

- Major earthquake
- Loss of power
- Loss of water supply
- Major fire
- Hazardous material release that threatens water supply or environment
- Major pipeline breaks
- Dam break
- Significant outage of SFPUC services
- Man-made or intentional acts of terrorism resulting in damage to the system or interruption in service

In addition to the documents described above, the SFPUC also maintains various plans and procedures that deal with the possibility of alternate supply schemes and options. These include:

- Emergency Disinfection and Recovery Plan (EDRP)
- Emergency Response Action Plan (ERAP)
- Emergency Drinking Water Equipment and Alternatives Report
- Disinfection of SFPUC Water Trailers Procedure
- City Distribution Division Hydrant Manifold Standard Operating Procedure
- Pilot plant trailer (Mobile Pilot Plan O&M Plan)

1.2 EMERGENCY DRINKING WATER PLANNING

In February 2005, the SFPUC published the City Emergency Drinking Water Alternatives report. The purpose of this report was to outline a plan for supplying emergency drinking water in the City after damage and/or contamination of the SFPUC raw and/or treated water systems resulting from a major disaster. Since the publication of this report, the SFPUC has implemented a number of projects to increase its capability to support the provision of emergency drinking water during an emergency. These projects include:

- Completion of many Water System Improvement Program (WSIP) projects and other capital upgrades to improve security, detection, and communication (see Section 1.4);

- Public Information and materials for home and business;

- Construction of a disinfection and fill station at the existing San Francisco Zoo well, and obtaining a permit to utilize this well as a standby emergency drinking water source;

- Constructed six wells as part of the San Francisco Groundwater Supply Project, two of which also serve as emergency drinking water supplies, including a distribution system to fill emergency water tankers;

- Purchase and engineering of emergency-related equipment, including water tanker trucks and water distribution manifolds, to help with distribution post-disaster; and

- Coordination of planning with other City departments, neighboring jurisdictions, and other public and private partners to maximize resources and supplies for emergency response.

The SFPUC has also prepared the RWS Water Quality Notifications and Communications Plan. This plan, which was first prepared in 1996 and was most recently updated in 2017, provides contact information, procedures, and guidelines to be implemented by several SFPUC divisions, wholesale customers, and BAWSCA in the event of water quality impacts. The plan treats water quality issues as potential or actual supply problems, which fall under the emergency response structure of the SFPUC ERP.

1.3 POWER OUTAGE PREPAREDNESS AND RESPONSE

The SFPUC's water transmission system is primarily gravity fed from Hetch Hetchy Reservoir to the City. Within the in-City distribution system, key pump stations have generators on site and all others have connections in place that would allow portable generators to be used.

Although water conveyance throughout the RWS would not be greatly impacted by power outages because it is gravity fed, the SFPUC has prepared for potential regional power outages as follows:

- The Tesla Treatment Facility, the Sunol Valley Water Treatment Plant (SVWTP), and the San Antonio Pump Station have back-up power on site in the form of generators or diesel-powered pumps. Additionally, both the SVWTP and San Antonio Pump Station would not be impacted by a failure of the regional power grid because these facilities are powered by hydropower generated by the Hetch Hetchy Water and Power System.

- Both the Harry Tracy Water Treatment Plant (HTWTP) and the Baden Pump Station (part of the Peninsula System) have back-up generators in place.

- Administrative facilities that will act as emergency operation centers also have back-up power.

- The SFPUC has an emergency water supply connection with the Santa Clara Valley Water District (SCVWD), the SCVWD intertie, which also has back-up generators in place.

- Additionally, as described in the next section, the WSIP includes projects that expand the SFPUC's ability to remain in operation during power outages and other emergency situations.

1.4 SEISMIC RISK ASSESSMENT AND MITIGATION PLAN

As part of the Facilities Reliability Program and the Water System Improvement Program (WSIP), the SFPUC performed an extensive multi-year evaluation of seismic risks to its water system that resulted in major capital improvements to increase seismic reliability. The goals of WSIP include enhancing the ability of the SFPUC water system to meet identified service goals for water quality, seismic reliability, delivery reliability, and water supply. One of the original goals of WSIP was to limit rationing to no more than 20 percent on a system-wide basis; the WSIP was developed to reduce the likelihood of shortages, thereby reducing the likelihood of needing to implement the WSCP.

The WSIP projects include several projects located in San Francisco to improve the seismic reliability of the in-City distribution system, including more wells that can be used as emergency drinking water sources. The WSIP also incorporates many projects related to the RWS to address both seismic reliability and overall system reliability. As of August 2018, the WSIP is over 96 percent complete. Local San Francisco projects are 100 percent complete as of June 2020. The current forecasted date to complete the overall WSIP is December 2021.

WSIP seismic levels of service (LOS) informed development of capital projects and guided program implementation. The LOS established post-earthquake delivery and recovery objectives under the following seismic scenarios:

- Magnitude 7.9 event on the San Andreas fault
- Magnitude 7.3 event on the Hayward fault
- Magnitude 6.9 event on the Calaveras fault

An assessment of seismic risk and resilience is contained in the body of analysis performed to support the WSIP. The risks associated with the seismic scenarios considered are reflected in the delivery objectives established in the LOS, specifically:

- Delivery of winter month demand 24 hours after a major earthquake, and
- Delivery of average day demand 30 days after a major earthquake

In addition to the improvements that have or will come from the WSIP, the City has already constructed system interties for use during catastrophic emergencies, short-term facility maintenance and upgrade activities, and times of water shortages. These are listed below:

- A 35 mgd intertie with the EBMUD allowing EBMUD to serve the City of Hayward's demand and/or supply the SFPUC directly (and vice versa);
-
- A 40-mgd system intertie between the SFPUC and SCVWD; and,
-
- One permanent and one temporary intertie to the South Bay Aqueduct, which would enable the SFPUC to receive State Water Project water.

The WSIP also includes projects related to standby power facilities at various locations. These projects provide for standby electrical power at six critical facilities to keep them in operation during power outages and other emergency situations. Permanent engine generators are located at four locations (San Pedro Valve Lot, Millbrae Facility, Alameda West, and HTWTP), while hookups for portable engine generators are at two locations (San Antonio Reservoir and Calaveras Reservoir).The City of San Francisco also has a Hazard Mitigation Plan which was last updated in June 2014 and includes sections describing earthquakes hazards and mitigation for assets within the City's boundary, including state-regulated reservoirs (Sutro, Sunset North and South, and University Mound North and South).

ATTACHMENT 5
RESOLUTION 6630 WATER SHORTAGE CONTINGENCY PLAN, 2020 UPDATE

RESOLUTION NO. 6630

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MENLO PARK ADOPTING THE 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, the Urban Water Management Planning Act (Water Code Section 10610 – 10656 and 10608) requires every urban water supplier to prepare an Urban Water Management Plan ("UWMP"), the primary function of which is to support the suppliers' long-term resource planning to ensure that adequate water supplies are available to meet existing and future water needs; and

WHEREAS, the City's Menlo Park Municipal Water is an urban water supplier serving approximately 19,000 water customers; and

WHEREAS, the Water Shortage Contingency Plan ("WSCP") is included as a chapter of the UWMP and provides an action plan for a drought or catastrophic water supply; and

WHEREAS, the City's last Urban Water Management Plan was prepared in 2016; and

WHEREAS, the Urban Water Management Planning Act requires periodic review of the UWMP at least once every five years, followed by any amendments or changes to the UWMP that are indicated by that review; and

WHEREAS, an updated Urban Water Management Plan must be adopted by the City Council by July 1, 2021 and filed with the California Department of Water Resources within 30 days of adoption; and

WHEREAS, recent amendments to the Urban Water Management Planning Act require an updated Water Shortage Contingency Plan must be adopted by the City Council by July 1, 2021 and filed with the California Department of Water Resources within 30 days of adoption; and

WHEREAS, the City hired EKI Environmental & Water, Inc. ("EKI") to develop Menlo Park Municipal Water's ("MPMW") 2020 UWMP and WSCP; and

WHEREAS, MPMW receives all of its water from the San Francisco Public Utilities Commission (SFPUC); and

WHEREAS, the SFPUC has provided supply reliability data with the 2018 Bay-Delta Plan Amendment based on projected demands which reduces available supplies by almost 50 percent starting in year 2023 during dry years; and

WHEREAS, the Bay Area Water Supply and Conservation Agency ("BAWSCA") provided a temporary refined methodology that allocates SFPUC supplies as an equal percent reduction applied across all agencies when SFPUC shortages are greater than 20 percent. This allocation method is only temporary as the preliminary basis for the 2020 UWMP supply reliability analysis, and does not in any way imply an agreement by BAWSCA member agencies as to the exact allocation methodology; and

WHEREAS, the City has prepared and circulated a draft Urban Water Management Plan and Water Shortage Contingency Plan for public review, and properly noticed a public hearing

regarding said plan held by the City Council on May 25, 2021; and

WHEREAS, the Menlo Park City Council considered the Urban Water Management Plan and Water Shortage Contingency Plan, staff report, and all public testimony on May 25, 2021;

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF MENLO PARK HEREBY RESOLVES, as follows:

1. The City Council hereby finds that the above recitations are true and correct and, accordingly, are incorporated as a material part of this Resolution.

2. The City Council adopts the 2020 Urban Water Management Plan.

3. The City Council adopts the 2020 Water Shortage Contingency Plan.

4. The City Council finds that adoption of the 2020 Urban Water Management Plan and 2020 Water Shortage Contingency Plan is categorically exempt from the California Environmental Quality Act ("CEQA") under Section 15307 of the CEQA Guidelines (Actions by Regulatory Agencies for Protection of Natural Resources).

I, Judi A. Herren, City Clerk of Menlo Park, do hereby certify that the above and foregoing City Council Resolution was duly and regularly passed and adopted at a meeting by said City Council on twenty-fifth day of May, 2021, by the following votes:

AYES: Combs, Mueller, Nash, Taylor, Wolosin

NOES: None

ABSENT: None

ABSTAIN: None

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the Official Seal of said City on this twenty-fifth day of May, 2021.

DocuSigned by:

39280A20D0BE491...

Judi A. Herren, City Clerk

APPENDIX L
RESOLUTION 6630 URBAN WATER MANAGEMENT PLAN, 2020 UPDATE

RESOLUTION NO. 6630

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AYES: Combs, Mueller, Nash, Taylor, Wolosin

NOES: None

ABSENT: None

ABSTAIN: None

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the Official Seal of said City on this twenty-fifth day of May, 2021.

DocuSigned by:

39280A20D0BE491...

Judi A. Herren, City Clerk

2001 Junipero Serra Blvd., Suite 300 | Daly City, CA 94014
(650) 292-9100 | Fax (650) 552-9012 | Ekiconsult.com

Appendix C

SFPUC 2020 Urban Water Management Plan

2020 URBAN WATER MANAGEMENT PLAN

for the City and County of San Francisco

June 2021

Prepared by:

The San Francisco
Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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TABLE OF CONTENTS

REFERENCES ..... **iv**

List of Appendices iv

List of Figures iv

List of Tables v

Acronyms and Abbreviations vi

SECTION 1: INTRODUCTION AND OVERVIEW **1-1**

SECTION 2: PLAN PREPARATION AND IMPLEMENTATION **2-1**

2.1 Basis for Preparing a Plan 2-1

2.2 Fiscal or Calendar Year and Units of Measure 2-1

2.3 Coordination and Outreach 2-1

2.3.1 Agency Coordination 2-1

2.3.2 Public Participation 2-2

2.4 Accounting for Groveland CSD 2-3

SECTION 3: SYSTEM DESCRIPTION **3-1**

3.1 SFPUC Water System Overview 3-1

3.1.1 Historical Development of the RWS 3-1

3.1.2 Water Distribution 3-2

3.1.3 Water Treatment 3-4

3.1.4 Water Storage 3-6

3.1.5 Other Retail Water Systems 3-8

3.2 Retail Service Area 3-9

3.2.1 Climate 3-9

3.2.2 Population and Demographics 3-11

3.3 Wholesale Service Area 3-12

3.3.1 Climate 3-12

3.3.2 Population and Demographics 3-14

SECTION 4: SYSTEM DEMANDS **4-1**

4.1 Retail Demands 4-2

4.1.1 Current Retail Demands 4-2

4.1.2 Projected Retail Demands 4-3

4.1.3 Retail Distribution System Water Losses 4-7

4.1.4 Onsite Water Reuse Water Savings 4-8

4.1.5 Demands of Lower Income Households 4-10

4.2 Wholesale Demands 4-10

4.2.1 Wholesale Water Contractual Obligations 4-11
4.2.2 Wholesale Demands 4-11
4.3 Climate Change Impacts to Demand 4-12
SECTION 5: RETAIL BASELINES AND TARGETS 5-1
5.1 Gross Per Capita Water Use Baselines & Targets Summary 5-1
5.2 Compliance with 2020 Daily Per Capita Water Use Target 5-1
5.3 Assistance to Wholesale Customers 5-2
SECTION 6: SYSTEM SUPPLIES 6-1
6.1 RWS Supplies for Retail and Wholesale Customers 6-1
6.1.1 Water Rights 6-1
6.1.2 Water Quality of RWS Supplies 6-2
6.1.3 Climate Change Impacts to RWS Supplies 6-2
6.1.4 Summary of Existing and Future RWS Supplies 6-4
6.2 Local Supplies for Retail Customers 6-5
6.2.1 Existing Local Supplies 6-5
6.2.2 Future Local Supplies 6-9
6.2.3 Water Quality of Local Supplies 6-11
6.2.4 Climate Change Impacts to Local Supplies 6-12
6.2.5 Summary of Existing and Future Local Supplies 6-12
6.3 Energy Intensity Analysis 6-14
SECTION 7: WATER SUPPLY RELIABILITY NARRATIVE 7-1
7.1 Water System Improvement Program 7-1
7.2 WSIP Dry-Year Water Supply Projects 7-2
7.3 Factors Affecting Future RWS Supplies 7-3
7.3.1 Adoption of the 2018 Bay-Delta Plan Amendment 7-3
7.3.2 Potential State and Federal Regulations 7-5
7.3.3 Additional Water Supply Decisions 7-5
7.4 Alternative Water Supply Program 7-6
7.4.1 Local Projects 7-7
7.4.2 Regional Projects 7-8
7.5 Bay Area Regional Efforts to Improve Water Supply Reliability 7-10
SECTION 8: WATER SUPPLY RELIABILITY ASSESSMENT 8-1
8.1 Constraints on Supplies 8-1
8.2 Water Supply Modeling 8-1
8.2.1 Data & Methods 8-1
8.2.2 Design Drought 8-2

8.2.3 Definition of Water Supply Scenarios *(Normal, Dry, and Multi-dry Years)* 8-2
8.2.4 Allocating Regional Water System Supply 8-5
8.3 Water Supply and Demand Comparisons, With Bay-Delta Plan Amendment 8-5
8.3.1 Retail Water Service Reliability Assessment – With Bay-Delta Plan Amendment 8-5
8.3.2 Wholesale Water Service Reliability Assessment – With Bay-Delta Plan Amendment 8-6
8.4 Water Supply and Demand Comparisons, Without Bay-Delta Plan Amendment 8-10
8.4.1 Retail Water Service Reliability Assessment – Without Bay-Delta Plan Amendment 8-10
8.4.2 Wholesale Water Service Reliability Assessment – Without Bay-Delta Plan Amendment 8-10
8.5 Drought Risk Assessment 8-13
8.5.1 Data & Methods 8-14
8.5.2 Basis for Supply Shortage Conditions 8-14
8.5.3 DRA Water Source Reliability 8-14
8.5.4 Water Supply and Demand Comparison for 5-Year Drought Sequence 8-14
SECTION 9: WATER SHORTAGE CONTINGENCY PLAN 9-1
SECTION 10: DEMAND MANAGEMENT MEASURES 10-1
10.1 Retail Water Conservation Program 10-1
10.2 Retail DMMs 10-3
10.2.1 Water Waste Prevention Ordinances 10-3
10.2.2 Metering 10-5
10.2.3 Conservation Pricing 10-5
10.2.4 Public Education and Outreach 10-6
10.2.5 Management of System Losses 10-7
10.2.6 Water Conservation Program 10-7
10.2.7 Other DMMs 10-8
10.3 Wholesale DMMs 10-8
10.3.1 Metering 10-9
10.3.2 Public Education and Outreach 10-9
10.3.3 Water Conservation Program Coordination and Staffing Support 10-9
10.3.4 Asset Management 10-9
10.3.5 Assistance to Wholesale Customers 10-10
SECTION 11: PLAN ADOPTION AND UWMP CHECKLIST 11-1
11.1 Plan Adoption, Submittal, and Implementation 11-1
11.2 UWMP Checklist 11-1

LIST OF APPENDICES

Appendix A California Urban Water Management Planning Act of 1983 (Last amended: 2020)

Appendix B UWMP Standardized Tables

Appendix C Evidence of Compliance with Outreach Requirements

Appendix D SB X7-7 Compliance Form

Appendix E 2020 Retail Demand Model and Projections Technical Memorandum

Appendix F In-City Retail Water Audit Worksheet (Draft)

Appendix G Conservation Tracking Model Summary

Appendix H Estimation of Sunol Population with DWR Population Tool

Appendix I Energy intensity analysis

Appendix J Supply Reliability Assessment Based on Level of Service Objective

Appendix K Water Shortage Contingency Plan

Appendix L Resolution to Adopt the 2020 Urban Water Management Plan

Appendix M UWMP Requirements Checklist

LIST OF FIGURES

Figure 3-1. Regional Water System 3-3

Figure 3-2. In-City Distribution System 3-5

Figure 3-3. Retail Service Area 3-10

Figure 3-4. Wholesale Service Area 3-13

Figure 4-1. Total Deliveries and In-City Retail Water Use in 2020 4-1

Figure 4-2. Trends in Retail Demands, Population, and Per Capita Use between 2005 and 2020 4-2

Figure 4-3. Projected Retail Demands, Population, and Per Capita Water Use. 4-7

Figure 10-1. Summary of SFPUC's Water Conservation Achievements 10-2

LIST OF TABLES

Note: Primary table numbers and titles are specific to the body of this 2020 UWMP. Secondary table numbers and titles that are shown in brackets (e.g., [Standardized Table 3-1 Retail: Population – Current and Projected]) indicate the corresponding standardized table that is required to be submitted to DWR in a prescribed format. Standardized tables are provided in Appendix B, and SB X7-7 Verification Form tables are provided in Appendix D.

Table 3-1. Regional Water System Storage Capacity 3-7

Table 3-2. In-City Potable Water System Storage Capacity 3-7

Table 3-3. Retail Service Area Population 3-11

Table 3-4. Wholesale Service Area Population 3-14

Table 4-1. Retail Demands (mgd) 4-6

Table 4-2. Onsite Water Reuse Program Potable Offsets (mgd) 4-10

Table 4-3. Wholesale Purchase Requests (mgd) 4-13

Table 4-4. Wholesale Contractual Obligations (mgd) 4-14

Table 5-1. Gross Per Capita Water Use Baselines and Targets Summary (GPCD) 5-1

Table 6-1. Regional Water System Normal Year Supplies (mgd) 6-4

Table 6-2. Groundwater Pumped (mgd) 6-7

Table 6-3. Projected and Actual Recycled Water Use for 2020 (mgd) 6-8

Table 6-4. Wastewater Operations within Retail Service Area 6-9

Table 6-5. Retail Supplies (mgd) 6-13

Table 8-1. WSIP Project Assumptions for RWS Supply Modeling 8-3

Table 8-2. Retail Groundwater and Recycled Water Supply Availability During Normal and Dry Years Using 2025 Base Year 8-4

Table 8-3. Regional Water System Supply Availability During Normal and Dry Years for Base Years 2025 through 2045 – With and Without Bay-Delta Plan Amendment 8-4

Table 8-4. Retail Supply and Demand Comparison for Projected Normal & Dry Year Scenarios With Bay-Delta Plan Amendment (mgd) 8-7

Table 8-5. Wholesale Supply and Demand Comparison for Projected Normal and Dry Year Scenarios With Bay-Delta Plan Amendment (mgd) 8-9

Table 8-6. Retail Supply and Demand Comparison for Projected Normal & Dry Year Scenarios Without Bay-Delta Plan Amendment (mgd) 8-11

Table 8-7. Wholesale Supply and Demand Comparison for Projected Normal and Dry Year Scenarios Without Bay-Delta Plan Amendment (mgd) 8-13

Table 8-8. Retail Supply and Demand Comparison for Five-Year Drought Risk Assessment – With Bay-Delta Plan Amendment (mgd) 8-15

Table 8-9. Retail Supply and Demand Comparison for Five-Year Drought Risk Assessment – Without Bay-Delta Plan Amendment (mgd) 8-16

Table 10-1. Summary of SFPUC Retail Educational and Outreach Activities Over Five Years (Conducted between FY15-16 and FY19-20) 10-6

Table 10-2. Summary of Key Water Conservation Programs Over Five Years (Conducted between FY15-16 and FY19-20) 10-8

ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
ABAG	Association of Bay Area Governments
AF	acre-feet (volume of water, equivalent to 325,851 gallons)
Act	California Urban Water Management Planning Act
ACWD	Alameda County Water District
AWWA	American Water Works Association
AMI	advanced metering infrastructure
BACWA	Bay Area Clean Water Agencies
BAIRWMP	Bay Area Integrated Regional Water Management Plan
BARR	Bay Area Regional Reliability
BAWSCA	Bay Area Water Supply and Conservation Agency
BDPL	Bay Division Pipeline
BG	billion gallons
BMP	Best Management Practice
CalWEP	California Water Efficiency Partnership
Castlewood CSA	Castlewood County Service Area
CCF	hundred cubic feet (volume of water, equivalent to 748 gallons)
CCWD	Contra Costa Water District
CEQA	California Environmental Quality Act
cfs	cubic feet per second (flow rate of water)
CII	commercial, industrial, and institutional
Cordilleras MWC	Cordilleras Mutual Water Company
City	City and County of San Francisco
CUWA	California Urban Water Agencies
CUWCC	California Urban Water Conservation Council
CWC	California Water Code
DMMs	demand management measures
DPR	direct potable reuse
DRA	drought risk assessment
DSOD	Division of Safety of Dams
DWR	California Department of Water Resources
EBMUD	East Bay Municipal Utility District
EIR	Environmental Impact Report
EOP	Emergency Operations Plan
ERRP	Emergency Response and Recovery Plan
FERC	Federal Energy Regulatory Commission
FY	fiscal year
GPCD	gallons per capita per day

gpm	gallons per minute
Groveland CSD	Groveland Community Services District
GSR	Groundwater Storage and Recovery
HET	high-efficiency toilet
HHLSM	Hetch Hetchy and Local Simulation Model
HTWTP	Harry Tracy Water Treatment Plant
IRWM	Integrated Regional Water Management
ISG	Individual Supply Guarantee
JPA	Joint Powers Authority
LCSD	Lower Crystal Springs Dam
LOS	Level of Service
LVE	Los Vaqueros Reservoir Expansion
MG	million gallons
mgd	million gallons per day (flow or usage rate of water)
MID	Modesto Irrigation District
MMWD	Marin Municipal Water District
MOU	Memorandum of Understanding
MW	megawatt
NSMCSD	North San Mateo County Sanitation District, a subsidiary of the City of Daly City
PEIR	Programmatic Environmental Impact Report
PREP	Potable Reuse Exploratory Plan
RWS	San Francisco Regional Water System
RWSAP	Retail Water Shortage Allocation Plan
SB	Senate Bill
SB X7-7	Senate Bill Seven of the Senate's Seventh Extraordinary Session of 2009 (a.k.a., Water Conservation Act of 2009)
SCVWD	Santa Clara Valley Water District
SFDBI	San Francisco Department of Building Inspection
SFDPH	San Francisco Department of Public Health
SFDPH-EH	San Francisco Department of Public Health-Environmental Health
SFPUC	San Francisco Public Utilities Commission
SFUSD	San Francisco Unified School District
SFO	San Francisco International Airport
State	State of California
SVCW	Silicon Valley Clean Water
SVWTP	Sunol Valley Water Treatment Plant
SWAP	Shared Water Access Program
SWRCB	State Water Resources Control Board
SWRCB DDW	SWRCB Division of Drinking Water, formerly the California Department of Public Health Drinking Water Program

TID	Turlock Irrigation District
U.S.	United States
USD	Union Sanitary District
USEPA	U.S. Environmental Protection Agency
UV	ultraviolet
UWMP	Urban Water Management Plan
WPCP	water pollution control plant
WQC	Clean Water Act section 401 Water Quality Certification for the Turlock Irrigation District and Modesto Irrigation District Don Pedro Hydroelectric Project and La Grange Hydroelectric Project
WSA	2009 Water Supply Agreement between SFPUC and its Wholesale Customers
WSAP	Water Shortage Allocation Plan
WSCP	Water Shortage Contingency Plan
WSIP	Water System Improvement Program
WTP	water treatment plant
WUEdata	DWR Water Use Efficiency data online submittal tool
Zone 7	Zone 7 Water Agency

SECTION 1: INTRODUCTION AND OVERVIEW

The San Francisco Public Utilities Commission (SFPUC) is pleased to present this 2020 update to the Urban Water Management Plan (UWMP) for the City and County of San Francisco (City).

The City owns and operates the San Francisco Regional Water System (RWS), a public asset that plays a key role in delivering high-quality drinking water to more than 2.7 million residents and businesses in the San Francisco Bay Area. The system collects water from the Tuolumne River in the Sierra Nevada and from protected local watersheds in the East Bay and Peninsula.

With the RWS, the SFPUC delivers water to 28 wholesale customers in Alameda, Santa Clara, and San Mateo Counties, as well as the Groveland Community Services District (Groveland CSD) in Tuolumne County and Cordilleras Mutual Water Company (MWC) in Redwood City. The Bay Area Water Supply and Conservation Agency (BAWSCA) represents the interests of 26 of the wholesale customers (not including Cordilleras MWC and Groveland CSD), generally referred to collectively as the Wholesale Customers, and coordinates their water conservation programming. The SFPUC also provides retail water service to customers in San Francisco (generally referred to as in-City retail customers) and a number of customers outside of San Francisco that are located along the RWS transmission system (generally referred to as suburban retail customers). Additionally, some retail customers are supplied with local groundwater and recycled water supplies.

This 2020 UWMP update presents the latest information on the SFPUC's retail and wholesale service areas; the RWS and other water systems operated by the SFPUC; system supplies and demands; water supply reliability; Water Conservation Act of 2009 compliance; and demand management. In addition, this update includes the SFPUC's current (Fiscal Year 2019-20) and projected demands and supplies for its retail and wholesale customers over the next 25 years. Retail demand projections have been updated to reflect population and employment growth, socioeconomic factors, and the latest conservation forecasts. This 2020 UWMP update coincides with additional planning efforts conducted by the SFPUC, including its 2020 Retail Water Conservation Plan update. When the UWMP was last updated in 2015, the State of California (State) was in the fourth year of a severe drought. During the drought, the unprecedented dry weather conditions prompted the implementation of Statewide conservation mandates; the SFPUC's customers met the call and continue to be among the lowest water consumers in the State. Consumption reached a historic low in 2015 and has remained low since. The SFPUC remains committed to comprehensive water efficiency efforts that will help sustain a continued reduction in water use.

In December 2018, the State Water Resources Control Board (SWRCB) adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) to establish water quality objectives with the stated goal of increasing salmonid populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay-Delta. It remains unclear how or if the Bay-Delta Plan Amendment will be implemented. In acknowledgment of the uncertainty of whether and when the Bay-Delta Plan Amendment will come into effect, this UWMP presents future supply scenarios both with and without it. The two scenarios provided are intended to bookend the potential future supply conditions for the RWS. If the Bay-Delta Plan Amendment is implemented, the SFPUC will be able to meet the projected water use demands presented in this UWMP in normal years but would experience significant supply shortages in single dry years and multiple dry years. Without the implementation of the Bay-Delta Plan Amendment, the SFPUC will not experience shortages until the 4th and 5th year of a multi-year drought at 2045 levels of projected demand.

The SFPUC has initiated an Alternative Water Supply Planning Program to ensure that San Francisco can meet its retail and Wholesale Customer water needs, address projected dry year shortages, and limit rationing to a maximum of 20 percent system-wide in accordance with adopted SFPUC policies. This program is in early planning stages and is intended

to meet future water supply challenges and vulnerabilities such as environmental flow needs and other regulatory changes; earthquakes, disasters, and emergencies; increases in population and employment; and climate change. As the region faces future challenges – both known and unknown – the SFPUC is considering a suite of diverse non-traditional supplies and leveraging regional partnerships to meet retail and Wholesale Customer needs through 2045.

In 2020, water suppliers are also required by the State of California to develop and adopt a Water Shortage Contingency Plan (WSCP). The WSCP contained herein describes the SFPUC's approach to meeting six standard water shortage stages, ranging from 10% to greater than 50% shortages. The WSCP includes a description of the SFPUC's annual Water Supply and Demand Assessment whereby total system water storage is compared to demands to evaluate the likelihood of a shortage in the coming year. Should a shortage be identified, the WSCP identifies appropriate shortage response actions, such as voluntary and mandatory rationing. The WSCP also describes the SFPUC's extensive emergency preparedness and planned response in the event of catastrophic interruptions of water supplies.

SECTION 2: PLAN PREPARATION AND IMPLEMENTATION

This section summarizes the actions taken by the SFPUC to assure agency coordination and public participation throughout the development of this 2020 UWMP.

2.1 BASIS FOR PREPARING A PLAN

The SFPUC has prepared this 2020 UWMP for the City and County of San Francisco (City) in accordance with the requirements of the 1983 California Urban Water Management Planning Act (Act), California Water Code (CWC) Division 6, Part 2.6, Sections 10610 through 10656, as last amended in 2020. A copy of the Act is provided in Appendix A. The purpose of the Act is to assure that water suppliers plan for long-term reliability, conservation, and efficient use of California's water supplies to meet existing and future demands. The Act requires that planning projections extend at least 20 years beyond the year of the UWMP, i.e., through 2040 for the 2020 UWMP cycle. The planning horizon for the SFPUC's 2020 UWMP is 25 years, i.e., through 2045.

The Act requires all urban water suppliers to prepare an UWMP every five years. The 2020 UWMPs are due to the California Department of Water Resources (DWR) by July 1, 2021. As defined by CWC Section 10617, an urban water supplier is a supplier (either publicly or privately owned) that provides water for municipal purposes to more than 3,000 customers (either directly or indirectly) or that supplies more than 3,000 acre-feet (AF) of water annually. The SFPUC meets these criteria as both a retail and wholesale supplier of water.

The SFPUC has prepared this individual UWMP specifically for the City and is not participating in the preparation of a regional UWMP.

2.2 FISCAL OR CALENDAR YEAR AND UNITS OF MEASURE

The data provided throughout this 2020 UWMP and the accompanying standardized tables are reported on a fiscal year (FY) basis. The SFPUC operates on a fiscal year that starts on July 1 and ends on June 30. The "current" fiscal year reported in this 2020 UWMP corresponds to FY 2019-2020, which represents the period from July 1, 2019 through June 30, 2020. Similarly, the projected year of 2025 denotes FY 2024-2025; 2030 denotes FY 2029-2030; and so on. Best efforts are made to convert data that are originally collected on a calendar year basis to a fiscal year basis. However, in a few cases, fiscal year quantities are approximated based on calendar year quantities and are noted as such.

The SFPUC's water supply planning, contracts, and related documents primarily use units of million gallons per day (mgd) when quantifying volumes of water. However, the standardized tables prescribed by DWR only allow volumetric water data to be reported in units of acre-feet (AF), million gallons (MG), or hundred cubic feet (CCF) per year. Therefore, the SFPUC has reported volumetric water data in this 2020 UWMP's standardized tables in units of acre-feet (AF) rounded to the nearest 10 AF (see Appendix B). The corresponding data in the body of this 2020 UWMP, however, are reported in units of mgd unless otherwise noted. Although reported in different units of measure, the quantities in both sets of data are equal. This approach has been discussed with and accepted by DWR staff in 2015 and is being carried forward in the 2020 plan.

2.3 COORDINATION AND OUTREACH

2.3.1 Agency Coordination

2.3.1.1 Coordination with City Agencies

The SFPUC coordinated with City agencies in developing elements of this 2020 UWMP and the documents referenced herein. The SFPUC consulted with the San Francisco Planning Department in developing water demand projections

based on the City's growth projections for housing and employment. City agencies were notified of the SFPUC's intent to prepare the 2020 UWMP. The notice included instructions for viewing the draft 2020 UWMP, as well as the date, time, and location of the public hearing on the draft 2020 UWMP. Comments received from these agencies on the proposed 2020 UWMP were reviewed and addressed, as appropriate. Documentation relating to these efforts and communications is provided in Appendix C.

2.3.1.2 Regional Interagency Coordination

The SFPUC coordinated the development of this 2020 UWMP with its wholesale customers and BAWSCA, a public agency representing 26 member agencies—24 cities and water districts, as well as two private utilities—in Alameda, Santa Clara, and San Mateo Counties that purchase water on a wholesale basis from the SFPUC. The SFPUC has individual water sales contracts with 27 wholesale customers, 26 of which are members of BAWSCA. Cordilleras Mutual Water Company (Cordilleras MWC) is a wholesale customer of the SFPUC but not a member of BAWSCA. Groveland Community Services District (Groveland CSD) is considered a retail customer by the SFPUC, but for the purposes of this 2020 UWMP, is recognized as a wholesale customer. Throughout this document, references to Wholesale Customers generally mean the 26 wholesale customers that are members of BAWSCA. For more information about the SFPUC's wholesale customers, see Section 3.3.

The SFPUC provided water supply reliability information for distribution to all BAWSCA members. Supplies were projected in five-year increments from 2020 through 2045 for normal, single dry, and multiple dry years. These projections are provided in Appendix C. The SFPUC also worked with all of its wholesale customers, either individually or through BAWSCA, to obtain population and water supply purchase projections in five-year increments through the year 2045. Wholesale customers that are urban water suppliers are concurrently preparing their own 2020 UWMPs; therefore, the data provided for use in the SFPUC's 2020 UWMP are subject to change.

In addition to coordinating with its wholesale customers, the SFPUC also communicated with other Bay Area water agencies, including the East Bay Municipal Utility District (EBMUD), Santa Clara Valley Water District (SCVWD), Contra Costa Water District (CCWD), and Zone 7 Water Agency (Zone 7); and counties in which the SFPUC provides water, which are the counties of San Francisco, San Mateo, Alameda, Santa Clara, San Joaquin, and Tuolumne.

All wholesale customers, Bay Area water agencies, and counties in which SFPUC provides water were notified of the SFPUC's intent to prepare the 2020 UWMP. The notice included instructions for viewing the draft 2020 UWMP, as well as the date, time, and location of the public hearing on the draft 2020 UWMP. Comments received from these agencies on the proposed 2020 UWMP were reviewed and addressed, as appropriate. Documentation relating to these efforts and communications is provided in Appendix C.

2.3.2 Public Participation

The SFPUC has always actively encouraged public participation in its urban water management planning efforts. Public outreach activities for the 2020 UWMP update are listed below. Further documentation is included in Appendix C. Notification of the 2020 UWMP update was electronically mailed on February 8, 2021, with an additional mailing on March 8, 2021, to all cities and counties within which the SFPUC provides water, as well as to other interested parties. The notification letter served as both (1) a notice to cities and counties about the 2020 UWMP update, and (2) a notice of the time and place of the corresponding public hearing, as required by the CWC. A list of notified organizations and individuals is provided in Appendix C.

The draft 2020 UWMP was made available for review between April 5th and May 5th, 2021 at **www.sfpuc.org/uwmp**. The SFPUC met with the Citizens Advisory Committee (CAC) and the CAC Water Subcommittee on April 20th, 2021 and April 27th, 2021, respectively, to present on the draft 2020 UWMP update. The Citizens Advisory Committee meetings were publicly noticed on the SFPUC website at www.sfpuc.org.

A public hearing was held on April 13, 2021 during an SFPUC Commission meeting. A notice of the hearing was advertised in the local newspaper on March 29, 2021 and April 5, 2021 in accordance with California Government Code Section 6066. Copies of newspaper advertisements of the public hearing are provided in Appendix C. Public comments on the draft 2020 UWMP were taken during the public hearing, as well as throughout the 30 day public comment period. An adoption hearing was held at a the June 8th, 2021 SFPUC Commission meeting. For 2020 UWMP adoption, submittal, and implementation, see Section 11.1.

2.4 ACCOUNTING FOR GROVELAND CSD

Groveland CSD, located in a semi-rural area of southern Tuolumne County, serves approximately 3,500 customers in Groveland, Big Oak Flat, and Pine Mountain Lake that are primarily residential and commercial water users. Prior to 2015, the SFPUC's UWMP had reported Groveland CSD as a retail customer since Groveland CSD had not prepared its own UWMP until 2010. The SFPUC also considers Groveland CSD a retail customer and accounts for it as such in its contractual obligations and supply planning. However, for the purposes of the 2015 UWMP update, DWR directed the SFPUC to report Groveland CSD as a wholesale customer. In order to accommodate both the SFPUC's planning needs and DWR's requirements, this 2020 UWMP accounts for Groveland CSD differently (either as a retail customer or a wholesale customer) depending on the context:

- For the purposes of describing the SFPUC's wholesale service area, population, demands, and supplies as directed by DWR, and to avoid potential double counting during regional or Statewide aggregation of UWMP data, Groveland CSD is considered a wholesale customer and reported as such in Section 3 of the body of this UWMP and the standardized tables in Appendix B.

- For the purposes of describing contractual obligations and RWS supply allocations between the SFPUC and its Wholesale Customers, Groveland CSD is considered a retail customer and is reported as such in the body of this 2020 UWMP, specifically Sections 4, 6, 7, and 8.

- For the purposes of calculating per capita baselines and targets in accordance with the Water Conservation Act of 2009, also known as Senate Bill (SB) X7-7, Groveland CSD is considered a wholesale customer. Therefore, Section 5 of the body of this 2020 UWMP and the corresponding SB X7-7 Verification Form tables in Appendix D do not include Groveland CSD.

The SFPUC obtained actual and projected population and demand data from Groveland CSD. As Groveland CSD is currently preparing its 2020 UWMP update, the data provided for use in the SFPUC's 2020 UWMP are subject to change.

Any discrepancies between corresponding tables in the body of this 2020 UWMP and Appendix B resulting from the difference in Groveland CSD accounting will be noted. This approach has been discussed with and deemed appropriate by DWR staff.

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SECTION 3: SYSTEM DESCRIPTION

This section describes the SFPUC's water system (including the RWS and in-City distribution system), retail and wholesale service areas, climate, and demographic features.

3.1 SFPUC WATER SYSTEM OVERVIEW

Over 2.7 million people in San Francisco and throughout the Bay Area rely on water supplied by the SFPUC to meet their daily water needs. The RWS is municipally-owned infrastructure operated by the SFPUC, a department of the City and County of San Francisco, and serves both retail and wholesale customers. The RWS supplies high-quality drinking water from the Tuolumne River watershed and from local reservoirs in the Alameda and Peninsula watersheds. The RWS draws an average of 85% of its supply from the Tuolumne River watershed, collected in Hetch Hetchy Reservoir in Yosemite National Park. This water feeds into an aqueduct system delivering water 167 miles by gravity to Bay Area reservoirs and customers. The remaining 15% of the RWS supply is drawn from local surface waters in the Alameda and Peninsula watersheds. The split between these resources varies from year to year depending on the water year hydrology and operational circumstances.

Separate from the RWS, the in-City distribution system is also owned and operated by the SFPUC and serves a population of nearly 900,000 in San Francisco. In-City retail customers are primarily served with RWS supply, but a few customers also receive groundwater and recycled water. Similarly, the SFPUC's suburban retail customers[1], outside of San Francisco, are primarily served with RWS supply, but a few customers also receive groundwater. The RWS, in-City distribution system, and other localized systems are described in the following sections.

3.1.1 Historical Development of the RWS

The RWS evolved through the development of two separate water systems: the Spring Valley Water Company system and the Hetch Hetchy Project. The Spring Valley Water Company was established in 1858 as it developed a spring and several creeks in San Francisco into a local water system. It expanded over the next few decades with the construction of the Pilarcitos, San Andreas, and Upper and Lower Crystal Springs Dams on the Peninsula. Further expansions included the development of the Pleasanton Well Field, the Sunol Filter Gallery, and Calaveras Dam in southern Alameda County.

Very early in San Francisco's development, it was recognized that the local water resources would be inadequate to support a burgeoning metropolis; thus, plans for importing water from the Sierra Nevada were born. In the late 1800s, the City's decision to develop its own water supply system culminated in the planning, financing, and construction of the Hetch Hetchy Project. Because many of the Hetch Hetchy Project facilities were to be located on public land within Yosemite National Park and Stanislaus National Forest, Congressional approval of the use of federal land was required. That approval was granted by the Raker Act of 1913 (38 Stat. 242). For more information about the Raker Act and the City's water rights under State law, see Section 3.1.4.

The construction of the Hetch Hetchy Project began in earnest in 1914. After almost 20 years of construction (including the building of Hetch Hetchy Reservoir and the 1930 acquisition of the Spring Valley Water Company by the City), Tuolumne River water began flowing into Upper Crystal Springs Reservoir in October 1934. Through the coordinated operation of the two systems, the SFPUC has been able to provide the residents of the City and its neighboring communities with a supply of high-quality potable water from high-quality sources.

[1] Suburban retail customers are retail customers located outside of SFPUC's retail service area. More information on suburban retail customers is provided in Section 3.1.5.2.

Since the 1930s, the major additions to the RWS have included the raising of O'Shaughnessy Dam and the development of Lake Lloyd (a.k.a., Cherry Lake); the construction of additional pipelines across the San Joaquin Valley; and the local construction of San Antonio Reservoir in Alameda County and Bay Division Pipelines (BDPL) Nos. 2, 3, and 4. Other local projects have included Crystal Springs Pipeline No. 3, Sunol Valley and San Andreas (now Harry Tracy) Water Treatment Plants, the Crystal Springs Bypass Tunnel and Balancing Reservoir, and the Tesla Treatment Facility.

3.1.2 Water Distribution

This section further describes how water is distributed by the RWS and the in-City distribution system.

3.1.2.1 Regional Water System

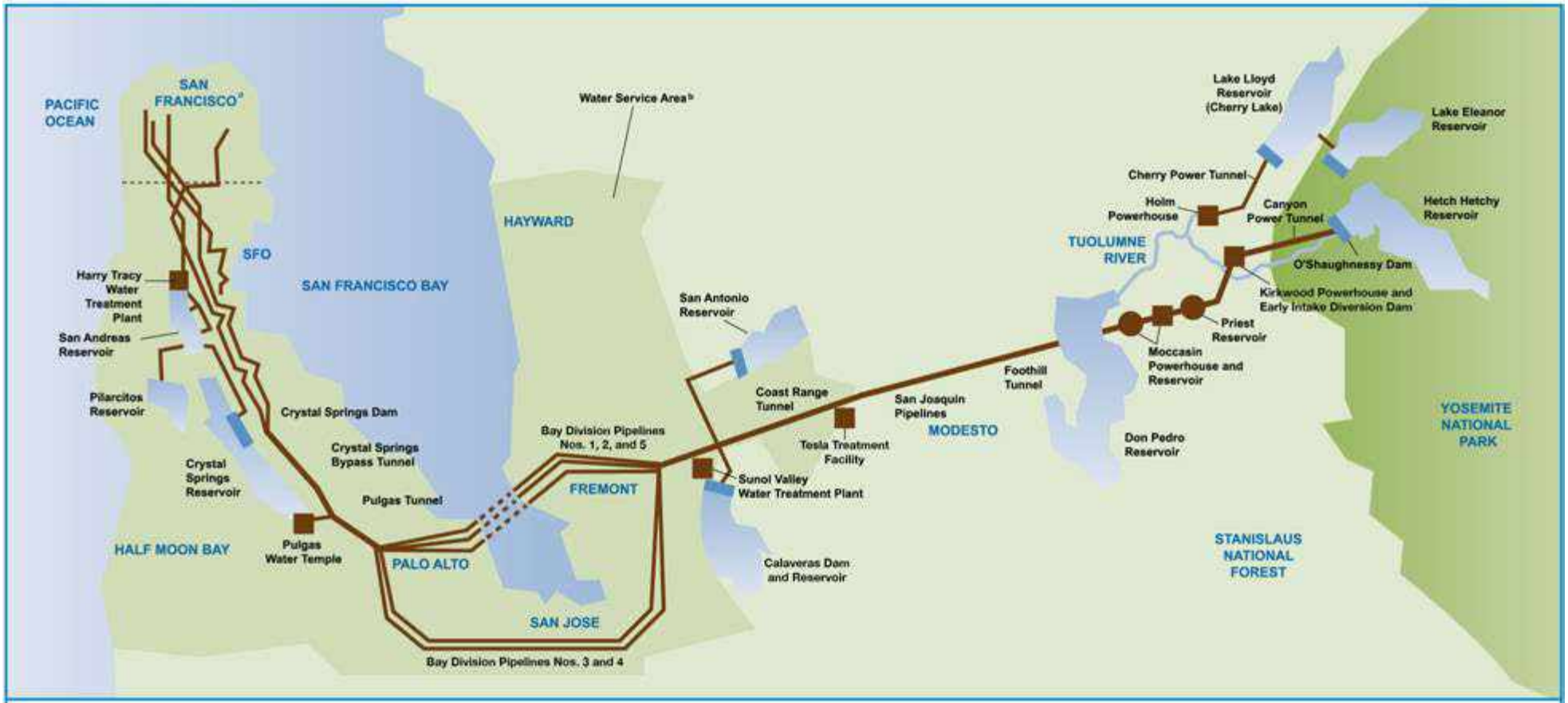
The RWS, shown in Figure 3-1, consists of more than 280 miles of pipelines, 60 miles of tunnels, 11 reservoirs, five pump stations, and two water treatment plants. It includes the Hetch Hetchy Project and the Bay Area water system facilities. The Hetch Hetchy Project is generally composed of the reservoirs, hydroelectric generation and transmission facilities, and water transmission facilities from the Hetch Hetchy Valley west to the Alameda East Portal of the Coast Range Tunnel in Sunol Valley. Water system components of the Hetch Hetchy Project are also referred to as the Hetch Hetchy System. The local Bay Area water system is comprised of two parts—the Alameda System and the Peninsula System—generally consisting of the facilities west of the Alameda East Portal of the Coast Range Tunnel, including the 63,000-acre Alameda and Peninsula watersheds, storage reservoirs, two water treatment plants, and the distribution system that delivers water to both retail and wholesale customers. The Hetch Hetchy, Alameda, and Peninsula Systems are described in more detail below.

- **Hetch Hetchy System:** In the Hetch Hetchy System, water is diverted from Hetch Hetchy Reservoir into a series of tunnels and aqueducts from the Sierra Nevada to the San Joaquin Pipelines that cross the San Joaquin Valley to the Coast Range Tunnel, which connects to the Alameda System at the Alameda East Portal. Hetch Hetchy System water is disinfected at the Tesla Treatment Facility.

- **Alameda System:** The Alameda System includes two reservoirs, San Antonio Reservoir and Calaveras Reservoir, which collect water from the San Antonio Creek, Upper Alameda Creek, and Arroyo Hondo watersheds in Alameda County. San Antonio Reservoir also receives water from the Hetch Hetchy System. Conveyance facilities in the Alameda System connect the Hetch Hetchy System and Alameda water sources to the Peninsula System. The BDPLs cross the South Bay to the Peninsula System delivering water to customers along the pipeline route. The Sunol Valley Water Treatment Plant (SVWTP) filters and disinfects water supplied from San Antonio Reservoir and Calaveras Reservoir.

- **Peninsula System:** The Peninsula System includes conveyance facilities connecting the BDPLs to the in-City distribution system and to other customers on the Peninsula. Two reservoirs, Crystal Springs Reservoir and San Andreas Reservoir, collect runoff from the San Mateo Creek watershed. Crystal Springs Reservoir also receives water from the Hetch Hetchy System. A third reservoir, Pilarcitos Reservoir, collects runoff from the Pilarcitos Creek watershed and directly serves one of the Wholesale Customers, the Coastside County Water District (which includes the City of Half Moon Bay), along with delivering water to Crystal Springs and San Andreas Reservoirs. The Harry Tracy Water Treatment Plant (HTWTP) filters and disinfects water supplied from Crystal Springs Reservoir and San Andreas Reservoir before it is delivered to customers on the Peninsula and the in-City distribution system.

Figure 3-1. Regional Water System



a Three pump stations on Treasure Island are not depicted.

b The water service area shown is approximate and for illustrative purposes only. For more accurate boundaries of the retail and wholesale service areas, see Figures 3-3 and 3-4, respectively.

3.1.2.2 In-City Distribution System

San Francisco's in-City distribution system (Public Water System No. CA3810011) was originally developed during the 100-year period between 1860 and 1960, reflecting the patterns and rates of growth in the City. Several major pipelines convey RWS supply from the Peninsula System to the City. Water to the eastside of the in-City distribution system is fed by two pipelines that terminate at University Mound Reservoir. Water to the westside of the in-City distribution is fed by two pipelines that terminate at Sunset Reservoir and one that terminates at Merced Manor Reservoir. As shown in Figure 3-1, the in-City distribution system also includes ten reservoirs and eight water tanks that store water supplied by the RWS. Seventeen pump stations[2] and approximately 1,250 miles of pipelines move water throughout the system and deliver water to homes and businesses in the City.

3.1.3 Water Treatment

The Hetch Hetchy Reservoir is the largest unfiltered water supply on the West Coast, and one of only a few large unfiltered municipal water supplies in the nation. The water originates from well-protected wilderness areas in Yosemite National Park, which flows down the Tuolumne River to Hetch Hetchy Reservoir. This water meets or exceeds all federal and State criteria for watershed protection. Water from Hetch Hetchy Reservoir is protected in pipes and tunnels as it is conveyed to the Bay Area, and requires pH adjustment to control pipeline corrosion and disinfection for bacteria control. Based on the SFPUC's disinfection treatment practice, extensive bacteriological quality monitoring, and high operational standards, the U.S. Environmental Protection Agency (USEPA) and the SWRCB Division of Drinking Water (DDW) determined that the Hetch Hetchy water source meets federal and State drinking water quality requirements without the need for filtration.

A new USEPA regulation took effect in 2012 requiring secondary disinfection for all unfiltered drinking water systems to control the waterborne parasite cryptosporidium. To comply with this regulation, the SFPUC completed construction of a new ultraviolet (UV) treatment facility in 2011. The Tesla Treatment Facility is a key component of the Water System Improvement Program (WSIP) and enhances the high-quality water from the RWS. The facility has a capacity of 315 mgd, making it the third largest UV drinking water disinfection facility in the U.S.

All water derived from sources other than Hetch Hetchy Reservoir is treated at one of two treatment plants: the SVWTP or the HTWTP. The SVWTP primarily treats water from the Alameda System reservoirs and has both a peak capacity and sustainable capacity of 160 mgd. Treatment processes include coagulation, flocculation, sedimentation, filtration, disinfection, fluoridation, corrosion control treatment, and chloramination. Fluoridation, chloramination, and corrosion control treatment can also be provided for the combined Hetch Hetchy System and SVWTP water at the Sunol Valley Chloramination Facility. The HTWTP treats water from the Peninsula System reservoirs and has a peak capacity of 180 mgd and a sustainable capacity of 140 mgd. Treatment processes include ozonation, coagulation, flocculation, filtration, disinfection, fluoridation, corrosion control treatment, and chloramination. Major upgrades to the SVWTP were completed in 2013 and to the HTWTP in 2015.

[2] This number of pump stations does not include three pump stations on Treasure Island, which are not operated by the SFPUC.

Figure 3-2. In-City Distribution System

3.1.4 Water Storage

The majority of the water delivered by the SFPUC is supplied by runoff from the upper Tuolumne River watershed on the western slope of the central Sierra Nevada. Three major reservoirs collect runoff: Hetch Hetchy Reservoir, Lake Lloyd (a.k.a., Cherry Lake), and Lake Eleanor. The storage capacity of these three reservoirs is included in Table 3-1. A "water bank" in Don Pedro Reservoir is also integrated into system operations.[3] Don Pedro Reservoir, which is jointly owned and operated by Modesto Irrigation District and Turlock Irrigation District (the Districts), is located on the Tuolumne River downstream of the Hetch Hetchy System.

As a by-product of water delivery and water supply management, hydroelectric power is generated by the Hetch Hetchy Water and Power System. Water stored in Hetch Hetchy Reservoir is used for hydroelectric generation and also satisfies instream flow requirements when released downstream. Normally, only Hetch Hetchy Reservoir water supplies are exported to the Bay Area, while releases from Lake Eleanor and Lake Lloyd are used to satisfy instream flow requirements, satisfy Raker Act entitlements to the Districts downstream, and produce hydroelectric power. The Hetch Hetchy Water and Power System includes three major hydroelectric powerhouses along the Tuolumne River—Holm, Kirkwood, and Moccasin—that have a collective generating capacity of nearly 400 megawatts.

Downstream of the Hetchy Hetchy System, the SFPUC utilizes local watersheds in the Bay Area. Crystal Springs, San Andreas, and Pilarcitos Reservoirs, located in San Mateo County, capture local runoff in the Peninsula watershed, and Calaveras and San Antonio Reservoirs, located in Alameda Country, capture local runoff in the Alameda watershed. In addition to capturing local runoff, San Andreas, San Antonio, and Crystal Springs Reservoirs also provide storage for water from the Hetch Hetchy System and, along with Calaveras Reservoir, are an important water supply in the event of an interruption to Hetch Hetchy System deliveries. The storage capacity of each of these Bay Area reservoirs is included in Table 3-1.

Calaveras Reservoir had been operating in recent years at one-third of its capacity due to restrictions imposed by the DWR Division of Safety of Dams (DSOD). The Calaveras Dam Replacement Project, which took place from 2011 to 2019, involved the construction of a new dam downstream of the existing dam. The SFPUC began impounding water behind the new dam in the winter of 2018/2019 and continued the initial fill of the reservoir during the 2019/2020 winter season.

The in-City reservoirs and tanks collectively have the capacity to hold approximately 413 MG of water. The SFPUC estimates this capacity to be a five-day supply at the current average water consumption rate for the City. In addition, there is an emergency supply of existing non-potable water immediately available within the City at Lake Merced. Lake Merced currently holds approximately 1.9 billion gallons of water.

Table 3-2 summarizes the storage capacity of in-City reservoirs and storage tanks, not including Lake Merced.

[3] The Turlock Irrigation District and Modesto Irrigation District (Districts) have senior water rights to the City for the Tuolumne River water and are provided the first increment of flow in the Upper Tuolumne River watershed according to the apportionment set forth in the Raker Act of 1913 (38 Stat. 242). The water bank at Don Pedro Reservoir provides a credit and debit system, which allows the City to divert water upstream while meeting its obligations to the Districts. Through this mechanism, the SFPUC may pre-deliver the Districts' entitlements and credit the water bank so that at other times the SFPUC may retain water upstream while the Districts debit the water bank.

Table 3-1. Regional Water System Storage Capacity

[Standardized Table: Not Applicable]

RWS Reservoir	Storage	
	Acre-Feet (AF)	Billions of Gallons (BG)
Up-Country[a]		
Hetch Hetchy	360,360	117.4
Lake Lloyd[b]	273,300	89.1
Lake Eleanor	27,100	8.8
Subtotal Up-Country	660,760	215.3
Local		
Calaveras (East Bay)[c]	96,800	31.5
San Antonio (East Bay)	50,500	16.5
Crystal Springs (Peninsula)[d]	69,300	22.6
San Andreas (Peninsula)	19,000	6.2
Pilarcitos (Peninsula)	3,100	1.0
Subtotal Local	238,700	77.8
Total RWS Storage[e]	899,460	293.1

a Three other regulating reservoirs are also part of the RWS: Early Intake, Priest, and Moccasin Reservoirs.

b Storage capacity shown includes flashboards, which are structures placed in a spillway to increase the capacity of a reservoir.

c Calaveras Reservoir was constructed with a storage capacity of 96,800 AF. Since December 2001, in response to safety concerns about the seismic stability of the dam and a directive from the Division of Safety of Dams (DSOD), the SFPUC held the maximum water level at approximately 37,800 AF (roughly 40% of its maximum capacity). The construction of a new replacement dam downstream was completed in 2019 to restore the dam's full storage capacity and the dam was continuing to be filled over the 2019/2020 winter season.

d Crystal Springs Reservoir has a maximum storage capacity of 22.6 BG (at 291.8 feet). Based on permit conditions, , the reservoir is currently operated at 287.8 feet (4 feet below capacity).

e This includes 63,700 AF in dead storage (i.e., the volume in a reservoir below the lowest controllable level). In addition, the SFPUC may draw against a credit of up to 570,000 AF in storage in a water bank account in Don Pedro Reservoir, for total storage for planning purposes of 1,469,460 AF.

Table 3-2. In-City Potable Water System Storage Capacity

[Standardized Table: Not Applicable]

In-City Reservoir	Storage	
	Acre-Feet (AF)	Millions of Gallons (MG)
Sunset	542	177
University Mound	432	141
Sutro	96	31
Summit	43	14
College Hill	41	13
Stanford Heights	40	13
Merced Manor	29	10
Lombard	8	3
Potrero	3	1
Hunters Point	3	1
Storage Tanks	29	9
Total In-City Storage	1,267[a]	413

a Rows above do not sum to total due to rounding.

3.1.5 Other Retail Water Systems

3.1.5.1 Groundwater and Recycled Water Systems

While the in-City distribution system is the primary system serving San Francisco retail customers, several customers also receive groundwater or recycled water. The San Francisco Recreation and Park Department (RPD) operates and maintains groundwater wells serving irrigation and other non-potable uses (e.g., lake filling, water exhibits) at Golden Gate Park, the San Francisco Zoo, and landscaped medians along the Great Highway. More information about this groundwater supply is provided in Section 6.2.1.1.

The City's golf courses at Harding Park (which includes Fleming Golf Course) and a portion of Sharp Park are provided recycled water for irrigation. Harding Park, an in-City retail customer, is served recycled water by the North San Mateo County Sanitation District (NSMCSD) in Daly City. Sharp Park, a suburban retail customer, is served recycled water by the North Coast County Water District (NCCWD) in Pacifica. The SFPUC neither owns nor operates either of these recycled water systems, except for a portion of the Harding Park recycled water transmission line that is within City limits, and an onsite 700,000-gallon underground storage tank and above-ground pump station at Harding Park. More information about these recycled water supplies is provided in Section 6.2.1.2.

3.1.5.2 Suburban Retail Water Systems

The SFPUC serves a number of retail customers outside the City. These customers are collectively referred to as suburban retail customers or customers in the suburban retail service area. These customers are generally located right off of RWS transmission pipelines and do not form one contiguous service area. More information about the suburban retail service area is provided in Section 3.2. However, there are two small water systems in unincorporated Alameda County that are operated by the SFPUC as permitted by the SWRCB DDW: the Castlewood Well System and the Town of Sunol domestic water system.

- **Castlewood Well System:** The SFPUC owns and operates the Pleasanton Well Field Water System[4] (Public Water System No. CA0110018; herein referred to as the Castlewood Well System), which in FY 2019-2020 supplied approximately 0.3 mgd of treated (potable) groundwater to the Castlewood County Service Area (CSA), a community comprised of the Castlewood Country Club and approximately 190 homes located in unincorporated Alameda County. The Castlewood community water system itself is owned and operated by the CSA and the California Water Service Company, respectively.

  The SFPUC serves the Castlewood CSA through one metered connection with groundwater pumped from the Castlewood Well System. This system consists of two wells, a 3,000-gallon control tank, and a 1.0-million gallon treated water reservoir. The supply is disinfected via sodium hypochlorite injection into the transmission main between the control tank and reservoir. Water quality is monitored weekly by the SFPUC.

- **Town of Sunol Domestic Water System:** The SFPUC owns and operates the domestic water system for the Town of Sunol (Public Water System No. CA0110012), which typically serves less than 0.1 mgd to approximately 120 metered and unmetered connections in unincorporated Alameda County. These connections are primarily residential customers and are supplied with potable water from the RWS. After RWS supply is fully treated, fluoridated, and chloraminated, the supply enters the Town of Sunol transmission pipeline downstream of Sunol Valley Mixing Manifold. The supply is then piped to a pump station at the SFPUC's Sunol Yard. The supply is pumped to two 130,000-gallon storage tanks. Water quality is overseen by the SFPUC.

[4] The Castlewood wells are the last remnant of Spring Valley's Pleasanton well system, which were last used to export water to San Francisco for 15 months in 1948-49.

3.2 RETAIL SERVICE AREA

Retail customers include the residents, businesses, and industries located within City limits, referred to as the in-City retail service area. Retail service is also provided to a patchwork of customers located outside the City, such as the Town of Sunol, San Francisco International Airport (SFO), Lawrence Livermore National Laboratory, and Castlewood CSA. These areas are not contiguous and are collectively referred to as the suburban retail service area. Both the in-City and suburban retail service areas are shown **in** Figure 3-2.

3.2.1 Climate

The San Francisco Bay Area as a whole has a Mediterranean climate. In the City and its vicinity, summers are cool and winters are mild with infrequent rainfall. Temperatures average 57 degrees Fahrenheit annually, ranging from the mid-40s in the winter to the upper 60s in the late summer. Strong onshore flow of wind in the summer keeps the air cool, generating fog through September. The warmest temperatures generally occur in September and October. Rainfall averages about 22 inches per year and is generally confined to the "wet" season from late October to early May.[5] Except for occasional light drizzles from thick marine stratus clouds, summers are nearly dry.

For a discussion of climate change and potential impacts, see Section 6.1.3.

[5] Average maximum and minimum temperatures and average monthly rainfall data obtained from Western Regional Climate Center, 1981-2010 data from two San Francisco monitoring stations (Mission Dolores/SF#047772 and Richmond/SF#047767). Accessed from: **www.wrcc.dri.edu**.

Figure 3-3. Retail Service Area

In-City Retail Service Area

1 City and County of San Francisco

Suburban Retail Service Area

2 Residential and Non-residential Customers in Daly City
3 Cemeteries in Colma
4 Golden Gate National Cemetery
5 San Francisco County Jail #5
6 Sharp Park Golf Course
7 San Francisco International Airport
8 SFPUC Millbrae Headquarters
9 Crystal Springs Golf Course
10 Penninsula Golf and Country Club
11 Residential Customers in Redwood City
12 Filoli Center
13 Menlo Country Club
14 NASA Ames Research Center
15 Cargill Salt
16 Residential and Non-residential Customers in Sunol
17 GE Hitachi Nuclear
18 Castlewood Country Club
19 Lawrence Livermore National Laboratory (two sites)

The suburban customers shown above represent the majority of water use in the suburban retail service area, but are not comprehensive. For the purposes of the 2020 UWMP, Groveland Community Services District is considered a retail customer in the context of the Water Supply Agreement and allocating Regional Water System supplies between retail and Wholesale Customers. Groveland is shown in Figure 3-4.

3.2.2 Population and Demographics

As shown in Table 3-3 the total population in the retail service area is currently estimated to be 897,806 and is projected to increase to nearly 1.3 million by 2045. Retail population projections are provided here; however, when future retail water demands are forecast, they are based on actual demand from existing households and new demand from projected housing growth rather than projected population growth. See Section 4.1 for further discussion of retail demand forecasting.

Table 3-3. Retail Service Area Population

[Standardized Table 3-1 Retail: Population - Current and Projected]

Retail Service Area	Actual	Projected				
	2020	2025	2030	2035	2040	2045
In-City Retail[a]	897,806	1,002,873	1,064,477	1,126,081	1,187,684	1,249.288
Suburban Retail[b]	1,926	1,926	1,926	1,926	1,926	1,926
Total Retail	899,732	1,004,799	1,066,403	1,128,007	1,189,610	1,251,214

a County of San Francisco population for January 1, 2020 obtained from the California Department of Finance Report E-5, released April 1, 2020. County of San Francisco population projections obtained from the San Francisco Planning Department consistent with their Housing Element 2022 Update.

b Actual and projected population based on the number of retail residential service connections in Redwood City, Daly City, Fremont, and Millbrae; the number of homes in Castlewood CSA; inmate population of the San Francisco County Jail #5 in San Bruno; Department of Water Resources (DWR) Population Tool for Town of Sunol; and 2000 and 2010 U.S. Census data. Methodology used to estimate population in the suburban retail service area was approved through pre-review with DWR and is detailed in Section 5.1. Population for Groveland CSD is not included as retail, but reported as wholesale in Table 3-4 instead.

The retail service area, particularly the in-City portion, is highly urbanized, dense, and experiencing infill development. Open space and landscaped areas are limited, as are lot sizes. Build-out is planned or already under construction at the few, large undeveloped or redevelopment areas that remain, such as Candlestick Point/Hunters Point Shipyard, Treasure Island/Yerba Buena Island, Mission Bay, and Pier 70. Most of these areas are located along the eastern shoreline of the City. The majority of current and planned development is comprised of mixed-use, multi-family residential, and commercial high-rise buildings.

Housing unit estimates for San Francisco are based on the Housing Element 2022 Update objective, which plans to add an average of 5,000 housing units per year, or an approximate growth in housing units of 1.3% per year. It is projected that the number of single family detached houses will not increase, and it is anticipated that nearly all of the new housing built in San Francisco will be multi-family buildings. Currently, the ratio of multi-family households to single family households in the City is approximately 2:1 (i.e., one third of total housing is single family). As new housing is built, the majority of which will be multi-family units, the ratio will increase to over 3:1 (i.e., one fourth of total housing is single family) by 2040.

Retail demand projections presented in this 2020 UWMP (Section 4.1) are based on housing projections provided by the San Francisco Planning Department for the in-City retail service area and employment forecasts from the Association of Bay Area Governments (ABAG). Additional information about demographic data sources and assumptions supporting the retail demand projections can be found in Appendix E.

3.3 WHOLESALE SERVICE AREA

The SFPUC sells water to 26 wholesale customers (collectively referred to as the Wholesale Customers) under the terms of a 25-year contract known as the Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County (WSA). The SFPUC also sells water to two additional wholesale customers, Cordilleras MWC and Groveland CSD. These customers are further described below:

- **Wholesale Customers and BAWSCA:** Enabled by Assembly Bill (AB) 2058, BAWSCA was established on May 27, 2003 to represent the interests of 24 cities and water districts, as well as two other utilities, in Alameda, Santa Clara, and San Mateo Counties that purchase water on a wholesale basis from the RWS. The SFPUC sells water to these Wholesale Customers under the terms of the WSA and the individual water sales contracts that each of the Wholesale Customers have with the SFPUC. Since 1970, the SFPUC has supplied approximately 65% of the total Wholesale Customers' demand. Some of the Wholesale Customers are entirely reliant on the SFPUC for their supply.

- **Cordilleras MWC:** Cordilleras MWC serves a community of 18 single family homes in Emerald Hills, located in unincorporated San Mateo County. It is not considered an urban water supplier as defined by CWC Section 10617. It is not a member of BAWSCA, and not subject to the terms of the WSA. However, Cordilleras MWC has a water supply contract with the SFPUC for 3,007 CCF annually (about 0.006 mgd).

- **Groveland CSD:** As described in Section 2.4, Groveland CSD primarily serves residential and commercial customers in Groveland, located in a semi-rural area of southern Tuolumne County. Although Groveland CSD is considered a retail customer of the SFPUC and is accounted as such in the SFPUC's contractual obligations and supply planning, the SFPUC was directed by DWR to report Groveland CSD as a wholesale customer for the 2015 UWMP and maintains this distinction in the 2020 UWMP update. Therefore, Groveland CSD is included in the wholesale service area for the remainder of this section. It is not a member of BAWSCA, and not subject to the terms of the WSA.

The wholesale service area encompassing the Wholesale Customers, Cordilleras MWC, and Groveland CSD is shown in Figure 3-4.

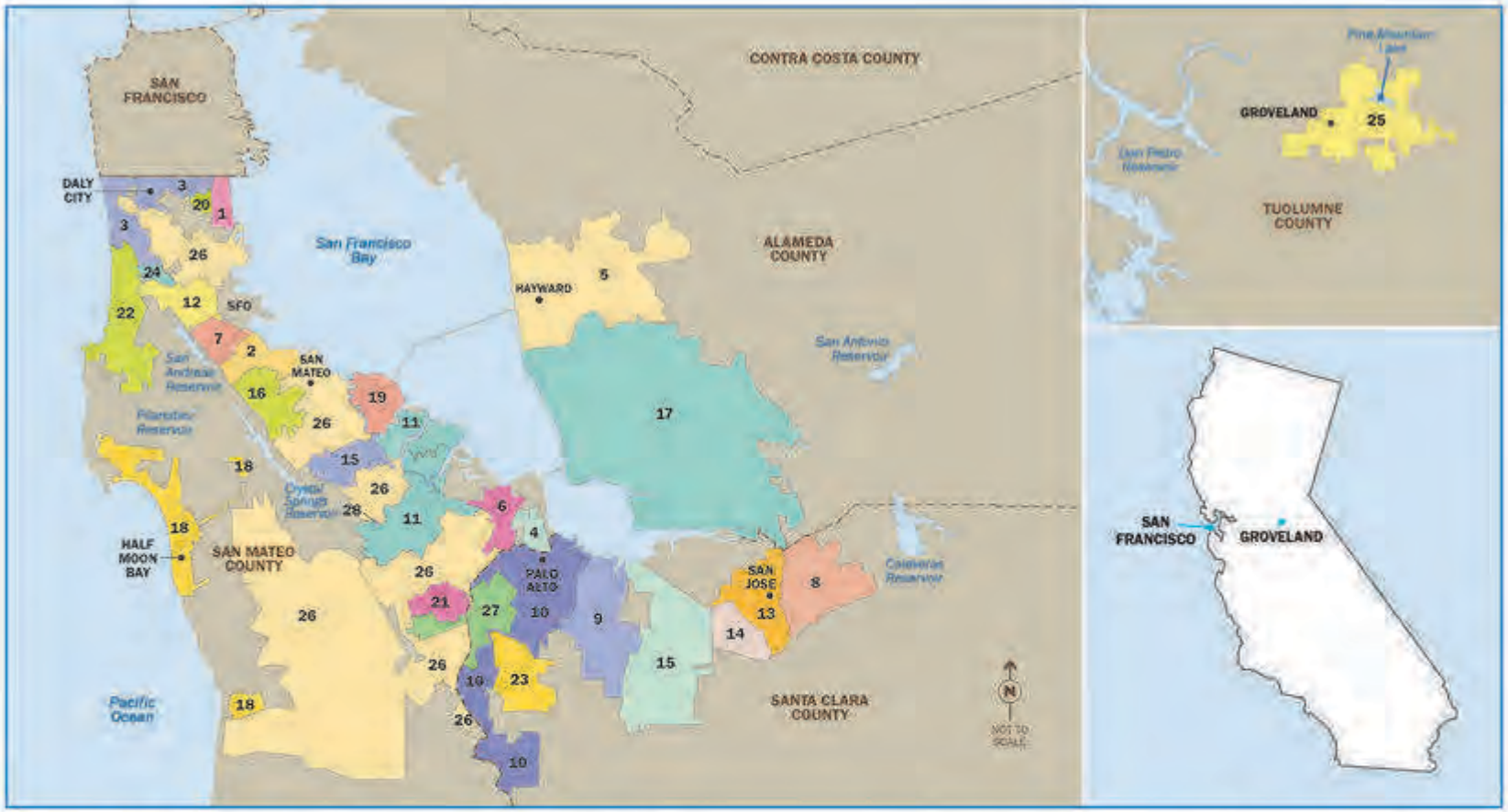
3.3.1 Climate

As described in Section 3.2.1 for the retail service area, the San Francisco Bay Area as a whole has a Mediterranean climate. Varied topography throughout the Bay Area creates numerous microclimates dependent upon elevation, proximity to the Bay or coast, orientation with respect to the ocean, and wind patterns. These microclimates also result in different rainfall amounts and evapotranspiration rates. However, in general, the Wholesale Customers and Cordilleras MWC experience a climate similar to the in-City retail service, except for customers located in the southern and inland regions that tend to experience warmer temperatures in the summer months with less incidence of fog.

Further inland in the Sierra Nevada foothills, Groveland CSD experiences hot, dry summers and mild winters. Most of Groveland CSD's service area is located at elevations of 2,800 to 3,300 feet, so is not subjected to the long, severe winters and heavy snowfall that are experienced at higher elevations above 5,000 feet.

For a discussion of climate change and potential impacts, see Section 6.1.3.

Figure 3-4. Wholesale Service



MUNICIPALITIES

1 City of Brisbane
2 City of Burlingame
3 City of Daly City
4 City of East Palo Alto
5 City of Hayward
6 City of Menlo Park
7 City of Millbrae
8 City of Milpitas
9 City of Mountain View
10 City of Palo Alto
11 City of Redwood City
12 City of San Bruno
13 City of San Jose[a]
14 City of Santa Clara[a]
15 City of Sunnyvale
16 Town of Hillsborough

WATER PURVEYING DISTRICTS

17 Alameda County Water District
18 Coastside County Water District
19 Estero Municipal Improvement District
20 Guadalupe Valley Municipal Improvement District
21 Mid-Peninsula Water District
22 North Coast County Water District
23 Purissima Hills Water District
24 Westborough Water District
25 Groveland Community Services District[b]

OTHER ENTITIES

26 California Water Service Company[c]
27 Stanford University
28 Cordilleras Mutual Water Company[d]

a The SFPUC provides water on an interruptible basis to fixed service areas in the northern portions of the Cities of San Jose and Santa Clara.

b Groveland Community Services District is not a member of BAWSCA. For the purposes of the 2020 UWMP, Groveland is considered a retail customer in the context of the Water Supply Agreement and allocating Regional Water System supplies between retail customers and Wholesale Customers. However, Groveland is accounted for as a wholesale customer in the standardized tables provided in **Appendix B**.

c California Water Service Company, an investor-owned utility, provides water service to four separate districts: Bear Gulch (Atherton vicinity), San Carlos/San Mateo, South San Francisco, and Skyline County Water District.

d Cordilleras Mutual Water Company is not a member of BAWSCA.

3.3.2 Population and Demographics

As shown in Table 3-4, the total population in the wholesale service area is currently estimated to be about 1.86 million and is projected to increase to over 2.4 million by 2045. This corresponds to an average growth rate of about 1.2% per year.

Compared to the retail service area, the majority of which is the City of San Francisco, the wholesale service area is less dense and populated, but still fairly urbanized and built out. Single family homes are more prevalent and lot sizes are larger.

Table 3-4. Wholesale Service Area Population

[Standardized Table 3-1 Wholesale: Population - Current and Projected]

Wholesale Service Area	Actual	Projected				
	2020	2025	2030	2035	2040	2045
BAWSCA Member Agencies[a]	1,858,392	1,941,725	2,032,304	2,187,849	2,311,562	2,438,515
Cordilleras MWC[b]	64	64	64	64	64	64
Groveland CSD[c]	3,027	3,065	3,104	3,143	3,182	3,222
Total Wholesale	1,861,483	1,944,854	2,035,472	2,191,056	2,314,808	2,441,801

a Data provided by BAWSCA and published in BAWSCA's Regional Water Demand and Conservation Projections Report, June 2020.

b Data provided by Cordilleras MWC.

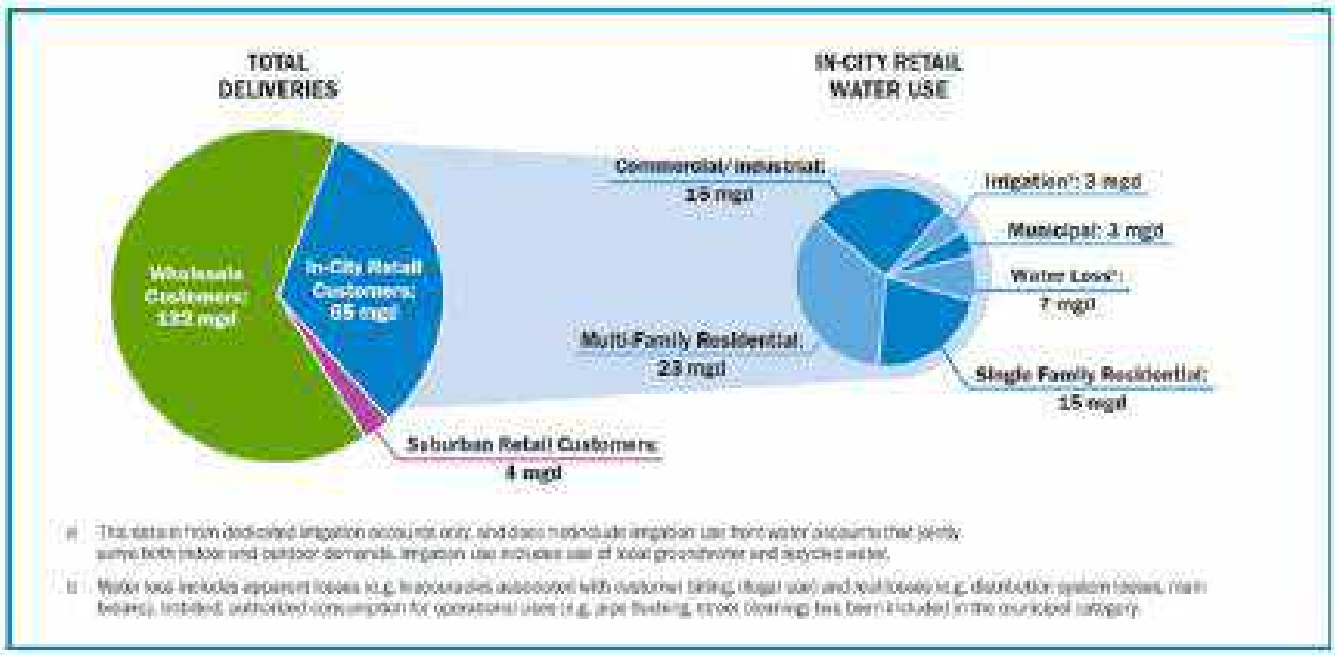
c Data provided by Groveland CSD (subject to change) and population projections are from Groveland CSD's 2015 UWMP and are according to a 0.25 percent annual growth rate estimate within the Groveland CSD service area through 2045.

SECTION 4: SYSTEM DEMANDS

This section describes and quantifies the current and projected water uses within the SFPUC's retail and wholesale service areas. Retail demand projections are based on recent demographic information and a detailed analysis of water use characteristics. Wholesale demand projections for RWS supplies were developed by the wholesale customers. Note that the terms "use," "demand," and "consumption" are used interchangeably. Additionally, water loss is included in total retail demands unless otherwise noted.

As described previously, approximately two thirds of the SFPUC's water supply is delivered to wholesale customers, and the remaining one third is delivered to retail customers. In 2020, the SFPUC delivered approximately 198 mgd of RWS supplies to its entire water service area, with an additional 2.3 mgd in local groundwater and recycled water provided to retail customers. Figure 4-1 shows the total volumes of water delivered to wholesale customers, in-City retail customers, and suburban retail customers. Approximate water use by sector in the in-City retail service area is also shown in Figure 4-1.

Figure 4-1. Total Deliveries and In-City Retail Water Use in 2020



Note that Groveland CSD is accounted for differently between this section of the 2020 UWMP and the corresponding standardized tables in Appendix B. This section includes Groveland CSD in the estimation of retail demands because, in the context of RWS supply allocations between the SFPUC and its Wholesale Customers, Groveland CSD is a retail customer. Where retail demands are subsequently compared to retail supplies in Section 8. Groveland CSD is accounted for in both the retail demand and retail supply projections. In contrast, the standardized tables in Appendix B include Groveland CSD in the estimation of wholesale demands, as directed by DWR and explained in Section 2.4.

4.1 RETAIL DEMANDS

4.1.1 Current Retail Demands

Water use within San Francisco (i.e., the in-City retail service area) continues to be among the lowest in the State and below historical consumption. Both total consumption and per capita water use (i.e., gallons of water consumed per person per day [GPCD]) have been on a general decline since the mid-1970s. Many factors have contributed to this reduction in water use, including significant changes to the mix of industrial and commercial businesses and their associated water demand, and the general characteristics of water use by San Franciscans. In particular, the severe droughts of 1976-77 and 1987-92, changes in plumbing codes, and conservation programs (either voluntarily embraced by residents and businesses or mandated by the City) have affected water demands. During the most recent drought in 2012 – 2016 per capita water use further declined.

As illustrated in Figure 4-2, per capita water use and deliveries for all retail customers (i.e., in-City and suburban) have declined over the past decade and have remained consistently low over the past five years. Figure 4-2 presents per capita water use on both a gross basis (i.e., water use by all sectors) and a residential basis (i.e., water use by the residential sector only). Currently, gross and residential per capita water use by in-City retail customers are 73 and 42 GPCD, respectively. Taking suburban retail customers into account, gross and residential per capita water use by all retail customers are 76 and 42 GPCD, respectively. These per capita rates are among the lowest in the State.

Since the summer of 2014, the SFPUC has reported total water production and residential per capita water use on a monthly basis to the SWRCB in compliance with its emergency conservation regulations. The SFPUC continued to report this data voluntarily to the SWRCB after the emergency conservation regulations adopted during the last drought ended. In April 2020, the SWRCB adopted a regulation making the monthly reporting permanent, and effective October 2020, it again became mandatory. The SFPUC monthly per capita rates have consistently been among the lowest reported by urban water suppliers in the State.

Figure 4-2. Trends in Retail Demands, Population, and Per Capita Use between 2005 and 2020

Total retail demand (including both in-City and suburban retail) in 2020 was 69 mgd, which is much lower than anticipated in the 2015 UWMP update. Of this demand, in-City retail customers used approximately 65.3 mgd (95% of total retail demand), of which 1.9 mgd was met with groundwater, 0.1 mgd was met with recycled water, and the remainder was met with RWS supplies. Suburban retail customers used approximately 3.7 mgd (5% of total retail demand), of which 0.3 mgd was met with groundwater and the remainder was met with RWS supplies. Total retail water loss, including both real and apparent losses, was estimated to be 7.18 mgd.

The SFPUC's retail demands are generally tracked and projected by each of the major sectors outlined below. Current retail demands for each of these sectors are shown alongside projected demands in Table 4-1.

- **Single Family Residential:** Single family households currently comprise approximately one third of the total households in the City, though this proportion is declining. This sector represents approximately 20% of total retail demand. Due to the Bay Area's moderate climate and high-density housing, especially in the City, residential water use is primarily indoors. Outdoor water use is estimated to be about 20% of single family residential use, on average.

- **Multi-Family Residential:** Multi-family households include apartments, condominiums, and townhouses. This sector comprises approximately two thirds of the total households in the City, and this proportion is increasing. This sector represents approximately 30% of total retail demand. Average outdoor water use is limited since outdoor space for many multi-family households are generally limited to patios and shared spaces, if any.

- **Non-residential:** This sector includes all sectors of water users not designated as residential and includes commercial, industrial, institutional, and municipal uses, as well as irrigation through dedicated meters. Non-residential water use represents approximately 40% of total retail demand.

- **Water Loss:** Water loss is defined as the difference between the quantity of water supplied to customers and the quantity of water actually consumed by customers. It is comprised of both apparent losses and real losses. Water loss typically represents less than 10% of total retail demand. For more information on water loss, see Section 4.1.3 and Appendix G.

One factor that impacted demands in FY 19-20 was the COVID-19 pandemic and the shelter in place order that was issued in March 2020. There was a shift in water demand as a result of people remaining at home and office building occupancy decreasing. As part of the retail demand forecasting, the impact of COVID-19 on water demand was estimated by sector. For the residential sectors, there was an estimated increase of 9% for the single-family and 6% for multi-family sectors. In the commercial and industrial sectors, the estimated change was a decrease of 40 - 57%. These changes may account for a lower level of retail demand than would otherwise have occurred.

4.1.2 Projected Retail Demands

4.1.2.1 Methodology Used to Project Retail Demands

Beginning in 2015, the SFPUC transitioned away from an end use-based model to an econometric model for demand forecasts. Econometric models incorporate socioeconomic factors to project demands and are able to capture a more complete demand picture. This demand forecasting methodology is becoming more prevalent among urban water utilities and managers. The demand forecasts shown in Table 4-1 below are comprised of the following components:

- **In-City Single Family, Multi-Family, and Commercial/Industrial Demands**: Econometric models are used to project the demands for these sectors. Detailed information about these models is provided in Appendix E.

- Active conservation savings are savings achieved through SFPUC conservation program activities, such as fixture incentives and leak alerts. The models explicitly incorporate active conservation savings. These savings were estimated by the SFPUC using an end-use-based water savings accounting model. This model is customized for the SFPUC from the Alliance for Water Efficiency Water Conservation Tracking Tool. Additional information about this customized model, referred to as the SFPUC Water Conservation Tracking Model, is provided in Appendix G.
- Passive conservation savings are savings that are achieved through natural fixture replacement and tightening of the plumbing code over time. In an effort to avoid double-counting of passive conservation savings, the passive savings estimated by the SFPUC Water Conservation Tracking Model were not subtracted from the modeled demands. It is assumed that some passive savings are accounted for in the response of demands to changes in water rates, e.g., when water rates increase, people may respond by replacing inefficient fixtures to reduce water consumption. Single family, multi-family, and commercial and industrial sectors all show a strong relationship between increasing water rates and decreasing water demands. Although all passive savings may not be accounted for in this rates impact, subtracting passive savings that were estimated separately would likely result in a double counting of conservation savings. For an estimate of both the passive and active conservation savings, refer to SFPUC's Retail Water Conservation Plan[6].
- The models incorporate savings from onsite water reuse. These savings were estimated by SFPUC staff. Additional information about this estimate can be found in Section 4.1.4.

- **Other in-City Non-Residential Retail Demands (i.e., irrigation and municipal) and Suburban Retail Demands**: These demands are estimated based on historical consumption and supplement the demands projected by the econometric models described above. These demands are assumed to be constant through 2040 since no significant growth is anticipated among these sectors.

- **Water Loss**: Water loss is forecasted separately and is described in Section 4.1.3.

A key new aspect of the retail demand projections in this 2020 UWMP update is that the econometric models were calibrated using 10 years (2010-2020) of historical San Francisco account-level water usage data. This data was combined with property characteristics, demographic characteristics, and historical climate data to create an econometric model that evaluates the impact of several factors on household-level demands. Demands are then projected based on the growth assumptions discussed below, along with expected future changes in rates and climate.

The new set of models relies on household and employment forecasts provided by the San Francisco Planning Department. The Planning Department is currently updating the city's General Plan Housing Element (Housing Element 2022 Update). The housing element update is required to be adopted by the city and submitted to the state Department of Housing and Community Development by January 2023. One of the primary goals of the Housing Element 2022 Update is to improve housing affordability by increasing the rate of housing production compared with the past several decades. The housing projections are based on the Housing Element 2022 Update objective of producing an average of 5,000 housing units per year with adjustments for certain large development plans. The employment forecasts are from the Planning Department's Land Use Allocation (LUA) 2017, which is a City-specific refinement of ABAG's growth forecasts, ABAG Projections 2017, which reflect the growth that is assumed in ABAG's Plan Bay Area and Sustainable Communities Strategy Jobs-Housing Connections Scenario.

[6] The Retail Water Conservation Plan provides an overview of the retail water conservation program, the factors that shaped the program, estimated water savings, and the program's effect on the overall retail water demand forecast. The Conservation Plan is a key element of the SFPUC's water supply management and planning, and is updated every five years to coincide with each UWMP update. The Conservation Plan may be accessed online at **https://sfpuc.org/learning/conserve-water**.

In the 2015 UWMP's demand projections, commercial and industrial demands were aggregated and based only on total employment, not sector-specific characteristics. In the updated models for this 2020 UWMP, the commercial and industrial sector model accounts for employment distributed across a variety of sectors, such as office/professional, manufacturing, health, and education.

The demand forecasts for the three sectors modeled with an econometric model (single family, multi-family, and commercial/industrial) were grown from a normalized base year, i.e. the FY19-20 demands were normalized to represent an average year. The impacts of the COVID-19 pandemic were removed, and the demands were adjusted to reflect average temperature conditions. Normalizing the base year for demand forecasting removes the impact of idiosyncrasies that make any given year different from the average year, rather than assuming that these idiosyncrasies will continue in all future years.

Separately, Groveland CSD prepared its own demand projections for use in its 2020 UWMP update. The projected demands were estimated by multiplying projected population by the 2020 target daily per capita water use (107 GPCD) as reported in Groveland CSD's 2015 UWMP. Groveland CSD provided these projections to the SFPUC to report as part of the SFPUC's wholesale demands in the standardized tables of this 2020 UWMP update (see Appendix B). However, in the body of this 2020 UWMP, Groveland CSD's demands are included in retail demands. These demand projections are subject to change as part of Groveland CSD's UWMP process.

4.1.2.2 Retail Demand Projections by Sector

Table 4-1 presents the updated retail demand projections by sector for 2025 through 2045. The updated projections result in a total retail demand of 77.5 mgd in 2040, which is 12.9 mgd lower than the corresponding projection in the 2015 UWMP. (The 2015 UWMP did not include projections for 2045.)

Table 4-1. Retail Demands (mgd)

[Standardized Table 4-1 Retail: Demands for Potable and Raw Water - Actual]
[Standardized Table 4-2 Retail: Demands for Potable and Raw Water - Projected]
[Standardized Table 4-3 Retail: Total Water Demands]
[Standardized Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area]

Retail Sector or Use Type	Actual[a]	Projected[b]				
	2020	2025	2030	2035	2040	2045
In-City Retail						
Single Family Residential	14.5	13.7	13.5	13.4	13.5	13.5
Multi-Family Residential	*22.9*	*23.7*	*25.6*	*27.9*	*30.3*	*33.0*
Non-residential	20.9	22.9	22.9	22.8	23.1	23.6
Water Loss[c]	7.2	6.0	6.0	6.0	6.0	6.0
Subtotal In-City Retail Demand	65.3	66.3	68.0	70.0	72.9	76.2
Suburban Retail						
Single Family Residential[d]	0.1	0.1	0.1	0.1	0.1	0.1
Non-residential	3.1	4	4	4	4	4
Groveland CSD[e]	0.3	0.3	0.3	0.3	0.3	0.3
Water Loss[c]	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal Suburban Retail Demand	3.5	4.4	4.4	4.4	4.4	4.4
Total Retail Demand	**68.8**	**70.7**	**72.4**	**74.5**	**77.4**	**80.6**

a Actual consumption data are obtained from customer billing data.

b Single family residential and multi-family residential demand projections are from an econometric model developed for the SFPUC. Non-residential demands include commercial/industrial demands, which are also from an econometric model, as well as municipal and irrigation demands, which are assumed to remain constant at the previous five-year average level.

c Water losses include both apparent and real losses. Suburban retail water losses are considered to be negligible. Estimate of actual water loss in 2020 is based on a draft audit under review as of the publication of this 2020 UWMP.

d Suburban retail residential demands are for single family only as no multi-family residential buildings are served.

e Groveland CSD is accounted for as a retail customer for the purpose of this table and subsequent retail supply and demand comparisons. Demand projections were provided by Groveland CSD based on its population projections and assumed per capita water use of 107 GPCD (projections are subject to change as part of its UWMP process). In the corresponding standardized tables in Appendix B, Groveland CSD is not reported as retail, but rather wholesale.

Demand is forecasted to increase steadily through 2045, with more rapid growth happening in the later years of the projection period. After accounting for the projected conservation savings, the total retail demand (excluding water loss) is projected to increase by about 21%, from 61.6 mgd in 2020 to 74.6 mgd in 2045. Although population and total retail water demand are projected to increase, gross and residential per capita water usage are both forecasted to decrease (see Figure 4-3).

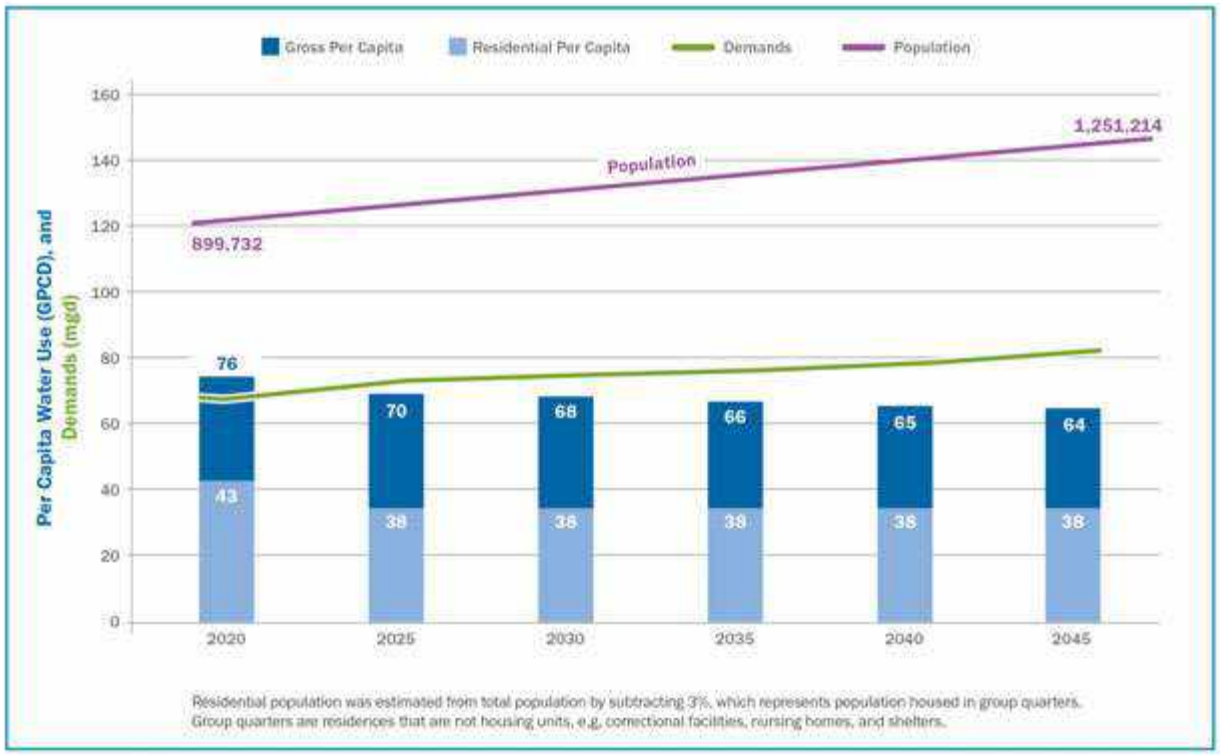
Both the projected demands and conservation savings are conservative as unanticipated new building codes, standards, and programs that increase water efficiency and reduce water use will likely be implemented. A closer analysis of the estimated conservation savings is provided in the Retail Water Conservation Plan. Sector-specific observations are summarized below:

- **Single Family Residential:** Single family residential water use is projected to decrease by 7% between 2020 and 2045. Unlike the 2015 UWMP, the 2020 demand forecasts assume that no new single family homes will be constructed in the retail service area over the planning horizon. In-City single family residential demands are modeled as a function of socioeconomic factors that include water price, precipitation, and temperature. Single

family per household usage is expected to decline as a result of conservation savings and responses to rate increases.

- **Multi-Family Residential:** Multi-family residential water use is projected to increase by 44% between 2020 and 2045. In-City multi-family residential demands are modeled as a function of the price of water, temperature, and precipitation. Compared to single family residential demands, multi-family residential demands are more responsive to price, but less responsive to increases in temperature or decreases in precipitation. Multi-family households have relatively little outdoor water use.
- **Non-residential:** Non-residential water use is projected to increase by 13% between 2020 and 2045. While the growth in in-City non-residential demands is directly related to the growth in employment, commercial and industrial water demands also reflect socioeconomic factors including price, precipitation, and temperature. As the price of water increases, the amount of water consumed per employee decreases.
- **Water Loss:** Water loss is projected to be a constant 6.0 mgd between 2020 and 2045 for planning purposes. More information on water loss projections is provided in the next section.

Figure 4-3. Projected Retail Demands, Population, and Per Capita Water Use.



4.1.3 Retail Distribution System Water Losses

Water loss is defined as the difference between the quantity of water supplied to customers and the quantity of water actually consumed by customers or other authorized uses. It is comprised of (1) apparent losses, which include inaccuracies associated with customer metering, estimated systematic data handling errors, and theft or illegal use; and (2) real losses, which include all water physically lost due to distribution system leaks, breaks, or overflows. In short, real losses are equivalent to distribution system water losses. Water loss in the retail service area ranges from 5 to 7 mgd annually, which is typically less than 10% of total retail demand.

The SFPUC has conducted water loss audits of its retail water system in accordance with the methods in AWWA's Manual of Water Supply Practices - M36, "Water Audits and Loss Control Programs" and Free Water Audit Software, pursuant to section 10608.34 of the Water Code. The water loss audits were validated following the California Water Code of Regulations and submitted annually to DWR. The results of the water loss audits from the past five years are reported in Table 4-2; these include both apparent and real losses, as calculated in the AWWA worksheet. Water loss in FY19 audit, water loss in FY 2019-20 was determined to be 7.18 mgd, of which 6.0 mgd was attributed to real losses. The AWWA worksheet is provided in Appendix G.

Table 4-2: Retail Annual Water Losses over the Past Five Years

Submittal Table 4-4 Retail: 12 Month Water Loss Audit Reporting

Reporting Period Start Date (mm/yyyy)	Volume of Water loss (MG/yr)
07/2015	2,200.13
07/2016	1,899.82
07/2017	2,199.14
07/2018	2,253.01
07/2019	2,628.01

For planning purposes, the SFPUC projects total water loss in its in-City retail service area to be a flat 6.0 mgd through 2045. This estimate reflects, among other things, the anticipation of leaks and breaks due to aging infrastructure, continuance of system flushing as necessary, and active management of losses (described below). Because apparent losses are not projected separately, the SFPUC's total projection for in-City water loss is a conservative estimate and reported as such in this 2020 UWMP.

Nearly all of the SFPUC's suburban retail customers are located immediately off of RWS transmission pipelines. Therefore, real losses in the suburban retail service area are assumed to be negligible and reported as such in this 2020 UWMP. As described in Section 3.1.5.2, the SFPUC operates the Castlewood Well System and the Town of Sunol domestic water system. However, the extent of distribution in the Castlewood Well System is limited from the well field to the control tank and reservoir; the system is not connected to the RWS. There is no master meter to the Town of Sunol, so loss in the Town of Sunol system cannot be directly measured. The primary source of water loss in the Town of Sunol is system maintenance flushing, which would occur regularly at a rate of 10,000 gallons per week for 50 weeks per year, or roughly 0.001 mgd (1.5 AF). These losses in the suburban retail service area are considered to be negligible.

The SFPUC manages real losses through its Automated Water Meter Program and Linear Assets Management Program. Deployment of the Automated Water Meter Program began in the spring of 2010 to upgrade all in-City retail water meters with wireless advanced metering technology. By 2013, 96% of meters were converted to Advanced Metering Infrastructure (AMI), and by 2020, 99.5% have been converted. The Linear Assets Management Program replaces and renews distribution system pipelines and customer service connections for approximately 1,250 miles of drinking water mains in the City. More information about management of retail system losses is provided in Section 10.2.5.

4.1.4 Onsite Water Reuse Water Savings

This 2020 UWMP update accounts for the water supply savings from buildings that install and operate onsite water reuse systems as a type of conservation savings. The water supplies produced by these systems are not municipally-supplied by the SFPUC, and they serve to reduce demands on SFPUC's system.

In September 2012, the City adopted the Onsite Water Reuse for Commercial, Multi-family, and Mixed Use Development Ordinance (Ordinance 195-12[7]). Commonly known as the Non-potable Water Ordinance, this ordinance added Article 12C to the San Francisco Health Code, allowing for the collection, treatment, and use of alternate water sources for non-potable applications. The ordinance also established the Non-potable Water Program, since re-named the Onsite Water Reuse Program, which provides grant funding for projects meeting specific eligibility criteria.

In October 2013, the ordinance was amended to allow district-scale water systems consisting of two or more buildings sharing non-potable water. Article 12C was further amended in July 2015 to mandate the installation of onsite water systems in new developments meeting specified criteria. Beginning November 1, 2015, all new development projects of 250,000 square feet or more of gross floor area located within the boundaries of San Francisco's designated recycled water use areas, as defined by the Recycled Water Ordinance, must install onsite water systems to treat and reuse available alternate water sources for toilet and urinal flushing and irrigation. This requirement expanded to the entire City the following year, on November 1, 2016. While not required to install an onsite water system under Article 12C, developments between 40,000 and 250,000 square feet of gross floor area must submit a water budget application and accompanying Water Use Calculator to the SFPUC. Additional guidelines and rules were published in 2017 for development projects implementing district-scale non-potable water systems.

Onsite water systems are operated, maintained, and monitored by the property owner. Under the Onsite Water Reuse Program, the San Francisco Department of Public Health-Environmental Health (SFDPH-EH) has established ongoing monitoring requirements and water quality standards that are protective of public health. Different treatment levels are required depending on the alternate water source and end use. The frequency of monitoring and reporting also vary depending on the alternate water source, and they are identified in the SFDPH's *Director's Rules and Regulations Regarding the Operation of Alternate Water Source Systems* and the operating permit for the onsite water system issued by the SFDPH-EH.

In addition to projects that install mandatory onsite water reuse systems in accordance with the Non-Potable Ordinance, there are several projects that have voluntarily implemented onsite reuse. Some of these have received grants from the SFPUC. The SFPUC also offers grant funding to breweries to collect, treat, and reuse process water (e.g. water used in the brewing process for applications such as rinsing bottles and cleaning equipment) generated onsite. The grant program includes water quality, treatment, and monitoring standards for brewery process water reuse systems.

The SFPUC received 21 water budget applications to install onsite water systems in FY 2019-2020, with a total of 119 water budget applications reviewed by the SFPUC since the beginning of the Onsite Water Reuse Program. SFPUC staff also maintain a database of future projects that have not yet submitted water budget applications, but will have to comply with the Non-Potable Water Ordinance based on their proposed gross square footage. Using existing water budget applications and the assumptions in the SFPUC's Water Use Calculator, staff have estimated the future potable offsets that will be achieved by all known onsite water reuse projects, as shown in Table 4-2. Note that this is a conservative estimate of future savings because it does not include savings from future unknown projects that are assumed in the demand forecasts; as these projects do not yet exist, no information about them is available to estimate the offsets from their potential onsite water reuse systems.

It is estimated that the Onsite Water Reuse Program (both mandatory and voluntary projects) will generate a total potable water offset of approximately 1.3 mgd by 2040, which will be sustained through 2045.

[7] San Francisco Health Code, Article 12C, Sections 850-861. Note that this ordinance was amended in October 2013 by Ordinance 208-13 to allow district-scale water systems, and in July 2015 by Ordinance 109-15 to mandate installation of onsite water systems in new development meeting specified criteria.

Table 4-2. Onsite Water Reuse Program Potable Offsets (mgd)

	Actual[a]	Projected[b]				
	2020	2025	2030	2035	2040	2045
Onsite Water Reuse Savings	0.1	0.3	0.5	0.9	1.3	1.3

a Actual onsite water reuse potable offsets are obtained from existing onsite water reuse projects water budget applications.

b Projected potable offsets are based on water budget applications submitted to the SFPUC, as well as assumptions about future projects that have not yet submitted water budget applications but are known to need to comply with the Non-Potable Water Ordinance.

4.1.5 Demands of Lower Income Households

The Act requires water suppliers to separately estimate future demands for lower income households (i.e., those with less than 80% of the area median income). This section documents the SFPUC's best effort to do so. However, please note that the SFPUC does not use this estimate for any planning purposes. The demands of lower income households are included in the demand projections presented about in Table 4-1.

Projected water use by lower income households is estimated by multiplying the planned future housing units for lower income residents by the estimated per household water use. This analysis, detailed below, is only performed for the in-City retail service area as lower income demands are primarily located in the City.

As described above, the demand projections presented here are based on housing growth projections from the 2022 update to the Housing Element of the San Francisco General Plan. The assumption used in the Housing Element is that 33% of future housing growth will be in lower income housing. Projected household growth between 2020 and 2025 is 25,805 new multi-family units. Based on the Housing Element's assumptions, that translates to 8,516 lower income households.

Based on the multi-family sector model (for additional information, see Appendix E), per household water use for future multi-family households is projected to be 78.7 gallons per household per day in 2025 (at an assumed occupancy rate of 2.3 persons per household, this translates to a per capita rate of about 34 gpcd). At this rate of household use, the demand in 2025 from 8,516 new lower income housing units will be an estimated 0.7 mgd.

This estimate of lower income water demand is reflected in the retail demand projections presented in Table 4-1. Lower income housing growth and demands have always been included in the SFPUC's retail demand projections and, subsequently, its related planning efforts.

4.2 WHOLESALE DEMANDS

As noted above and discussed in further detail below, the SFPUC sells water to 26 wholesale customers (collectively referred to as the Wholesale Customers) under the terms of a 25-year contract known as the Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County (WSA) and associated individual water sales contracts with each Wholesale Customer. Collectively, the Wholesale Customers receive over two thirds of the SFPUC's supply. Of the 26 Wholesale Customers, 10 rely on the SFPUC for 100% of their total supply. The remaining 16 Wholesale Customers rely on the SFPUC for a portion of their supply, but also use other local and imported supplies to meet their water customers' needs, including, but not limited to local groundwater and surface water, and purchases from the Santa Clara Valley Water District and the State Water Project.

In addition to the 26 Wholesale Customers, the SFPUC also provides water on a wholesale basis to Cordilleras MWC in San Mateo County and Groveland CSD in Tuolumne County. Cordilleras MWC relies entirely on the SFPUC for its supply, and

Groveland CSD relies on the SFPUC for the majority of its supply. The demands of these two additional wholesale customers are small compared to the collective demands of the other Wholesale Customers.

4.2.1 Wholesale Water Contractual Obligations

The following section describes the water supply contracts that the SFPUC has with the Wholesale Customers.

4.2.1.1 Water Supply Agreement and Individual Water Sales Contracts

The WSA became effective on July 1, 2009, as its predecessor agreement, the 1984 Settlement Agreement and Master Water Sales Contract between the SFPUC and the Wholesale Customers (1984 Agreement), expired. The WSA, as amended and restated in December 2018, describes the current contractual relationship between the SFPUC and the Wholesale Customers.

The WSA carries forward many components of the 1984 Agreement, including the SFPUC's "Supply Assurance" of 184 mgd to the Wholesale Customers. The SFPUC has agreed to deliver water to the Wholesale Customers up to the amount of the Supply Assurance, and this agreement is perpetual and survives the expiration of the WSA. The Supply Assurance is, however, subject to reduction due to water shortage, drought, scheduled RWS maintenance activities, and emergencies.

The Supply Assurance is shared among 24 of the 26 Wholesale Customers (all Wholesale Customers, except the Cities of San Jose and Santa Clara, as discussed in Section 4.2.1.2 below). Twenty-three of these 24 Wholesale Customers have an "Individual Supply Guarantee" (ISG), which represents their dedicated individual share of the 184 mgd Supply Assurance. The ISGs are also perpetual and survive the expiration of the WSA. The City of Hayward is the 24th Wholesale Customer, and it does not have an ISG due to the terms of its 1962 individual water supply contract with the SFPUC that did not contain a fixed allocation of water. The City of Hayward's unspecified water supply allocation is included in the Supply Assurance as the difference between 184 mgd and the sum of the other 23 Wholesale Customers' ISGs. In the event that Hayward's water use exceeds its unspecified water supply allocation, the 23 Wholesale Customers with ISGs would be required to reduce their individual ISGs to accommodate the demands of Hayward.

Each of the 26 Wholesale Customers also has an individual water sales contract with the SFPUC that describes the service area of the customer, identifies the location and size of service connections between the RWS and the customer's distribution systems, and in some instances contain additional specific provisions unique to the particular customer. The individual water sales contracts may be amended from time to time by the SFPUC and the applicable Wholesale Customers pursuant to the terms of the WSA.

4.2.1.2 Interruptible Customers

As noted above, the Cities of San Jose and Santa Clara are not included in the Supply Assurance, and they do not have an ISG, because the SFPUC has provided water to them on a temporary and interruptible basis under the 1984 Agreement and the WSA. While the SFPUC has never interrupted water supply to San Jose and Santa Clara, the WSA allows the SFPUC to issue a conditional notice of termination of supply if sufficient long-term water supplies from the RWS are not available. The SFPUC has committed to making a decision by 2028 about whether or not to make San Jose and Santa Clara permanent customers of the RWS. Additional discussion about the San Jose and Santa Clara and the 2028 decision can be found in Section 7.3.3.

4.2.2 Wholesale Demands

Wholesale demands reached a historic low during the most recent drought and have increased slightly since the end of the drought. As shown in Table 4-3, RWS supplies purchased by the SFPUC's wholesale customers in 2020 totaled 132.1 mgd.

In 2020, BAWSCA updated the demand projections of its member agencies (26 of the SFPUC's 28 wholesale customers) using a combination of two different models: (1) an econometric (or statistical) model developed for each member agency and (2) the Demand Side Management Least Cost Planning Decision Support System (a.k.a., DSS Model). BAWSCA's population projections for its member agencies are based on each member agency's population projections, ABAG Plan Bay Area 2040 data, California Department of Finance, the U.S. Census, and agency planning documents. The forecast methodology and resulting projections are documented in BAWSCA's 2020 report titled "Regional Water Demand and Conservation Projections," and they support BAWSCA's Long-Term Reliable Water Supply Strategy (Strategy). The Strategy's projections indicate that demands by the Wholesale Customers for RWS supplies through 2045 will be significantly less than anticipated at the time the Phased WSIP was adopted in 2008. BAWSCA's member agencies that are urban water suppliers preparing an individual 2020 UWMP are in some cases using the projections developed for the Strategy, and in other cases using their own set of projections. Table 4-3 provides each Wholesale Customer's projected purchase requests for RWS supplies through 2045 provided to the SFPUC by BAWSCA.

Given the SFPUC's Supply Assurance to the Wholesale Customers described above, this 2020 UWMP also presents the wholesale demands based on contract obligations in Table 4-4.

Regarding the SFPUC's two additional wholesale customers, the demand projections for Cordilleras MWC shown in Table 4-3 are based on the SFPUC's knowledge of the small, residential-only service area for that customer where no growth is anticipated. As noted earlier, the demand projections for Groveland CSD are presented as part of retail demands in Table 4-1 in the body of this 2020 UWMP, but as part of wholesale demands in the corresponding standardized tables in Appendix B.

4.3 CLIMATE CHANGE IMPACTS TO DEMAND

The retail demand modeling included a sensitivity analysis that modeled a range of future temperature and precipitation conditions. The baseline assumptions for temperature and precipitation were an increase in average temperature of 1.1ºC by 2045 and no change in average annual precipitation. The two other scenarios considered were a "hot and dry" scenario, which assumed a 1.7ºC increase in temperature and an 8.3% decline in precipitation by 2045 relative to 2020; and a "wet and slower warming" scenario where average temperature increased by 0.5 ºC and precipitation increased by 8.3% by 2045 relative to 2020. The demand forecasts for these three scenarios were not significantly different. For example, in the single-family sector model—where we might expect the biggest impact due to more outdoor water use—the unadjusted per-unit demand forecast (i.e. the forecast before being adjusted for conservation savings) in 2045 under the baseline conditions is 109.9 gallons per day (gpd). In the "hot and dry" scenario, the per-unit forecast in 2045 is 110.3 gpd, and in the "wet and slower warming" scenario it is 109.8 gpd. The impacts in the multi-family and commercial and industrial sector models are similarly small (see Appendix E for additional information).

The fact that the SFPUC's projected retail demands are not significantly impacted by future changes in temperature and precipitation as described above is likely primarily due to the fact that irrigation demands in the SFPUC's retail service area are relatively low due to the dense urban environment, especially in the City. Therefore, the potential increase in irrigation demand as a result of increased temperature or decreased precipitation is low.

Table 4-3. Wholesale Purchase Requests (mgd)

[Standardized Table 4-1 Wholesale: Demands for Potable and Raw Water - Actual]

[Standardized Table 4-2 Wholesale: Demands for Potable and Raw Water - Projected]

[Standardized Table 4-3 Wholesale: Total Water Demands]

Wholesale Customer	ISG[a]	Actual 2020 Purchases[b]	Purchase Request[c]				
			2025	2030	2035	2040	2045
Alameda County Water District	13.76	7.76	7.68	7.68	7.68	7.68	9.11
City of Brisbane / Guadalupe Valley Municipal Improvement District[d]	0.98	0.63	0.89	0.89	0.88	0.89	0.89
City of Burlingame	5.23	3.48	4.33	4.40	4.47	4.58	4.69
California Water Service Company	35.68	29.02	29.99	29.74	29.81	30.27	30.70
Coastside County Water District	2.18	0.88	1.40	1.38	1.36	1.33	1.33
City of Daly City	4.29	3.92	3.57	3.52	3.49	3.46	3.43
City of East Palo Alto	1.96	1.57	1.88	1.95	2.10	2.49	2.89
Estero Municipal Improvement District	5.90	4.34	4.07	4.11	4.18	4.23	4.38
City of Hayward	22.08	14.20	17.86	18.68	19.75	20.82	22.14
Town of Hillsborough	4.09	2.57	3.26	3.25	3.26	3.26	2.26
City of Menlo Park	4.46	2.82	3.55	3.68	3.87	4.06	4.29
Mid-Peninsula Water District	3.89	2.66	2.86	2.84	2.88	2.89	2.93
City of Millbrae	3.15	1.90	2.29	2.50	2.45	2.82	3.20
City of Milpitas	9.23	6.06	6.59	6.75	7.03	7.27	7.53
City of Mountain View	13.46	7.60	8.60	8.90	9.20	9.51	9.93
North Coast County Water District	3.84	2.28	2.34	2.33	2.34	2.34	2.34
City of Palo Alto	17.08	9.75	10.06	10.15	10.28	10.51	10.79
Purissima Hills Water District	1.63	1.71	2.09	2.09	2.12	2.13	2.15
City of Redwood City	10.93	8.75	8.46	8.49	8.64	8.74	8.90
City of San Bruno	3.25	0.96	3.24	3.22	3.20	3.20	3.21
Stanford University	3.03	1.43	2.01	2.18	2.35	2.53	2.70
City of Sunnyvale	12.58	9.43	9.16	9.3	10.70	11.44	12.10
Westborough County Water District	1.32	0.87	0.86	0.85	0.85	0.84	0.84
Cordilleras Mutual Water Company[e]	—	0.01	0.01	0.01	0.01	0.01	0.01
Subtotal Permanent Customer Purchase Requests	**184.0**	**124.6**	**137.05**	**138.89**	**142.90**	**147.30**	**153.74**
City of San Jose	0.00	4.23	4.50	4.50	4.50	4.50	4.50
City of Santa Clara	0.00	3.29	4.50	4.50	4.50	4.50	4.50
Total Wholesale Purchase Requests	**—**	**132.1**	**146.05**	**147.89**	**151.90**	**156.30**	**162.74**

a Individual Supply Guarantee (ISG) refers to each Wholesale Customer's share of the Supply Assurance as defined in the Water Supply Agreement (WSA). The Supply Assurance is the 184 mgd maximum annual average metered supply of water dedicated by San Francisco to public use in the Wholesale Customer service area (not including the Cities of San Jose and Santa Clara). The City of Hayward's ISG is calculated as 184 mgd less the total of permanent customer ISGs (161.92 mgd).

b Actual demands are equivalent to purchases as reported in customer billing data.

c Purchase requests for RWS supplies as anticipated to be reported in each agency's individual 2020 UWMP if one is to be prepared (estimates are subject to change). Projections were provided to the SFPUC by BAWSCA in January 2021. See each agency's 2020 UWMPs for their most up to date purchase request projections.

d The City of Brisbane and Guadalupe Valley Municipal Improvement District are two Wholesale Customers that are jointly operated.

e Cordilleras MWC is not a member of BAWSCA or a party to the WSA, and therefore does not have an ISG.

Note: Groveland CSD is not accounted for as a wholesale customer for the purpose of this table and subsequent wholesale supply and demand comparisons. Refer to Table 4-1 for Groveland CSD's current and projected demands. However, in the corresponding standardized tables in Appendix B, Groveland CSD is reported as wholesale rather than retail.

Table 4-4. Wholesale Contractual Obligations (mgd)

[Standardized Table Not Applicable]

Wholesale Customer	ISG[a]	Actual 2020 Purchases[b]	Contractual Obligation[c]				
			2020	2025	2030	2035	2040
Alameda County Water District	13.76	7.76	13.76	13.76	13.76	13.76	13.76
City of Brisbane / Guadalupe Valley Municipal Improvement District[d]	0.98	0.63	0.98	0.98	0.98	0.98	0.98
City of Burlingame	5.23	3.48	5.23	5.23	5.23	5.23	5.23
California Water Service Company	35.68	29.02	35.68	35.68	35.68	35.68	35.68
Coastside County Water District	2.18	0.88	2.18	2.18	2.18	2.18	2.18
City of Daly City	4.29	3.92	4.29	4.29	4.29	4.29	4.29
City of East Palo Alto	1.96	1.57	1.96	1.96	1.96	1.96	1.96
Estero Municipal Improvement District	5.90	4.34	5.90	5.90	5.90	5.90	5.90
City of Hayward	22.08	14.20	22.08	22.08	22.08	22.08	22.08
Town of Hillsborough	4.09	2.57	4.09	4.09	4.09	4.09	4.09
City of Menlo Park	4.46	2.82	4.46	4.46	4.46	4.46	4.46
Mid-Peninsula Water District	3.89	2.66	3.89	3.89	3.89	3.89	3.89
City of Millbrae	3.15	1.90	3.15	3.15	3.15	3.15	3.15
City of Milpitas	9.23	6.06	9.23	9.23	9.23	9.23	9.23
City of Mountain View	13.46	7.60	13.46	13.46	13.46	13.46	13.46
North Coast County Water District	3.84	2.28	3.84	3.84	3.84	3.84	3.84
City of Palo Alto	17.08	9.75	17.08	17.08	17.08	17.08	17.08
Purissima Hills Water District	1.63	1.71	1.63	1.63	1.63	1.63	1.63
City of Redwood City	10.93	8.75	10.93	10.93	10.93	10.93	10.93
City of San Bruno	3.25	0.96	3.25	3.25	3.25	3.25	3.25
City of San Jose[e]	0.00	4.23	0.00	0.00	0.00	0.00	0.00
City of Santa Clara[e]	0.00	3.29	0.00	0.00	0.00	0.00	0.00
Stanford University	3.03	1.43	3.03	3.03	3.03	3.03	3.03
City of Sunnyvale	12.58	9.43	12.58	12.58	12.58	12.58	12.58
Westborough County Water District	1.32	0.87	1.32	1.32	1.32	1.32	1.32
Subtotal BAWSCA Member Agency Demand	**184.0**	**132.1**	**184.0**	**184.0**	**184.0**	**184.0**	**184.0**
Cordilleras Mutual Water Company[f]	—	0.01	0.01	0.01	0.01	0.01	0.01
Total Wholesale Demand[i]	**—**	**132.1**	**184.0**	**184.0**	**184.0**	**184.0**	**184.0**

a Individual Supply Guarantee (ISG) refers to each Wholesale Customer's share of the Supply Assurance as defined in the Water Supply Agreement (WSA). The Supply Assurance is the 184 mgd maximum annual average metered supply of water dedicated by San Francisco to public use in the Wholesale Customer service area (not including the Cities of San Jose and Santa Clara). The City of Hayward's ISG is calculated as 184 mgd less the total of permanent customer ISGs (161.92 mgd).

b Actual demands are equivalent to purchases as reported in customer billing data.

c Wholesale Customer ISGs are shown in lieu of purchase request projections, which are shown in Table 4-3.

d The City of Brisbane and Guadalupe Valley Municipal Improvement District are two Wholesale Customers that are jointly operated.

e No contractual obligations are shown for the Cities of San Jose and Santa Clara, as they do not have an allocated share of the Supply Assurance due to their temporary, interruptible status under the WSA.

f Cordilleras MWC is not a member of BAWSCA or a party to the WSA, and therefore does not have an ISG. Cordilleras MWC has a water supply contract with the SFPUC for 3,007 CCF annually (about 0.006 mgd).

Note: Groveland CSD is not accounted for as a wholesale customer for the purpose of this table and subsequent wholesale supply and demand comparisons. Refer to Table 4-1 for Groveland CSD's current and projected demands. However, in the corresponding standardized tables in Appendix B, Groveland CSD is reported as wholesale rather than retail.

SECTION 5: RETAIL BASELINES AND TARGETS

With the adoption of the Water Conservation Act of 2009, also known as SB X7-7, the State was required to set a goal of reducing urban water use by 20% by the year 2020. Each retail urban water supplier was required to determine its baseline water use, expressed in gallons per capita per day (GPCD) during its baseline period, as well as its target water use for the years 2015 and 2020 in order to help the State achieve the 20% reduction.

In its 2010 UWMP, the SFPUC first established the baseline per capita water use, as well as the interim (i.e. 2015) and 2020 water use targets. In the 2015 UWMP, the SFPUC performed a detailed analysis to update the baselines and targets per capitas based on in-City retail service area population and water use, by (1) revising the population of the in-City retail service area to reflect the 2010 U.S. Census rather than the 2000 U.S. Census, and (2) including the population and water use of the suburban retail service area. The narrative of the 2015 baseline and targets analysis and the SB X7-7 2020 Compliance Form tables are included in Appendix D. This section provides a summary of the 2015 analysis and shows the SFPUC's compliance with the 2020 target.

Additionally, Groveland CSD is not included in this section, as explained in Section 2.4.

5.1 GROSS PER CAPITA WATER USE BASELINES & TARGETS SUMMARY

As described in DWR's *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use (For the Consistent Implementation of the Water Conservation Act of 2009)*, the SFPUC calculated its per capita urban retail water use five-year baseline, 10-year baseline, 2015 interim target and 2020 compliance target in compliance with the Water Conservation Act of 2009. The SFPUC used Method 3 of the four approved methods provided by the Water Conservation Act of 2009 for determining urban water use targets, and adjusted them to meet the minimum water use reduction requirement, of 95% of the five-year baseline. Table 5-1 includes a summary of the baselines and targets calculated in the 2015 UWMP.

Table 5-1. Gross Per Capita Water Use Baselines and Targets Summary (GPCD)

[Standardized Table 5-1: Baselines and Targets Summary]

Baseline Period	Start Year	End Year	Average Baseline	Interim 2015 Target	Confirmed 2020 Target
10–Year Baseline	2001	2010	107	102	96
Five-Year Baseline	2006	2010	101	—	—

5.2 COMPLIANCE WITH 2020 DAILY PER CAPITA WATER USE TARGET

The 2020 gross water use includes the water from the RWS and the groundwater sources supplied by SFPUC to the In-city and suburban retail customers. No deductions for indirect recycled water, agricultural water use or process water was applied. All water sources are metered and meters are calibrated on an annual basis. Note that water use reflects gross water use (i.e., water use by all sectors, including water loss).

The 2020 service area population includes In-City population and suburban retail population. For the in-City retail service area, population data were obtained from the California Department of Finance for the County of San Francisco. However, the same method could not be used for the suburban retail service area since the service area does not align with municipal boundaries. The population estimates for the connections in Redwood City, Daly City, Fremont and Millbrae were calculated using persons-per-household data. Therefore, the SFPUC consulted with DWR (i.e., pre-review) on an appropriate, alternate methodology based on U.S. Census data at the census block level and persons-per-household data. Use of persons-per-

household data was deemed adequate since it is assumed that all residential accounts serve single family homes in the suburban retail service area, and no multi-family residences are served. Therefore, the number of connections can be considered equivalent to number of households. For the Town of Sunol specifically, the SFPUC used the web-based DWR Population Tool since the corresponding service area was difficult to define at the census block level (output provided in Appendix H).

The base daily per capita water use was calculated by dividing the annual gross water use by population and averaging the value per day.

As shown in Error! Reference source not found., with a 2020 per capita water use of 76 GPCD, the SFPUC is in compliance with its 2020 target of 96 GPCD. No adjustments were needed.

Table 5-2. Gross Per Capita Water Use Baselines and Targets Summary (GPCD)

[SB X7-7 2020 Compliance Form Table 5: 2020 Gallons Per Capita Per Day (GPCD)]

2020 Gross Water Use (mgd)	2020 Service Area Population	2020 Daily Per Capita Water Use (GPCD)
68.5	899,732	76

Taking into consideration the impact of population and employment growth, as well as passive and active conservation efforts, the SFPUC initially projected in 2015 that its 2020 daily per capita water use would be approximately 86 GPCD. With its continued water conservation program, the SFPUC has achieved a lower than initially predicted per capita water use with a 2020 per capita water use of 76 GPCD, in compliance with the final 2020 target of 96 GPCD.

5.3 ASSISTANCE TO WHOLESALE CUSTOMERS

As a wholesale supplier, the SFPUC is required to provide an assessment of present and proposed future measures, programs, and policies that will help the retail water suppliers in their wholesale service area to achieve their water use reduction targets. This is further discussed in Section 10.3.

SECTION 6: SYSTEM SUPPLIES

This section describes current and projected water supplies, as well as the various sources of supplies available to meet retail and wholesale water demands. Potential recycled water uses and supply availability are addressed. This section also summarizes the options used, or being considered, by the SFPUC to maximize resources and minimize the need to import water from the RWS watersheds.

As explained in Section 2.4, Groveland CSD is accounted for as a retail customer in this section, but as a wholesale customer in the corresponding standardized tables in Appendix B.

6.1 RWS SUPPLIES FOR RETAIL AND WHOLESALE CUSTOMERS

The SFPUC serves its retail and wholesale customers through the integrated operation of local Bay Area water production facilities and the Hetch Hetchy System. The local watershed facilities are operated to conserve local runoff for delivery and to maintain enough stored water to meet demands in the event of an emergency that affects the supply of water from Hetch Hetchy. Demands that are not met by local runoff are met with water diverted from the Tuolumne River through the Hetch Hetchy System. On average, the Hetch Hetchy System provides approximately 85% of the water delivered by the SFPUC. During dry years, the water received from the Hetch Hetchy System can amount to over 90% of the total water delivered.

The amount of water available to the SFPUC is constrained by hydrology, physical facilities, and the institutional parameters that allocate the water supply of the Tuolumne River. Due to these constraints, the SFPUC depends on reservoir storage to maximize the reliability of its water supplies. More importantly, reservoir storage provides water supply carry-over capability. During dry years, a very small share of the Tuolumne River supply is available to the SFPUC and the local watersheds produce very little water. Reservoir storage is critical during drought cycles because it enables the SFPUC to carry over water supply from wet years to dry years.

As discussed further in Section 7.1, deliveries from the RWS to both retail and wholesale customers are limited by the WSIP Phased Variant adopted by the Commission to an average annual of 265 mgd from the watersheds. The allocation between wholesale and retail customers is described in the Water Supply Agreement. It provides for 184 mgd to the Wholesale Customers consistent with the Supply Assurance and 81 mgd to the retail customers. Although SFPUC can take up to 265 mgd annual average from the RWS, for the purposes of the tables in this section and those in Chapter 8, supplies shown will be those projected to be utilized by the retail and wholesale customers. Given that the SFPUC has a Level of Service objective, based on its contractual obligations to its Wholesale Customers, to provide 265 mgd in normal years, an analysis of our ability to meet this objective in normal, single dry, and multiple dry years is provided in Appendix J.

6.1.1 Water Rights

The City and County of San Francisco holds both pre-1914 appropriative water rights and post-1914 water rights to store and deliver water from the Tuolumne River and local watersheds. Appropriative water rights allow the holder to divert water from a particular water source without regard to the contiguity of the location of use to the source. These rights are based on seniority and the use of water must be reasonable, beneficial, and not wasteful. In 1914, California established a formal water rights permit system (by the 1913 Water Commission Act) administered by the SWRCB. The SWRCB does not have permitting jurisdiction over pre-1914 appropriative water rights.

With the Raker Act of 1913 (38 Stat. 242), Congress granted San Francisco rights of way for the construction and operation of Hetch Hetchy facilities, which are predominantly located on federally owned land in Yosemite National Park and Stanislaus National Forest. The Raker Act recognized the senior water rights of Turlock Irrigation District (TID) and Modesto Irrigation District (MID)

(collectively, the Districts) to divert water from the Tuolumne River, and specified conditions for the release of water to the Districts and other conditions imposed by Congress for the protection of recreation in Yosemite and other purposes.

Under Raker Act Section 9(c) and the subsequent Fourth Agreement between San Francisco and the Districts, the Districts are entitled to the natural flow of the Tuolumne River (2,416 cubic feet per second [cfs] between June 13 and April 15 of each year and 4,066 cfs between April 15 and June 13, the spring snowmelt period). These flows are computed on a daily basis based on unimpaired conditions at La Grange Dam below Don Pedro. During multiple drought years, the SFPUC's water diversions from the Tuolumne River may be limited to previously stored (carry-over) water in system reservoirs and the water bank account in Don Pedro reservoir.[8]

6.1.2 Water Quality of RWS Supplies

As described in Section 3.1, the RWS delivers high-quality water. The current surface water supplies available to the RWS include the Tuolumne River and supplies from local Bay Area reservoirs. The majority of the water supply originates in the upper Tuolumne River watershed high in the Sierra Nevada, remote from human development and pollution. This water from the Hetch Hetchy reservoir is protected in pipes and tunnels as it is conveyed to the Bay Area, requiring only primary disinfection and pH adjustment to control corrosion in the pipelines. In addition, this water undergoes UV disinfection at the Tesla Treatment Facility, further ensuring high water quality.

The USEPA and SWRCB DDW have approved the use of this drinking water source without requiring filtration at a treatment plant. However, local water from the local watersheds requires filtration to meet drinking water quality requirements. The filtered and treated water from the local watersheds is blended with water from the Hetch Hetchy reservoir, and most customers receive this blended water supply. System water quality, including both raw water and treated water, is continuously monitored and tested to assure that water delivered to customers meets or exceeds federal and State drinking water and public health requirements.

The SFPUC will continue to rely on these high-quality water sources. No degradation of water quality is anticipated in the future.

The SFPUC prepares an annual water quality report (i.e., Consumer Confidence Report) for its customers each spring, which is available at **www.sfpuc.org/accounts-services/water-quality/annual-water-quality-reports**.

6.1.3 Climate Change Impacts to RWS Supplies

Climate change has become an important factor in water resources planning in the State and is frequently considered in urban water management planning, although the extent and precise effects of climate change remain uncertain. There is convincing evidence that increasing concentrations of greenhouse gases have caused and will continue to cause a rise in temperatures around the world, which will result in a wide range of changes in climate patterns. Moreover, observational data shows that a warming trend occurred during the latter part of the 20th century and will likely continue through the 21st century. These changes will have a direct effect on water resources in California, and numerous studies have been conducted to determine the potential impacts to water resources. Based on these studies, climate change could result in the following types of water resource impacts, some of which are likely to affect the Tuolumne River watershed and local watersheds in the Bay Area:

- Reductions in the average Sierra Nevada annual snowpack due to a rise in the snowline elevation and a shallower snowpack at lower elevations, and a shift in snowmelt runoff to earlier in the year;

[8] The Districts have senior water rights to the City for the Tuolumne River water and are provided to the first increment of flow in the Upper Tuolumne River watershed according to the apportionment set forth in the Raker Act of 1913. The water bank at Don Pedro Reservoir provides a credit and debit system which allows the City to divert water upstream while meeting its obligations to the Districts. Through this mechanism the SFPUC may pre-deliver the Districts entitlements and credit the water bank so that at other times the SFPUC may retain water upstream while the Districts debit the water bank.

- Changes in the timing, annual average, intensity, and variability of precipitation, and an increased amount of precipitation falling as rain instead of as snow;
- Long-term changes in watershed vegetation and increased incidence of wildfires that could affect water quantity and quality;
- Sea level rise and an increase in saltwater intrusion;
- Increased water temperatures with accompanying potential adverse effects on some fisheries and water quality;
- Increases in evaporation and concomitant increased irrigation need; and
- Changes in urban and agricultural water demand.

Both the SFPUC and BAWSCA participated in the 2019 update of the Bay Area Integrated Regional Water Management Plan (BAIRWMP), which includes an assessment of the potential climate change vulnerabilities of the region's water resources and identifies climate change adaptation strategies. In addition, the SFPUC has studied and continues to study the effects of climate change on the RWS. These works are summarized below.

6.1.3.1 Bay Area Integrated Regional Water Management Plan

Climate change adaptation was established as an overarching theme for the 2019 BAIRWMP update. As stated in the BAIRWMP, identification of watershed characteristics that could potentially be vulnerable to future climate change is the first step in assessing vulnerabilities of water resources in the Bay Area Region (Region). Vulnerability is defined as the degree to which a system is exposed to, susceptible to, and able to cope with or adjust to, the adverse effects of climate change. A vulnerability assessment was conducted in accordance with the DWR's *Climate Change Handbook for Regional Water Planning* and using the most current science available for the Region. The vulnerability assessment provides the main water planning categories applicable to the Region—including demand, supply, and water quality, ecosystems and habitat, and sea-level rise—and a general overview of the qualitative assessment of each category with respect to anticipated climate change impacts.

6.1.3.2 SFPUC Climate Change Studies

The SFPUC views assessment of the effects of climate change as an ongoing project requiring regular updating to reflect improvements in climate science, atmospheric/ocean modeling, and human response to the threat of greenhouse gas emissions. Climate change research by the SFPUC began in 2009 and continues to be refined. In its 2012 report "Sensitivity of Upper Tuolumne River Flow to Climate Change Scenarios," the SFPUC assessed the sensitivity of runoff into Hetch Hetchy Reservoir to a range of changes in temperature and precipitation due to climate change. Key conclusions from the report include the following:

- With differing increases in temperature alone, the median annual runoff at Hetch Hetchy would decrease by 0.7-2.1% from present-day conditions by 2040 and by 2.6-10.2% from present-day conditions by 2100. Adding differing decreases in precipitation on top of temperature increases, the median annual runoff at Hetch Hetchy would decrease by 7.6-8.6% from present-day conditions by 2040 and by 24.7-29.4% from present-day conditions by 2100.
- In critically dry years, these reductions in annual runoff at Hetch Hetchy would be significantly greater, with runoff decreasing up to 46.5% from present day conditions by 2100 utilizing the same climate change scenarios.
- In addition to the total change in runoff, there will be a shift in the annual distribution of runoff. Winter and early spring runoff would increase, and late spring and summer runoff would decrease.
- Under all scenarios, snow accumulation would be reduced and snow would melt earlier in the spring, with significant reductions in maximum peak snow water equivalent under most scenarios.

Currently, the SFPUC is conducting a Long-term Vulnerability Assessment which assesses the potential effects of climate change on water supply using a wide range of plausible increases in temperature and changes in precipitation to address the wide uncertainty in climate projections over the planning horizon 2020 to 2070. There are many uncertain factors such as climate change, changing regulations, water quality, growth and economic cycles that may create vulnerabilities for the RWS's ability to meet levels of service. The uncertainties associated with the degree to which these factors will occur and how much risk they present to the water system are difficult to predict, but nonetheless they need to be considered in SFPUC planning. To address this planning challenge, the assessment uses a vulnerability-based planning approach to explore a range of future conditions to identify vulnerabilities, and to assess the risks associated with these vulnerabilities, that could lead to developing an adaptation plan that is flexible and robust to a wide range of future outcomes. This study is expected to be completed in the Summer of 2021.

6.1.4 Summary of Existing and Future RWS Supplies

As discussed further in Section 7.1, deliveries from the RWS to both retail and wholesale customers are limited by the WSIP Phased Variant adopted by the Commission to an average annual of 265 mgd for the watersheds. The allocation between wholesale and retail customers is described in the Water Supply Agreement. It provides for 184 mgd to the Wholesale Customers consistent with the Supply Assurance and 81 mgd to the retail customers. In the context of this document, normal year RWS supply is defined as the supply that will be used to meet the full demands on the RWS in a normal year. Current and projected normal year RWS supplies for both retail and wholesale customers are shown in Table 6-1.

Table 6-1. Regional Water System Normal Year Supplies (mgd)

[Standardized Table 6-9 Retail: Water Supplies – Projected]

[Standardized Table 6-9 Wholesale: Water Supplies – Projected]

RWS Supply[a]	Actual	Projected				
	2020	2025	2030	2035	2040	2045
Retail Customers[b, c]	66.5	67.2	67.5	68.6	70.5	73.7
Wholesale Customers[d, e, f]	132.1	146.0	147.9	151.9	156.3	162.8
Total RWS Supplies	198.6	213.2	215.4	220.5	226.8	236.5

a In the context of this document, normal year RWS supply is defined as the supply that will be used to meet the full demands on the RWS in a normal year.

b Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if these alternative supplies are not available, up to 81 mgd of RWS supply could be used in normal years.

c Groveland CSD is reported as a wholesale customer for the purposes of this 2020 UWMP, but it is considered a retail customer of the SFPUC solely for purposes of allocating RWS supplies between retail customers and Wholesale Customers. Its demands would be met by the retail supply allocation of 81 mgd.

d Projected RWS supplies to be used by Wholesale Customers are based on the purchase request projections provided to the SFPUC by BAWSCA in January 2021. These purchase requests are subject to change in each individual agency's UWMP.

e Projected Wholesale Customer deliveries are limited to 184 mgd. 184 mgd includes the demands of the Cities of San Jose and Santa Clara, which are supplied on a temporary and interruptible basis, with their total supply not exceeding 9 mgd assuming supply is available (decision to be made by end of 2028).

f Cordilleras MWC is not a party to the WSA, and it is not included in the wholesale supply allocation of 184 mgd. The demands of Cordilleras MWC are minor (projected to be less than 0.01 mgd) and are anticipated to be met with RWS supplies through 2045.

6.2 LOCAL SUPPLIES FOR RETAIL CUSTOMERS

The RWS comprises about 97% of total retail water supplies, while the remaining portion is from locally produced groundwater, recycled water, and non-potable water. These local supplies are described in the following sections.

6.2.1 Existing Local Supplies

Existing supplies of groundwater, recycled water, and non-potable water are described below. Future supplies are described in Section 6.2.2.

6.2.1.1 Local Groundwater and the San Francisco Groundwater Supply Project

San Francisco overlies all or part of seven un-adjudicated groundwater basins. These groundwater basins include the Westside, Lobos, Marina, Downtown, Islais Valley, South San Francisco, and Visitacion Valley basins. The Lobos, Marina, Downtown, and South San Francisco basins are located wholly within City limits, while the remaining three extend south into San Mateo County. The portion of the Westside Basin aquifer located within the City is referred to as the North Westside Groundwater Basin (or North Westside Basin). With the exception of the Westside and Lobos basins, the basins are generally inadequate to supply groundwater for municipal supply due to low yield, contamination, or potential subsidence concerns.

Early in its history, the City made use of local groundwater, springs, and spring-fed surface water ranging from approximately 6.0 to 8.5 mgd prior to 1934. After imports of water from the Hetch Hetchy Reservoir began in October 1934, municipal supplies began to rely almost exclusively on surface water from the RWS. Local groundwater use, however, has continued in the City. In addition, groundwater has been used and continues to be used in the suburban retail service area.

The local groundwater basins are described below.

Westside Groundwater Basin. With an area of about 40 square miles, the Westside Groundwater Basin is the largest groundwater basin in San Francisco and is currently used to meet water demands for both irrigation and municipal uses. The Westside Groundwater Basin is separated from the Lobos Basin to the north by a northwest-trending bedrock ridge through the northeastern part of Golden Gate Park. San Bruno Mountain and San Francisco Bay form the eastern boundary, and the San Andreas Fault and Pacific Ocean form the western boundary. The southern limit of the Westside Groundwater Basin is defined by a bedrock high that separates it from the San Mateo Plain Groundwater Basin. The basin opens to the Pacific Ocean on the northwest and San Francisco Bay on the southeast. The Westside Groundwater Basin contains three relatively distinct aquifer zones referred to as the Shallow Aquifer, Primary Production Aquifer, and Deep Aquifer. The clayey aquitards that separate these aquifers become discontinuous or absent north of Lake Merced. The basin has not been adjudicated nor has it been identified by DWR as overdrafted, or as projected to be overdrafted in the future.

The Westside Groundwater Basin is subdivided for management purposes into northern and southern portions by the county line separating San Francisco and San Mateo Counties. The county-line boundary between the North and South Westside Groundwater Basins does not have hydrogeological significance other than influencing the jurisdictional distribution of groundwater pumping. No geologic features restrict groundwater flow between the northern and southern parts of the groundwater basin.

Within San Mateo County, the South Westside Groundwater Basin (or South Westside Basin) encompasses 25 square miles and extends southeast across the San Francisco Peninsula south of San Bruno Mountain from the ocean near Daly City to San Francisco Bay in Burlingame. It is described in the South Westside Basin Groundwater Management Plan.[9] Municipal water demand within the South Westside Basin is served by the City of San Bruno, California Water Service Company, City of Daly City, and the SFPUC as a wholesaler to those entities.

The North Westside Basin has a land surface area of 15 square miles encompassing much of the western third of the City, including Lake Merced and most of Golden Gate Park. The North Westside Basin is largely residential, with residential and

[9] City of San Bruno, California Water Service Company, Daly City, and Hetch Hetchy Regional Water System. 2012. *South Westside Basin Groundwater Management Plan*.

commercial land uses accounting for about 75%, including the Sunset and Parkside districts; and at least 25% park and open space, most notably Golden Gate Park, Lake Merced, golf clubs, and hilltop parks along the basin's eastern boundary. The North Westside Basin land surface extends from sea level along Ocean Beach to nearly 1,000 feet above sea level along a bedrock ridge three to four miles inland. The North Westside Basin is bounded on the north by a mostly buried bedrock ridge extending from Point Lobos southeast through Golden Gate Park and northeast through Lone Mountain. The basin boundary encompasses the panhandle of Golden Gate Park, then extends south-southwest through Twin Peaks and Mount Davidson, crossing south into San Mateo County a little more than a mile east of Lake Merced. The San Andreas Fault Zone trends offshore to the northwest of Daly City and is interpreted to bound the basin on the west. Existing retail groundwater sources are pumped from the North Westside Basin.

The SFPUC leads the basin-wide Westside Basin Groundwater Monitoring Program. It provides information summarizing groundwater pumping, groundwater levels, and groundwater quality, along with Lake Merced water elevations. This program publishes an annual monitoring report, which may be accessed at **www.sfpuc.org/programs/water-supply-planning/groundwater**. Monitoring in the North Westside Basin is accomplished by wells constructed in either single, nested, or clustered configurations at approximately 21 locations. Groundwater levels in all wells are measured quarterly by hand and supplemented by continuous monitoring using pressure transducers at select locations. Based on regular groundwater monitoring conducted in the North Westside Basin since 2004, static groundwater levels along the Pacific Coast and north of Lake Merced have generally remained above sea level in the Shallow and Primary Production Aquifers.

Within the City, the SFPUC samples groundwater at 13 monitoring well locations semiannually to monitor general water quality in the groundwater basin, including locations in Golden Gate Park, coastal wells located in the vicinity of the Great Highway, lake-aquifer monitoring wells in the vicinity of Lake Merced, and one at the West Sunset Playground. The monitored parameters include total alkalinity, calcium, magnesium, sodium, potassium, bicarbonate, hardness, chloride, nitrate, sulfate, TDS, pH, and specific conductance.

Since 1872, groundwater has been pumped from wells located in Golden Gate Park, and by the San Francisco Zoo since the 1930s. Based on flow meter data, about 1.5 mgd is produced by these wells on an average annual basis. The groundwater is mostly used by the San Francisco Recreation and Parks Department for irrigation and other non-potable uses (e.g., lake filling, water exhibits) at Golden Gate Park, the San Francisco Zoo, and landscaped medians along the Great Highway.

The San Francisco Groundwater Supply Project (SFGW) constructed or rehabilitated six groundwater supply wells and their associated pump stations, and more than five miles of pipelines to distribute groundwater to in-City reservoirs for blending with the municipal drinking water supply. Construction began in 2014 and was completed in 2020. These wells pump groundwater from 120 to 460 feet below ground within the San Francisco portion of the Westside Basin. Before entering the in-City distribution system, the pumped groundwater is disinfected and then blended in relatively small quantities in Sunset and Sutro Reservoirs with water supplied by the RWS. During calendar year 2020, the SFGW wells supplied an average of 0.5 mgd to the reservoirs. Once the Westside Recycled Water Project is completed and the project's wells in Golden Gate Park are no longer needed for irrigation, the project will add an average of up to 1 mgd to the local water system for one or more years. Over the following several years, with continued monitoring and testing, production will step up to an average of 4 mgd. Given approximately 1.3 mgd of existing groundwater use for irrigation, this project represents approximately 2.7 mgd of net new supply. Two of the six wells are capable of serving as emergency drinking water supplies following an earthquake or other natural disaster, and include filling stations for emergency water tankers.

The SFPUC developed a draft Groundwater Management Plan (GMP) for the North Westside Basin in 2005 in response to the 1992 California Groundwater Management Act (AB 3030). Following passage of the 2014 California Sustainable Groundwater Management Act (SGMA), the SFPUC established itself in March 2015 as the Groundwater Sustainability Agency (GSA) for all of San Francisco. The SFPUC then completed a draft Groundwater Sustainability Plan (GSP) for the North Westside Basin in 2016. This plan has guided the implementation of the SFGW Project to ensure sustainable groundwater management in the northern portion of the Basin. The plan summarizes the Basin hydrogeology and defines

measurable objectives and actions for protecting groundwater yield and quality, such as avoiding salt water intrusion, land subsidence, and impacts to interconnected surface water resources. Because DWR designated the Westside Basin and San Francisco's other groundwater basins as very low priority in early 2019, the SFPUC is not required to submit a GSP to the State, but will sustainably manage the northern portion of the Westside Basin consistent with SGMA. Currently, the SFPUC is updating the 2016 plan and will finalize it as a GMP under AB 3030. Adherence to this plan will ensure a long-term, high quality, local water supply for current and future uses.

Livermore Valley Basin, Central Groundwater Sub Basin. In the suburban retail service area, about 0.4 mgd of groundwater is delivered to the Castlewood CSA from the Castlewood Well System operated by the SFPUC (this system is described in Section 3.1.5.2). Groundwater is drawn from the Central Groundwater Sub Basin in the Livermore Valley Basin. DWR has not identified this basin as overdrafted, nor as projected to be overdrafted in the future. These wells are metered and have been in operation for several decades. The system serving Castlewood is not connected to the RWS.

The volumes of groundwater pumped between 2016 and 2020 from the three sources described above are shown in Table 6-2.

Table 6-2. Groundwater Pumped (mgd)

[Standardized Table 6-1 Retail: Groundwater Volume Pumped]

Groundwater Source	2016	2017	2018	2019	2020
Westside Groundwater Basin[a]	1.2	1.3	1.7	1.7	2.0
Livermore Valley Basin, Central Groundwater Sub Basin[b]	0.4	0.4	0.3	0.4	0.3

a Data from 2016-2019 are obtained from the 2019 Annual Groundwater Monitoring Report, Westside Basin (SFPUC, April 2020), 2020 data are from verbal communications with SFPUC groundwater staff. Pumping volumes are reported on a calendar year basis, but are used to approximate fiscal year data for this table.

b This basin is the source of water for the Castlewood Well System. Pumping volumes are assumed to be equivalent to billed consumption for Castlewood CSA; obtained from customer billing data.

6.2.1.2 Other Surface Water

The Sunol Filter Gallery (Gallery) is located adjacent to Alameda Creek in Sunol, south of the SFPUC's Sunol Pump Station. The supplies are from subsurface flows directly tied to flow in the creek and creek bed. As such, it is considered to be surface water and is subject to surface water permitting. This supply source provided approximately 0.3 mgd of water for irrigation purposes to the Sunol Valley Golf Club until January 2016, when the golf course ceased operating and thus the source production was substantially reduced. Since 2016, the Gallery diversions from Alameda Creek have been limited to maintenance water supply and emergency fire water for the golf course property. The SFPUC is currently evaluating options to make the Sunol Filter Gallery fully operational and use the source to its full capacity

6.2.1.3 Local Recycled Water

From 1932 to 1981, the City's McQueen Treatment Plant provided recycled water to Golden Gate Park for irrigation and flow augmentation of its streams and lakes. Due to changes in State regulations, the plant could no longer meet required standards. Subsequently, the City closed the McQueen Treatment Plant and discontinued the use of recycled water in Golden Gate Park; however, a limited volume of recycled water is currently used in the retail service area as described below.

Southeast Water Pollution Control Plant. Disinfected secondary-treated recycled water from the Southeast WPCP was provided to construction contractors, City departments, and other interested parties for use within the City via the truck-

fill station through 2015. The facility has not been operational since 2015. The SFPUC is exploring resuming recycled water production dedicated to onsite uses at the plant.

Harding Park. The Harding Park Recycled Water Project, a partnership between the SFPUC and NSMCSD, was completed in October 2012 and provides tertiary-treated recycled water for irrigating the Harding Park and Fleming Golf Courses in San Francisco. The project replaces the use of potable water from the RWS for golf course irrigation and has an average capacity of 0.23 mgd. However, in 2020, the system was offline for most of the year due to infrastructure upgrades. The system therefore supplied approximately 5 MG (0.01 mgd) to Harding Park, a retail customer of the SFPUC.

Sharp Park. The Pacifica Recycled Water Project provides recycled water to several irrigation customers in Pacifica including a portion of the Sharp Park Golf Course, a retail customer of the SFPUC. This project was developed and constructed through a partnership between the SFPUC and NCCWD. An automated irrigation system was installed on the east side of the golf course, and recycled water delivery began in October 2014. In 2020, the Sharp Park operation was fully online and recycled water deliveries were estimated to be 0.1 mgd.

Projections of recycled water use in the retail service area were provided in the 2015 UWMP. At that time, it was estimated that 0.3 mgd of recycled water would be used in 2020. Actual use in 2020 was approximately 0.1 mgd, since the Harding Park Recycled Water Project was offline during most of 2020. A comparison of projected and actual recycled water uses is shown in Table 6-3.

Table 6-3. Projected and Actual Recycled Water Use for 2020 (mgd)

[Standardized Table 6-5 Retail: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual]

Use Type	2015 Projection for 2020	Actual Use in 2020
Golf Course Irrigation[a]	0.3	0.1

a Golf course irrigation includes Harding Park, Fleming and Sharp Park golf courses.

6.2.1.4 Wastewater Assessment

The SFPUC's Wastewater Enterprise operates the City's wastewater collection, treatment, and disposal system, which consists of a combined sewer system (which collects both sewage and stormwater), three water pollution control plants, and outfalls to San Francisco Bay and the Pacific Ocean. The collection and conveyance system consists of over 900 miles of various sizes of underground sewer pipes, transport/storage structures, and pump stations located throughout the City. The Southeast WPCP and Oceanside WPCP provide secondary treatment and operate year-round; while the North Point Wet Weather Facility operates only during wet weather and provides primary treatment. Ultimate disposal of treated wastewater effluent is currently through outfalls to both San Francisco Bay and the Pacific Ocean. The Treasure Island Wastewater Treatment Plant provides secondary treatment of domestic and commercial wastewater from Treasure Island and Yerba Buena Island, located in the San Francisco Bay. The plant's effluent is discharged to Central San Francisco Bay. The Mel Leong Treatment Plan is located at the San Francisco International Airport and treats domestic and industrial wastewater from the airport facilities. The plant's effluent is eventually discharged to the Lower San Francisco Bay[10]. Table 6-4 summarizes the current volumes of wastewater collected, treated and discharged within the retail service area.

[10] The effluent of the Mel Leong Treatment Plant is discharged to the North Bayside System Unit forcemain, which conveys the treated wastewater to dechlorination facilities prior to its discharge to the Lower San Francisco Bay.

As mentioned previously, suburban retail water use in 2020 was 3.5 mgd, which was about 5% of total retail demand. As such, the volume of wastewater generated within the SFPUC's suburban water retail service area is assumed to be small compared to in-City wastewater generation. However, notable large suburban retail customers are included in Table 6-4.

Table 6-4. Wastewater Operations within Retail Service Area
[Standardized Table 6-2 Retail: Wastewater Collected Within Service Area]
[Standardized Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2020]

Treatment Plant	Operator	Location	Volume of Wastewater in 2020 (mgd)				Recycled Water Delivered within Retail Service Area in 2020 (mgd)
			Collected	Treated (Level)	Discharged	Recycled	
Southeast WPCP[a,b]	SFPUC	San Francisco	56.2	56.2 (secondary, disinfected)	52.1[c]	0	0
Oceanside WPCP[b]	SFPUC	San Francisco	14.5	14.5 (secondary, undisinfected)	15.0[d]	0	0
Treasure Island Wastewater Treatment Plant	US Navy and Treasure Island Development Authority	Treasure Island	0.33	0.33 (secondary disinfected)	0.30	0	0
Mel Leong Treatment Plant[e,f,]	City and County of San Francisco	San Francisco International Airport	0.38	0.38 (secondary, disinfected)	0.38	0	0

a The Southeast Water Pollution Control Plant (WPCP) and North Point Wet Weather Facility are grouped together as one facility because they are hydraulically connected (both plants receive influent from the same collection system) and their discharges are covered by the same permit.

b At the Southeast and Oceanside WPCPs, metered effluent flows include both primary-only and secondary treated effluent (the bulk of which is secondary treated) and flows include treated combined wastewater and stormwater because the collection systems are predominantly combined systems.

c The volume discharged is less than the volume collected because a small volume of the discharged wastewater is treated to secondary, disinfected-23 level and used for other purposes.

d The volume discharged is higher than the volume collected because the discharged volume includes additional plant recycle streams.

e The Mel Leong Treatment Plant is the only wastewater facility that treats and discharges wastewater generated by a suburban retail water customer within the suburban retail service area. Wastewater utilities serving other suburban retail customers do not treat or dispose of wastewater within the suburban retail service area.

f Volumes of wastewater treated at and discharged from the Mel Leong Treatment Plant correspond to calendar year 2020.

6.2.2 Future Local Supplies

The SFPUC anticipates that the existing local supplies described above will be available in the future. However, to reliably and sustainably meet the future water needs of its retail customers, the SFPUC is supplementing and diversifying its water supply portfolio through the further development of local water supplies, such as increasing groundwater and recycled water production. These projects are critical to reducing impacts associated with any one supply being disrupted, reduced, or interrupted. Projects related to these efforts are described below, and projected volumes are later provided in Table 6-5. Additional water supply projects being developed under the new Alternative Water Supply Program are described in Section 7-4.

6.2.2.1 Westside Recycled Water Project

The Westside Recycled Water Project includes construction of a tertiary recycled water plant and associated pipelines to replace RWS and groundwater supplies currently used to irrigate Golden Gate Park, Lincoln Park and Golf Course, the

San Francisco Zoo, and the Presidio Golf Course, as well as other landscaping in the Presidio. The plant is currently under construction on the west side of the City at the Oceanside WPCP. For planning purposes, deliveries from the Westside project are estimated to be 1.6 mgd in 2025 and 1.8 mgd in 2030 and beyond. The project is designed to deliver an annual average of up to 2 mgd.

The project Environmental Impact Report (EIR) was certified by the San Francisco Planning Commission and approved by the SFPUC's Commission in September 2015. The construction of the recycled water pipeline began in early 2017 and was completed in July 2018. The treatment facility and pump station are currently under construction, which began in late 2017 and mid-2019, respectively. Work is currently underway to retrofit the irrigation systems in Golden Gate Park and Lincoln Park and bring them into compliance with California recycled water regulations.

The SFPUC is currently in the early design phase of the San Francisco Zoo Recycled Water Project, which will extend recycled water service from the Westside Recycled Water Treatment Facility to the San Francisco Zoo. The recycled water pipeline that currently extends from the RWTF to Golden Gate Park includes a turnout to the Zoo. Extending a new pipeline from the turnout to the non-potable reservoir on Zoo grounds will allow RPD to switch from groundwater to recycled water to meet the Zoo's non-potable water demands, while supporting groundwater management goals for the Westside groundwater basin.

Recycled water deliveries to Golden Gate Park and Lincoln Park (annual average of 1.3 mgd) are expected to begin in early 2022. Deliveries to the San Francisco Zoo (annual average of 0.3 mgd) are expected to begin in 2023. SFPUC is also currently planning for deliveries to the Presidio (annual average of 0.2 mgd) beginning by 2030.

6.2.2.2 Treasure Island Recycled Water Project

The Treasure Island Water Resource Recovery Facility (TIWRRF) will be located on the northeast corner of Treasure Island (TI) in San Francisco, California on a geotechnically improved "greenfield" site of approximately 10 acres. The TIWRRF will provide tertiary wastewater treatment and wetlands to achieve an average dry weather flow (ADWF) capacity of at least 1.3 mgd and peak wet weather flow (PWWF) of 3.9 mgd. The TIWRRF will support the redevelopment of Treasure Island and Yerba Buena Island and the 8,000 new homes currently under construction.

The TIWRRF will include liquid treatment processes, solids handling, odor control, a wetland, and produce Title 22 disinfected tertiary quality of treated wastewater effluent. It is anticipated that the TI development will use an average of 0.4 MGD and a peak of 1.0 MGD of recycled water for uses that include dual plumbing in buildings and outdoor urban agriculture and irrigation. The TIWRRF and associated wetlands are consistent with the open space vision for the Development. Construction is anticipated to start in early to mid-2022 and be completed in early to mid-2024.

6.2.2.3 Other Actions to Expand Recycled Water Use

The SFPUC is actively involved in encouraging and expanding recycled water use and onsite water reuse. These efforts are described below.

Projects and Partnerships. As demonstrated by the Harding Park and Pacifica Recycled Water Projects, the SFPUC has and will continue to explore opportunities for regional recycled water partnerships with other Bay Area agencies. Through these partnerships, the SFPUC aims to develop recycled water projects that will benefit the SFPUC and partners by reducing demands for RWS supplies and/or freeing up groundwater that could be used for potable supplies.

Ordinances, Programs, and Services. The SFPUC administers or helps to administer the following ordinances, programs, and services in the City related to recycled water and water reuse. The majority of these ordinances, programs, and services have been established for many years and are ongoing, resulting in increased water reuse.

- **Recycled Water Program and Ordinance:** To encourage the use of recycled water in San Francisco, the City adopted Ordinances 390-91 and 391-91, collectively referred to as the Recycled Water Ordinance.[11] This ordinance requires the installation of dual-plumbed systems within designated areas of the City for new, remodeled or converted buildings; all subdivisions of 40,000 square feet or more; and for new, modified, or existing irrigated areas of 10,000 square feet or more. The number of dual-plumbed systems installed as required by the ordinance continues to increase with the increase of new construction and rehabilitation projects in the City.

- **Soil Compaction and Dust Control Ordinance:** In 1991, the City also passed Ordinance 175-91[12], which restricts the use of potable water for soil compaction and dust control activities for construction and demolition projects. To facilitate the use of non-potable water for these activities, the SFPUC installed a recycled water truck-fill station at its Southeast WPCP. Construction contractors, City departments, and other interested parties may fill water trucks at the station after receiving a permit from the SFPUC.

- **Large Landscape Grant Program:** The SFPUC initiated a Large Landscape Grant Program in 2009. In-City retail customers with 1/4 acre or more (originally 2.5 acres or more when the program started) of irrigated landscape are eligible to apply. Grant funding is available for water-saving and recycled water retrofits that reduce potable water use for landscape irrigation. The SFPUC also provides technical assistance in implementing retrofits. The recycled water irrigation system retrofits at both Harding Park and Sharp Park received grant funding through this program.

- **Non-potable Water Program and Ordinance:** As described in Section 4.1.4, the City adopted the Non-potable Water Ordinance in 2012 to allow for the collection, treatment, and use of alternate water sources for non-potable applications. The Non-potable Water Program outlines the oversight of the SFPUC, the SFDPH-EH, and the San Francisco Department of Building Inspection (SFDBI) during the review process. The ordinance was amended in 2015 to mandate the installation of onsite water systems in new development meeting specified criteria.

- **Public Outreach:** The SFPUC actively promotes its programs to conserve, diversify, and supplement RWS supplies. Marketing campaigns, factsheets, and articles are developed and shared with media, customers, and public officials.

Research and Knowledge Sharing. The SFPUC is a member of the Bay Area Clean Water Agencies (BACWA) Recycled Water Committee. BACWA is composed of Bay Area wastewater agencies that discharge into the San Francisco Bay estuary. The purpose of the Recycled Water Committee is to provide a forum to share recycled water information and expertise to support and advance regional water recycling efforts. SFPUC is also an active member of the national WateReuse Association and the California Section., SFPUC is also an active member of the Water Research Foundation.. In addition, SFPUC participates on the California Urban Water Association (CUWA) water reuse committee.

6.2.3 Water Quality of Local Supplies

Local groundwater, recycled water, and non-potable water supplies are primarily used for irrigation and other non-potable uses. The SFPUC strives to meet or exceed the quality standards established by State agencies for these end uses, and works closely with regulatory agencies and partners to achieve the highest standards. Water quality of each supply is further described below.

[11] San Francisco Public Works Code, Article 22, Sections 1200-1210. Note that this ordinance was amended in 1994 by Ordinance 393-94, which expanded the designated recycled water use area to include Treasure Island, Yerba Buena Island, and Hunters Point Shipyard.
[12] San Francisco Public Works Code, Article 21, Sections 1100-1107.

6.2.3.1 Local Groundwater Quality

This section describes the water quality of existing and future groundwater supplies.

Westside Groundwater Basin. Groundwater from the Westside Groundwater Basin has been supplying drinking water to Daly City, San Bruno, and South San Francisco for over 60 years, and in 2017 was incorporated into the drinking water supply for San Francisco. The pumped groundwater is disinfected and blended with RWS supplies before entering the in-City distribution system. Disinfection with sodium hypochlorite and pH adjustment for corrosion control is performed. The quality of the blended water satisfies all health-based drinking water standards set forth by the SWRCB DDW.

As described in Section 6.2.1.1, the SFPUC conducts the Westside Basin Groundwater Monitoring Program. It includes monitoring groundwater quality to provide early warning for potential saltwater intrusion and other potential sources of contamination. The SFPUC will continue to monitor these wells and add additional wells to the network as needed to assess how the basin is responding to SFGW and other related project operations.

Castlewood Well System. Groundwater supplies from the Castlewood Well System are disinfected via sodium hypochlorite injection and are potable when delivered to Castlewood CSA. Water quality is monitored weekly by the SFPUC.

6.2.3.2 Local Recycled Water Quality

This subsection describes the water quality of existing and future recycled water supplies.

Harding Park. Recycled water produced by NSMCSD's wastewater treatment plant in Daly City is used for irrigation at the Harding Park and Fleming Golf Courses. This tertiary-treated recycled water meets the Title 22 California Code of Regulations (Title 22) requirements for approved non-potable uses.

Sharp Park. Recycled water produced by the City of Pacifica's Calera Creek Water Recycling Plant and delivered by NCCWD is used to irrigate a portion of the Sharp Park Golf Course. This tertiary-treated recycled water meets the Title 22 requirements for approved non-potable uses.

Westside Recycled Water Project. Recycled water produced by the Westside Recycled Water Project treatment facility will undergo tertiary treatment, followed by reverse osmosis and UV, resulting in water quality that meets Title 22 requirements and the needs of the project's planned end uses, including irrigation at Golden Gate Park, Lincoln Park and Golf Course, the Presidio Golf Course, and other landscaped areas at the Presidio.

6.2.4 Climate Change Impacts to Local Supplies

The SFPUC's primary concern related to climate change is the potential impact to RWS supplies, as addressed in Section 6.1.3. Implementation of the Groundwater Sustainability Plan for the North Westside Basin will ensure that in-City groundwater supplies are maintained for current and future uses. Recycled water is considered a drought-resistant supply that is not impacted by precipitation or hydrologic year type.

6.2.5 Summary of Existing and Future Local Supplies

Table 6-5 provides a breakdown of current and projected water supply sources for meeting retail water demand through 2045. Up to 81 mgd of RWS supplies are available to retail customers in normal years. The SFPUC is also committed to developing local supplies to meet retail demands; therefore, the SFPUC would use local groundwater and recycled water supplies before using RWS supplies to meet retail demands.

Table 6-5. Retail Supplies (mgd)

[Standardized Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial uses Within Service Area]

[Standardized Table 6-8 Retail: Water Supplies – Actual]

[Standardized Table 6-9 Retail: Water Supplies – Projected]

Retail Supply	Actual	Projected				
	2020	2025	2030	2035	2040	2045
RWS Supply Utilized by Retail Customers[a]	66.5	67.2	67.5	68.6	70.5	73.7
Groundwater						
In-City Potable [b]	0.4	1.0	2.0	3.0	4.0	4.0
In-City Irrigation[b,c]	1.5	0.0	0.0	0.0	0.0	0.0
Castlewood Well System[d]	0.3	0.4	0.4	0.4	0.4	0.4
Subtotal Groundwater	2.2	1.4	2.4	3.4	4.4	4.4
Recycled Water						
Westside Recycled Water Project[e]	—	1.6	1.8	1.8	1.8	1.8
Harding Park Recycled Water Project[f]	0.0	0.2	0.2	0.2	0.2	0.2
Sharp Park Recycled Water Project[g]	0.1	0.1	0.1	0.1	0.1	0.1
Treasure Island Recycled Water Project[h]	0.0	0.2	0.4	0.4	0.4	0.4
Subtotal Recycled Water	0.1	2.1	2.5	2.5	2.5	2.5
Total Retail Supply	68.8	70.7	72.4	74.5	77.4	80.6

a Assuming that the retail supply allocation remains 81 mgd through 2045, up to 81 mgd of RWS supply may be used.

b The San Francisco Groundwater Supply Project will ramp up potable water production from 1 mgd in 2025 to 4 mgd by 2030. About 1.5 mgd of groundwater currently serves irrigation at Golden Gate Park, the San Francisco Zoo, and the Great Highway medians. This 1.5 mgd of groundwater will be converted to potable supply under the San Francisco Groundwater Supply Project.

c No groundwater will be used for in-city irrigation once the Westside Recycled Water Project comes online.

d Castlewood CSA is served by the Castlewood Well System.

e The Westside Recycled Water Project will supply Golden Gate Park (1.2 mgd), Lincoln Park (0.1 mgd) and the Zoo (0.3 mgd) by 2025, and the Presidio (0.2 mgd) by 2030.

f Irrigation at Harding Park and Fleming Golf Courses is provided recycled water from NSMCSD. The Harding Park Recycled Water Project was not operational in 2020 and is planned to be back online by 2025.

g Irrigation at Sharp Park Golf Course is provided recycled water from NCCWD. The Sharp Park Recycled Water Project was fully online in 2020 and approximately 0.1 mgd was provided in 2020.

h Recycled water operations will begin in 2025, but the full infrastructure for delivery will not be built out at that time; the full capacity of 0.4 mgd annual average is anticipated to be reached by 2030.

6.3 ENERGY INTENSITY ANALYSIS

As mandated by Section 10631.2(a) of the CWC, energy intensity data for FY19-20 for the SFPUC system is included in the following section and in Appendix I.

Based on the SFPUC's water delivery system, it is not possible to separate the energy data for the retail and wholesale water deliveries. The Total Utility Approach is therefore used to report the system's available energy intensity information. While the total volume of water delivered includes both retail and wholesale usage, SFPUC does not have access to electricity meter records for the electricity usage of its wholesale customers to distribute water within their own service areas, and is therefore not included in this analysis. In addition, the electricity consumed by other entities to produce recycled water is not included.

The reported energy consumed includes the consequential hydropower produced as a result of the water delivery through the RWS. The RWS is almost entirely gravity-driven from its Sierra Reservoirs to the Bay Area; no electricity is used for pumping at wholesale customer turnouts. Electricity usage taken into account in this analysis primarily represents pumping to off-stream storage in the Bay Area, in-city pumping for water distribution, and usage at the SFPUC's two water treatment plants (Sunol and Harry Tracy WTPs). The electricity usage also includes administrative and support facilities. The Hetch Hetchy Regional Power System is composed of three (3) hydroelectric powerhouses, which account for a total hydroelectric generating capacity of 385 MW: Moccasin Powerhouse, Kirkwood Powerhouse and Holm Powerhouse.

SECTION 7: WATER SUPPLY RELIABILITY NARRATIVE

This section describes the reliability of the RWS and local supplies to meet retail and wholesale demands through the year 2045. As described previously, supplies to meet retail demands come from the RWS and local water supply sources, including groundwater and recycled water. Approximately one third of the SFPUC's RWS supply is delivered to retail customers, and the remaining two thirds is delivered to wholesale customers.

Reliability of the RWS is expressed in terms of the system's ability to deliver water during droughts. Reliability may be quantified by the amount and frequency of water delivery reductions (i.e., deficiencies) required to balance customer demands with available supplies. The SFPUC plans deliveries under the premise that a drought more severe than the worst drought on record may occur. This section describes the SFPUC's nearly-completed Water System Improvement Program (WSIP), new and continued factors that are impacting supply reliability, and the SFPUC's new Alternative Water Supply Planning Program whose aim is to address future potential supply shortfalls.

7.1 WATER SYSTEM IMPROVEMENT PROGRAM

The WSIP is a $4.8 billion, multi-year capital program to upgrade the RWS and is approximately 96% complete to date. The SFPUC undertook the WSIP to ensure the ability of the RWS to meet Level of Service (LOS) goals and objectives for water quality, seismic reliability, delivery reliability, and water supply. The Water Supply LOS goal, stated in the WSIP and adopted in 2008, is to meet customer water needs in non-drought and drought periods.

As required under the California Environmental Quality Act (CEQA), the San Francisco Planning Department prepared a Programmatic Environmental Impact Report (PEIR) for the WSIP, which was certified in October 2008. The PEIR evaluated the potential environmental impacts of the proposed WSIP projects and identified potential mitigations to those impacts. The PEIR also evaluated several alternatives to meet the SFPUC service area's projected increase in water demand through 2030. The water supply improvement options that were evaluated included 10 alternatives using various water supply combinations from the local watersheds; the Tuolumne and Lower Tuolumne River; ocean desalination; and additional recycled water, groundwater, and conservation.

The Phased WSIP Variant includes the following water supply elements:

- Cap on RWS deliveries at 265 mgd annual average, referred to as the Interim Supply Limitation (ISL). This includes 184 mgd for the Wholesale Customers and 81 mgd for retail customers.[13]
- Water supply sources include 265 mgd average annual from the RWS and 20 mgd of water conservation[14], recycled water, and local groundwater developed within the SFPUC's service area (10 mgd in the retail service area and 10 mgd in the wholesale service area);
- Water supply projects to meet dry-year demands with no greater than 20% system-wide rationing in any one year. For a discussion of the WSIP dry-year projects and their current status, see Section 7.2 below.
- Reevaluation of 2030 demand projections, potential RWS purchase requests, and water supply options by December 31, 2018 and a separate SFPUC decision no later than 2018 regarding RWS future water deliveries after 2018. As discussed further below in Section 7.3.3, this process has been postponed to 2028 to allow for the necessary supply assessments and environmental review.

[13] As explained in Section 2.4, Groveland CSD is considered a retail customer of the SFPUC. Thus, RWS supplies to Groveland CSD are accounted for in the retail supply allocation of 81 mgd.
[14] Water conservation is accounted for as a demand reduction.

7.2 WSIP DRY-YEAR WATER SUPPLY PROJECTS

The SFPUC undertook a number of water supply projects through WSIP to meet dry-year demands with no greater than 20 percent system-wide rationing in any one year.

Calaveras Dam Replacement Project. Calaveras Dam is located in the East Bay near a seismically active fault zone and was determined to be seismically vulnerable. The SFPUC operated Calaveras Reservoir at 39 percent of its capacity as a result of a California Division of Safety of Dams (DSOD) order from 2001 to 2018. The reduced capacity significantly affected the ability of the SFPUC to carryover dry-year water supplies from one year to the next and, therefore, impacted the SFPUC's dry-year water supplies. To address the dam's vulnerability, the SFPUC constructed a new dam of equal height downstream of the existing dam. Construction of the embankment dam was completed in Fall 2018; at that time, the SFPUC began impounding water behind the new dam in accordance with DSOD guidance. As of December 2020, reservoir storage was at 55% of total capacity. Maximum reservoir storage since refill began was 67% of capacity, in May of 2019. Storage has declined since then due to dry hydrologic conditions. The project reached final completion in July 2019 and has been in the closeout phase since 2019 without the Calaveras Reservoir reaching sufficient level to fulfill Initial Fill Plan inspections. The project team continues to monitor and is ready to resume reservoir initial fill inspections in 2021.

Alameda Creek Recapture Project. The Alameda Creek Recapture Project[15] will recapture the water system yield that is either lost due to instream flow releases at Calaveras Reservoir or bypassed around the Alameda Creek Diversion Dam and return this yield to the RWS through facilities in the Sunol Valley. Water that naturally infiltrates from Alameda Creek will be recaptured into an existing quarry pond known as SMP (Surface Mining Permit)-24 Pond F2. The project will be designed to allow the recaptured water to be pumped to the Sunol Valley Water Treatment Plant or to San Antonio Reservoir. Construction of this project will occur from spring 2021 to spring 2023.

Lower Crystal Springs Dam Improvements Project. The Lower Crystal Springs Dam (LCSD) Improvements Project was completed in May 2012. The related joint San Mateo County/SFPUC Bridge Replacement Project to replace the bridge across the Lower Crystal Springs Dam was completed in January 2019. A WSIP follow up project to modify the LCSD Stilling Basin for fish habitat and upgrade the fish water release and other valves started in April 2019. While the main improvements to the dam have been completed, environmental permitting issues for reservoir operation remain significant. When the reservoir elevation was lowered due to DSOD restrictions, habitat for Fountain Thistle, an endangered plant species, was discovered in areas formerly inundated by the reservoir. Raising the reservoir elevation now requires that new plant populations be reinstated incrementally before the reservoir elevation is restored. The result is that it may be several years before pre-project water storage volumes can be realized.

Regional Groundwater Storage and Recovery Project. The Regional Groundwater Storage and Recovery (GSR) Project is a strategic partnership between the SFPUC and three San Mateo County agencies: the California Water Service Company (serving South San Francisco and Colma), the City of Daly City, and the City of San Bruno. The project sustainably manages groundwater and surface water resources in order to provide the RWS with additional supplies during times of drought. During years of normal or heavy rainfall, the project would provide additional surface water to the partner agencies in San Mateo County, allowing them to reduce the amount of groundwater that they pump from the South Westside Groundwater Basin. Over time, the reduced pumping would allow the aquifer to naturally recharge and result in increased groundwater storage of up to 61,000 acre feet of new water supply available during dry years.

Phase 1 of this project, which includes constructing of thirteen well sites, is over 99 percent complete. Testing of the groundwater delivery system took place in 2020. Construction of Phase 1 is expected to be complete in 2021. Phase 2 of this project consists of completing construction of the well station at the South San Francisco Main site that was delayed due to access restrictions, and also various carryover work at the other well sites that were not completed during Phase 1.

[15] The project formerly known as the Upper Alameda Creek Filter Gallery Project in the WSIP was later reconfigured as the Alameda Creek Recapture Project.

Phase 2 design work began in early 2020. The 95% design has been completed and submitted to fellow partner agencies for review, and the 100% design package is being drafted.

A new project called "Regional Groundwater Treatment Improvements" was approved in the 10-Year Water Enterprise Capital Improvement Program for FY 2021-2030 and includes treatment facilities for several of the GSR wells to address groundwater quality issues that have emerged since the wells were constructed. This project will be initiated in 2021.

Water Transfers. During the planning and implementation of the Phased WSIP, the SFPUC pursued a long-term agreement to transfer 2 mgd from Modesto Irrigation District (MID) to the SFPUC in drought years. Negotiations with MID ended in 2012 when an agreement could not be reached. The dry-year transfer project is now being included as part of the new SFPUC Alternative Water Supply Program and is described in further detail in Section 7.3.9.

7.3 FACTORS AFFECTING FUTURE RWS SUPPLIES

There are several factors that may impact future RWS supplies; these factors are described below.

7.3.1 Adoption of the 2018 Bay-Delta Plan Amendment

In December 2018, the State Water Resources Control Board (SWRCB) adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) to establish water quality objectives to maintain the health of the Bay-Delta ecosystem. The SWRCB is required by law to regularly review this plan. The adopted Bay-Delta Plan Amendment was developed with the stated goal of increasing salmonid populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay-Delta. The Bay-Delta Plan Amendment requires the release of 30-50% of the "unimpaired flow"[16] on the three tributaries from February through June in every year type. In SFPUC modeling of the new flow standard, it is assumed that the required release is 40% of unimpaired flow.

If the Bay-Delta Plan Amendment is implemented, the SFPUC will be able to meet the projected water demands presented in this UWMP in normal years but would experience supply shortages in single dry years or multiple dry years. Implementation of the Bay-Delta Plan Amendment will require rationing in all single dry years and multiple dry years.

The SWRCB has stated that it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, assuming all required approvals are obtained by that time. But implementation of the Plan Amendment is uncertain for multiple reasons.

- Since adoption of the Bay-Delta Plan Amendment, over a dozen lawsuits have been filed in both state and federal courts, challenging the SWRCB's adoption of the Bay-Delta Plan Amendment, including a legal challenge filed by the federal government, at the request of the U.S. Department of Interior, Bureau of Reclamation. This litigation is in the early stages and there have been no dispositive court rulings as of this date.
- The Bay-Delta Plan Amendment is not self-implementing and does not automatically allocate responsibility for meeting its new flow requirements to the SFPUC or any other water rights holders. Rather, the Bay-Delta Plan Amendment merely provides a regulatory framework for flow allocation, which must be accomplished by other regulatory and/or adjudicatory proceedings, such as a comprehensive water rights adjudication or, in the case of the Tuolumne River, may be implemented through the water quality certification process set forth in section 401

[16] "Unimpaired flow represents the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds." (Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Dec. 12, 2018) p.17, fn. 14, available at **https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf**.)

of the Clean Water Act as part of the Federal Energy Regulatory Commission's (FERC) licensing proceedings for the Don Pedro and La Grange hydroelectric projects.

- On January 15, 2021, the SWRCB released the Clean Water Act section 401 Water Quality Certification for the Turlock Irrigation District and Modesto Irrigation District Don Pedro Hydroelectric Project and La Grange Hydroelectric Project, FERC Project Nos. 2299 and 14581 (WQC). The WQC includes the 40% unimpaired flow objective from the Bay Delta Plan Amendment, as well as additional conditions that, if incorporated into FERC licenses for the Don Pedro and La Grange Projects, would severely impact SFPUC's water supply; the WQC's requirements differ significantly from the recommended flows and conditions that FERC has analyzed in the Staff Alternative of its Final Environmental Impact Statement for the licenses. To date, FERC has not taken action to incorporate the WQC into the licenses or to finalize the licenses for issuance. At this time, it is highly uncertain whether the WQC will be implemented by either the state or federal government for several reasons:

    - On February 16, 2021, multiple parties, including the City, Modesto and Turlock Irrigation Districts, and BAWSCA, filed with the SWRCB Petitions for Reconsideration of the WQC. Those petitions are currently pending before the SWRCB. In its March 15, 2021 order denying the Districts' request for a stay of the WQC, SWRCB stated that "[i]t is not the State Water Board's practice to seek enforcement while a petition for reconsideration of a certification is pending" and that "the State Water Board has *never* sought to enforce a certification before [a FERC] license is issued." (SWRCB, Order No. WQ 2021-0007-EXEC.) SWRCB emphasized that there was further "no information to support the conclusion that FERC will imminently issue licenses incorporating some or all of the certification." (Id.)

    - If the SWRCB denies the pending petitions for reconsideration or otherwise fails to revise or rescind the WQC, litigation is expected. In addition, the Districts filed a petition for declaratory order at FERC alleging that the SWRCB has waived its authority to issue the WQC, and they sought rehearing of FERC's January 19, 2021 order denying that petition. On March 22, 2021, FERC issued a Notice of Denial of Rehearing by Operation of Law and Providing for Further Consideration. The Districts have the option to appeal FERC's decision. These legal challenges could take years to resolve and may result in temporary or permanent stays of implementation of the WQC. FERC's policy is not to issue a license when a WQC has been stayed pending appeal within a state process. *See Alcoa Power Generating Inc.*, 130 FERC ¶ 61,037, P 15 (2010).

    - Aside from legal challenges, there are additional steps to complete in the licensing process before FERC is likely to issue the licenses: (a) completion of Endangered Species Act consultation, and (b) additional environmental review under NEPA to evaluate the WQC conditions. FERC also cannot issue the licenses without making a determination that the terms and conditions, including the requirements of the WQC, meet the statutory criteria of the Federal Power Act.

    - If FERC were to issue license(s) for the Don Pedro and La Grange Projects incorporating the current WQC, the Districts and other parties to the licensing proceeding would have the option to seek rehearing of FERC's licensing order, and depending on the outcome of that process, then challenge the license(s) in the court and seek a stay. The Districts would also have the option to refuse to accept the license(s).

Due to the above, it is speculative whether the current WQC will be placed in the FERC licenses and when these licenses will be issued. Accordingly, this UWMP does not model projections of SFPUC water supply under the WQC.

In recognition of the obstacles to implementation of the Bay-Delta Plan Amendment, the SWRCB Resolution No. 2018-0059 adopting the Bay-Delta Plan Amendment directed staff to help complete a "Delta watershed-wide agreement, including potential flow measures for the Tuolumne River" by March 1, 2019, and to incorporate such agreements as an

"alternative" for a future amendment to the Bay-Delta Plan to be presented to the SWRCB "as early as possible after December 1, 2019." In accordance with the SWRCB's instruction, on March 1, 2019, the SFPUC, in partnership with other key stakeholders, submitted a proposed project description for the Tuolumne River that could be the basis for a voluntary substitute agreement with the SWRCB ("March 1st Proposed Voluntary Agreement"). On March 26, 2019, the SFPUC adopted Resolution No. 19-0057 to support the SFPUC's participation in the Voluntary Agreement negotiation process. To date, those negotiations are ongoing under the California Natural Resources Agency and the leadership of the Newsom administration.[17]

Because of the uncertainty surrounding implementation of the Bay-Delta Plan Amendment, the water service reliability assessment presented in Section 8 of this draft UWMP looks at two future supply scenarios, both with and without implementation of the Bay-Delta Plan Amendment. Although the SWRCB has stated it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, given the current level of uncertainty, it is assumed for the purposes of this draft UWMP that the Bay-Delta Plan Amendment will be fully implemented starting in 2023.

7.3.2 Potential State and Federal Regulations

The SFPUC's operation of the RWS is subject to numerous State and federal agency permits designed to protect drinking water quality and the environment. Some permit requirements have been in place for decades and influence the way water supply is managed. Requirements for instream flows, for example, may increase the releases or bypass flow from SFPUC facilities. In the Tuolumne River watershed, the SFPUC currently maintains a specific flow release schedule downstream of Hetch Hetchy Reservoir, Cherry Lake, and Lake Eleanor. When the WSIP was analyzed in the PEIR, local system reservoirs had no formal flow release requirements, so no instream flow release and bypass requirements were reflected in the water supply program for the Calaveras Dam Replacement and Lower Crystal Springs Dam Improvement Projects. However, as noted earlier, changes to the flow schedules for dams on Alameda and San Mateo Creeks that resulted from project permitting impacted the water supply reliability of the RWS. Permitting for future projects may further impact water supply reliability through additional instream flow release or bypass requirements.

As described in Section 3.1.4, the SFPUC uses a portion of Don Pedro Reservoir as a water bank under agreement with the Districts. The re-licensing of the Don Pedro reservoir by FERC may require additional water released from the reservoir for the preservation of aquatic species in the lower Tuolumne River, potentially affecting the yield of the RWS by reducing the balance of water stored in the water bank. The final Environmental Impact Statement was released by FERC on July 7, 2020. There is no schedule for when FERC will issue the relicense.

7.3.3 Additional Water Supply Decisions

In the 2009 WSA, the SFPUC committed to make two decisions before the end of 2018 that affect water supply development:

- Whether or not to make the Cities of San Jose and Santa Clara permanent customers of the RWS, and
- Whether or not to increase Supply Assurance above 184 mgd to meet future Wholesale Customer demands.

The SFPUC determined prior to 2018 that it needed to reevaluate water system demands and supply options, and conduct additional supply reliability studies and environmental reviews necessary to address the water supply decisions. As a result, instead of arriving at a decision point in 2018, the SFPUC and the Wholesale Customers updated the WSA and deferred the supply decisions to 2028 to allow the SFPUC to conduct the necessary water supply planning and CEQA analysis.

[17] California Natural Resources Agency, "Voluntary Agreements to Improve Habitat and Flow in the Delta and its Watersheds," available at **https://files.resources.ca.gov/voluntary-agreements/**.

The SFPUC's planning efforts to fulfill the water supply needs for the Cities of San Jose and Santa Clara are included in the Alternative Water Supply Program as described further below in Section 7.4.

7.4 ALTERNATIVE WATER SUPPLY PROGRAM

The SFPUC is increasing and accelerating its efforts to acquire additional water supplies and explore other projects that would increase overall water supply resilience through the Alternative Water Supply Planning Program. The drivers for the program include: (1) the adoption of the Bay-Delta Plan Amendment and the resulting potential limitations to RWS supply during dry years, (2) the net supply shortfall following the implementation of WSIP, (3) San Francisco's perpetual obligation to supply 184 MGD to the Wholesale Customers, (4) adopted Level of Service (LOS) Goals and Objectives to limit rationing to no more than 20 percent system-wide during droughts, and (5) the potential need to identify water supplies that would be required to offer permanent status to interruptible customers. Developing additional supplies through this program would reduce water supply shortfalls and reduce rationing associated with such shortfalls. The planning priorities guiding the Alternative Water Supply Program are as follows:

1. Offset instream flow needs and meet regulatory requirements
2. Meet existing obligations to existing permanent customers
3. Make interruptible customers permanent
4. Meet increased demands of existing and interruptible customers

In conjunction with these planning priorities, the SFPUC considers how the new framework fits within the LOS Goals and Objectives related to water supply and sustainability when considering new water supply opportunities. The SFPUC adopted LOS Goals and Objectives in 2008, in conjunction with the adoption of WSIP. The key LOS Goals and Objectives relevant to this effort can be summarized as:

- Meet dry-year delivery needs while limiting rationing to a maximum of 20 percent system-wide reduction in water service during extended droughts;
- Diversify water supply options during non-drought and drought periods;
- Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers;
- Meet, at a minimum, all current and anticipated legal requirements for protection of fish and wildlife habitat;
- Maintain operational flexibility (although this LOS Goal was not intended explicitly for the addition of new supplies, it is applicable here).

Together, the planning priorities and LOS Goals and Objectives provide a lens through which the SFPUC considers water supply options and opportunities to meet all foreseeable water supply needs.

In addition to the Daly City Recycled Water Expansion project[18], which was a potential project identified in the 2015 UWMP and had committed funding at that time, the SFPUC has taken action to fund the study of several other potential additional water supply projects. Capital projects under consideration to develop additional water supplies include surface

[18] While this potential project was identified in the 2015 UWMP, it has since been approved by Daly City following environmental review and has a higher likelihood of being implemented.

water storage expansion, recycled water expansion, water transfers, desalination, and potable reuse projects. A more detailed list and descriptions of these efforts are provided below.

The capital projects that are under consideration would be costly and are still in the early feasibility or conceptual planning stages. Because these water supply projects would take 10 to 30 years to implement, and because required environmental permitting negotiations may reduce the amount of water that can be developed, the yield from these projects are not currently incorporated into the SFPUC's supply projections. State and federal grants and other financing opportunities would be pursued for eligible projects, to the extent feasible, to offset costs borne by ratepayers.

If all the projects identified through the current planning process could be implemented, there would still be a supply shortfall to meet projected needs. Furthermore, each of the supply options being considered has its own inherent challenges and uncertainties that may affect the SFPUC's ability to implement it.

Given the limited availability of water supply alternatives - unless the supply risks are significantly reduced or the SFPUC's needs change significantly - the SFPUC will continue to plan, develop, and implement all project opportunities that can help bridge the anticipated water supply gaps during droughts. In 2019, the SFPUC completed a survey among water and wastewater agencies within the SFPUC's service area to identify additional opportunities for purified water. Such opportunities remain limited, but the SFPUC continues to pursue all possibilities.

The SFPUC will prepare an Alternative Water Supply Plan by July 2023, which will include a planning framework that will consider water supply needs and related tradeoffs, guide the decisions to proceed with environmental review, and continue the development of projects that can best meet anticipated water supply needs. In the meantime, the SFPUC has been preparing quarterly reports that provide an update on the status of planning efforts regarding the regional and local water supply, storage, and related infrastructure planned projects.

The following capital projects are the alternative local and regional water supply and storage projects that represent the SFPUC's early planning to meet future water supply challenges and vulnerabilities, such as environmental flow needs and other regulatory changes, earthquakes, disasters and emergencies, population and employment increases, and climate change.

7.4.1 Local Projects

San Francisco Purified Water. The San Francisco Purified Water Project envisions providing a new, local drinking water supply in San Francisco. The project would treat secondary effluent sourced from the SFPUC's Southeast Treatment Plant or Oceanside Treatment Plant through a multi-stage, multi-barrier advanced treatment process to produce water that meets state and federal drinking water standards. The treated water would then be blended at one or more of San Francisco's drinking water reservoirs. Before engaging at a project-level, the SFPUC will participate in research and data collection around water quality and process reliability for purified water opportunities.

With the successful completion of PureWaterSF, San Francisco's initial research and demonstration of a small-scale Direct Potable Reuse (DPR) project, the SFPUC is beginning to plan next steps for the development of purified water. SFPUC staff has begun putting together a scope of work to consider the size and scope of purified water opportunities in San Francisco, as well as identify research, training and outreach needs.

Satellite Recycled Water. A potential Satellite Recycled Water Project would provide a tertiary recycled water supply to meet the demands of dual plumbed buildings in San Francisco that do not currently have a non-potable water supply source. This project would provide an appropriate water supply source for non-potable irrigation, as well as commercial and industrial uses not addressed by the Non-Potable Water Ordinance.

Innovations Program. This program supports the development of new technologies and initiatives. Included in the Innovations Program are demonstrations of new technologies and grant funds to support partnership opportunities. Examples of projects within the Innovations Program include a grant program to treat process in breweries, and grants to support onsite reuse projects with heat recovery systems. The SFPUC is also pursuing a prospective project to expand leak detection and a project to test atmospheric water generation technology.

Potable Offset Potential. The purpose of this project is to explore the potential to offset the incremental water demand associated with large new developments in San Francisco. Through coordination with other City departments such as Planning and the Department of Building Inspection, the SFPUC will identify options and potable water thresholds that may result in policy recommendations. The first step in the planning process will be to survey proposed developments to determine the volume and characteristics of incremental demand that are not already being offset by the Non-Potable Water Ordinance or other existing requirements. An initial review of existing potable offset programs has been conducted.

7.4.2 Regional Projects

Daly City Recycled Water Expansion. This project has been designed to produce up to 3 mgd of tertiary recycled water during the irrigation season (~7 months). On an average annual basis, this is equivalent to 1.25 mgd or 1,400 acre-feet per year. The project is envisioned to provide recycled water to 13 cemeteries and other smaller irrigation customers, offsetting existing groundwater pumping from the South Westside Groundwater Basin; this will increase groundwater storage, enhancing the reliability of the GSR Project in the Basin. The project is a regional partnership between the SFPUC the City of Daly City, and the California Water Service Company, whose service area includes numerous irrigators using a combination of groundwater and surface water from the RWS. RWS customers will benefit from the increased reliability of the South Westside Basin for additional drinking water supply during droughts.

ACWD-USD Purified Water Partnership. This project could provide a new purified water supply to the RWS utilizing Union Sanitary District's (USD) treated wastewater. Purified water produced by advanced water treatment at USD in the East Bay could be transmitted to the Quarry Lakes Groundwater Recharge Area to supplement recharge into the Niles Cone Groundwater Basin as part of an indirect potable reuse project or be put to other uses in ACWD's service area. With the latter option, providing additional water supply to ACWD as part of an in-lieu exchange with the SFPUC would result in more water left in the RWS. Additional water supply could also be directly transmitted to the SFPUC through a new intertie between ACWD and the SFPUC.

Crystal Springs Purified Water. The Crystal Springs Purified Water Project, also referred to as the Potable Reuse Exploratory Plan (PREP) is a purified water project (indirect potable reuse) that could provide 6-12 mgd of water supply through reservoir water augmentation at Crystal Springs Reservoir, which is a facility of the RWS. Treated wastewater from Silicon Valley Clean Water (SVCW) and/or the City of San Mateo would go through an advanced water treatment plant to produce purified water that meets state and federal drinking water quality standards. The purified water would then be transmitted 10-20 miles (depending on the alignment) to Crystal Springs Reservoir, blended with regional surface water supplies, and treated again at Harry Tracy Water Treatment Plant.

Los Vaqueros Reservoir Expansion. The Los Vaqueros Reservoir Expansion (LVE) Project is a multi-agency storage project that will enlarge the existing reservoir located in northeastern Contra Costa County from 160,000 acre-feet to 275,000 acre-feet. While the existing reservoir is owned and operated by Contra Costa Water District (CCWD), the expanded reservoir will have regional benefits for numerous water agencies and their customers and will be managed by a Joint Powers Authority (JPA) that will be set up prior to construction. Meanwhile, CCWD is leading the planning, design and environmental review efforts. CCWD's Board certified the EIS/EIR and approved the LVE Project on May 13, 2020.

The additional storage capacity from the LVE Project would provide a dry year water supply benefit to the SFPUC. However, the challenges of securing a water supply to store in the SFPUC's portion of reservoir and ensuring there is an

available path for conveyance of that water supply to and from the reservoir may both be significant barriers to realizing the full water supply potential of storage for SFPUC customers. In particular, issues related to conveyance must be better understood before the SFPUC can determine the extent of its participation in the LVE project. As such, this project is being planned in conjunction with the following projects described below: Conveyance Alternatives, the Bay Area Regional Reliability (BARR) Shared Water Access Program, and the Bay Area Brackish Water Desalination Project.

Conveyance Alternatives. The SFPUC is considering two main pathways to move water from storage in a prospective LVE Project to the SFPUC's service area: either directly to RWS facilities or indirectly via an exchange with partner agencies. The SFPUC is evaluating potential alignments for conveyance.

The Bay Area Regional Reliability (BARR) Shared Water Access Program. As part of the BARR Partnership, a consortium of 8 Bay Area water utilities (including ACWD, BAWSCA, CCWD, East Bay Municipal Utility District (EBMUD), Marin Municipal Water District (MMWD), SFPUC, Valley Water, and Zone 7 Water Agency) are exploring opportunities to move water across the region as efficiently as possible, particularly during times of drought and emergencies. The BARR agencies are proposing two separate pilot projects in 2020-2021 through the Shared Water Access Program (SWAP) to test conveyance pathways and identify potential hurdles to better prepare for sharing water during a future drought or emergency. A strategy report identifying opportunities and considerations will accompany these pilot projects and will be completed in 2021.

Bay Area Brackish Water Desalination. The Bay Area Brackish Water Desalination (Regional Desalination) Project is a partnership between CCWD, SFPUC, Valley Water, and Zone 7 Water Agency. EBMUD and ACWD may also participate in the project. The project could provide a new drinking water supply to the region by treating brackish water from CCWD's existing Mallard Slough intake in Contra Costa County. While this project has independent utility as a water supply project, for the current planning effort the SFPUC is considering it as a source of supply for storage in LVE. While the allocations remain to be determined among partners, the SFPUC is considering the project would provide a water supply benefit to its customers of between 5 and 15 mgd during drought conditions when combined with storage at LVE.

Calaveras Reservoir Expansion. This storage project envisions the expansion of the existing Calaveras Reservoir to create up to 289,000 AF of additional capacity to store excess RWS supplies or other source water in wet and normal years. In addition to reservoir enlargement, the project would involve infrastructure to pump water to the reservoir, such as pump stations and transmission facilities. Unlike the other regional projects under review in this program, no external partners are anticipated for this project. The SFPUC has conducted a preliminary analysis reviewing potential dam raise scenarios, which indicated that an expansion of the dam at various elevations is technical feasible. Water supply, conveyance, and capacity constraints at related facilities will be evaluated.

Groundwater Banking. Groundwater banking in the Modesto Irrigation District (MID) and Turlock Irrigation District (TID) service areas could be used to provide some additional water supply to meet instream releases in dry years, reducing water supply impacts to the SFPUC service area. For example, additional surface water could be provided to irrigators in wet years, which would offset the use of groundwater, thereby allowing the groundwater to remain in the basin rather than be consumptively used. The groundwater that remains in the basin can then be used in a subsequent dry year for irrigation, freeing up surface water that would have otherwise been delivered to irrigators to meet instream flow requirements.

Feasibility study of this option is included in the proposed Tuolumne River Voluntary Agreement. Progress on this potential water supply option will depend on the negotiations of the Voluntary Agreement.

Inter-Basin Collaborations. Inter-Basin Collaborations could provide net water supply benefits in dry years by sharing responsibility for in-stream flows in the San Joaquin River and Delta more broadly among several tributary reservoir systems. One mechanism by which this could be accomplished would be to establish a partnership between interests on

the Tuolumne River and those on the Stanislaus River, which would allow responsibility for streamflow to be assigned variably based on the annual hydrology.

As is the case with Groundwater Banking, feasibility of this option is included in the proposed Tuolumne River Voluntary Agreement.

Dry-Year Transfers. WSIP included a water transfer between the SFPUC and other water users on the Tuolumne River. In 2012, staff of the SFPUC and MID developed a term sheet for a 2 mgd dry-year water supply transfer for approval by their governing boards. The SFPUC and MID were ultimately unable to reach agreement on mutually beneficial terms and the water transfer negotiations were terminated. Subsequently, the SFPUC began discussions with the Oakdale Irrigation District (OID) for a one-year transfer agreement with the SFPUC for 2 mgd. No progress towards agreement on a transfer was made in 2020, but the irrigation districts recognize the SFPUC's continued interest, and the SFPUC is continuing to pursue transfers in conjunction with ongoing discussions associated with the implementation of the Bay-Delta Plan Amendment.

7.5 BAY AREA REGIONAL EFFORTS TO IMPROVE WATER SUPPLY RELIABILITY

The following projects and efforts are currently underway or completed and will help the RWS meet its water supply reliability needs. Some of these projects are reflected in the SFPUC's current strategy for meeting water supply needs described above. As the remainder of these projects move through the planning stages, they will continue to inform the SFPUC's water supply strategy.

Bay Area Regional Reliability. The SFPUC is continuing to work with seven water agencies in the Bay Area (ACWD, BAWSCA, CCWD, EBMUD, MMWD, Valley Water and Zone 7 Water Agency) to investigate opportunities for collaboration, particularly during future droughts. The purpose of this planning effort, known as Bay Area Regional Reliability (BARR), is to identify projects and processes to enhance water supply reliability across the region, leverage existing infrastructure investments, facilitate water transfers during critical shortages, and improve climate change resiliency. In 2017, with funding support from the U.S. Bureau of Reclamation, the BARR partner agencies completed a Drought Contingency Plan. The Plan identified short-term response actions and longer-term projects that could facilitate the sharing of infrastructure for the benefit of the region including interties, expanded storage, new water supply and operational improvements. To further evaluate the potential for building regional resilience, in 2019 the BARR partners (with the exception of MMWD) initiated development of the Bay Area Shared Water Access Program (Bay Area SWAP). The Bay Area SWAP effort has also received funding support from the U.S. Bureau of Reclamation and is ongoing. The goal of Bay Area SWAP is to develop a Strategy Report outlining an implementation plan to facilitate transfers to and exchanges within the Bay Area, leveraging existing infrastructure and institutional agreements and identifying new components that may be needed. Through the Drought Contingency Plan and Bay Area SWAP efforts, the BARR partner agencies have convened a Stakeholder Task Force to provide stakeholders, interested parties and BARR partners an opportunity for meaningful engagement and input.

Regional Interties. Regional interties help increase the reliability of the RWS by allowing for water exchanges during emergencies, water shortages, or maintenance.

- **EBMUD-Hayward-SFPUC Emergency Intertie:** In 2002, the SFPUC formed a partnership with EBMUD and the City of Hayward to construct Skywest Pump Station and 1.5 miles of pipeline to link their systems. These facilities can convey up to 30 mgd among these three agencies to boost water supply reliability when needed. EBMUD and the SFPUC own these facilities jointly, while the City of Hayward maintains and operates them in coordination with EBMUD and the SFPUC.

- **SFPUC-Valley Water Emergency Intertie:** The SFPUC and Valley Water maintain a 40-mgd intertie between their two systems at Milpitas to exchange water during emergencies and planned maintenance. The intertie has been used on several occasions during maintenance of Valley Water's system.

- **South Bay Aqueduct Interties:** In the 1990s, the SFPUC used a temporary intertie from the South Bay Aqueduct into San Antonio Reservoir for water a two-year water transfer. To enable deliveries from the Los Vaqueros Reservoir Expansion project, the SFPUC is evaluating the potential for a new intertie.

Bay Area Integrated Regional Water Management Plan. The SFPUC chairs the nine-county Bay Area Integrated Regional Water Management Plan Coordinating Committee. The BAIRWMP was first completed in November 2006 and was updated in 2013 and 2019. The BAIRWMP describes the region's water supply and water quality, wastewater and water recycling, storm water and flood protection, and habitat protection and ecosystem restoration objectives and efforts. The BAIRWMP also identifies integrated and collaborative projects among Bay Area agencies. To date, the Bay Area has received $148.5 million in Propositions 50 and 84 Integrated Regional Water Management (IRWM) implementation grant funding. More recently, the Bay Area received $65 million in Proposition 1 IRWM grant funding for implementation, planning, and disadvantaged community involvement efforts.

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SECTION 8: WATER SUPPLY RELIABILITY ASSESSMENT

8.1 CONSTRAINTS ON SUPPLIES

The list below summarizes the legal, environmental, water quality, climatic, and other factors potentially resulting in inconsistent supply.

- **RWS:** As described previously, there may be shortfalls of RWS supplies in dry years as a result of several factors, including required instream flow releases (see Section 7.3) as well as climate change (see Section 6.1.3).

- **Retail Groundwater:** Groundwater supplies are typically limited by the quality and quantity of available supplies. However, the probability of these impacts occurring is low with proper management of the Westside Groundwater Basin as described in Section 6.2.1.1.

- **Retail Recycled Water:** Recycled water is limited by water quality requirements that legally restrict recycled water supply for some uses. However, recycled water supplies discussed herein are treated, or are planned to be treated, to the standards established by State agencies that are required for each designated end use. As a result, no limitations on use of recycled water for designated purposes are expected to occur.

The adoption of the Bay-Delta Plan Amendment may significantly impact the supply available from the RWS. The SFPUC recognizes that the Bay-Delta Plan Amendment has been adopted and that, given that it is now state law, we must plan for a future in which it is fully implemented. The SFPUC also acknowledges that the plan is not self-implementing and therefore does not automatically go into effect. The SFPUC is currently pursuing a voluntary agreement as well as a lawsuit which would limit implementation of the Plan. With both of these processes occurring on an unknown timeline, the SFPUC does not know at this time when the Bay-Delta Plan Amendment is likely to go into effect. As a result, it makes sense to conduct future supply modeling for a scenario that doesn't include implementation of the Bay-Delta Plan Amendment, as that represents a potential supply reliability scenario.

Because of the uncertainty surrounding implementation of the Bay-Delta Plan Amendment, the following water service reliability assessment includes two sets of tables: (1) a scenario in which the Bay-Delta Plan Amendment is fully implemented in 2023, and (2) a scenario that considers the SFPUC system's current situation without the Bay-Delta Plan Amendment. The two scenarios provide a bookend for the possible future scenarios regarding RWS supplies. The standardized tables associated with this UWMP contain the future scenario that assumes implementation of the Bay-Delta Plan Amendment starting in 2023.

8.2 WATER SUPPLY MODELING

8.2.1 Data & Methods

The SFPUC used the Hetch Hetchy and Local Simulation Model (HHLSM) to perform the water supply analyses for the supply reliability assessment and the drought risk assessment. HHLSM combines a historical record of hydrology from 1920 through 2017 with a current representation of SFPUC RWS infrastructure and operations. The simulated operations include decisions on water supply rationing during droughts. The use of those results is described below.

A key input for the HHLSM model is the anticipated level of demand on the RWS. Supply modeling results presented in the text of this plan reflect an input of projected demands on the RWS consisting of (1) projected retail demands on the RWS (total retail demands minus local groundwater and recycled water supplies, see Table 4-1 and Table 6-5), and (2) projected Wholesale Customer purchases (see Table 4-3). The SFPUC has a Level of Service objective of meeting average annual water demand of 265 mgd from the SFPUC watersheds for retail and Wholesale Customers during non-

drought years, as well as a contractual obligation to supply 184 mgd to the Wholesale Customers. Therefore, the SFPUC has also conducted modeling based on a demand of 265 mgd in order to facilitate planning that supports meeting this Level of Service goal and our contractual obligations. The results of this modeling can be found in Appendix J.

Note that, as shown in Appendix J, in a normal year the SFPUC can provide up to 265 mgd of supply from the RWS. However, as described previously in Section 6.1.4, within the context of this document, normal year RWS supply is defined as the supply that will be used to meet the full demands on the RWS in a normal year.

8.2.2 Design Drought

In the six-year period from 1987-92, a shortfall developed between the SFPUC's supplies and its customers' demands such that significant rationing of water supply became necessary. Other than during the drought of 1976-77, drought sequences in the past did not seriously affect the ability of the RWS to sustain full deliveries to its retail and wholesale customers. Following the 1987-92 drought experience, the SFPUC includes the concept of its "firm" capability in water supply planning, which is defined as the amount of water the RWS can be expected to deliver during drought periods.

The SFPUC uses a hypothetical drought that is more severe than what the RWS has historically experienced. This drought sequence is referred to as the "design drought" and serves as the basis for planning and modeling of future scenarios. The design drought consists of the 1987-92 drought, followed by an additional 2.5 years of dry conditions from the hydrologic record that include the 1976-77 drought. While the latest drought (2012-2015) consists of some of the driest years on record for the SFPUC's watersheds, the design drought still represents a more severe drought in duration and overall water supply deficit.

More specifically, the design drought sequence used by the SFPUC for reliability planning is an 8.5-year period composed of the following elements:

- **Historical Hydrology:** A six-year sequence of hydrology from the historical drought that occurred from July 1986 to June 1992;
- **Prospective Drought:** A 2.5-year period that includes the 1976-77 drought (to represent a drought sequence worse than historical); and
- **System Recovery Period:** The last six months of the design drought are the beginning of the system recovery period. The precipitation begins in the fall, and by approximately the month of December, inflow to RWS reservoirs exceeds customer demands and SFPUC system storage begins to recover.

8.2.3 Definition of Water Supply Scenarios *(Normal, Dry, and Multi-dry Years)*

The total amount of water the SFPUC can deliver to retail and wholesale customers depends on several factors, including the amount of water that is available to the SFPUC from natural runoff, the amount of water in reservoir storage, and the amount of that water that must be released from the RWS for purposes other than customer deliveries (e.g., required instream flow releases below RWS reservoirs). For planning purposes, the SFPUC "normal year" is based on historical hydrology under conditions that allow the reservoirs to be filled over the course of the snowmelt season, allowing full deliveries to customers.

For dry-year supply scenarios, the SFPUC plans its water deliveries using indicators for water supply rationing that are developed through analysis with the design drought sequence described above. As a result, the SFPUC system operations are designed to provide sufficient carry-over water in SFPUC reservoirs to continue delivering water, although at reduced levels, during and after multiple-year droughts.

The supply reliability assessment presented herein assumed the statuses of the ongoing WSIP projects shown in Table 8-1. The WSIP projects will contribute to reducing the anticipated RWS supply reductions in a multi-dry year event.

The levels of water supply deficiency presented for this 2020 UWMP were estimated using the design drought methodology discussed above. The five-consecutive-year dry sequence shown in the tables below represents years 2 through 6 of the design drought; this sequence was chosen because year 2 is the first year when system-wide rationing would come into effect. The results are presented in the standardized format prescribed by DWR for use in the 2020 UWMPs.

Table 8-2 and Table 8-3 summarize the expected availability of local groundwater, recycled water, and RWS supplies under normal, single dry, and multiple dry year conditions. These are the bases for the retail and wholesale supply reliability assessments presented in Sections 8.3 and 8.4. The SFPUC currently operates under a plan that anticipates multiple stages of response to water supply shortages, ranging from use of dry year water supplies (when available) and voluntary customer demand reductions to enforced mandatory water use reductions.

For RWS supplies, supply modeling both with and without the implementation of the Bay-Delta Plan Amendment is included here. The two modeled scenarios show significantly different supply reliability projections for the RWS:

- **With Full Implementation of the Bay-Delta Plan Amendment:** Under the Bay-Delta Plan Amendment conditions, it is anticipated that the RWS supplies will experience a reduction of up to 49% from normal year supplies through the multiple dry-year sequence. The implementation of the Alternative Water Supply Program and associated potential projects will help reduce the anticipated supply shortfalls.

- **Without Implementation of the Bay-Delta Plan Amendment:** Assuming the availability of existing supplies at current demand levels, the SFPUC system can expect to experience no RWS supply reductions until the level of demand anticipated in 2045 is reached. At that level of demand, 10% shortages of RWS supply would occur in years 4 and 5 of the five-consecutive dry year sequence.

Table 8-1. WSIP Project Assumptions for RWS Supply Modeling

Projects	Base Year 2020	Base Year 2025 and Beyond
Calaveras Dam Replacement Project	Calaveras Reservoir partially refilled at spring 2020 level of 63,900 AF	Calaveras Reservoir fully refilled
Lower Crystal Springs Dam Improvements	Crystal Springs storage not fully restored	Crystal Springs storage not fully restored
Regional Groundwater Storage and Recovery (GSR) Project	GSR account partially filled at spring 2020 level of 23,500 AF; GSR recovery rate of 6.2 mgd[a]	GSR account fully filled; GSR recovery rate of 6.2 mgd[a]
Alameda Creek Recapture Project	Project not built	Project built
Dry-year Transfers	Not in effect	Not in effect

[a] The GSR Project was intended to provide 7.2 mgd over 7.5 years, however current limitations on the number of wells available will result in deliveries less than 7.2 mgd over 7.5 years.

Table 8-2. Retail Groundwater and Recycled Water Supply Availability During Normal and Dry Years Using 2025 Base Year

[Standardized Table 7-1 Retail: Bases of Water Year Data]

Water Supply	Normal Year	Single Dry Year	Multiple Dry Years				
			Year 1	Year 2	Year 3	Year 4	Year 5
Projected Years 2025 through 2045 (post-WSIP completion) – both with and without Bay-Delta Plan Amendment							
Local Groundwater[a]	100%	100%	100%	100%	100%	100%	100%
Local Recycled Water[a]	100%	100%	100%	100%	100%	100%	100%

Normal, single dry, and multiple dry year conditions are on a water year basis. Dry year availability is presented in terms of percentage of normal year availability. Groundwater and recycled water availability are not impacted by the implementation of the Bay-Delta Plan Amendment.

a Local supplies are available only to meet retail demands.

Table 8-3. Regional Water System Supply Availability During Normal and Dry Years for Base Years 2025 through 2045 – With and Without Bay-Delta Plan Amendment

Base Year	Normal Year[a]	Single Dry Year	Multiple Dry Years				
			Year 1	Year 2	Year 3	Year 4	Year 5
With Bay-Delta Plan Amendment							
2020[b]	100%	100%	100%	100%	60%	60%	60%
2025	100%	70%	70%	60%	60%	60%	60%
2030	100%	70%	70%	60%	60%	60%	60%
2035	100%	70%	70%	60%	60%	60%	55%
2040	100%	70%	70%	60%	60%	53%	53%
2045	100%	60%	60%	60%	60%	51%	51%
Without Bay-Delta Plan Amendment							
2020	100%	100%	100%	100%	100%	100%	100%
2025	100%	100%	100%	100%	100%	100%	100%
2030	100%	100%	100%	100%	100%	100%	100%
2035	100%	100%	100%	100%	100%	100%	100%
2040	100%	100%	100%	100%	100%	100%	100%
2045	100%	100%	100%	100%	100%	90%	90%

Normal, single dry, and multiple dry year conditions are on a water year basis. Dry year availability is presented in terms of percentage of normal year availability.

RWS supplies are available to meet both retail and wholesale demands. Retail and wholesale allocations are provided in Section 8.3 and Section 8.4(Table 8-4 and Table 8-6 for retail, and Table 8-5 and Table 8-7 for wholesale)

a Normal year supply corresponds to supply that will be used to meet the full demands on the RWS in a normal year, as shown in Table 6-1.

b For base year 2020, the Bay-Delta Plan Amendment is assumed to come into effect in 2023, which is shown here as Year 3 of the multiple dry year sequence.

8.2.4 Allocating Regional Water System Supply

In order to compare retail and wholesale supplies and demands, the available RWS supply in a dry year must first be allocated between the Retail and Wholesale Customers. Procedures to allocate RWS supplies between Retail and Wholesale Customers during system shortages are specified in the SFPUC's Water Shortage Allocation Plan (WSAP), which is an appendix to the Water Supply Agreement. The WSAP is further described in Appendix K. The WSAP defines a percentage split between Retail and Wholesale Customers at different RWS system-wide shortage levels. For example, at a 10% RWS shortage, 36% of available RWS supply is allocated to the Retail Customers, and 64% to the Wholesale Customers. Appendix K presents the percentage splits between Wholesale and Retail Customers at different shortage levels. Per the WSAP, in the event that the retail share of the available water supply results in retail customers having a positive allocation (i.e. a supply of additional water rather than a percentage reduction in water use), the share of the available water supply for retail customers shall be reduced to eliminate any positive allocation, with a corresponding increase in the percentage share of the available water supply allocated to the Wholesale Customers.

In addition, as amended in 2018, the WSAP requires Retail Customers to conserve a minimum of 5% during droughts. If retail demands on the RWS are lower than the retail allocation in a dry year, it is assumed that the retail customers will achieve a 5% demand reduction.

8.3 WATER SUPPLY AND DEMAND COMPARISONS, WITH BAY-DELTA PLAN AMENDMENT

The following sections summarize the projected retail and wholesale supplies and demands during normal, single dry, and multiple dry years for the scenario with full implementation of the Bay-Delta Plan Amendment. The demand assumptions for this analysis are as follows:

- Total retail demands are presented in Section 4.1 and reflect active and passive conservation, onsite water reuse savings, and water loss.
- Wholesale Customer purchase request projections as presented in Table 4-3. A reliability assessment for the Level of Service objective of 265 mgd, which includes the Supply Assurance of 184 mgd, is presented in Appendix J.

Supplies are listed by source: RWS, groundwater (retail only) and recycled water (retail only). The difference between supply and demand, resulting in either a supply surplus or deficit, is also provided for each scenario. As noted earlier, Groveland CSD is accounted for as a retail customer in this section, but, but as a wholesale customer in the corresponding standardized tables in Appendix B.

8.3.1 Retail Water Service Reliability Assessment – With Bay-Delta Plan Amendment

The instream flow requirements of the Bay-Delta Plan Amendment would impact the RWS supplies in the dry-year and multi-dry scenarios. The comparison of retail demands and supplies under the Bay-Delta Plan Amendment is presented in Table 8-4 and demonstrates the following:

- **Normal Years:** During normal hydrologic years, the SFPUC will have adequate supplies to meet its projected retail water demands.

- **Single Dry Year:** During single dry years, there would be an anticipated 30 - 40% shortage of RWS supplies, as described in Table 8-2. When the available RWS supply is allocated between retail and Wholesale Customers (described in Section 8.2.4), and the supplies available to retail customers (RWS plus local supplies) are compared to the projected retail demands (as shown in Table 8-4), a retail supply shortfall of 14% to 25% (11 – 20 mgd) is expected in single dry year conditions.

- **Multiple Dry Years:** If a multiple dry year event occurs, there would be anticipated shortages in RWS supplies of 30 to 49%, depending on demand levels. When the available RWS supply is allocated between retail and Wholesale Customers (described in Section 8.2.4), and the supplies available to retail customers (RWS plus local supplies) are compared to the projected retail demands (as shown in Table 8-4), there is an anticipated shortfall of up to 35%, or almost 29 mgd, by the fifth dry year at 2045 projected levels of demand.

8.3.2 Wholesale Water Service Reliability Assessment – With Bay-Delta Plan Amendment

The comparison of wholesale demands and supplies under the Bay-Delta Plan Amendment presented in Table 8-5 demonstrates the following:

- **Normal Years:** During normal hydrologic years, the SFPUC will have adequate supplies to meet its projected wholesale water demands.

- **Single Dry Year:** During single dry years, there would be an anticipated 30 - 40% shortage of RWS supplies, as described in Table 8-2. When the available RWS supply is allocated between retail and Wholesale Customers (described in Section 8.2.4), and the Wholesale Customer allocation is compared to the projected Wholesale Customer demand (as shown in Table 8-5), this would result in a 36 to 46% (53 – 74 mgd) shortfall for the Wholesale Customers.

- **Multiple Dry Years:** In a multiple dry year event, there would be anticipated shortages in RWS supplies for all projected years, ranging from 30 to 49% shortages. When the available RWS supply is allocated between retail and Wholesale Customers (described in Section 8.2.4), and the Wholesale Customer allocation is compared to the projected Wholesale Customer demand (as shown in Table 8-5), these RWS shortages would result in up to 54% shortfalls for the Wholesale Customers.

Table 8-4. Retail Supply and Demand Comparison for Projected Normal & Dry Year Scenarios With Bay-Delta Plan Amendment (mgd)

[Standardized Table 7-2 Retail: Normal Year Supply and Demand Comparison]

[Standardized Table 7-3 Retail: Single Dry Year Supply and Demand Comparison]

[Standardized Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison]

Year	Retail Supply and Demand	Normal Year	Single Dry Year[a]	Multiple Dry Years[b]				
				Year 1	Year 2	Year 3	Year 4	Year 5
2025	Total Retail Demand	70.7	70.7	70.7	70.7	70.7	70.7	70.7
	Baseline Retail Demand[c]	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*
	WSA 5% Demand Reduction	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	70.7	59.5	59.5	51.5	51.5	51.5	51.5
	Retail Groundwater[e]	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*
	Retail Recycled Water[f]	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*
	RWS Supply Utilized by Retail[g]	*67.2*	*56.0*	*56.0*	*48.0*	*48.0*	*48.0*	*48.0*
	Difference (Supply Surplus or Shortfall)	0.0	-11.2	-11.2	-19.2	-19.2	-19.2	-19.2
	Difference as Percentage of Demand	0.0%	-15.9%	-15.9%	-27.2%	-27.2%	-27.2%	-27.2%
2030	Total Retail Demand	72.4	72.4	72.4	72.4	72.4	72.4	72.4
	Baseline Retail Demand[c]	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*
	WSA 5% Demand Reduction	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	72.4	61.4	61.4	53.4	53.4	53.4	53.4
	Retail Groundwater[e]	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Utilized by Retail[g]	*67.5*	*56.5*	*56.5*	*48.5*	*48.5*	*48.5*	*48.5*
	Difference (Supply Surplus or Shortfall)	0.0	-11.0	-11.0	-19.0	-19.0	-19.0	-19.0
	Difference as Percentage of Demand	0.0%	-15.1%	-15.1%	-26.3%	-26.3%	-26.3%	-26.3%
2035	Total Retail Demand	74.5	74.5	74.5	74.5	74.5	74.5	74.5
	Baseline Retail Demand[c]	*74.5*	*74.5*	*74.5*	*74.5*	*74.5*	*74.5*	*74.5*
	WSA 5% Demand Reduction	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	74.5	63.8	63.8	55.5	55.5	55.5	51.4
	Retail Groundwater[e]	*3.4*	*3.4*	*3.4*	*3.4*	*3.4*	*3.4*	*3.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Utilized by Retail[g]	*68.6*	*57.9*	*57.9*	*49.6*	*49.6*	*49.6*	45.5
	Difference (Supply Surplus or Shortfall)	0.0	-10.7	-10.7	-19.0	-19.0	-19.0	-23.1
	Difference as Percentage of Demand	0.0%	-14.4%	-14.4%	-25.5%	-25.5%	-25.5%	-31.0%
2040	Total Retail Demand	77.4	77.4	77.4	77.4	77.4	77.4	77.4
	Baseline Retail Demand[c]	*77.4*	*77.4*	*77.4*	*77.4*	*77.4*	*77.4*	*77.4*
	WSA 5% Demand Reduction	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	77.4	66.4	66.4	57.9	57.9	52.0	52.0
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*

Year	Retail Supply and Demand	Normal Year	Single Dry Year[a]	Multiple Dry Years[b]				
				Year 1	Year 2	Year 3	Year 4	Year 5
	RWS Supply Utilized by Retail[g]	*70.5*	*59.5*	*59.5*	*51.0*	*51.0*	45.1	45.1
	Difference (Supply Surplus or Shortfall)	0.0	-11.0	-11.0	-19.5	-19.5	-24.5	-25.4
	Difference as Percentage of Demand	0.0%	-14.2%	-14.2%	-25.2%	-25.2%	-32.8%	-32.8%
2045	Total Retail Demand	80.6	80.6	80.6	80.6	80.6	80.6	80.6
	Baseline Retail Demand[c]	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*
	WSA 5% Demand Reduction	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	80.6	60.1	60.1	60.1	60.1	52.1	52.1
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Utilized by Retail[g]	*73.7*	*53.2*	*53.2*	*53.2*	*53.2*	45.2	45.2
	Difference (Supply Surplus or Shortfall)	0.0	-20.5	-20.5	-20.5	-20.5	-28.5	-28.5
	Difference as Percentage of Demand	0.0%	-25.4%	-25.4%	-25.4%	-25.4%	-35.4%	-35.4%

Normal, single dry, and multiple dry year conditions are on a water year basis.

a During a single dry year, system-wide shortages of 30 – 40% are in effect (see Table 8-3). For this analysis, shortages greater than 20% are considered to have the same retail/wholesale allocation as the maximum Stage 4, 16-20% system-wide shortage in the WSAP.

b During multiple dry years, system-wide shortages of 30 – 55% are in effect (see Table 8-3). For this analysis, shortages greater than 20% are considered to have the same retail/wholesale allocation as the maximum Stage 4, 16-20% system-wide shortage in the WSAP.

c Total retail demands correspond to those in Table 4-1, and reflect passive and active conservation, onsite water reuse savings, and water loss. Demands for Groveland CSD is included in the table above. However, in the corresponding standardized tables in Appendix B, Groveland CSD is accounted for as a wholesale customer instead of a retail customer, as explained in Section 2.4.

d As amended in 2018, the WSAP Tier One Allocation Plan requires retail customers to conserve a minimum of 5% during droughts. If, during a declared water shortage, retail demands on the Regional Water System are lower than the retail allocation in a dry year, retail demands on the RWS will be reduced by 5%. An N/A on this row means that either this 5% rationing requirement doesn't apply (i.e. no declared water shortage), or retail customers are already rationing greater than 5%.

e Groundwater supplies are assumed to be equivalent to projected demands for the San Francisco Groundwater Supply Project (ramping up to 4 mgd by 2040) and Castlewood CSA (0.4 mgd). Groundwater availability would not be affected by dry year conditions.

f Recycled water supplies are assumed to be equivalent to projected demands related to the Westside Recycled Water Project (1.6 mgd by 2021 and 1.8 mgd by 2030), Harding Park and Fleming Golf Courses (0.23 mgd), and Sharp Park Golf Course (up to 0.1 mgd) and Treasure Island (0.2 mgd by 2025 and 0.4 mgd by 2030). Recycled water availability would not be affected by dry year conditions.

g Procedures for RWS allocations and the WSAP are described in Section 8.3. Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, in normal years, if groundwater and recycled water supplies are not available, up to 81 mgd of RWS supply could be used.

Table 8-5. Wholesale Supply and Demand Comparison for Projected Normal and Dry Year Scenarios With Bay-Delta Plan Amendment (mgd)

[Standardized Table 7-2 Wholesale: Normal Year Supply and Demand Comparison]

[Standardized Table 7-3 Wholesale: Single Dry Year Supply and Demand Comparison]

[Standardized Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison]

Year	Wholesale Supply and Demand	Normal Year	Single Dry Year[a]	Multiple Dry Years[b]				
				Year 1	Year 2	Year 3	Year 4	Year 5
2025	Total Wholesale Demand[c]	146.0	146.0	146.0	146.0	146.0	146.0	146.0
	Total Wholesale RWS Supply[d]	146.0	93.3	93.3	80.0	80.0	80.0	80.0
	Difference (Surplus or Shortfall)	0.0	-52.7	-52.7	-66.0	-66.0	-66.0	-66.0
	Difference as % of Demand	0.0%	-36.1%	-36.1%	-45.2%	-45.2%	-45.2%	-45.2%
2030	Total Wholesale Demand[c]	147.9	147.9	147.9	147.9	147.9	147.9	147.9
	Total Wholesale RWS Supply[d]	147.9	94.2	94.2	80.8	80.8	80.8	80.8
	Difference (Surplus or Shortfall)	0.0	-53.7	-53.7	-67.1	-67.1	-67.1	-67.1
	Difference as % of Demand	0.0%	-36.3%	-36.3%	-45.4%	-45.4%	-45.4%	-45.4%
2035	Total Wholesale Demand[c]	151.9	151.9	151.9	151.9	151.9	151.9	151.9
	Total Wholesale RWS Supply[d]	151.9	96.5	96.5	82.7	82.7	82.7	75.8
	Difference (Surplus or Shortfall)	0.0	-55.4	-55.4	-69.2	-69.2	-69.2	-76.1
	Difference as % of Demand	0.0%	-36.5%	-36.5%	-45.6%	-45.6%	-45.6%	-50.1%
2040	Total Wholesale Demand[c]	156.3	156.3	156.3	156.3	156.3	156.3	156.3
	Total Wholesale RWS Supply[d]	156.3	99.2	99.2	85.1	85.1	75.1	75.1
	Difference (Surplus or Shortfall)	0.0	-57.1	-57.1	-71.2	-71.2	-81.2	-81.2
	Difference as % of Demand	0.0%	-36.5%	-36.5%	-45.6%	-45.6%	-52.0%	-52.0%
2045	Total Wholesale Demand[c]	162.8	162.8	162.8	162.8	162.8	162.8	162.8
	Total Wholesale RWS Supply[d]	162.8	88.7	88.7	88.7	88.7	75.4	75.4
	Difference (Surplus or Shortfall)	0.0	-74.1	-74.1	-74.1	-74.1	-87.4	-87.4
	Difference as % of Demand	0.0%	-45.5%	-45.5%	-45.5%	-45.5%	-53.7%	-53.7%

Normal, single dry, and multiple dry year conditions are on a water year basis.

Groveland CSD is not accounted for as a wholesale customer for the purpose of this table. Refer to Table 8-4 for the retail supply and demand comparison including Groveland CSD. However, in the corresponding standardized tables in Appendix B, Groveland CSD is reported as wholesale rather than retail.

a During a single dry year, system-wide shortages of 30 – 40% are in effect (see Table 8-3). For this analysis, shortages greater than 20% are considered to have the same retail/wholesale allocation as the maximum Stage 4, 16-20% system-wide shortage in the WSAP.

b During multiple dry years, system-wide shortages of 30 – 55% are in effect (see Table 8-3). For this analysis, shortages greater than 20% are considered to have the same retail/wholesale allocation as the maximum Stage 4, 16-20% system-wide shortage in the WSAP.

c Total wholesale demands correspond to projected purchase requests shown in Table 4-3, including those of the Cities of San Jose and Santa Clara.

d Procedures for RWS allocations and the WSAP are described in Section 8.3.

8.4 WATER SUPPLY AND DEMAND COMPARISONS, WITHOUT BAY-DELTA PLAN AMENDMENT

The following sections summarize the projected retail and wholesale supplies and demands during normal, single dry, and multiple dry years for the scenario without implementation of the Bay-Delta Plan Amendment.

8.4.1 Retail Water Service Reliability Assessment – Without Bay-Delta Plan Amendment

In general, the comparison of retail demands and supplies presented in Table 8-6 demonstrates the following:

- **Normal Years:** During normal hydrologic years, the SFPUC will have adequate supplies to meet its projected retail water demands.
- **Single Dry Year:** During single dry years, there are no anticipated shortages of RWS supplies.
- **Multiple Dry Years:** In the multiple dry year scenario, the SFPUC would only experience shortages in RWS supplies of 10% during years 4 and 5 of an extended drought at 2045 levels of demand. In a 10% shortage, retail customers are allocated 36% of available supplies, which results in a positive allocation to retail (i.e. allocation greater than demand). The allocation above the retail demand level would be re-allocated to the Wholesale Customers, and retail customers would reduce their demands by 5% as required by the WSA.

8.4.2 Wholesale Water Service Reliability Assessment – Without Bay-Delta Plan Amendment

In general, the comparison of wholesale demands and supplies presented in Table 8-7 demonstrates the following:

- **Normal Years:** During normal hydrologic years, the SFPUC will have adequate supplies to meet its projected wholesale water demands.
- **Single Dry Year:** During single dry years, there are no anticipated shortages of RWS supplies.
- **Multiple Dry Years:** In a multiple dry year event, there would only be anticipated shortages in RWS supplies for years 4 and 5 of an extended drought at 2045 levels of demand. In a 10% shortage, the Wholesale Customers are allocated 64% of available supplies, and as described above, they receive any allocation above the retail demands. This would result in a 15% shortage (about 23 mgd) for the Wholesale Customers.

Table 8-6. Retail Supply and Demand Comparison for Projected Normal & Dry Year Scenarios Without Bay-Delta Plan Amendment (mgd)

Year	Retail Supply and Demand	Normal Year	Single Dry Year[a]	Multiple Dry Years[b]				
				Year 1	Year 2	Year 3	Year 4	Year 5
2025	Total Retail Demand	70.7	70.7	70.7	70.7	70.7	70.7	70.7
	Baseline Retail Demand[c]	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*
	WSA 5% Demand Reduction	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	70.7	70.7	70.7	70.7	70.7	70.7	70.7
	Retail Groundwater[e]	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*
	Retail Recycled Water[f]	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*
	RWS Supply Utilized by Retail[g]	*67.2*	*67.2*	*67.2*	*67.2*	*67.2*	*67.2*	*67.2*
	Difference (Supply Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Difference as Percentage of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2030	Total Retail Demand	72.4	72.4	72.4	72.4	72.4	72.4	72.4
	Baseline Retail Demand[c]	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*
	WSA 5% Demand Reduction	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	72.4	72.4	72.4	72.4	72.4	72.4	72.4
	Retail Groundwater[e]	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*	*2.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Utilized by Retail[g]	*67.5*	*67.5*	*67.5*	*67.5*	*67.5*	*67.5*	*67.5*
	Difference (Supply Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Difference as Percentage of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2035	Total Retail Demand	74.5	74.5	74.5	74.5	74.5	74.5	74.5
	Baseline Retail Demand[c]	*74.5*	*74.5*	*74.5*	*74.5*	*74.5*	*74.5*	*74.5*
	WSA 5% Demand Reduction	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	74.5	74.5	74.5	74.5	74.5	74.5	74.5
	Retail Groundwater[e]	*3.4*	*3.4*	*3.4*	*3.4*	*3.4*	*3.4*	*3.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Utilized by Retail[g]	*68.6*	*68.6*	*68.6*	*68.6*	*68.6*	*68.6*	*68.6*
	Difference (Supply Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Difference as Percentage of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2040	Total Retail Demand	77.4	77.4	77.4	77.4	77.4	77.4	77.4
	Baseline Retail Demand[c]	*77.4*	*77.4*	*77.4*	*77.4*	*77.4*	*77.4*	*77.4*
	WSA 5% Demand Reduction	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	77.4	77.4	77.4	77.4	77.4	77.4	77.4
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Utilized by Retail[g]	*70.5*	*70.5*	*70.5*	*70.5*	*70.5*	*70.5*	*70.5*
	Difference (Supply Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Year	Retail Supply and Demand	Normal Year	Single Dry Year[a]	Multiple Dry Years[b]				
				Year 1	Year 2	Year 3	Year 4	Year 5
	Difference as Percentage of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2045	Total Retail Demand	80.6	80.6	80.6	80.6	80.6	76.6	76.6
	Baseline Retail Demand[c]	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*
	WSA 5% Demand Reduction	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*-4.0*	*-4.0*
	Total Retail Supply	80.6	80.6	80.6	80.6	80.6	80.6	80.6
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Utilized by Retail[g]	*73.7*	*73.7*	*73.7*	*73.7*	*73.7*	*73.7*	*73.7*
	Difference (Supply Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	4.0	4.0
	Difference as Percentage of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	5.3%	5.3%

Normal, single dry, and multiple dry year conditions are on a water year basis.

a During all single dry years, no RWS system-wide shortages are in effect.

b During multiple dry years, no RWS system-wide shortages are in effect until years 4 and 5 at 2045 levels of demand. During those years, a 10% system-wide shortage is in effect.

c Total retail demands correspond to those in Table 4-1, and reflect passive and active conservation, onsite water reuse savings, and water loss. Demands from Groveland CSD are included in the table above. However, in the corresponding standardized tables in Appendix B, Groveland CSD is accounted for as a wholesale customer instead of a retail customer, as explained in Section 2.4.

d As amended in 2018, the WSAP Tier One Allocation Plan requires retail customers to conserve a minimum of 5% during droughts. If, during a declared water shortage, retail demands on the Regional Water System are lower than the retail allocation in a dry year, retail demands on the RWS will be reduced by 5%. An N/A on this row means that either this 5% rationing requirement doesn't apply (i.e. no declared water shortage), or retail customers are already rationing greater than 5%.

e Groundwater supplies are assumed to be equivalent to projected demands for the San Francisco Groundwater Supply Project (ramping up to 4 mgd by 2040) and Castlewood CSA (0.4 mgd). Groundwater availability would not be affected by dry year conditions.

f Recycled water supplies are assumed to be equivalent to projected demands related to the Westside Recycled Water Project (1.6 mgd by 2021 and 1.8 mgd by 2030), Harding Park and Fleming Golf Courses (0.23 mgd), and Sharp Park Golf Course (up to 0.1 mgd) and Treasure Island (0.2 mgd by 2025 and 0.4 mgd by 2030). Recycled water availability would not be affected by dry year conditions.

g Procedures for RWS allocations and the WSAP are described in Section 8.3. Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if groundwater and recycled water supplies are not available, up to 81 mgd of RWS supply could be used.

Table 8-7. Wholesale Supply and Demand Comparison for Projected Normal and Dry Year Scenarios Without Bay-Delta Plan Amendment (mgd)

Year	Wholesale Supply and Demand	Normal Year	Single Dry Year[a]	Multiple Dry Years[b]				
				Year 1	Year 2	Year 3	Year 4	Year 5
2025	Total Wholesale Demand[c]	146.0	146.0	146.0	146.0	146.0	146.0	146.0
	Total Wholesale RWS Supply[d]	146.0	146.0	146.0	146.0	146.0	146.0	146.0
	Difference (Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2030	Total Wholesale Demand[c]	147.9	147.9	147.9	147.9	147.9	147.9	147.9
	Total Wholesale RWS Supply[d]	147.9	147.9	147.9	147.9	147.9	147.9	147.9
	Difference (Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2035	Total Wholesale Demand[c]	151.9	151.9	151.9	151.9	151.9	151.9	151.9
	Total Wholesale RWS Supply[d]	151.9	151.9	151.9	151.9	151.9	151.9	151.9
	Difference (Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2040	Total Wholesale Demand[c]	156.3	156.3	156.3	156.3	156.3	156.3	156.3
	Total Wholesale RWS Supply[d]	156.3	156.3	156.3	156.3	156.3	156.3	156.3
	Difference (Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2045	Total Wholesale Demand[c]	162.8	162.8	162.8	162.8	162.8	162.8	162.8
	Total Wholesale RWS Supply[d]	162.8	162.8	162.8	162.8	162.8	139.1	139.1
	Difference (Surplus or Shortfall)	0.0	0.0	0.0	0.0	0.0	-23.7	-23.7
	Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%	-14.6%	-14.6%

Normal, single dry, and multiple dry year conditions are on a water year basis.

Groveland CSD is not accounted for as a wholesale customer for the purpose of this table. Refer to Table 8-6.

for the retail supply and demand comparison including Groveland CSD. However, in the corresponding standardized tables in Appendix B, Groveland CSD is reported as wholesale rather than retail.

a During all single dry years, no RWS system-wide shortages are in effect.

b During multiple dry years, no RWS system-wide shortages are in effect until years 4 and 5 at 2045 levels of demand. During those years, a 10% system-wide shortage is in effect.

c Total wholesale demands correspond to projected purchase requests shown in Table 4-3, including those of the Cities of San Jose and Santa Clara.

d Procedures for RWS allocations and the WSAP are described in Section 8.3.

8.5 DROUGHT RISK ASSESSMENT

The SFPUC developed the following Drought Risk Assessment (DRA) in compliance with Water Code Section 10635(b). The analysis presents a methodical assessment of water supplies and water uses under a hypothetical five-year drought scenario that extends from 2021 to 2025.

8.5.1 Data & Methods

The data and methods used to determine the RWS supply for the DRA dry-year sequence are the same as those described in Section 8.2. The SFPUC used the HHLSM model with the design drought sequence to perform the water supply analyses and simulate the water supply shortage conditions over the five-year drought period.

As with the supply reliability assessment, the DRA includes two scenarios, with and without the implementation of the Bay-Delta Plan Amendment, to show the drought conditions under two potential regulatory scenarios that may occur over the 2021-2025 period. The Bay-Delta Plan Amendment implementation scenario considers the implementation of the full Bay-Delta Plan Amendment in 2023.

The DRA takes into consideration the roll-out of recycled water and groundwater supply projects that the SFPUC has planned to be implemented by 2025. In addition, the retail demands for the DRA are based on linear interpolation between the current 2020 retail demands of 68.8 mgd and the projected 2025 retail demands of 70.7, as presented in Section 4.

8.5.2 Basis for Supply Shortage Conditions

The DRA analysis uses 2020 as a base year and considers the current status of the ongoing supply WSIP projects, as shown in Table 8-1.

The anticipated supply availabilities for the five-year drought period were presented above in Table 8-2 and Table 8-3. The overall impacts for the two scenarios are as follows:

- **With Full Implementation of the Bay-Delta Plan Amendment:** In this dry-year sequence, there would not be anticipated reductions in RWS supplies prior to the implementation of the Bay-Delta Plan Amendment in 2023. The RWS supply reductions would reach 40% upon the implementation of the Bay-Delta Plan Amendment in 2023 until the end of the drought sequence in 2025. The split between wholesale and retail customers (see Section 8.2.4) at this shortage level informs the available retail RWS supplies considered in this analysis.

- **Without Implementation of the Bay-Delta Plan Amendment:** Assuming the availability of existing supplies at current demand levels, there are no anticipated reductions in RWS supply.

8.5.3 DRA Water Source Reliability

The DRA takes into account the supplies from the RWS, local groundwater, and local recycled water. The recycled water and groundwater projects that the SFPUC has planned for implementation within the next 5 years are integrated into the available supply portfolio for this five-year drought scenario. The SFPUC plans to increase recycled water supplies from 0.1 mgd in 2021 to 2.1 mgd in 2025, through the implementation of the Westside Recycled Water Project, the Treasure Island Recycled Water Project, and the restoration of the Harding Park Recycled Water Project. It is assumed that the Westside Recycled Water Project will supply approximately 1.3 mgd to Golden Gate Park and Lincoln Park in 2022 and will serve approximately 0.3 mgd to the San Francisco Zoo by 2023. In addition, the groundwater supplies used for irrigation in 2022 will be replaced by recycled water from the Westside Recycled Water Project. The groundwater production from 2022 to 2024 includes the in-city potable use (~0.5 mgd) and the Castlewood well system (~0.4 mgd). The in-City potable groundwater use is assumed to increase from 0.5 mgd to 1 mgd in 2025.

8.5.4 Water Supply and Demand Comparison for 5-Year Drought Sequence

The supply and demand comparisons for the hypothetical drought sequence from 2021 to 2025 are presented below in Table 8-8 and Table 8-9 for scenarios with and without the implementation of the Bay-Delta Plan Amendment, respectively. Where a shortage condition is identified, the tables reflect actions that would be taken in accordance with the Water Shortage Contingency Plan (WSCP), as shown in Appendix K.

With Implementation of the Bay-Delta Plan Amendment. Table 8-8 compares the total water supply sources available with the total projected water demand through the 2021-2025 drought scenario, assuming the full implementation of the Bay-Delta Plan Amendment starting in 2023. As such, the years 2021 and 2022 are not affected by upcoming regulatory changes and show no supply shortfall.

The implementation of the Bay-Delta Plan Amendment in 2023 is expected to result in a 40% shortage of RWS supplies. The WSAP does not address shortages above 20%; therefore, for the purposes of this analysis it was assumed that the 20% shortage allocations would apply for the 40% shortage scenario. Based on this split, starting in the third year of this drought sequence, the retail allocation from the RWS drops to 44.7 mgd. This reduction in RWS supplies for retail would lead to a supply shortfall of up to 32%, or 22.5 mgd in 2024 and 2025. As detailed in the WSCP, the supply shortfall will be addressed through mandatory water use rationing.

Without Implementation of the Bay-Delta Plan Amendment. Table 8-9 compares the total water supply sources available with the total projected water use through this 2021-2025 drought scenario without the Bay-Delta Plan Amendment. Without implementation of the Bay-Delta Plan Amendment, the SFPUC has sufficient supplies to serve its retail demands in the event of a five-year drought starting in 2021.

Table 8-8. Retail Supply and Demand Comparison for Five-Year Drought Risk Assessment – With Bay-Delta Plan Amendment (mgd)

[Standardized Table 7-5 Five-Year Drought Risk Assessment to address Water Code Section 106359b)]

	2021	2022	2023	2024	2025
Gross Water Use[a]	69.2	69.6	69.9	70.3	70.7
Supply Sources					
RWS Supply[b]	66.9	67.3	44.7	44.7	44.7
Groundwater[c]	2.2	0.9	0.9	0.9	1.4
Recycled Water[d]	0.1	1.4	1.7	1.7	2.1
Total Supplies	65.8	66.2	47.3	47.3	48.2
Surplus/(Shortfall) w/o WSCP Action	0.0	0.0	(22.6)	(23.0)	(22.5)
Planned WSCP Actions (use reduction and supply augmentation)					
WSCP - supply augmentation benefit	-	-	-	-	-
WSCP - use reduction savings benefit[f]	-	-	22.6	23.0	22.5
Revised Surplus/(Shortfall)	-	-	0.0	0.0	0.0
Resulting % Use Reduction from WSCP action[e]	-	-	32.4%	32.07	31.8%

a. Total retail demands reflect active and passive conservation, onsite water reuse savings, and water loss and demands are linearly interpolated between 2020 and 2025.
b. Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if these alternative supplies are not available, up to 81 mgd of RWS supply could be used in normal years.
c. Assuming that the in-city irrigation groundwater capacity accounts for approximately 1.5 mgd , the in-city potable groundwater use is 0.5 mgd and Castlewood CSA uses 0.3 mgd in 2021. When the Westside Recycled Water Project comes online in 2022 and the irrigation groundwater use is phased out. The groundwater production from 2022 to 2024 assumes 0.5 mgd production for in-city potable use and 0.4 mgd supplied by the Castlewood Well System. The potable groundwater production is anticipated to increase to 1.4 mgd in 2025.
d. Assuming that the Westside Recycled Water Project will provide 1.3 mgd to Golden Gate Park and Lincoln Park by 2022, and 0.3 mgd to the San Francisco Zoo by 2023.
e. The demand rationing actions and respective shortage levels are detailed in the WSCP.

Table 8-9. Retail Supply and Demand Comparison for Five-Year Drought Risk Assessment – Without Bay-Delta Plan Amendment (mgd)

	2021	2022	2023	2024	2025
Gross Water Use[a]	69.2	69.6	69.9	70.3	70.7
Supply Sources					
RWS Supply[b]	66.9	67.3	67.3	67.7	67.2
Groundwater[c]	2.2	0.9	0.9	0.9	1.4
Recycled Water[d]	0.1	1.4	1.7	1.7	2.1
Total Supplies	69.2	69.6	69.9	70.3	70.7
Surplus/(Shortfall) w/o WSCP Action	0	0	0	0	0
Planned WSCP Actions (use reduction and supply augmentation)					
WSCP - supply augmentation benefit	-	-	-	-	-
WSCP - use reduction savings benefit	-	-	-	-	-
Revised Surplus/(Shortfall)	-	-	-	-	-
Resulting % Use Reduction from WSCP action	-	-	-	-	-

a. Total retail demands reflect active and passive conservation, onsite water reuse savings, and water loss and demands are linearly interpolated between 2020 and 2025.

b. Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if these alternative supplies are not available, up to 81 mgd of RWS supply could be used in normal years.

c. Assuming that the in-city irrigation groundwater capacity accounts for approximately 1.5 mgd , the in-city potable groundwater use is 0.5 mgd and Castlewood CSA uses 0.3 mgd in 2021. When the Westside Recycled Water Project comes online in 2022 and the irrigation groundwater use is phased out. The groundwater production from 2022 to 2024 assumes 0.5 mgd production for in-city potable use and 0.4 mgd supplied by the Castlewood Well System. The potable groundwater production is anticipated to increase to 1.4 mgd in 2025.

d. Assuming that the Westside Recycled Water Project will provide 1.3 mgd to Golden Gate park and Lincoln Park by 2022, and 0.3 mgd to the San Francisco Zoo by 2023

SECTION 9: WATER SHORTAGE CONTINGENCY PLAN

The Water Shortage Contingency Plan is included as Appendix K.

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SECTION 10: DEMAND MANAGEMENT MEASURES

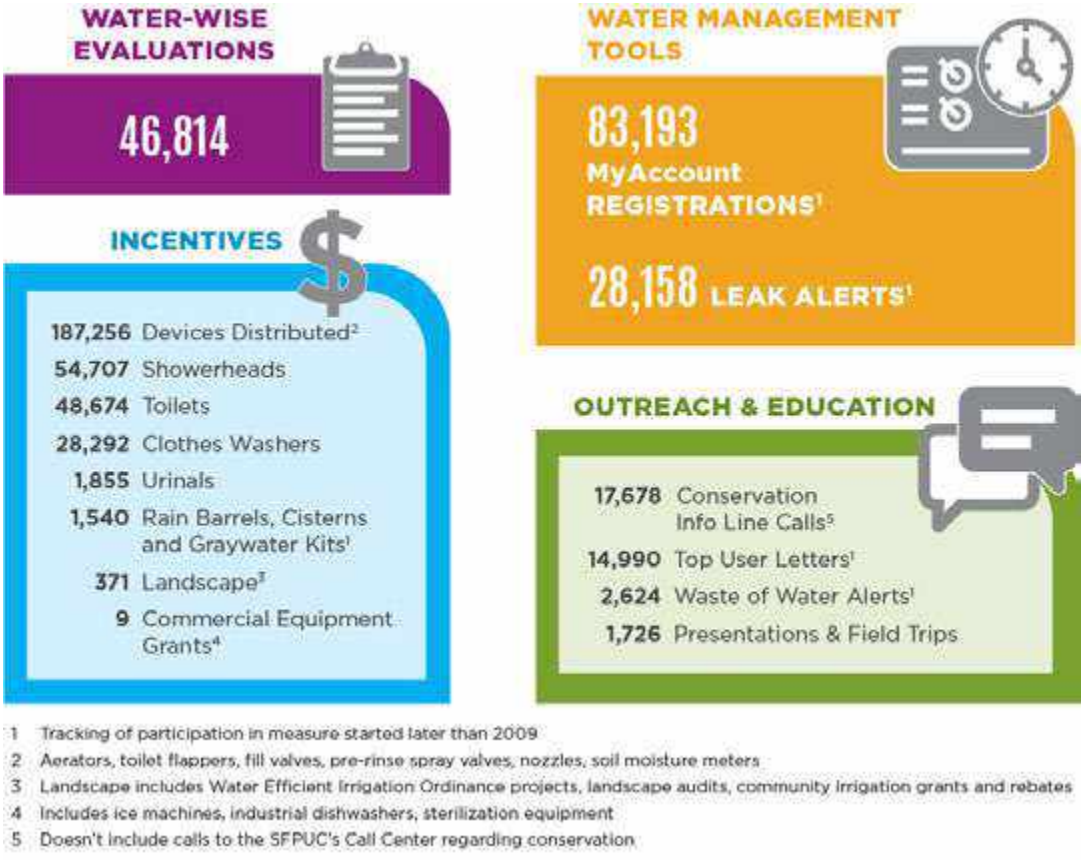
This section describes the SFPUC's efforts to promote conservation and to reduce demand on water supply. Several demand management measures (DMMs)—including metering, public education and outreach, and water conservation program coordination—are addressed.

10.1 RETAIL WATER CONSERVATION PROGRAM

The SFPUC's retail water conservation program has historically consisted of a mix of financial incentives, technical assistance, water management tools, education and outreach, and mandates. These offerings are planned to continue over the next five years and beyond. Between 2005 and 2025, the SFPUC will have evaluated and implemented over 80 different conservation measures and mandates, providing extensive customer water-savings assistance that has played a major role in the significant decline in water use occurring over this period. These include conservation best management practices found successful by major water utilities and efficiency experts across the nation; measures demonstrated by third-party studies to have water savings and customer benefits; and measures that make sense for the site conditions and characteristics unique to San Francisco water use. During its Retail Water Conservation Plan updates in 2011, 2015 and 2020, the SFPUC conducted thorough analyses of all measures in place at the time of each plan, potential new measures not implemented before, and measures previously offered and discontinued.

The SFPUC estimates its conservation program and efficient plumbing codes have a "past savings" of approximately 86,385 AF (28,149 MG or 5.5 mgd) between 2005 (the year the SFPUC developed its first conservation forecast model) and 2019. "Future savings" are estimated at 117,221 AF (38,197 MG or 4.2 mgd) between 2020 and 2045. This estimate does not reflect water savings from conservation measures the SFPUC offers but does not model or from SFPUC efforts that are not part of its conservation program but may generate potable water savings, including its supply-side water loss program. The SFPUC has provided water-saving assistance to many thousands of residential and non-residential customers. Figure 10-1 highlights the SFPUC's water conservation accomplishments between 2010 and 2020.

Figure 10-1. Summary of SFPUC's Water Conservation Achievements



The SFPUC's conservation measures can be broadly characterized as foundational customer assistance measures and water efficiency mandates that the SFPUC anticipates continuing through the 2045 planning horizon with no definite end date, such as evaluations, site usage reports and tools, free devices, education and outreach, and mandates or incentive-based measures that have specific and varying end dates, depending on factors such as plumbing code impacts and market saturation rates. Collectively, the measures proposed for 2020 and beyond support the SFPUC's strategies for tapping into anticipated remaining water-saving opportunities, specifically:

- Maintaining efficiency among customers, properties and sites that already have water-wise use.
- Improving efficiency among residential customers with over average water use due to leaks, old fixtures, inefficient irrigation, or other forms of water waste.
- Increasing commercial property compliance with requirements for efficient plumbing fixtures and awareness of opportunities for equipment retrofits, reuse technologies, and efficiency audits and action plans.
- Increasing commercial customer awareness of constant and/or abnormally high-water use, with focus on hotels, restaurants, office buildings, and schools that represent the non-residential sectors with the overall highest water use.
- Promoting compliance with new efficiency standards among large landscapes served by dedicated irrigation meters and smaller sites with inefficient irrigation
- Maximizing opportunities for onsite reuse in new development.

Moving forward, the SFPUC will continue to utilize a mix of demand-side, customer water-saving strategies, including voluntary incentives, assistance services, tools to help customers understand and manage their water use, education and outreach, and mandates that require indoor and outdoor water efficiency.

10.2 RETAIL DMMs

The SFPUC's conservation program is now guided by a mix of agency and City policy directives and state and local water efficiency requirements that have evolved over time. On the state level, these requirements have shifted from meeting Best Management Practices (BMPs) to meeting the state per capita water reduction targets set by the Water Conservation Action of 2009 (SB x7-7) to meeting new water efficiency targets mandates by AB 1668 and SB 606 that urban suppliers will need to meet starting in 2023 based on standards for efficient indoor, outdoor water use, and supply side water loss. Locally, San Francisco has adopted state requirements for mandating water-efficient plumbing fixtures, landscapes and irrigation systems, as well as restrictions against outdoor water waste and sub-metering in new multi-family construction. The SFPUC also continues to set its own Level of Service (LOS) goals that promote efficiency and sustainability, including maintaining average residential per capita use under 50 gallons a day. The SFPUC met state BMP goals for the many years they were in effect; is well below its state-imposed SB x7-7 per capita use target for 2020; and is on track to meet California's new efficiency targets.

The SFPUC has been implementing conservation measures for decades. Through the SFPUC's longstanding, intensive efforts to promote conservation and educate San Franciscans and its other retail customers on efficient and appropriate uses of water, San Francisco has had one of the lowest per capita water uses in the State. As stated in Section 4.1, gross and residential per capita consumption by in-City retail water customers are 73 and 42 GPCD, respectively. Taking suburban retail use into account, gross and residential per capita consumption by all retail water customers are 76 and 42 GPCD, respectively.

The SFPUC voluntarily prepares a conservation plan for its retail service area, which includes more details on DMMs planned over the next five to 25 years. The 2020 conservation plan can be viewed on or downloaded from the SFPUC's website at **www.sfpuc.org/learning/conserve-water**.

The SFPUC was a signatory of the California Urban Water Conservation Council (CUWCC)'s Memorandum of Understanding (MOU) for the duration of its existence from 1991 to 2016, agreeing to voluntarily meet and report on conservation BMPs. During that time, the SFPUC implemented conservation measures in accordance with CUWCC BMP compliance goals and met requirements for biannual BMP reporting. In 2016, the CUWCC underwent an organizational transformation and decided to sunset in response to social, economic, environmental, regulatory and political conditions that changed substantially over its 25 years of existence, including passage of California's Water Conservation Act of 2009 mandating a 20 percent reduction in statewide urban per capita water use by 2020 followed by new state water conservation mandates (Executive Order B-37-16) and reporting requirements. In 2017, it relaunched as a new organization, the California Water Efficiency Partnership (CalWEP), dedicated to advancing water efficiency in the state through research, assistance, tools, and education but not through a MOU requiring member compliance with specific BMPs. The SFPUC is a member of CalWEP and continues to implement numerous DMMs in the form of conservation programs, most of which builds from and meet the goals of the last iteration of the CUWCC's foundational and programmatic BMPs.

10.2.1 Water Waste Prevention Ordinances

10.2.1.1 Past Implementation

Permanent water use restrictions were first established in Section E of the SFPUC Rules and Regulations Governing Water Service to Customers. During the 1987-92 drought, the SFPUC enacted numerous additional water use restrictions and prohibitions in response to the severe water shortage. With the end of the drought in 1993, the SFPUC elected to

continue certain restrictions to promote long-term conservation. These restrictions are also included as part of the WSCP's water waste prohibitions (see Appendix K).

Violation of any water use restriction may result in the installation of a flow-restricting device in the service line of the customer, and continued violation could result in termination of service. The customer bears the cost of any enforcement action.

Section F of the SFPUC Rules and Regulations Governing Water Service to Customers, which is implemented as part of the City's Water Efficient Irrigation Ordinance, took effect in 2010 and was updated in 2015. Section F establishes water efficient irrigation rules, which prohibit water runoff from landscapes of any size due to low head drainage, overspray, broken irrigation hardware, or other conditions where water flows onto adjacent property, walks, roadways, parking lots, or other structures.

In 2016, the SFPUC adopted expanded permanent water waste restrictions as part of Section E, Rule 12 of its Rules and Regulations Governing Water Service to Customers. These rules restrict the following uses of water:

- Application of potable water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots or structures
- Use of hoses for any purpose without a positive shut off valve
- Use of potable water to wash sidewalks, driveways, plazas and other outdoor hardscapes for reasons other than health, safety, or to meet City of San Francisco standards for sidewalk cleanliness (per the Department of Public Works Streets and Sidewalks Maintenance Manual as required by City Charter Section F, 102) and in a non-water-efficient manner that causes runoff to storm drains and sewer catch basins
- Use of single-pass cooling systems, fountains, decorative water features, and commercial car washes
- Application of potable water to outdoor landscapes during and within 48 hours after measurable rainfall
- Irrigation with potable water of ornamental turf on public street medians
- Use of potable water for consolidation of backfill, dust control, or other nonessential construction purposes if foundation drainage or recycled water is available and approved by the Department of Public Health
- Serving drinking water other than upon request at eating or drinking establishments, including restaurants, hotels, cafes, cafeterias, bars or other public places where food or drink are served
- To promote conservation, hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily and display notice of this option in guestrooms

Members of the public are encouraged to report incidents of water waste online or by phone through the City of San Francisco's 311 system, and the SFPUC Water Conservation Section investigates and responds to all reports.

10.2.1.2 Planned Implementation

The SFPUC will continue to implement the water use restrictions and water efficient irrigation rules in its Rules and Regulations Governing Water Service to Customers and continue to monitor and respond to public reports of water waste.

10.2.2 Metering

10.2.2.1 Past Implementation

All in-City retail customers have been metered since 1916 and are billed by volume. All suburban retail customers are also fully metered and are billed by volume. There are approximately 181,000 existing water meters in the City and approximately 225 in the suburban retail service area.

By 2018, the SFPUC completed substantial deployment of its Automated Water Meter Program to upgrade in-City and suburban retail water meters with wireless advanced metering technology. The SFPUC was the first major water utility in the State to implement a system of this scale. As of 2020, 99% of retail system meters are automated.

The automated water meter reading system enabled the launch of tools to help monitor customer water use and identify potential high or unusual usage: My Account and the Leak Alert Program. My Account, a bill management system and web portal for viewing water use, was launched in May 2014 and upgraded since and allows customers to view their hourly and daily water use data provided by the automated water meter reading system. The SFPUC also launched a Leak Detection Program in April 2015 to notify single family residential customers about potential plumbing leaks that may be occurring at their homes. Since then, the SFPUC has expanded its program to include multi-family, commercial and irrigation account customers. Hourly water consumption data collected through the automated water meter reading system are analyzed, and if continuous water use is observed, automated courtesy alerts via email, text message, phone message and letter are sent to the account holder, property owner and site occupant.

Existing sub-metering requirements are established in the San Francisco Green Building Code and Section F of the SFPUC Rules and Regulations Governing Water Service to Customers. Per the Green Building Code, new non-residential buildings must install a separate sub-meter for each individual building tenant that would consume more than 1,000 gallons per day. For new non-residential buildings over 50,000 square feet, a sub-meter must be installed for each tenant that consumes more than 100 gallons per day. Section F of the SFPUC Rules and Regulations Governing Water Service to Customers, which is implemented as part of the Water Efficient Irrigation Ordinance, requires dedicated irrigation meters for landscape areas greater than 5,000 square feet. In 2016, California passed Senate Bill 7 (SB 7), which requires new multi-family residential buildings in California constructed after January 1, 2018 to include a submeter for each dwelling unit and to bill tenants in apartment buildings accordingly for their water use. In response, the SFPUC, in coordination with the San Francisco Department of Building Inspection (DBI) and Department of Public Health (DPH), began requiring proof of sub-metering before approving requests for water service from new multi-family residential buildings.

10.2.2.2 Planned Implementation

Replacement of a small number of remaining old meters is ongoing. The SFPUC will be continuing and expanding its Leak Alert Program.

10.2.3 Conservation Pricing

10.2.3.1 Past Implementation

For many years, the SFPUC has used conservation pricing as an incentive to conserve water. To promote the installation of efficient plumbing fixtures, the SFPUC implemented an incentive rate structure for its retail customers. Under the four-year rate schedule for FY2018-2019 through FY 2021-2022, water rates for both single family and multi-family residential accounts were set with a two-tier increasing block rate structure, where the Tier 1 threshold was 4 CCF for single family and 3 CCF for multi-family. Non-residential (i.e., commercial) water rates were set with a uniform rate structure. Water rates across all customer sectors were scheduled to increase annually.

The rate schedule also addresses violation of water use restrictions. Violations may result in the installation of flow-restricting devices, and continued violation may result in discontinuance of water service. The costs of these actions are borne by the customer.

The SFPUC's current rate schedule, effective for FY 2018-2019 through FY2021-2021, may be accessed at: . **www.sfpuc.org/accounts-services/water-power-and-sewer-rates**.

10.2.3.2 Planned Implementation

The current rate schedule is in effect through FY2021-2022. The SFPUC conducts an independent rate study every four to five years to inform the next rate schedule.

10.2.4 Public Education and Outreach

10.2.4.1 Past Implementation

Throughout the year, the SFPUC markets its conservation services and assistance measures through numerous means, including social media, digital and print newsletters, bill inserts, email blasts, direct mailings, local media and trade publications, and its website. For example, the SFPUC periodically contacts top residential water users to encourage them to improve efficiency, alert them to the possibility of plumbing leaks, and offer free Water Wise Evaluations. The SFPUC's newsletters issued in print and digitally to customers and stakeholders almost always feature a conservation-related article or water-saving tips in each issue.

The SFPUC also participates in community events and presentations that reach residents and businesses, as well as events that target specific audiences and industry trade groups. Water conservation staff, along with education partners, conduct in-class and virtual (during the COVID pandemic) presentations during the school year. Program offerings are aligned with State curriculum standards, and many focus on providing placed-based or outdoor learning opportunities to supplement students' classroom work. The SFPUC also participates in local festivals, street fair events, and community presentations. The SFPUC offers a variety of free teacher resources, including guides, lesson plans, fact sheets and activity sheets. The SFPUC maintains and offers public access and organized adult and youth programming at several demonstration gardens that promote water-efficient gardening and irrigation practices.

Below is a summary of some of the key educational and outreach activities conducted between FY 2015-2016 and FY 2019-2020.

Table 10-1. Summary of SFPUC Retail Educational and Outreach Activities Over Five Years (Conducted between FY15-16 and FY19-20)

Activity	Total
School Presentations & Field Trips	374
Community Events, & Presentations	209
Conservation Information Line Calls	13,441
Waste of Water Reports	1,383
Leak Incidents Notified by Alerts	28,158
Top User Letters	5,788
MyAccount Online Portal Users	Over 86,000 customers

10.2.4.2 Planned Implementation

The SFPUC plans to continue conducting a wide range of public education and outreach efforts over the next five years and beyond to promote water efficiency among residents, businesses and customers.

10.2.5 Management of System Losses

10.2.5.1 Past Implementation

The SFPUC controls system losses primarily through asset and leak management. The SFPUC's Linear Assets Management Program replaces and renews distribution system pipelines and customer service connections for approximately 1,250 miles of drinking water mains in the City. Planning analysis has demonstrated an annual pipeline improvement rate of 15 miles per year is needed to meet customer Level of Service goals for uninterrupted service. Improvements include replacement, rehabilitation, re-lining, and cathodic protection of all pipe size categories to extend or renew pipeline useful life.

A renew service program renews assets at the end of their useful life between the water main and the customer's service connection. These assets include 1-inch to 8-inch diameter service pipes made of cast iron, galvanized steel, and plastic, to be replaced with copper or ductile iron; broken meter boxes; outdated or undersized meters and associated piping; and subsequent associated sidewalk and roadway restoration.

The SFPUC's proactive leak management employs acoustic leak detection to accurately pinpoint leaks in mains of all material types. In addition, the SFPUC prioritizes leak repairs to meet Level of Services goals for uninterrupted service and to reduce real water losses.

The SFPUC also collects and compiles main break data throughout its system. A study analyzed historic main break data to determine what types of pipes are statistically prone to failure due to natural causes. A geographical hot-spot analysis was also conducted to identify areas in the City that are especially prone to high occurrences of main breaks. This information is used to target high risk pipes for prioritized replacement or improvement.

In addition, the SFPUC's Automated Water Meter Program (described previously in Section 10.2.2) enables improved management of system losses.

10.2.5.2 Planned Implementation

The SFPUC is developing a Water Loss Control Master Plan to reduce water loss and to comply with California Senate Bill 555 (SB 555), Water Loss Management.

10.2.6 Water Conservation Program

10.2.6.1 Past Implementation

The SFPUC Water Conservation Section has 13 full-time time staff under the direction of a Water Conservation Section Manager. Conservation staff coordinate implementation of various residential, landscape, and CII conservation programs. The SFPUC's retail water conservation program consists of an extensive mix of measures, including incentives, services, and educational assistance. Incentives include rebates for high-efficiency fixtures, free toilets and installations for qualifying customers, discounts for graywater and rainwater systems, grants for large landscape irrigation efficiency improvements, and free efficient devices. Services include conservation surveys, landscape plan review, and school education programs. The SFPUC also provides a host of tools to help customers understand and manage their water use, including the previously mentioned My Account feature, leak alerts, and a bill adjustment program for leak repair. Below is a summary of key activities accomplished between FY 2015-2016 and FY 2019-2020.

Table 10-2. Summary of Key Water Conservation Programs Over Five Years (Conducted between FY15-16 and FY19-20)

Activity	Total
Surveys	15,409
Toilet Installations	4,326
Toilet Rebates	8,765
Washer Rebates	4,579
Urinal Rebate / Installations	642
Showerheads Distributed	15,884
Landscape and Irrigation Meter Grants	19
Laundry-to-Landscape Kit Discounts	37
Rain Barrel Discounts	1,330
Cistern Discounts	64
Water-Saving Devices Distributed	44,119

10.2.6.2 Planned Implementation

The SFPUC will continue to evaluate and adapt its conservation measures to respond to changing conditions and regulations. This dynamic approach to conservation has contributed to significant reductions in water demand, despite population growth. Moving forward, the SFPUC will continue to utilize a mix of demand-side, customer water-saving strategies, including voluntary incentives, assistance services, tools to help customers understand and manage their water use, education and outreach, and mandates that require indoor and outdoor water efficiency. Foundational customer assistance measures will continue to include water evaluation surveys, site usage reports and tools, free devices, landscape water budgets, and public education and outreach. Fixture incentive measures will continue to include toilets, clothes washers, rainwater barrels and cisterns, residential outdoor graywater system parts, and large commercial equipment over the next five years. Several new incentives are planned to launch within the next five years, including rebates for residential on-demand recirculating hot water pumps and weather-based irrigation controllers.

10.2.7 Other DMMs

In addition to DMMs administered through its water conservation section, the SFPUC also implements several other programs expected to contribute to potable water savings. These include its onsite reuse program that requires new construction over a certain size to use available graywater, rainwater, and foundation drainage for toilet and urinal flushing and irrigation; its stormwater management program that mandates and incentivizes use of rainwater for irrigation; and a high bill adjustment and water and sewer lateral insurance program that may reduce water waste through faster leak repair.

10.3 WHOLESALE DMMs

As described in Section 5.3, BAWSCA coordinates water conservation programs and services for its member agencies. Under the terms of the WSA, the SFPUC cannot provide direct financial assistance for conservation programs to a single Wholesale Customer. For details about BAWSCA-coordinated conservation measures provided in the SFPUC's wholesale service area, visit **https://bawsca.org**. However, the SFPUC's past and planned implementation of wholesale DMMs, to the extent allowed under the WSA, are described below.

10.3.1 Metering

10.3.1.1 Past Implementation

The SFPUC's wholesale customers are fully metered. Approximately 91% of wholesale meters were outfitted with a wireless transmitter so they can transmit hourly water consumption through a cellular endpoint that does not require a fixed network infrastructure. The water consumption is analyzed and recorded in advanced metering software, allowing SFPUC and its wholesale customers to view hourly and daily water consumption rather than waiting for a monthly billing meter read. The software also provides custom alerts for issues in the system or unusual consumption patterns, such as leaks.

10.3.1.2 Planned Implementation

SFPUC's ongoing preventative maintenance program ensures that the meters are regularly inspected, maintained and calibrated. The SFPUC is currently in the process of evaluating the calibration, maintenance and replacement procedures of the wholesale meters and will update the current practices of the annual meter calibration program.

10.3.2 Public Education and Outreach

The SFPUC provides technical and administrative assistance for public information and school education to its Wholesale Customers as requested. The last such assistance was a regional drought awareness marketing and media campaign that covered some of Wholesale Customers' service areas that started in 2014 and continued into 2017.

10.3.3 Water Conservation Program Coordination and Staffing Support

As previously described in Section 5.3, BAWSCA manages a Regional Water Conservation Program (see http://bayareaconservation.org) and represents the interests of the Wholesale Customers. The program is composed of several different conservation measures and is designed to support and augment its member agencies' customer efforts to use water more efficiently.

Under the terms of the WSA with its Wholesale Customers, the SFPUC cannot provide direct financial assistance for conservation programs to an individual Wholesale Customer and add this expense to the wholesale revenue requirement for that year. The SFPUC can provide staff to assist Wholesale Customer conservation efforts and, through agreement with BAWSCA, can develop service area-wide conservation programs that can be funded as a joint expense by its retail customers and Wholesale Customers.

10.3.4 Asset Management

The SFPUC initiated a Pipeline Inspection Program in the early 1990s for the 350 miles of water transmission lines in the RWS. Routine inspections are considered preventive maintenance measures, but they also provide information on pipeline leaks. These inspections are usually conducted year-round with no more than one section of a major pipeline out of service at any time. The Pipeline Inspection Program covers the entire water transmission system over a 20-year period and then repeats. The SFPUC has a goal to inspect one section per quarter, averaging 10 to 12 miles per year. In 2018 and 2019, 13 and 12 miles of pipe were inspected, respectively. Due to the COVID-19 pandemic, the rate of inspection decreased in 2020 (approximately 3.6 miles), and is expected to return to normal in 2021. Technically, the RWS does not have any distribution system components, only transmission system components. In addition to inspections, SFPUC staff also regularly compare production volumes with customer consumption to help identify the leakage rate.

10.3.4.1 Past Implementation

The major focus of asset management for the wholesale system in the past decade has been the WSIP. To date, the program is at approximately 96% completion. Within the last five years, system improvements included significant pipeline

and tunnel construction, rehabilitation and replacement. Since 2016, the completed WSIP projects include the completion of the new 3.52 mile-long steel-lined Irvington Tunnel (now IT2), the implementation of seismic upgrades and pipeline improvements along the BDPL Nos. 3 and 4, the completion of the new 5-mile long steel-line Bay Tunnel under the San Francisco Bay, and targeted pipeline replacements and seismic upgrades along the San Andreas Pipeline Nos. 2 and 3, and the Sunset Supply Pipeline. The implemented improvements provide additional system redundancy, increased system capacity and improved seismic resiliency. Two additional major projects were completed within the last five years, which included key seismic upgrades, such as the addition of isolation valves and the upgrade of existing appurtenances, and pipeline replacements along the San Andreas Pipeline No.2.

10.3.4.2 Planned Implementation

Major pipeline rehabilitation and replacement projects are planned within the next 5 to 10 years. Key pipeline replacements will be implemented along the Crystal Springs Pipeline No.2, which will involve the replacement of welded steel pipe, the replacement of coal tar lining, the addition of new access manholes and isolation valves, and improvements to appurtenances. The SFPUC also plans to conduct internal lining repairs (removing corrosion accumulation at pipe joints and spalled mortar lining, cleaning metal surfaces, applying new mortar lining, and cleaning debris and sediment found inside the pipe) at the Bay Division Pipeline Nos 1-4 and will implement targeted repairs, rehabilitation or replacement of the pre-stressed concrete pipe of the Bay Division Pipeline No.4, as needed. Sections of the Bay Division Pipelines Nos. 3 and 4 will be relocated in the Santa Clara area.

During implementation of the WSIP, about half of the wholesale system transmission pipelines were replaced. The transmission lines that were not replaced under the WSIP are subject to a prioritization program based on findings from the Pipeline Inspection Program and additional factors such as material type, age, redundancy, leak history, and water quality issues. The program is informed by ongoing inspections to determine when pipelines need to be replaced and the SFPUC has been focusing on unmanned-type inspections. As part of the Safe Pipeline Entry Program, the SFPUC initiated considering the installation of additional valves to be included as part of pipeline replacement projects.

10.3.5 Assistance to Wholesale Customers

BAWSCA is the only entity of its kind to have authority to perform regional water supply reliability planning for its member agencies. Among other services, it also has the authority to coordinate water conservation programs and services for its member agencies. BAWSCA manages a Regional Water Conservation Program that is composed of several different conservation measures and is designed to support and augment its member agencies' customer efforts to use water more efficiently. These efforts include the administration of several regional water conservation measures, including measures designed to educate member agency customers about water-efficient landscaping and incentivize irrigated turf removal.

As previously stated, under the terms of the WSA with its Wholesale Customers, the SFPUC cannot provide direct financial assistance for conservation programs to an individual Wholesale Customer and subsequently adds this expense to the wholesale revenue requirement for that year. The SFPUC can provide staff to assist Wholesale Customer conservation efforts and, through agreement with BAWSCA, can develop service area-wide conservation programs that can be funded as a joint expense by its retail customers and Wholesale Customers. To this end, the SFPUC works closely with BAWSCA as opportunities arise to jointly develop outreach and communications related to the RWS and conservation. Refer to Section 10.3.2 for information on the SFPUC's collaborative efforts with BAWSCA on public education and outreach efforts. The SFPUC also provides technical and administrative assistance to the Wholesale Customers on preparing information to the public as requested.

SECTION 11: PLAN ADOPTION AND UWMP CHECKLIST

This section describes the adoption, submittal, and implementation of this 2020 UWMP. A checklist is also provided to facilitate DWR's review of the 2020 UWMP.

11.1 PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

The SFPUC prepared this draft 2020 UWMP and presented it to the SFPUC Commission for adoption at the regular meeting on June 8, 2021. The plan was adopted at a special meeting of the Commission on June 11, 2021. A copy of the SFPUC resolution adopting this 2020 UWMP update is provided in Appendix L.

Within 30 days of SFPUC Commission approval, the adopted 2020 UWMP will be submitted electronically to the DWR via its Water Use Efficiency data online submittal tool (WUEdata). Electronic copies will also be provided on compact disc to the California State Library and via e-mail to cities and counties within which the SFPUC provides water. The SFPUC will implement the adopted 2020 UWMP in accordance with the California Urban Water Management Planning Act.

Following adoption, the SFPUC will continue to implement water supply planning programs and projects identified in this 2020 UWMP, including those related to conservation, groundwater, recycled water, and Alternative Water Supply Planning.

11.2 UWMP CHECKLIST

The UWMP 2020 checklist is provided in Appendix M to facilitate DWR's review of the completeness of this document and is organized by subject matter. In addition, complete sets of standardized tables and SB X7-7 Verification Form tables prescribed by DWR are provided in Appendices B and D, respectively.

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2020 URBAN WATER MANAGEMENT PLAN

for the City and County of San Francisco

APPENDICES

June 2021

Prepared by:

The San Francisco
Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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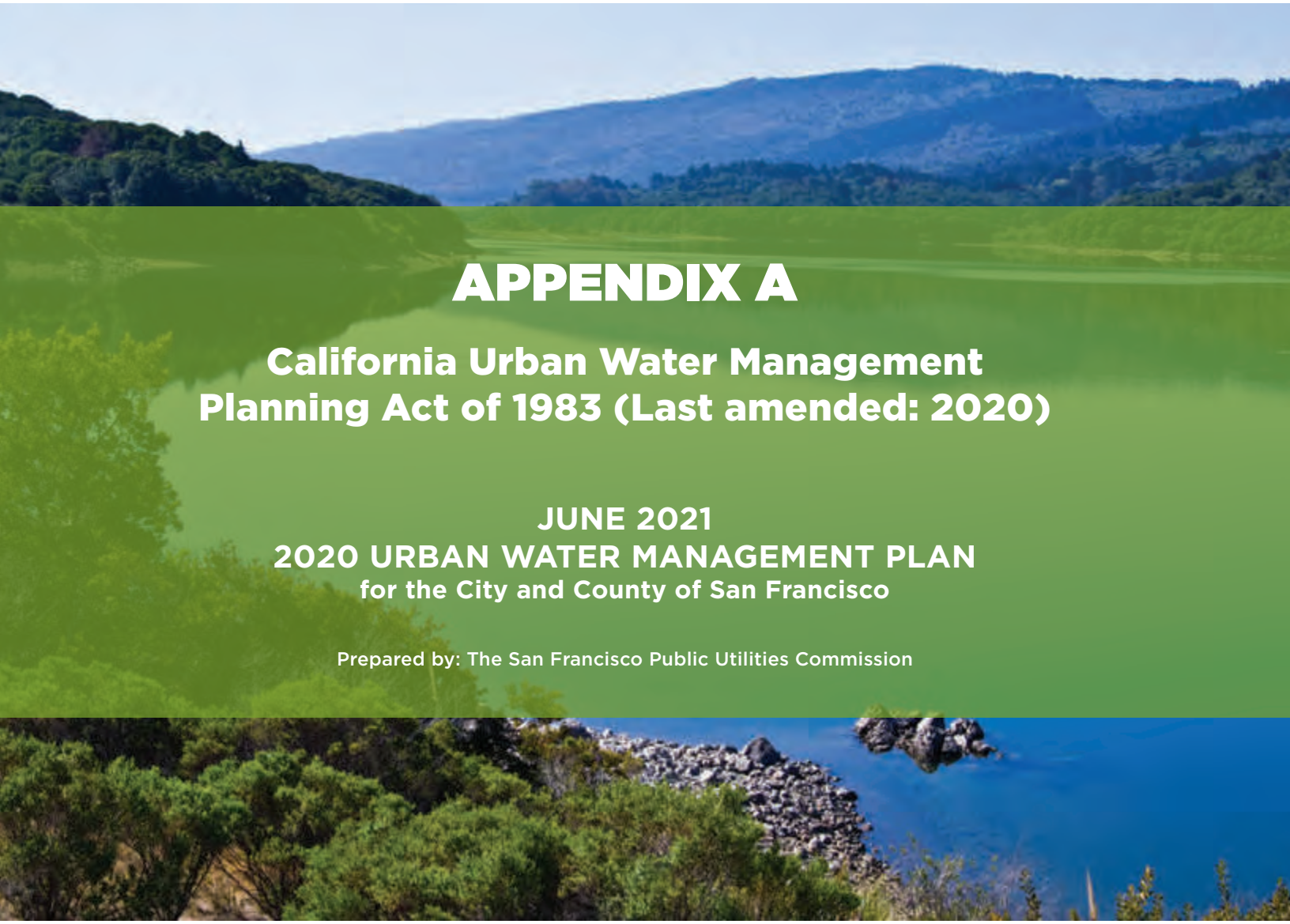

APPENDIX A

California Urban Water Management Planning Act of 1983 (Last amended: 2020)

JUNE 2021

2020 URBAN WATER MANAGEMENT PLAN

for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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Urban Water Management Planning Act, Water Code Division 6, Part 2.6

All Codes have been updated to include the 2020 Statues, as of January 1, 2020.

PART 2.6. URBAN WATER MANAGEMENT PLANNING [10610 – 10657]

CHAPTER 1. General Declaration and Policy [10610 – 10610.4]

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate, and increasing long-term water conservation among Californians, improving water use efficiency within the state's communities and agricultural production, and strengthening local and regional drought planning are critical to California's resilience to drought and climate change.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years now and into the foreseeable future, and every urban water supplier should collaborate closely with local land-use authorities to ensure water demand forecasts are consistent with current land-use planning.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

10610.4. The Legislature finds and declares that it is the policy of the state as follows:

(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.

(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.

(c) Urban water suppliers shall be required to develop water management plans to achieve the efficient use of available supplies and strengthen local drought planning.

CHAPTER 2. Definitions [10611 – 10618]

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.3. “Customer” means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10611.5. “Demand management” means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. “Drought risk assessment” means a method that examines water shortage risks based on the driest five-year historic sequence for the agency’s water supply, as described in subdivision (b) of Section 10635.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

10617.5. “Water shortage contingency plan” means a document that incorporates the provisions detailed in subdivision (a) of Section 10632 and is subsequently adopted by an urban water supplier pursuant to this article.

10618. "Water supply and demand assessment" means a method that looks at current year and one or more dry year supplies and demands for determining water shortage risks, as described in Section 10632.1.

CHAPTER 3. Urban Water Management Plans

ARTICLE 1. General Provisions [10620 – 10621]

10620. (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d) (1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation, efficient water use, and improved local drought resilience.

(2) Notwithstanding paragraph (1), each urban water supplier shall develop its own water shortage contingency plan, but an urban water supplier may incorporate, collaborate, and otherwise share information with other urban water suppliers or other governing entities participating in an areawide, regional, watershed, or basinwide urban water management plan, an agricultural management plan, or groundwater sustainability plan development.

(3) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10621. (a) Each urban water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) An urban water supplier regulated by the Public Utilities Commission shall include its most recent plan and water shortage contingency plan as part of the supplier's general rate case filings.

(d) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

(e) Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.

(f) Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.

ARTICLE 2. Contents of Plans [10630 – 10634]

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied, while accounting for impacts from climate change.

10630.5. Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.

10631. A plan shall be adopted in accordance with this chapter that shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other social, economic, and demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available. The description shall include the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following:

(1) A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.

(2) When multiple sources of water supply are identified, a description of the management of each supply in correlation with the other identified supplies.

(3) For any planned sources of water supply, a description of the measures that are being undertaken to acquire and develop those water supplies.

(4) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information:

(A) The current version of any groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720), any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management for basins underlying the urban water supplier's service area.

(B) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater.

For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For a basin that has not been adjudicated, information as to whether the department has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to coordinate with groundwater sustainability agencies or groundwater management agencies listed in subdivision (c) of Section 10723 to maintain or achieve sustainable groundwater conditions in accordance with a groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720).

(C) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(D) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(d) (1) For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following: (A) Single-family residential.

(B) Multifamily. (C)

Commercial. (D)

Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(J) Distribution system water loss.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(3) (A) The distribution system water loss shall be quantified for each of the five years preceding the plan update, in accordance with rules adopted pursuant to Section 10608.34.

(B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.

(C) In the plan due July 1, 2021, and in each update thereafter, data shall be included to show whether the urban retail water supplier met the distribution loss standards enacted by the board pursuant to Section 10608.34.

(4) (A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.

(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:

(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.

(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.

(e) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:

(i) Water waste prevention ordinances.

(ii) Metering.

(iii) Conservation pricing.

(iv) Public education and outreach.

(v) Programs to assess and manage distribution system real loss.

(vi) Water conservation program coordination and staffing support.

(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.

(2) For an urban wholesale water supplier, as defined in Section 10608.12, a narrative description of the items in clauses (ii), (iv), (vi), and (vii) of subparagraph (B) of paragraph (1), and a narrative description of its distribution system asset management and wholesale supplier assistance programs.

(f) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in normal and single-dry water years and for a period of drought lasting five consecutive water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(g) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

(h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five- year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).

10631.1. (a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirement under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

10631.2. (a) In addition to the requirements of Section 10631, an urban water management plan shall include any of the following information that the urban water supplier can readily obtain:

(1) An estimate of the amount of energy used to extract or divert water supplies.

(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.

(3) An estimate of the amount of energy used to treat water supplies. (4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.

(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.

(6) An estimate of the amount of energy used to place water into or withdraw from storage.

(7) Any other energy-related information the urban water supplier deems appropriate.

(b) The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.

(c) The Legislature finds and declares that energy use is only one factor in water supply planning and shall not be considered independently of other factors.

10632. (a) Every urban water supplier shall prepare and adopt a water shortage contingency plan as part of its urban water management plan that consists of each of the following elements:

(1) The analysis of water supply reliability conducted pursuant to Section 10635.

(2) The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:

(A) The written decision making process that an urban water supplier will use each year to determine its water supply reliability.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

(iii)Existing infrastructure capabilities and plausible constraints.

(iv)A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of water supply.

(3) (A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.

(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross- reference relating its existing categories to the six standard water shortage levels.

(4) Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions. (B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state- mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

(5) Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications.

(6) For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.

(7) (A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(A) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(B) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

(8) A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

(9) For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.

(10) Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.

(b) For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

(c) The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.

10632.1. An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.

10632.2. An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan, as identified in subdivision (a) of Section 10632, or reasonable alternative actions, provided that descriptions of the alternative actions are submitted with the annual water shortage assessment report pursuant to Section 10632.1. Nothing in this section prohibits an urban water supplier from taking actions not specified in its water shortage contingency plan, if needed, without having to formally amend its urban water management plan or water shortage contingency plan.

10632.3. It is the intent of the Legislature that, upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the board defer to implementation of locally adopted water shortage contingency plans to the extent practicable.

10632.5. (a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

CHAPTER 3. Urban Water Management Plans

ARTICLE 2.5. Water Service Reliability [10635]

10635. (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following:

(1) A description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted.

(2) A determination of the reliability of each source of supply under a variety of water shortage conditions. This may include a determination that a particular source of water supply is fully reliable under most, if not all, conditions.

(3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.

(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.

(d) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(e) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(f) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

ARTICLE 3. Adoption and Implementation of Plans [10640 – 10645]

10640. (a) Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

(b) Every urban water supplier required to prepare a water shortage contingency plan shall prepare a water shortage contingency plan pursuant to Section 10632. The supplier shall likewise periodically review the water shortage contingency plan as required by paragraph

(10) of subdivision (a) of Section 10632 and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan or a water shortage contingency plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644. (a) (1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1) shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

(b) If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its water shortage contingency plan prepared pursuant to subdivision (a) of Section 10632 no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.

(c) (1) (A) Notwithstanding Section 10231.5 of the Government Code, the department shall prepare and submit to the Legislature, on or before July 1, in the years ending in seven and two, a report summarizing the status of the plans and water shortage contingency plans adopted pursuant to this part. The report prepared by the department shall identify the exemplary elements of the individual plans and water shortage contingency plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan and water shortage contingency plan to the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans and water shortage contingency plans submitted pursuant to this part.

(B) The department shall prepare and submit to the board, on or before September 30 of each year, a report summarizing the submitted water supply and demand assessment results along with appropriate reported water shortage conditions and the regional and statewide analysis of water supply conditions developed by the department. As part of the report, the department shall

provide a summary and, as appropriate, urban water supplier specific information regarding various shortage response actions implemented as a result of annual supplier-specific water supply and demand assessments performed pursuant to Section 10632.1.

(C) The department shall submit the report to the Legislature for the 2015 plans by July 1, 2017, and the report to the Legislature for the 2020 plans and water shortage contingency plans by July 1, 2022.

(2) A report to be submitted pursuant to subparagraph (A) of paragraph (1) shall be submitted in compliance with Section 9795 of the Government Code.

(d) The department shall make available to the public the standard the department will use to identify exemplary water demand management measures.

10645. (a) Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

(b) Not later than 30 days after filing a copy of its water shortage contingency plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

CHAPTER 4. Miscellaneous Provisions [10650 – 10657]

10650. Any actions or proceedings, other than actions by the board, to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan or a water shortage contingency plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan or water shortage contingency plan, or action taken pursuant to either, does not comply with this part shall be commenced within 90 days after filing of the plan or water shortage contingency plan or an amendment to either pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan or a water shortage contingency plan, or an action taken pursuant to either by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the board and the Public Utilities Commission, for the preparation of water management plans, water shortage contingency plans, or conservation plans; provided, that if the board or the Public Utilities Commission requires additional information concerning water conservation, drought response measures,

or financial conditions to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan that complies with analogous federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its urban water management plan, its drought risk assessment, its water supply and demand assessment, and its water shortage contingency plan and implementing the reasonable water conservation measures included in either of the plans.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier is not eligible for a water grant or loan awarded or administered by the state unless the urban water supplier complies with this part.

10657. The department may adopt regulations regarding the definitions of water, water use, and reporting periods, and may adopt any other regulations deemed necessary or desirable to implement this part. In developing regulations pursuant to this section, the department shall solicit broad public participation from stakeholders and other interested persons.

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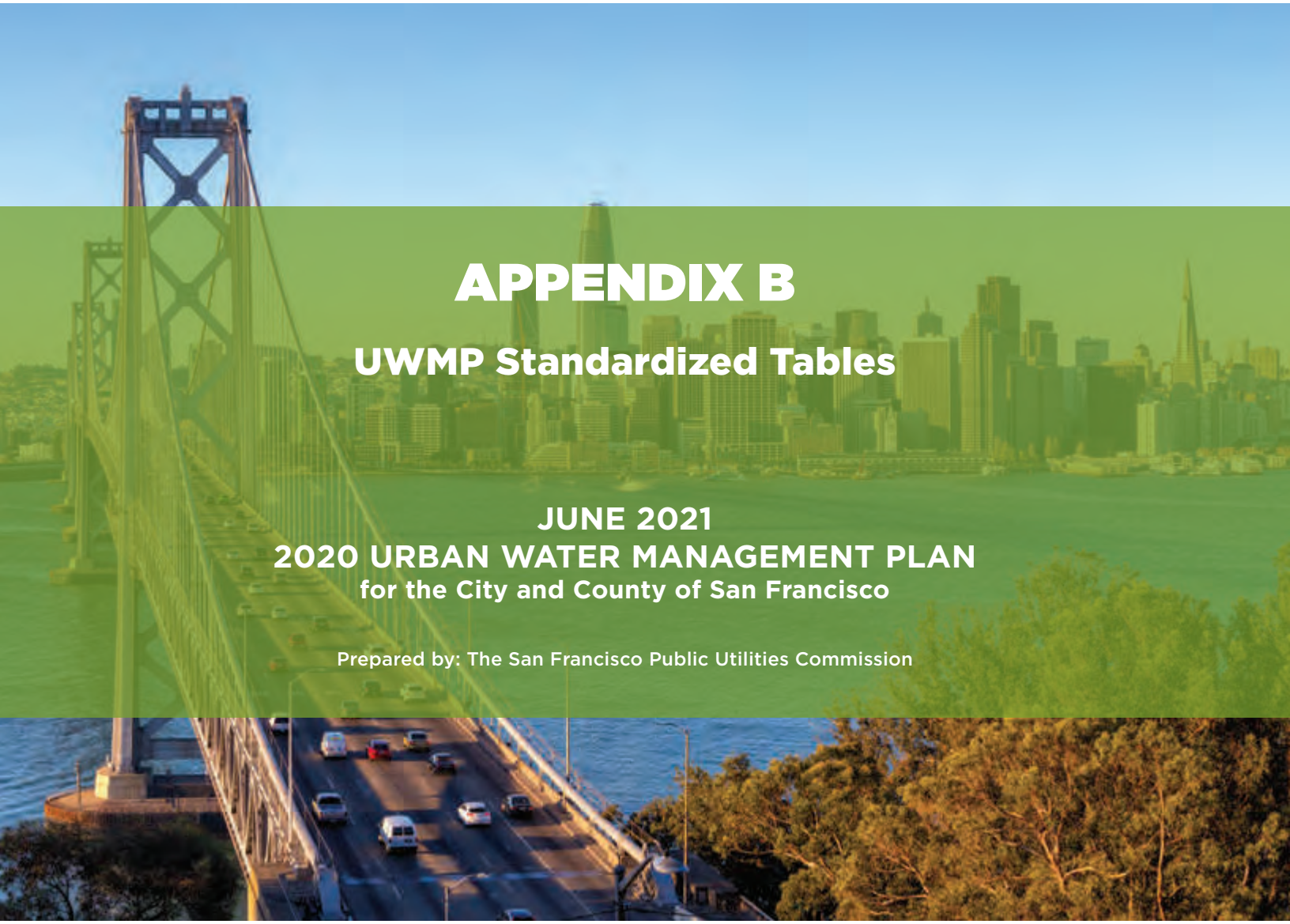

APPENDIX B

UWMP Standardized Tables

JUNE 2021

2020 URBAN WATER MANAGEMENT PLAN

for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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Submittal Table 2-1 Retail Only: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020 *
Add additional rows as needed			
CA3810011	SFPUC - CITY DISTRIBUTION DIVISION	181,011	73,150
CA0110018	SFPUC - PLEASANTON WELLS	1	340
CA0110012	SFPUC - TOWN OF SUNOL	141	470
	TOTAL	181,153	73,960
**** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*			

NOTES:
Some suburban retail water connections served by the SFPUC are not included in this list, as they are covered under the San Francisco Regional Water System PWS (CA3810001), which primarily serves wholesale connections.

Submittal Table 2-2: Plan Identification			
Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance** *if applicable* (select from drop down list)
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☐	Water Supplier is also a member of a Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**		
NOTES:			

Submittal Table 2-3: Supplier Identification	
Type of Supplier (select one or both)	
☑	Supplier is a wholesaler
☑	Supplier is a retailer
Fiscal or Calendar Year (select one)	
☐	UWMP Tables are in calendar years
☑	UWMP Tables are in fiscal years
If using fiscal years provide month and date that the fiscal year begins (mm/dd)	
7/1	
Units of measure used in UWMP * (select from drop down)	
Unit	AF
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*	
NOTES: Values are rounded to the nearest 10 AF in the standardized tables. The units of measure used in the body of the UWMP are millions of gallons per day (mgd).	

Submittal Table 2-4 Retail: Water Supplier Information Exchange
The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.
Wholesale Water Supplier Name
Add additional rows as needed
Not applicable. The SFPUC does not receive water from any wholesale supplier.
NOTES:

Submittal Table 2-4 Wholesale: Water Supplier Information Exchange (select one)	
☑	Supplier has informed more than 10 other water suppliers of water supplies available in accordance with Water Code Section 10631. Completion of the table below is optional. If not completed, include a list of the water suppliers that were informed.
	Provide page number for location of the list.
☐	Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with Water Code Section 10631. **Complete the table below.**
Water Supplier Name	
Add additional rows as needed	
City of Brisbane	
City of Burlingame	
City of Daly City	
City of East Palo Alto	
City of Hayward	
City of Menlo Park	
City of Millbrae	
City of Milpitas	
City of Mountain View	
City of Palo Alto	
City of Redwood City	
City of San Bruno	
City of San Jose	
City of Santa Clara	
City of Sunnyvale	
Town of Hillsborough	
Alameda County Water District	
Coastside County Water District	
Cordilleras Mutual Water Company	
Estero Municipal Improvement District	
Guadalupe Valley Municipal Improvement District	
Mid-Peninsula Water District	
North Coast County Water District	
Purissima Hills Water District	
Westborough Water District	
California Water Service Company	
Stanford University	
Groveland Community Services District [1]	
NOTES: 1. Groveland Community Services District (CSD) is contractually defined as a retail customer of the SFPUC and is accounted as such in SFPUC's previous planning documents. However, for the purpose of the 2020 UWMP update, SFPUC was directed by DWR to report Groveland CSD as a wholesale customer.	

Submittal Table 3-1 Retail: Population - Current and Projected						
Population Served	2020	2025	2030	2035	2040	2045*(opt)*
	899,732	1,004,799	1,066,403	1,128,007	1,189,610	1,251,214
NOTES: Population projections reflect the total population of in-City and suburban retail customers. Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is therefore reported in Table 3-1W instead of this table.						

Submittal Table 3-1 Wholesale: Population - Current and Projected						
Population Served	2020	2025	2030	2035	2040	2045*(opt)*
	1,861,643	1,944,854	2,035,472	2,191,056	2,314,808	2,441,801
NOTES: Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is included this table.						

Submittal Table 4-1 Retail: Demands for Potable and Non-Potable[1] Water - Actual			
Use Type	2020 Actual		
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool	Additional Description (as needed)	Level of Treatment When Delivered Drop down list	Volume[2]
Add additional rows as needed			
Single Family		Drinking Water	16,350
Multi-Family		Drinking Water	25,650
Other	Non-residential: commercial, industrial and institutional	Drinking Water	26,880
Losses	Includes both apparent losses and real losses (See Appendix F for AWWA audit worksheet)	Drinking Water	8,070
		TOTAL	76,950

[1] Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.
[2] Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.

NOTES: Per DWR direction, Groveland CSD is not accounted for as a retail customer, but rather wholesale customer in all the standardized tables. Their demand is included in Table 4-1W. However, the corresponding retail table in the UWMP includes Groveland CSD.

Submittal Table 4-1 Wholesale: Demands for Potable and Non-Potable[1] Water - Actual

Use Type	2020 Actual		
Drop down list May select each use multiple times These are the only use types that will be recognized by the WUE data online submittal tool	Additional Description (as needed)	Level of Treatment When Delivered Drop down list	Volume[2]
Add additional rows as needed			
Sales to other agencies		Drinking Water	148,310
		TOTAL	148,310

[1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.*
[2] *Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is included in this table. However, the corresponding wholesale table in the UWMP excludes Groveland CSD.

Submittal Table 4-2 Retail: Use for Potable and Non-Potable[1] Water - Projected

Use Type **Drop down list** May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool	Additional Description (as needed)	Projected Water Use[2] *Report To the Extent that Records are Available*				
		2025	2030	2035	2040	2045 (opt)
Add additional rows as needed						
Single Family		15,460	15,240	15,120	15,240	15,230
Multi-Family		26,550	28,680	31,260	33,940	36,970
Other	All non-residential [1]	27,780	27,330	27,220	27,670	28,230
Losses		6,720	6,720	6,720	6,720	6,720
TOTAL		76,510	77,970	80,320	83,570	87,150

[1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.*
[2] *Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Per DWR direction, Groveland CSD is not accounted for as a retail customer, but rather wholesale customer. Their demand is included in Table 4-2W. However, the corresponding retail table in the UWMP includes Groveland CSD.
1. The "Other" category includes all non-residential water demands (commercial, industrial, irrigation, etc.). Water demands served by recycled water supplies fall under this category and were subtracted from the numbers reported in this table, in accordance with Table 6-4, which provides a separate line item for the "Recycled Water Demands".

Submittal Table 4-2 Wholesale: Use for Potable and Raw Water - Projected						
Use Type	Additional Description (as needed)	Projected Water Use * Report To the Extent that Records are Available				
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool.		2025	2030	2035	2040	2045 (opt)
Add additional rows as needed						
Sales to other agencies	Projected purchase requests	163,940	166,000	170,490	175,420	182,640
TOTAL		163,940	166,000	170,490	175,420	182,640
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*						

NOTES: Per DWR direction, Groveland CSD is accounted for as a wholesale customer in this standardized table. However, the corresponding wholesale table in the UWMP excludes Groveland CSD.

Submittal Table 4-3 Retail: Total Water Use (Potable and Non-Potable)						
	2020	2025	2030	2035	2040	2045 (opt)
Potable Water, Raw, Other Non-potable *From Tables 4-1R and 4-2 R*	76,950	76,510	77,970	80,320	83,560	87,150
Recycled Water Demand[1] *From Table 6-4*	110	2,350	2,800	2,800	2,800	2,800
Optional Deduction of Recycled Water Put Into Long-Term Storage[2]						
TOTAL WATER USE	77,060	78,860	80,770	83,120	86,360	89,950

[1]Recycled water demand fields will be blank until Table 6-4 is complete
*[2] Long term storage means water placed into groundwater or surface storage that is not removed from storage in the same year. Supplier **may** deduct recycled water placed in long-term storage from their reported demand. This value is manually entered into Table 4-3.*

NOTES:
Recycled water use for landscape irrigation in 2020 reflects the recycled water supplied by the Sharp Park Recycled Water Project for golf course irrigation. Future projections reflect recycled water supply served by the planned Westside Recycled Water Project, and the existing Sharp Park Recycled Water Project and the Harding Park Recycled Water Project.
Also note that per DWR direction, Groveland CSD is not accounted for as a retail customer, but rather wholesale customer in all standardized tables. Their demand is included in Table 4-3W. However, the corresponding retail table in the UWMP includes Groveland CSD.

Submittal Table 4-3 Wholesale: Total Water Use (Potable and Non-Potable)						
	2020	2025	2030	2035	2040	2045 (opt)
Potable and Raw Water From Tables 4-1W and 4-2W	148,310	163,940	166,000	170,490	175,420	182,640
Recycled Water Demand* From Table 6-4W	0	0	0	0	0	0
TOTAL WATER DEMAND	148,310	163,940	166,000	170,490	175,420	182,640
**Recycled water demand fields will be blank until Table 6-4 is complete.*						

NOTES:
Wholesale demands are based on purchase requests projections.
Per DWR direction, Groveland CSD is accounted for as a wholesale customer in all the standardized tables and is therefore included in this table. However, the corresponding wholesale table in the UWMP excludes Groveland CSD.

Submittal Table 4-4 Retail: Last Five Years of Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss [1,2]
07/2015	6,750
07/2016	5,830
07/2017	6,750
07/2018	6,910
07/2019	8,070
[1] Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet. ***[2] Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*	
NOTES:	

Submittal Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) *Drop down list (y/n)*	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, or otherwise are utilized in demand projections are found.	Appendix G
Are Lower Income Residential Demands Included In Projections? *Drop down list (y/n)*	Yes
NOTES:	

Submittal Table 5-1 Baselines and Targets Summary
From SB X7-7 Verification Form
Retail Supplier or Regional Alliance Only

Baseline Period	Start Year *	End Year *	Average Baseline GPCD*	Confirmed 2020 Target*
10-15 year	*2001*	*2010*	*107*	*96*
5 Year	*2006*	*2010*	*101*	

**All cells in this table should be populated manually from the supplier's SBX7-7 Verification Form and reported in Gallons per Capita per Day (GPCD)*

NOTES: Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is therefore excluded from SB X7-7 calculations.

Submittal Table 5-2: 2020 Compliance
From SB X7-7 2020 Compliance Form
Retail Supplier or Regional Alliance Only

2020 GPCD			2020 Confirmed Target GPCD*	Did Supplier Achieve Targeted Reduction for 2020? Y/N
Actual 2020 GPCD*	2020 TOTAL Adjustments*	Adjusted 2020 GPCD* *(Adjusted if applicable)*		
76	-	-	*96*	*Y*

**All cells in this table should be populated manually from the supplier's SBX7-7 2020 Compliance Form and reported in Gallons per Capita per Day (GPCD)*

NOTES: Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is therefore excluded from SB X7-7 calculations.

Submittal Table 6-1 Retail: Groundwater Volume Pumped

☐	Supplier does not pump groundwater. The supplier will not complete the table below.
☐	All or part of the groundwater described below is desalinated.

Groundwater Type ***Drop Down List*** *May use each category multiple times*	Location or Basin Name	2016*	2017*	2018*	2019*	2020*
Add additional rows as needed						
Alluvial Basin	Westside Basin (1)	1340	1460	1900	1904	2240
Alluvial Basin	Livermore Valley Basin, Central Groundwater Sub Basin (2)	450	450	340	450	340
	TOTAL	1,790	1,910	2,240	2,354	2,580

**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:
(1) Data from 2016-2019 are obtained from the 2019 Annual Groundwater Monitoring Report, Westside Basin (SFPUC, April 2020), 2020 data are from verbal communications with SFPUC groundwater staff. Pumping volumes are reported on a calendar year basis, but are used to approximate fiscal year data for this table.
(2) The Livermore Valley Basin and Central Groundwater Sub Basin are the source of water for the Castlewood Well System. Pumping volumes are assumed to be equivalent to billed consumption for Castlewood CSA.

Submittal Table 6-1 Wholesale: Groundwater Volume Pumped						
☑	Supplier does not pump groundwater. The supplier will not complete the table below.					
☐	All or part of the groundwater described below is desalinated.					
Groundwater Type ***Drop Down List*** *May use each category multiple times*	Location or Basin Name	2016*	2017*	2018*	2019*	2020*
Add additional rows as needed						
TOTAL		0	0	0	0	0
**** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*						
NOTES:						

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area in 2020

☐	There is no wastewater collection system. The supplier will not complete the table below.
100%	Percentage of 2015 service area covered by wastewater collection system *(optional)*
100%	Percentage of 2015 service area population covered by wastewater collection system *(optional)*

Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? *Drop Down List*	Volume of Wastewater Collected from UWMP Service Area 2020 *	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area? *Drop Down List*	Is WWTP Operation Contracted to a Third Party? *(optional)* *Drop Down List*
SFPUC [1]	Metered	63,350	SFPUC	Southeast Water Pollution Control Plant	Yes	No
SFPUC [1]	Metered	16,410	SFPUC	Oceanside Water Pollution Control Plant	Yes	No
US Navy	Metered	370	US Navy and Treasure Island Development Authority	Treasure Island Wastewater Treatment Plant	Yes	Yes
City and County of San Francisco [2]	Metered	430	City and County of San Francisco	Mel Leong Treatment Plant	Yes	No
Total Wastewater Collected from Service Area in 2020:		80,560				

**** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:
1. At the Southeast and Oceanside WPCPs, metered effluent flows include both primary-only and secondary treated effluent (the bulk of which is secondary treated) and flows include treated combined wastewater and stormwater because the collection systems are predominantly combined systems.
2. Volume of wastewater collected at the Mel Leong Treatment Plant corresponds to calendar year 2020.

Submittal Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2020

☐ **No wastewater is treated or disposed of within the UWMP service area.** The supplier will not complete the table below.

Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)* 2	Method of Disposal ***Drop down list***	Does This Plant Treat Wastewater Generated Outside the Service Area? ***Drop down list***	Treatment Level ***Drop down list***	2020 volumes [1]				
							Waste water Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
Southeast Water Pollution Control Plant and North Point Wet Weather Facility [1,2]	Discharge Point No. 001; Discharge Point No. 002; Discharge Point Nos. 003-006	Lower San Francisco Bay; Islais Creek; Central San Francisco Bay	2 386010001	Bay or estuary outfall	Yes	Secondary, Undisinfected*	62,920	58,310 [4]	0	0	0
Oceanside Water Pollution Control Plant [1]	Discharge Point No. 001	Pacific Ocean, Offshore	2 386009001	Ocean outfall	Yes	Secondary, Undisinfected	16,300	16,790 [5]	0	0	0
Treasure Island Wastewater Treatment Plant [2]	Discharge Point No. 001	Central San Francisco Bay	2 386013001	Bay or estuary outfall	No	Secondary, Undisinfected*	370	330	0	0	0
Mel Leong Treatment Plant [2,3]	North Bayside System Unit	Lower San Francisco Bay	2 417033001	Bay or estuary outfall	No	Secondary, Undisinfected*	430	430	0	0	0
						Total	80,020	75,860	0	0	0

[1] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.
[2] If the **Wastewater Discharge ID Number** is not available to the UWMP preparer, access the SWRCB CIWQS regulated facility website at https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet?inCommand=reset&reportName=RegulatedFacility

NOTES: 1. At the Southeast and Oceanside WPCPs, metered effluent flows include both primary-only and secondary treated effluent (the bulk of which is secondary treated) and flows include treated combined wastewater and stormwater because the collection systems are predominantly combined systems.
2. At the Southeast Water Pollution Control Plant, Treasure Island Wastewater Treatment Plant, and Mel Leong Treatment Plant, wastewater are secondary treated and disinfected (that option was not available in the spreadsheet template's original dropdown menu.)
3. Volume of wastewater collected at the Mel Leong Treatment Plant corresponds to calendar year 2020.
4. The volume discharged is less than the volume collected because a small volume of the discharged wastewater is treated to secondary, disinfected-23 level and used for other purposes.
5. The volume discharged is higher than the volume collected because the discharged volume includes additional plant recycle streams.

Submittal Table 6-3 Wholesale: Wastewater Treatment and Discharge Within Service Area in 2020

☑	Wholesale Supplier neither distributes nor provides supplemental treatment to recycled water. The Supplier will not complete the table below.

Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)* [2]	Method of Disposal ***Drop down list***	Does This Plant Treat Wastewater Generated Outside the Service Area? ***Drop down list***	Treatment Level ***Drop down list***	2020 volumes [1]				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
Add additional rows as needed											
						Total	0	0	0	0	0

[1] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.
[2] If the **Wastewater Discharge ID Number** is not available to the UWMP preparer, access the SWRCB CIWQS regulated facility website at https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet?inCommand=reset&reportName=RegulatedFacility

NOTES:

Submittal Table 6-4a Retail: Recycled Water Direct Beneficial Uses Within Service Area
Please see Tables 6-4b and 6-4c below.

☐	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.
Name of Supplier Producing (Treating) the Recycled Water:	SFPUC
Name of Supplier Operating the Recycled Water Distribution System:	SFPUC
Supplemental Water Added in 2020 (volume) *Include units*	0
Source of 2020 Supplemental Water	Not applicable

Beneficial Use Type *Insert additional rows if needed.*	**Potential** Beneficial Uses of Recycled Water (Describe)	Amount of **Potential** Uses of Recycled Water (Quantity) *Include volume units*[1]	General Description of 2020 Uses	Level of Treatment *Drop down list*	2020 [1]	2025 [1]	2030[1]	2035[1]	2040[1]	2045[1] (opt)
Landscape irrigation (exc golf courses)	Irrigation for Golden Gate Park and SF Zoo		No uses in 2020	Advanced	0	1,680	1,680	1,680	1,680	1,680
Landscape irrigation (exc golf courses)	Irrigation for Treasure Island		No uses in 2020	Tertiary	0	220	220	220	220	220
Golf course irrigation	Irrigation for Lincoln Park and Presidio golf courses		No uses in 2020	Advanced	0	120	340	340	340	340
Other (Description Required)	Direct non-potable reuse to serve dual plumbed buildings on Treasure Island		No uses in 2020	Tertiary	0	0	230	230	230	230
				Total:	0	2,020	2,470	2,470	2,470	2,470
				2020 Internal Reuse						

[1] ***Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: The landscape and irrigation recycled water uses included in this table will be supplied by the Westside Recycled Water Project and the Treasure Island Recycled Water Project.

Submittal Table 6-4b Retail: Recycled Water Direct Beneficial Uses Within Service Area

☐	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.

Name of Supplier Producing (Treating) the Recycled Water:	North San Mateo County Sanitation District (NSMCSD)
Name of Supplier Operating the Recycled Water Distribution System:	NSMCSD (portion of transmission line within the City and County of San Francisco is operated by SFPUC)
Supplemental Water Added in 2020 (volume) *Include units*	0
Source of 2020 Supplemental Water	Not applicable

Beneficial Use Type *Insert additional rows if needed.*	**Potential** Beneficial Uses of Recycled Water (Describe)	Amount of **Potential** Uses of Recycled Water (Quantity) *Include volume units*[1]	General Description of 2020 Uses	Level of Treatment *Drop down list*	2020 [1]	2025 [1]	2030[1]	2035[1]	2040[1]	2045[1] (opt)
Golf course irrigation	Harding Park and Fleming Golf Courses irrigation		No uses in 2020	Tertiary	0	220	220	220	220	220
				Total:	0	220	220	220	220	220
				2020 Internal Reuse						

[1] ***Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 6-4c Retail: Recycled Water Direct Beneficial Uses Within Service Area

☐	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.

Name of Supplier Producing (Treating) the Recycled Water:	North Coast County Water District
Name of Supplier Operating the Recycled Water Distribution System:	North Coast County Water District
Supplemental Water Added in 2020 (volume) *Include units*	0
Source of 2020 Supplemental Water	Not applicable

Beneficial Use Type *Insert additional rows if needed.*	**Potential** Beneficial Uses of Recycled Water (Describe)	Amount of **Potential** Uses of Recycled Water (Quantity) *Include volume units*[1]	General Description of 2020 Uses	Level of Treatment *Drop down list*	2020 [1]	2025 [1]	2030[1]	2035[1]	2040[1]	2045[1] (opt)
Golf course irrigation	irrigation of Sharp Park Golf Course		irrigation of Sharp Park Golf Course	Tertiary	110	110	110	110	110	110
				Total:	110	110	110	110	110	110
				2020 Internal Reuse						

[1] ***Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 6-4 Wholesale: Current and Projected Retailers Provided Recycled Water Within Service Area							
☑	Recycled water is not directly treated or distributed by the Supplier. The Supplier will not complete the table below.						
Name of Receiving Supplier or Direct Use by Wholesaler	Level of Treatment *Drop down list*	2020*	2025*	2030*	2035*	2040*	2045* *(opt)*
Add additional rows as needed							
	Total	0	0	0	0	0	0
*** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.							
NOTES:							

Submittal Table 6-5 Retail: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual

☐	Recycled water was not used in 2015 nor projected for use in 2020. The supplier will not complete the table below. If recycled water was not used in 2020, and was not predicted to be in 2015, then check the box and do not complete the table.

Beneficial Use Type	2015 Projection for 2020 [1]	2020 Actual Use[1]
Insert additional rows as needed.		
Agricultural irrigation		
Landscape irrigation (exc golf courses)		
Golf course irrigation	340	110
Commercial use		
Industrial use		
Geothermal and other energy production		
Seawater intrusion barrier		
Recreational impoundment		
Wetlands or wildlife habitat		
Groundwater recharge (IPR)		
Reservoir water augmentation (IPR)		
Direct potable reuse		
Other (Description Required)		
Total	340	110

[1] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.

NOTE:
Golf course irrigation includes Harding Park, Fleming and Sharp Park golf courses. The disparity between the predicted 2020 recycled water use and the actual 2020 recycled water used is approximately 230 acre-feet because the Harding Park Recycled Water Project was offline in 2020 due to necessary infrastructure upgrades.

Submittal Table 6-5 Wholesale: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual		
☑	Recycled water was not used or distributed by the supplier in 2015, nor projected for use or distribution in 2020. The wholesale supplier will not complete the table below.	
Name of Receiving Supplier or Direct Use by Wholesaler	2015 Projection for 2020*	2020 Actual Use*
Add additional rows as needed		
Total	0	0
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*		
NOTES:		

Submittal Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
☐	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
Section 6.2.2	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use *
Add additional rows as needed			
Westside Recycled Water Project	Construction of a Recycled Water Treatment Plant at the Oceanside Water Pollution Control Plant to serve recycled water for landscape irrigation at Golden Gate Park, Lincoln Park Golf Course, Presidio Golf Course, and other irrigated areas in the Presidio.	2025	2,020
Treasure Island Water Resource Recovery Facility	Construction of a wastewater treatment facility that will provide Title 22 disinfected tertiary-level treated effluent that will serve dual-plumbed buildings, and supply water for outdoor urban agriculture and irrigation.	2022	450
Ordinances, Programs, and Services	The SFPUC administers or helps to administer various ordinances, programs, and services in the City related to recycled water and water reuse. The majority of these ordinances, programs, and services have been established for many years and are ongoing, resulting in increased water reuse. These include Soil Compaction and Dust Control Ordinance, Recycled Water Ordinance, Large Landscape Grant Program and Onsite Potable Reuse Program.	2022	0
		Total	2,470
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*			
NOTES: See UWMP Section 6.2.2 for more information.			

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs						
☐	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
☑	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
Sections 6.2.2 & 7.4	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other suppliers?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type *Drop Down List*	Expected Increase in Water Supply to Supplier* *This may be a range*
	Drop Down List (y/n)	*If Yes, Supplier Name*				
Add additional rows as needed						
Westside Recycled Water Project	No			2025	All Year Types	2,020
Treasure Island Recycled Water Project	No			2022	All Year Types	450 - 1120
San Francisco Groundwater Supply Project [1]	No			Existing & Progressive Expansion	All Year Types	Up to 4480
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*						
NOTES: 1. Part of the San Francisco Groundwater Supply Project has been implemented, and currently produces approximately 450 acre-feet of potable water. A progressive expansion is planned, adding 1120 acre-feet of supply at a time, with a total anticipated capacity of 4480 acre-feet.						

Submittal Table 6-7 Wholesale: Expected Future Water Supply Projects or Programs						
☐	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
☑	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
Section 7.4	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other suppliers?		Description *(if needed)*	Planned Implementation Year	Planned for Use in Year Type *Drop Down list*	Expected Increase in Water Supply to Supplier*
	Drop Down Menu	*If Yes, Supplier Name*				
Add additional rows as needed						
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*						
NOTES:						

Submittal Table 6-8 Retail: Water Supplies — Actual				
Water Supply	Additional Detail on Water Supply	2020		
Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool		Actual Volume*	Water Quality Drop Down List	Total Right or Safe Yield* (optional)
Add additional rows as needed				
Surface water (not desalinated)		74,490	Drinking Water	
Groundwater (not desalinated)		450	Drinking Water	
Groundwater (not desalinated)		1,680	Other Non-Potable Water	
Purchased or Imported Water	Sharp Park	110	Recycled Water	
Purchased or Imported Water	Harding Park	0	Recycled Water	
	Total	76,730		0
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*				

NOTES:
Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is therefore reported in Table 6-8 Wholesale instead of this table. However, the corresponding retail table in the UWMP includes Groveland CSD.

Submittal Table 6-8 Wholesale: Water Supplies — Actual				
Water Supply	Additional Detail on Water Supply	2020		
Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool		Actual Volume*	Water Quality Drop Down List	Total Right or Safe Yield* (optional)
Add additional rows as needed				
Surface water (not desalinated)		148,310	Drinking Water	
Total		148,310		0
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*				
NOTES: Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is included in this table. However, the corresponding wholesale table in the UWMP excludes Groveland CSD.				

Submittal Table 6-9 Retail: Water Supplies — Projected											
Water Supply		Projected Water Supply * Report To the Extent Practicable									
Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool	Additional Detail on Water Supply	**2025**		**2030**		**2035**		**2040**		**2045** (opt)	
		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Add additional rows as needed											
Surface water (not desalinated)		74,940		75,280		76,510		78,640		82,220	
Groundwater (not desalinated)		1,570		2,690		3,810		4,930		4,930	
Recycled Water	See Table 6-4R for recycled water supplies	2,350		2,800		2,800		2,800		2,800	
Total		78,860	0	80,770	0	83,120	0	86,370	0	89,950	0
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*											
NOTES: Per DWR direction, Groveland CSD is reported as a wholesale customer in all standardized tables.											

Submittal Table 6-9 Wholesale: Water Supplies — Projected

Water Supply		Projected Water Supply* Report To the Extent Practicable									
		2025		**2030**		**2035**		**2040**		**2045** (opt)	
Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool	Additional Detail on Water Supply	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Add additional rows as needed											
Surface water (not desalinated)		163,940		166,000		170,490		175,420		182,640	
Total		163,940	0	166,000	0	170,490	0	175,420	0	182,640	0

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment)			
Year Type	**Base Year** If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 2019-2020, use 2020	**Available Supplies if Year Type Repeats**	
		☑	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location: Table 8-2 & Table 8-3
		☐	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available *	**% of Average Supply**
Average Year			100%
Single-Dry Year			
Consecutive Dry Years 1st Year			
Consecutive Dry Years 2nd Year			
Consecutive Dry Years 3rd Year			
Consecutive Dry Years 4th Year			
Consecutive Dry Years 5th Year			

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a Supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

Submittal Table 7-1 Wholesale: Basis of Water Year Data (Reliability Assessment)			
Year Type	**Base Year** If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000	**Available Supplies if Year Type Repeats**	
		☑	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location: Table 8-3
		☐	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available *	**% of Average Supply**
Average Year			100%
Single-Dry Year			
Consecutive Dry Years 1st Year			
Consecutive Dry Years 2nd Year			
Consecutive Dry Years 3rd Year			
Consecutive Dry Years 4th Year			
Consecutive Dry Years 5th Year			
Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.			
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*			
NOTES:			

Submittal Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 *(Opt)*
Supply totals *(autofill from Table 6-9)*	78,860	80,770	83,120	86,370	89,950
Demand totals *(autofill from Table 4-3)*	78,860	80,770	83,120	86,370	89,950
Difference	0	0	0	0	0
NOTES: Per DWR direction, Groveland CSD is reported as a wholesale customer in the standardized tables. Their supplies and demands are included in Table 7-2W.					

Submittal Table 7-2 Wholesale: Normal Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 *(Opt)*
Supply totals *(autofill from Table 6-9)*	163,940	166,000	170,490	175,420	182,640
Demand totals *(autofill fm Table 4-3)*	163,940	166,000	170,490	175,420	182,640
Difference	0	0	0	0	0
NOTES: Per DWR direction, Groveland CSD is reported as a wholesale customer in the standardized tables. Their supplies and demands are included in this table.					

Submittal Table 7-3 Retail: Single Dry Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 (Opt)
Supply totals*	66,650	68,780	71,470	74,380	67,320
Demand totals*	79,200	81,100	83,450	86,700	90,290
Difference	(12,550)	(12,320)	(11,980)	(12,320)	(22,970)
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*					

NOTES: Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is therefore included in Table 7-3W.
These tables assume implementation of the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) starting in 2023. The implementation of the Bay-Delta Plan Amendment is uncertain for multiple reasons, including ongoing litigation. The SFPUC recognizes that the Bay-Delta Plan Amendment has been adopted and that, given that it is now state law, we must plan for a future in which it is fully implemented. The SFPUC also acknowledges that the plan is not self-implementing and therefore does not automatically go into effect. The SFPUC is currently pursuing a voluntary agreement as well as a lawsuit which would limit implementation of the Plan. With both of these processes occurring on an unknown timeline, the SFPUC does not know at this time when the Bay-Delta Plan Amendment is likely to go into effect.

Submittal Table 7-3 Wholesale: Single Dry Year Supply and Demand Comparison					
	2025	2030	2035	2040 (Opt)	2045
Supply totals*	104,510	105,520	108,100	111,120	99,360
Demand totals*	163,550	165,680	170,160	175,080	182,370
Difference	(59,040)	(60,160)	(62,060)	(63,960)	(83,010)
***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*					

NOTES: Groveland CSD is accounted for as a wholesale customer and is included in this table.
These tables assume implementation of the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) starting in 2023. The implementation of the Bay-Delta Plan Amendment is uncertain for multiple reasons, including ongoing litigation. The SFPUC recognizes that the Bay-Delta Plan Amendment has been adopted and that, given that it is now state law, we must plan for a future in which it is fully implemented. The SFPUC also acknowledges that the plan is not self-implementing and therefore does not automatically go into effect. The SFPUC is currently pursuing a voluntary agreement as well as a lawsuit which would limit implementation of the Plan. With both of these processes occurring on an unknown timeline, the SFPUC does not know at this time when the Bay-Delta Plan Amendment is likely to go into effect.

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison						
		2025*	2030*	2035*	2040*	2045* (Opt)
First year	Supply totals	66,650	68,780	71,470	74,380	67,320
	Demand totals	79,200	81,100	83,450	86,700	90,290
	Difference	(12,550)	(12,320)	(11,980)	(12,320)	(22,970)
Second year	Supply totals	57,690	59,820	62,170	64,860	67,320
	Demand totals	79,200	81,100	83,450	86,700	90,290
	Difference	(21,510)	(21,280)	(21,280)	(21,840)	(22,970)
Third year	Supply totals	57,690	59,820	62,170	64,860	67,320
	Demand totals	79,200	81,100	83,450	86,700	90,290
	Difference	(21,510)	(21,280)	(21,280)	(21,840)	(22,970)
Fourth year	Supply totals	57,690	59,820	62,170	58,250	58,360
	Demand totals	79,200	81,100	83,450	86,700	90,290
	Difference	(21,510)	(21,280)	(21,280)	(28,450)	(31,930)
Fifth year	Supply totals	57,690	59,820	57,580	58,250	58,360
	Demand totals	79,200	81,100	83,450	86,700	90,290
	Difference	(21,510)	(21,280)	(25,870)	(28,450)	(31,930)
Sixth year *(optional)*	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is therefore reported in Table 7-4 Wholesale instead of this table. However, the corresponding retail table in the UWMP includes Groveland CSD.
These tables assume implementation of the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) starting in 2023. The implementation of the Bay-Delta Plan Amendment is uncertain for multiple reasons, including ongoing litigation. The SFPUC recognizes that the Bay-Delta Plan Amendment has been adopted and that, given that it is now state law, we must plan for a future in which it is fully implemented. The SFPUC also acknowledges that the plan is not self-implementing and therefore does not automatically go into effect. The SFPUC is currently pursuing a voluntary agreement as well as a lawsuit which would limit implementation of the Plan. With both of these processes occurring on an unknown timeline, the SFPUC does not know at this time when the Bay-Delta Plan Amendment is likely to go into effect.

Submittal Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison

		2025*	2030*	2035*	2040*	2045* (Opt)
First year	Supply totals	104,510	105,520	108,100	111,120	99,360
	Demand totals	163,550	165,680	170,160	175,080	182,370
	Difference	(59,040)	(60,160)	(62,060)	(63,960)	(83,010)
Second year	Supply totals	104,180	90,510	92,640	95,330	99,360
	Demand totals	163,550	165,680	170,160	175,080	182,370
	Difference	(59,370)	(75,170)	(77,520)	(79,750)	(83,010)
Third year	Supply totals	89,610	90,510	92,640	95,330	99,360
	Demand totals	163,550	165,680	170,160	175,080	182,370
	Difference	(73,940)	(75,170)	(77,520)	(79,750)	(83,010)
Fourth year	Supply totals	89,610	90,510	92,640	84,130	84,460
	Demand totals	163,550	165,680	170,160	175,080	182,370
	Difference	(73,940)	(75,170)	(77,520)	(90,950)	(97,910)
Fifth year	Supply totals	89,610	90,510	84,910	84,130	84,460
	Demand totals	163,550	165,680	170,160	175,080	182,370
	Difference	(73,940)	(75,170)	(85,250)	(90,950)	(97,910)
Sixth year *(optional)*	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0

***Units of measure (AF, CCF, MG) m**ust remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is included in this table. However, the corresponding wholesale table in the UWMP excludes Groveland CSD.

These tables assume implementation of the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) starting in 2023. The implementation of the Bay-Delta Plan Amendment is uncertain for multiple reasons, including ongoing litigation. The SFPUC recognizes that the Bay-Delta Plan Amendment has been adopted and that, given that it is now state law, we must plan for a future in which it is fully implemented. The SFPUC also acknowledges that the plan is not self-implementing and therefore does not automatically go into effect. The SFPUC is currently pursuing a voluntary agreement as well as a lawsuit which would limit implementation of the Plan. With both of these processes occurring on an unknown timeline, the SFPUC does not know at this time when the Bay-Delta Plan Amendment is likely to go into effect.

Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)	
2021	**Total**
Total Water Use	77,520
Total Supplies	73,710
Surplus/Shortfall w/o WSCP Action	(3,810)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	-3,810
Resulting % Use Reduction from WSCP action	0%
2022	**Total**
Total Water Use	77,960
Total Supplies	74,160
Surplus/Shortfall w/o WSCP Action	(3,800)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	-3,800
Resulting % Use Reduction from WSCP action	0%
2023	**Total**
Total Water Use	78,300
Total Supplies	52,980
Surplus/Shortfall w/o WSCP Action	(25,320)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	25,320
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	32%
2024	**Total**
Total Water Use	78,750
Total Supplies	52,980
Surplus/Shortfall w/o WSCP Action	(25,770)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	25,760
Revised Surplus/(shortfall)	-10
Resulting % Use Reduction from WSCP action	33%

2025	Total
Total Water Use	79,200
Total Supplies	53,990
Surplus/Shortfall w/o WSCP Action	(25,210)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	25,200
Revised Surplus/(shortfall)	-10
Resulting % Use Reduction from WSCP action	32%

NOTE: These tables assume implementation of the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) starting in 2023. The implementation of the Bay-Delta Plan Amendment is uncertain for multiple reasons, including ongoing litigation. The SFPUC recognizes that the Bay-Delta Plan Amendment has been adopted and that, given that it is now state law, we must plan for a future in which it is fully implemented. The SFPUC also acknowledges that the plan is not self-implementing and therefore does not automatically go into effect. The SFPUC is currently pursuing a voluntary agreement as well as a lawsuit which would limit implementation of the Plan. With both of these processes occurring on an unknown timeline, the SFPUC does not know at this time when the Bay-Delta Plan Amendment is likely to go into effect.

Submittal Table 8-1
Water Shortage Contingency Plan Levels

Shortage Level	Percent Shortage Range	Shortage Response Actions (*Narrative description*)
1	Up to 10%	Voluntary retail water use reduction of 5%
2	Up to 20%	Voluntary retail water use reduction of 5%
3	Up to 30%	Voluntary retail water use reduction of 5%
4	Up to 40%	Voluntary or mandatory retail water use reduction of 5% to 18%
5	Up to 50%	Mandatory retail water use reduction of 18% to 32%
6	>50%	Mandatory retail water use reduction of >32%

NOTES:

Submittal Table 8-2: Demand Reduction Actions

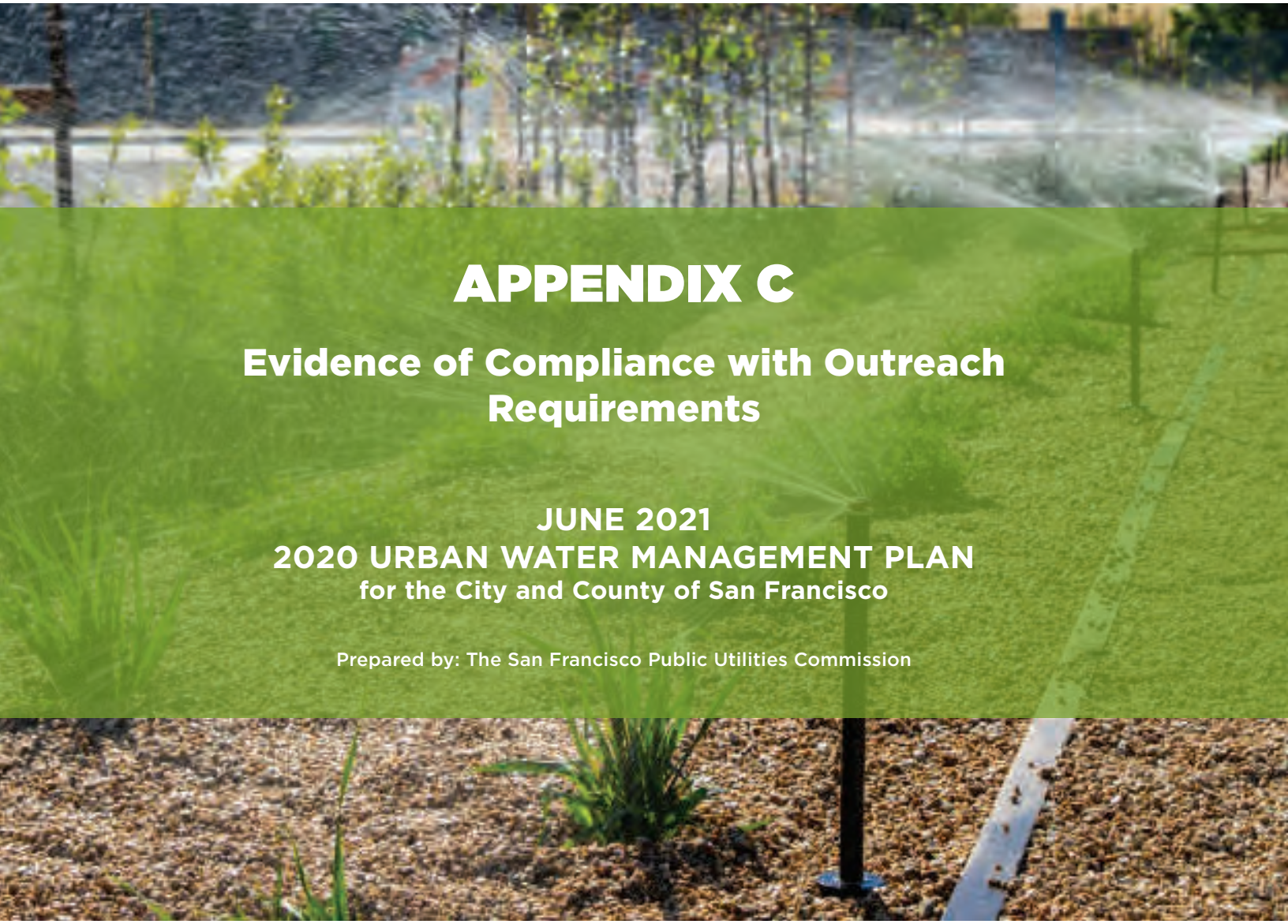
Shortage Level	Demand Reduction Actions ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? ***For Retail Suppliers Only*** *Drop Down List*
Add additional rows as needed				
1, 2, and 3	Other	3.3 mgd	Voluntary call for water use reductions	No
4	Other	6.3 mgd	Mandatory water use reduction	Yes
5	Other	16.2 mgd	Mandatory water use reduction	Yes
6	Other	21.2 mgd	Mandatory water use reduction	Yes

NOTES:
a. Associated volume of reduction is based on 2025 projected unconstrained SFPUC Retail customer demands on the Regional Water System of 65.9 mgd. Volumes shown for each level represent the total shortage that must be met with the associated response action at that shortage level.
b. For Shortage Levels 1-3, the SFPUC expects to have enough supply to meet projected unconstrained retail demands. However, SFPUC has a contractual obligation that for any level of required reduction in system-wide water use during shortages, the SFPUC shall require Retail Customers to conserve a minimum of 5 percent. A 5 percent reduction in retail demand can be achieved with a voluntary call for reductions in water use.
c. The Level 6 shortage (assumed to be 55% system-wide supply reduction) has an associated 21.2 mgd shortage gap in 2025. The demand reductions are assumed to ultimately be met with a demand reduction approach consisting of a 25 gpcd floor for residential accounts, a 50% demand reduction in irrigation accounts, and 30% demand reduction in other non-residential accounts.

Submittal Table 8-3: Supply Augmentation and Other Actions			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*
Add additional rows as needed			
NOTES:			

Submittal Table 10-1 Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
San Francisco	Yes	Yes
County Name *Drop Down List*	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
Alameda County	Yes	Yes
San Mateo County	Yes	Yes
Santa Clara County	Yes	Yes
San Joaquin County	Yes	Yes
Tuolumne County	Yes	Yes
NOTES: In addition to the cities and counties listed above, the SFPUC also notified various private organizations and communities that may be interested in participating in the UWMP process. A complete list of these entities can be found in Appendix C.		

Submittal Table 10-1 Wholesale: Notification to Cities and Counties (select one)		
☑	Supplier has notified more than 10 cities or counties in accordance with Water Code Sections 10621 (b) and 10642. **Completion of the table below is not required. Provide a separate list of the cities and counties that were notified.**	
Appendix C	Provide the page or location of this list in the UWMP.	
☐	Supplier has notified 10 or fewer cities or counties. **Complete the table below.**	
City Name	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
County Name *Drop Down List*	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
NOTES:		



APPENDIX C

Evidence of Compliance with Outreach Requirements

JUNE 2021
2020 URBAN WATER MANAGEMENT PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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Summary Table of SFPUC Compliance with Public Notification Elements of the Urban Water Management Plan Act

Code Section	Code Requirement	Summary of Action Taken	Documentation (Attached after this Table)
Water Code Section 10620	Notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes.	✓ January 29, February 8 and March 12, 2021: Sent notification letters via email to City agencies, wholesale customers of the SFPUC Regional Water System, suburban retail customers (e.g., SFO), large regional water agencies (e.g., EBMUD), Bay Area Water Supply Conservation Agency (BAWSCA), and a larger distribution list of parties known by the SFPUC to be interested in water resources planning issues.	• Example of 2/08/21 letter sent via email • Example of 03/12/2021 letter sent via email • Recipient list
Water Code Section 10642	Encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	✓ February 8 and March 12, 2021: Sent emails to a larger distribution list of parties known by the SFPUC to be interested in water resources planning issues. ✓ Currents hardcopy newsletter included with the March/April 2021 bill ✓ April 5, 2021: Posted the Draft 2020 UWMP on the SFPUC website at www.sfpuc.org ✓ March 29 and April 5, 2021: Posted advertisement in local community newspaper(s) regarding the availability of the Draft 2020 UWMP, as well as the time and location of the public hearing.	• Example of 2/08/21 letter sent via email (same letter sent via email on 03/12/21 to additional recipients) • Declaration of publication of San Francisco Chronicle and copy of advertisement • Copy of Currents newsletter included into customers' hard copy bills in March/April 2021
Water Code Section 10642	Prior to the required hearing, publish the notice of time and place of hearing within the jurisdiction of the supplier pursuant to Section 6066 of the Government Code.	✓ March 29 and April 5, 2021: Posted Notification of Public Hearing in local community newspaper meeting requirement of Section 6066 of the Government Code.	• Declaration of publication in San Francisco Chronicle and copy of advertisement
Water Code Section 10642	Prior to the required hearing, provide notice of time and place of hearing to any city of county within which the supplier provides water.	✓ February 8, March 12, April 5, 2021: Provided notification of public hearing, including time and place of the hearing, in the same notification letter regarding the preparation of the 2020 UWMP Update.	• Example of 2/08/21 letter sent via email (same letter sent via email on 03/12/21 to additional recipients) • Recipient list (same as recipient list listed earlier)

Code Section	Code Requirement	Summary of Action Taken	Documentation (Attached after this Table)
Water Code Section 10642	Prior to adoption, make the plan available for public inspection.	✓ April 5, 2021: Posted the Draft 2020 UWMP on the SFPUC website at www.sfpuc.org, sent a notification email to announce availability of the Plan for public inspection. ✓ April 5, 2021: Sent emails to all parties listed above regarding the availability of the Draft 2020 UWMP. ✓ April 19, 2021: Sent reminder notification email about availability of the Plan for public inspection.	• Copy of web posting • Example of 4/05/21 letter sent via email • Example of 04/19/2021 letter sent via email • Recipient list (same as recipient list listed earlier)
Water Code Section 10642	Prior to adoption, hold a public hearing.	✓ April 13, 2021: Held a public hearing during the meeting of the San Francisco Public Utilities Commission.	• Copy of Commission Meeting Agenda including public hearing
Water Code Section 10642	After the hearing, the plan shall be adopted as prepared or as modified after the meeting.	✓ June 11, 2021: Adopted the SFPUC 2020 UWMP during the meeting of the San Francisco Public Utilities Commission.	• Resolution to Adopt the 2020 UWMP
Water Code Section 10644(a)	Within 30 days of plan adoption, submit a copy to DWR.	✓ By July 1, 2021 (exact date to be determined): Will submit the adopted 2020 UWMP electronically via the WUEdata Online Submittal Tool.	• *On file with the SFPUC:* Copy of DWR submittal confirmation
Water Code Section 10644(a)	Within 30 days of plan adoption, submit a copy to the California State Library.	✓ By July 11, 2021 (exact date to be determined): Will mail an electronic copy of the adopted 2020 UWMP on compact disc to the California State Library.	• *On file with the SFPUC:* Copy of delivery confirmation to the California State Library
Water Code Section 10644(a)	Within 30 days of plan adoption, submit a copy to any city or county within which the supplier provides water.	✓ By July 11, 2021 (exact date to be determined): Will email the adopted 2020 UWMP to all wholesale customers of the SFPUC Regional Water System, and cities or counties within which the SFPUC provides water.	• *On file with the SFPUC:* Copy of notification email
Water Code Section 10645	Within 30 days of submittal to DWR, make the plan available for public review during normal business hours.	✓ By July 30, 2021 (exact date to be determined): Will provide two copies of the adopted 2020 UWMP to the San Francisco Main Library. ✓ By July 30, 2021 (exact date to be determined): Will post the adopted 2020 UWMP on the SFPUC website at www.sfpuc.org	• *On file with the SFPUC:* Copy of delivery confirmation to the San Francisco Public Library and copy of library catalog record • *On file with the SFPUC:* Copy of web posting

Urban Water Management Plan

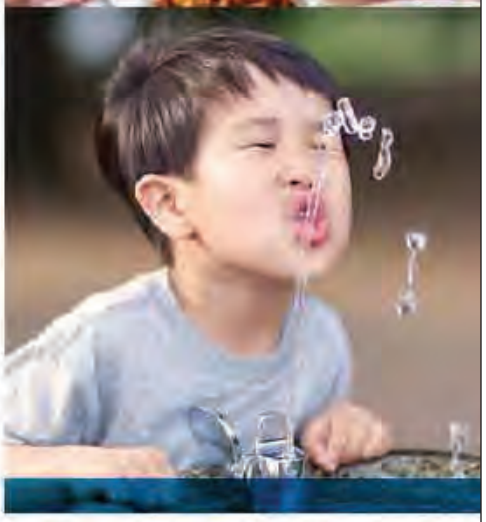
Dear Stakeholders,

The Urban Water Management Planning Act (Water Code Section 10610-10657) requires urban water supplier to **update its Urban Water Management Plan (UWMP)** and submit the completed plan to the California Department of Water Resources (DWR) every 5 years. The City and County of San Francisco is currently reviewing its UWMP and will be considering amendments or changes to the document. The 2020 update to the UWMP is due to DWR by July 1, 2021.

State law requires that urban water suppliers conduct a public hearing during the UWMP update process and that, at least 60 days prior to the public hearing, the City and County of San Francisco provide notice that it intends to update the UWMP to any city and county within which it provides water supplies. This letter serves as the required notification.

The UWMP will **provide an overview of our water deliveries and uses, water supply sources, and water conservation programs.** It will also include discussions on supply and demand projections over a 25-year planning horizon (from 2020 to 2045), available water supplies to meet existing and future demands under a range of water supply conditions, and our water demand management measures to reduce long-term water demand.

Proposed revisions to the UWMP will be available for public review and comment from April 5, 2021 to May 5, 2021. The Draft UWMP 2020 Update will be available on the SFPUC website and available for physical review and/or pick-up at a central location in downtown San Francisco. Additional information on how to access the UWMP will be provided in a later notification, prior to the start of the public review period.



Notice of Public Hearing

A public hearing will be held on April 13, 2021 at 1:30 pm at the meeting of the San Francisco Public Utilities Commission to allow interested members of the public to participate in the review process. All interested parties are invited to attend the public hearing and present their views. The hearing will be held virtually and can be accessed using the following information:

WATCH LIVE MEETING

Call-in number: 1 (415) 655-0001 / **MEETING ID:** 146 929 4145 # #

The final 2020 UWMP will be adopted by the Commission in June.

Submission of Comments

Any interested parties may also submit written comments to the City during the public comment period in one of three ways.

1. Written comments can be **e-mailed to Sarah Triolo,** striolo@sfwater.org.
2. Written comments can be **mailed to the address below.** To ensure that comments can be reviewed and incorporated, any mailed comments must be post-marked by **April 30th, 2021.**

   Steve Ritchie, San Francisco Public Utilities Commission
   525 Golden Gate Avenue, 13th Floor
   San Francisco, CA 94102

3. Written comments can be **deposited in the drop box** at 525 Golden Gate Avenue. Comments submitted via the drop box must be in an envelope with the following information clearly printed: "Urban Water Management Plan Comments, c/o Sarah Triolo".

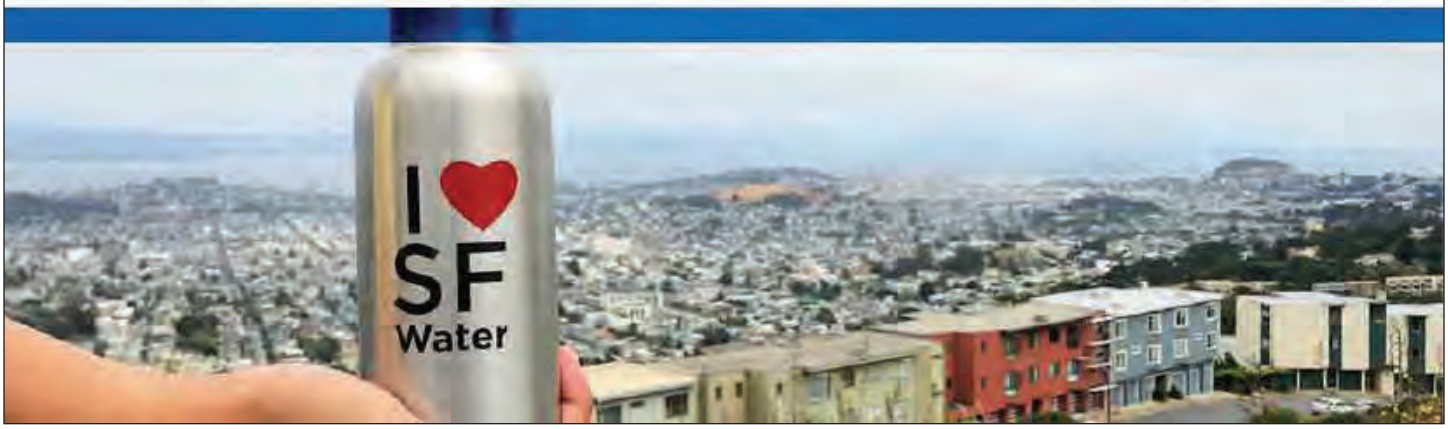
In the meantime, if you have any questions about our UWMP, or the process of updating it, please contact Sarah Triolo at striolo@sfwater.org.

Sincerely,

Paula Kehoe

Director of Water Resources

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

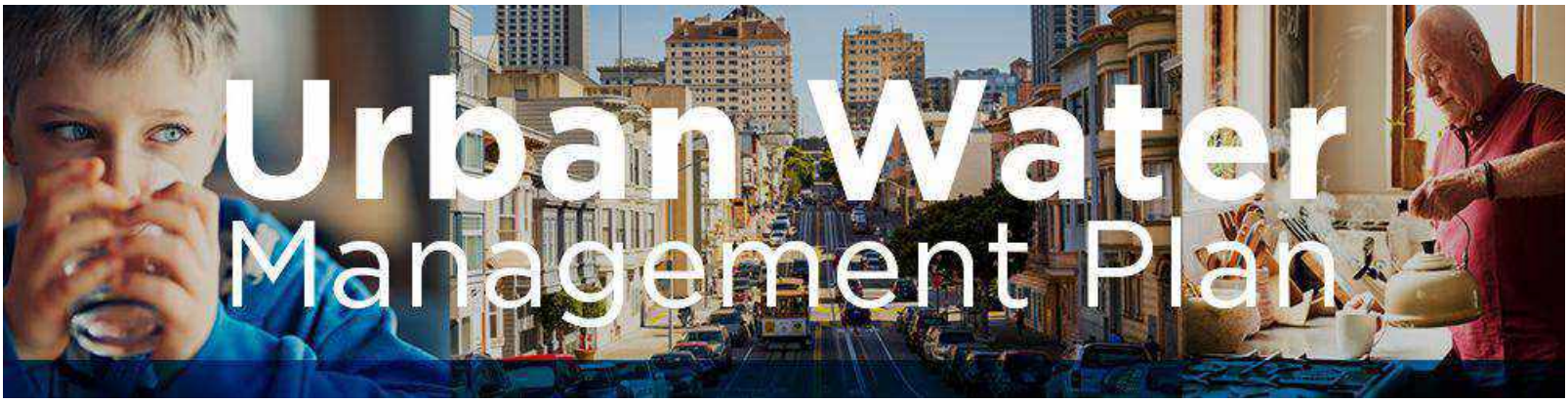


Letter sent on 03/12/2021 via email

Lauppe Rhodes, Betsy

From: Paula Kehoe <PKehoe@sfwater.org>
Sent: Friday, March 12, 2021 11:44 AM
To: Lauppe Rhodes, Betsy
Subject: [Test]:Reminder of Preparation of the City and County of San Francisco Urban Water Management Plan 2020 Update and Public Hearing

CAUTION: This email originated from **outside** of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.



Dear Stakeholders,

As previously noticed, the City and County of San Francisco is currently reviewing its Urban Water Management Plan (UWMP) and will be considering amendments or changes to the document. The 2020 update to the UWMP is due to the Department of Water Resources by July 1, 2021.

The UWMP will provide an overview of our water deliveries and uses, water supply sources, and water conservation programs. It will also include discussions on supply and demand projections over a 25-year planning horizon (from 2020 to 2045), available water supplies to meet existing and future demands under a range of water supply conditions, and our water demand management measures to reduce long-term water demand.

Proposed revisions to the UWMP will be available for public review and comment from April 5, 2021 to May 5, 2021. The Draft UWMP 2020 Update will be available on the SFPUC website at sfpuc.org/uwmp.

Notice of Public Hearing

A public hearing will be held on April 13, 2021 at 1:30 pm at the meeting of the San Francisco Public Utilities Commission to allow interested members of the public to participate in the review process. All interested parties are invited to attend the public hearing and present their views. The hearing will be held virtually and can be accessed using the following information:

WATCH LIVE MEETING

Call-in number: 1 (415) 655-0001 / **MEETING ID:** 146 929 4145 # #

The final 2020 UWMP will be adopted by the Commission in June.

Submission of Comments

Any interested parties may also submit written comments to the City during the public comment period in one of three ways.

1. Written comments can be **e-mailed to Sarah Triolo,** striolo@sfwater.org.
2. Written comments can be **mailed to the address below.** To ensure that comments can be reviewed and incorporated, any mailed comments must be post-marked by **April 30th, 2021.**

   Steve Ritchie, San Francisco Public Utilities Commission
   525 Golden Gate Avenue, 13th Floor
   San Francisco, CA 94102

3. Written comments can be **deposited in the drop box** at 525 Golden Gate Avenue. Comments submitted via the drop box must be in an envelope with the following information clearly printed: "Urban Water Management Plan Comments, c/o Sarah Triolo".

In the meantime, if you have any questions about our UWMP, or the process of updating it, please contact Sarah Triolo at striolo@sfwater.org.

Sincerely,

Paula Kehoe

Director of Water Resources

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

Contact list of stakeholders

Recipients of 2020 UWMP Update Notification
(Sent via e-mail on January 29, 2021, February 8, 2021 and March 12, 2021)

No.	Organization	Contact
1	City College of San Francisco	Robert Gabriner
2	Mayor - Senior Advisor on Environment	Tyrone Jue
3	Mayor's Office of Neighborhood Services	David Miree
4	Port of San Francisco	Brad Benson
5	Port of San Francisco	Monique Moyer
6	San Francisco Board of Supervisors	Aaron Peskin
7	San Francisco Board of Supervisors	Ahsha Safai
8	San Francisco Board of Supervisors	Catherine Stefani
9	San Francisco Board of Supervisors	Connie Chan
10	San Francisco Board of Supervisors	Dean Preston
11	San Francisco Board of Supervisors	Gordon Mar
12	San Francisco Board of Supervisors	Hillary Ronen
13	San Francisco Board of Supervisors	Rafael Mandelman
14	San Francisco Board of Supervisors	Matt Haney
15	San Francisco Board of Supervisors	Myrna Melgar
16	San Francisco Board of Supervisors	Shamann Walton
17	San Francisco Department of Building Inspection	Lily Madjus-Wu
18	San Francisco Department of Building Inspection	Patrick O'Riordan
19	San Francisco Department of Public Health	June Weintraub
20	San Francisco Department of Public Works	Alaric Degrafinried
21	San Francisco Department of Real Estate	Sachiko Tanikawa
22	San Francisco Department of the Environment	Debbie Raphael
23	San Francisco Fire Department	Janine Nicholson
24	San Francisco International Airport	Erin Cooke
25	San Francisco International Airport	Ivar C Satero
26	San Francisco International Airport	Jennifer Acton
27	San Francisco International Airport	Nupur Sinha
28	San Francisco Municipal Transportation Agency	Jeffrey Tumlin
29	San Francisco Office of Community Investment and Infrastructure	Jose Campos
30	San Francisco Office of Community Investment and Infrastructure	Salley Oerth
31	San Francisco Office of Small Business	Regina Dick-Endrizzi
32	San Francisco Office of the City Attorney	Dennis Herrera
33	San Francisco Planning Department	Chris Kern
34	San Francisco Planning Department	Rich Hillis
35	San Francisco Public Library	Michael Lambert
36	San Francisco Recreation and Park Department	Dennis Kern
37	San Francisco Recreation and Park Department	Phil Ginsburg
38	San Francisco Sheriff's Department	Paul Miyamoto
39	San Francisco Unified School District- Director of Sustainability	Nik Kaestner
40	San Francisco Unified School District- Water Conservation Mgr	Nate Kinsey

Recipients of 2020 UWMP Update Notification
(Sent via e-mail on January 29, 2021, February 8, 2021 and March 12, 2021)

41	Sunshine Ordinance Task Force	General
42	California Water Service Company	Dawn Smithson
43	California Water Service Company	Ken Jenkins
44	California Water Service Company	Ross Moilan
45	City of Brisbane	Jerry Flanagan
46	City of Brisbane/Guadalupe Valley Municipal Improvement District	Randy Breault
47	City of Burlingame	Art Morimoto
48	City of Burlingame	Tim McAuliffe
49	City of Daly City	Greg Krauss
50	City of Daly City	Ward Donnelly
51	City of East Palo Alto	Kamal Fallaha
52	City of East Palo Alto	Patrick Heisinger
53	City of Hayward	Alex Ameri
54	City of Hayward	Cheryl Munoz
55	City of Menlo Park	Christopher Lam
56	City of Menlo Park	Pam Lowe
57	City of Millbrae	Khee Lim
58	City of Millbrae	Shelley Reider
59	City of Milpitas	Tony Ndah
60	City of Mountain View	Elizabeth Flegel
61	City of Mountain View	Lisa Au
62	City of Palo Alto	Karla Dailey
63	City of Palo Alto	Lisa Bilir
64	City of Redwood City, Public Works Services Department	Justin Chapel
65	City of Redwood City, Public Works Services Department	Terrence Kyaw
66	City of San Bruno	Jimmy Tan
67	City of San Bruno	Mark Reinhardt
68	City of San Jose	Henry Louie
69	City of San Jose	Jeff Provenzano
70	City of Santa Clara	Gary Welling
71	City of Santa Clara	Shilpa Mehta
72	City of Sunnyvale	Mansour Nasser
73	City of Sunnyvale	Ramana Chinnakotla
74	Coastside County Water District	Cathleen Brennan
75	Coastside County Water District	Mary Rogren
76	Cordilleras Water District	Rick Thall
77	Estero Municipal Improvement District	Allen Smith
78	Estero Municipal Improvement District	Norm Dorais
79	Groveland Community Service	Peter Kampa
80	Mid-Peninsula Water District	Tammy Rudock
81	Mid-Peninsula Water District	Rene Ramirez

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82	North Coast County Water District	Adrianne Carr
83	Purissima Hills Water District	Phil Witt
84	Purissima Hills Water District	Sam Wu
85	Stanford University	Brian Manning
86	Stanford University	Julia Nussbaum
87	Town of Hillsborough	Paul Willis
88	Westborough Water District	Darryl Barrow
89	Town of Hillsborough	Ed Cooney
90	BAWSCA	Allison Schutte
91	BAWSCA	Christina Tang
92	BAWSCA	Danielle McPherson
93	BAWSCA	Kyle Ramey
94	BAWSCA	Enrique Lourdes
95	BAWSCA	Negin Ashoori
96	BAWSCA	Nicole Sandkulla
97	BAWSCA	Tom Francis
98	California State Assembly, AD12	Heath Flora
99	California State Coastal Conservancy	Moira McEnespy
100	California State Library Government Publications Section	Janet Coles
101	California State Seismic Safety Commission	Rick McCarthy
102	Department of Water Resources Office of Water Use Efficiency & Transfer	David Todd
103	San Francisco Housing Authority	Alicia Sisca
104	San Francisco Housing Authority	Barbara Smith
105	U.S. Environmental Protection Agency, Region 9	Eric Byous
106	U.S. EPA Region 9	David W. Smith
107	U.S. EPA Region 9	Tomas Torres
108	Contra Costa Water District	Steve Welch
109	East Bay Municipal Utility District	Clifford Chan
110	East Bay Municipal Utility District	Priyanka Jain
111	Marin Municipal Water District	Ben Horenstein
112	Santa Clara Valley Water District	Kristen Struve
113	Santa Clara Valley Water District	Rick Callender
114	Turlock Irrigation District	Tou Her
115	Zone 7 Water Agency	Amparo Flores
116	Zone 7 Water Agency	Elke Rank
117	Zone 7 Water Agency	Valerie Pryor
118	Alameda County	Susan S. Muranishi
119	County of San Mateo	Mike Callagy
120	County of Santa Clara	Jeffrey V. Smith
121	San Joaquin County	Matthew Paulin
122	Tuolumne County	Tracie Riggs

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(Sent via e-mail on January 29, 2021, February 8, 2021 and March 12, 2021)

123	Castlewood Country Club	John Vest
124	Golden Gate National Cemetery	Justin Blakeslee
125	Lawrence Livermore National Laboratory	Aaron W.Ward
126	Menlo Country Club	Kip Prahl
127	National Park Service GGNRA	Laura Joss
128	San Francisco State University	Caitlin Steele
129	San Francisco State University	Charles A. Meyer
130	San Francisco State University	General
131	San Francisco Zoo	Tanya Peterson
132	The Villas Parkmerced	General e-mail address
133	American True / True Youth	Daniel Leininger
134	Bay Area Council	Adrian Covert
135	Bayview Merchants Association	Al Norman
136	Building Owner and Management Association (BOMA)	Ken Cleaveland
137	Building Owner and Management Association (BOMA)	
138	California Native Plant Society - Yerba Buena Chapter	Eddie Bartley
139	California Sportfishing Protection Alliance	Chris Shutes
140	California Trout	Patrick Samuel
141	Coalition For San Francisco Neighborhoods	Joan Girardot
142	Coalition for San Francisco Neighborhoods	George Wooding
143	Coalition for San Francisco Neighborhoods	Nancy Wuerfel
144	Environmental Defense Fund	Ann Hayden
145	Environmental Defense Fund	Beth Trask
146	Golden Gate Audubon Society	Dan Murphy
147	Golden Gate Audubon Society	Pam Young
148	Golden Gate Heights Neighborhood Association	Frank Noto
149	Golden Gate Restaurant Association	Donnalyn Murphy
150	Golden Gate Restaurant Association	Laurie Thomas
151	Greater West Portal Neighborhood Association	Thomas Kanaley
152	Greater West Portal Neighborhood Association	Karen Tarantola
153	Greenway Belt- Visitacion Valley	Fran Martin
154	H2O Econ	Brian Browne
155	Hotel Council	Kevin Carroll
156	Joint Venture Silicon Valley	Kara Gross
157	Lakeshore Acres Improvement Club	Jim Stark
158	Natural Resources Defense Council	Ed Osann
159	North of the Panhandle Neighborhood Association	Julian Mackey
160	Oceanview, Merced Heights, Ingleside - Neighbors in Action (OMI-NIA)	Al Harris
161	Oceanview, Merced Heights, Ingleside - Neighbors in Action (OMI-NIA)	Mary Harris
162	Pacific Institute	Heather Cooley
163	Pacific Institute	Peter Gleick

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164	People of Parkside Sunset	Wesley Footracer
165	Planning and Conservation League	Jonas Minton
166	Planning Association for the Richmond (PAR)	Ray Holland
167	Planning Association for the Richmond (PAR)	Kate Lazarus
168	Plumbers Union Local 38	Larry Mazzola Jr.
169	Presidio Teachers Night	Lisa Hillstrom
170	Rebuild Together	Karen Nemsick
171	Restore Hetch Hetchy	Spreck Rosekrans
172	San Francisco Beautiful	Darcy Brown
173	San Francisco Chamber of Commerce	Emily Abraham
174	San Francisco Chamber of Commerce	Jay Cheng
175	San Francisco Chamber of Commerce	Rodney Fong
176	San Francisco Council of District Merchants	Maryo Mogannam
177	San Francisco Democratic County Central Committee	General e-mail address
178	San Francisco Neighborhood Parks Council- Exec Director	Meredith Thomas
179	San Francisco Parks Alliance	Drew Becher
180	San Francisco Parks Alliance	Kearstin Krehbiel
181	San Francisco Republican Central Committee	Christian Foster
182	San Francisco Republican County Central Committee	John Dennis
183	San Francisco Small Business Network	Art Swanson
184	San Francisco Tomorrow	Jennifer Clary
185	Save the Bay- Executive Director	David Lewis
186	SF Apartment Association	Janan New
187	SF Apartment Association	Maria Shea
188	SF Council of District Merchants - President	Henry Karnilowicz
189	SF Power	Steven Moss
190	SFPUC Citizens' Advisory Committee (CAC)	Amy Nagengast
191	SFPUC Citizens' Advisory Committee (CAC)	Amy Zock
192	SFPUC Citizens' Advisory Committee (CAC)	Anietie Ekanem
193	SFPUC Citizens' Advisory Committee (CAC)	Eliahu Perszyk
194	SFPUC Citizens' Advisory Committee (CAC)	Moises Garcia
195	SFPUC Citizens' Advisory Committee (CAC)	Jim McHugh
196	SFPUC Citizens' Advisory Committee (CAC)	Misty McKinney
197	SFPUC Citizens' Advisory Committee (CAC)	Mayara Ruski Augusto Sa
198	SFPUC Citizens' Advisory Committee (CAC)	Steven Kight
199	SFPUC Citizens' Advisory Committee (CAC)	Mark Tang
200	SFPUC Citizens' Advisory Committee (CAC)	Ted Lowenberg
201	Sierra Club San Francisco	Minda Berbeco
202	Silicon Valley Leadership Group	Mike Mielke
203	Southeast Community Facility	Emily Rogers-Pharr
204	SPUR	Laura Feinstein

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205	Sunset Beacon/Richmond Review	Paul Kozakiewicz
206	Sunset Heights Associaton of Responsible People	Dennis Minnick
207	Sunset Neighborhood Beacon Center	Matt Pemberton
208	Sunset Parkside Education and Action Committee (SPEAK)	Marc Duffett
209	Sunset-Parkside Education & Action Committee	Mary Anne Miller
210	Tuolumne River Trust	Eric Wesselman
211	Tuolumne River Trust	Peter Drekmeier
212	Tuolumne River Trust & California Sportfishing Protection Alliance	Cindy Charles
213	Twin Peaks Improvement Association	Doris Linnenbach
214	Urban Resource Systems	Isabel Wade
215	West of Twin Peaks Central Council	Dena Aslanian-Williams
216	West of Twin Peaks Central Council	George Wooding
217	Westsdie Observer	Doug Comstock
218	Westwood Park Association	Michael Ahrens
219	City College of San Francisco	Ted Aranas
220	Presidio Trust	Jean S Fraser
221	UCSF, Director Facilities Management	Maric S. Munn
222	University of San Francisco	Richard Hsu
223	Interested Stakeholders	Benny Bleiman
224	Interested Stakeholders	Bry Sarte
225	Interested Stakeholders	David Warner
226	Interested Stakeholders	Paul Collachi
227	Interested Stakeholders	William Martin
228	Interested Stakeholders	Ruth Gravanis
229	Interested Stakeholders	Dick Allen
230	Interested Stakeholders	Kathy Howard
231	Interested Stakeholders	Dick Morten
232	Interested Stakeholders	Steve Lawrence

Declaration of Publication - Notice of public hearing posted in San Francisco Chronicle on 03/29/2021 and 04/05/2021

DECLARATION OF PUBLICATION OF
SAN FRANCISCO CHRONICLE

San Francisco Water Power Sewer
services of the San Francisco Public Utilities Commission

NOTICE OF PUBLIC HEARING Tuesday, April 13, 2021 - 1:30pm at a Regular Meeting of the San Francisco Public Utilities Commission (SFPUC), the governing board of the publicly owned utility operations of the City and County of San Francisco: Notice is hereby given that the SFPUC will conduct a public hearing to consider the Draft 2020 Urban Water Management Plan (UWMP) for the City and County of San Francisco. The detailed agenda and related files will be available at least 72 hours before the scheduled meetings at the SFPUC website: www.sfwater.org or by calling (415) 554-3165. The hearing will be held virtually and can be accessed using the following information: Watch the meeting live: https://www.sfgovtv.org/sfpuc. Call-in number: 1 (415) 655-0001 / MEETING ID: 146 929 4145 # #

All interested parties are invited to attend the public hearing and present their views. Persons who are unable to attend the public hearing may also submit written comments regarding the subject of the hearing. These comments will be brought to the attention of the Commission and will become part of the official public record. Written comments can be delivered to SFPUC in one of three ways:

1) Emailed to Sarah Triolo, striolo@sfwater.org.
2) Mailed to the following address: Steve Ritchie, SFPUC, 525 Golden Gate Avenue, 13th Floor, SF, CA 94102.
3) Deposited in the drop box at 525 Golden Gate Avenue. Comments submitted via the drop box must be in an envelope with the following information clearly printed: "Urban Water Management Plan Comments, c/o Sarah Triolo".

The Draft 2020 UWMP can be viewed and printed from the SFPUC website at: https://sfpuc.org/uwmp.

DIANE FITZGIBBON

declares that:

The annexed advertisement has been regularly published in the

SAN FRANCISCO CHRONICLE

which is and was at all times herein mentioned established as newspaper of general circulation in the City and County of San Francisco, State of California, as that term is defined by Section 6000 of the Government Code.

SAN FRANCISCO CHRONICLE
(Name of Newspaper)

901 Mission Street
San Francisco, CA 94103

From 3/29/2021
To 4/5/2021
Namely, on 3/29, 4/5/2021

(Dates of Publication)

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 4/5/2021

at San Francisco, California.

Diane Fitzgibbon

DIANE FITZGIBBON

Currents Newsletter sent with March/April bill

A Newsletter of the San Francisco Public Utilities Commission

currents

MARCH/APRIL 2021

CHECK OUT OUR
NEW WEBSITE
FIND US AT SFPUC.ORG

It has been more than **10 years** since we have updated our website. So much has changed over the last decade and it was time for our website to get a full refresh! We've even updated our name! You can now find us at **SFPUC.org**!

Water is still at the very core of everything we do, but it is only a fraction of what we focus on as a City department of more than 2,300 employees across various bureaus and divisions.

Our new site puts user experience first. It's mobile and tablet friendly, and a lot easier to navigate.

Now you can easily find exactly what you are looking for. From Bill Pay to Construction Updates and Start/Stop Services, everything is easily accessible right from the homepage.

If you are a CleanPowerSF customer, you will now find them at **SFPUC.org/CleanPowerSF**.

SCAN THE QR CODE AND EXPLORE THE SFPUC.ORG NOW!

We Want to Hear From You

We are engaging in long-term water supply planning through our update to the Urban Water Management Plan. Public comment on the plan will be accepted between April 5 and May 5, 2021. We invite all interested parties to review and comment. Review the plan and learn about public meeting dates at **SFPUC.org/UWMP**.

"Climate change is one of the great challenges of our day, which is why we prioritize our commitment to sustainability. Whether it is exploring innovative water reuse programs like the Westside Water Recycling Project, providing renewable energy through CleanPowerSF or investing in a new Biosolids Digester facility, we are always guided by responsible environmental standards." - Michael Carlin, Acting General Manager

Combating Climate Change with Clean Energy

Hetch Hetchy Power – San Francisco's publicly owned utility — has been generating 100 percent greenhouse gas-free hydro-electric power for over a century and continues to evolve to meet today's growing clean energy needs. The utility currently manages over 23 publicly-owned solar arrays in San Francisco, and recently constructed and energized its first solar plus battery storage project, which will allow excess solar energy produced during the day to be stored in batteries and used at night. These ongoing local investments are reducing climate change causing greenhouse gas emissions and accelerating San Francisco's transition to a 100% renewable energy future. **SFPUC.org/hetchypower**

Safeguarding Our Vital Infrastructure

San Francisco's Ocean Beach shoreline is being washed away. The City's vital wastewater infrastructure, the Great Highway, and even community access are threatened by the increasing pace of coastal erosion. The Ocean Beach Climate Adaptation Plan is a joint effort between the SFPUC and City, state, and federal agencies as well as beach users and community members. Projects outlined in the Plan will help us adapt to climate-driven changes and protect critical infrastructure while supporting open space, recreation, and natural habitats citywide. Learn more about our various short and long term climate change adaptation efforts at **SFPUC.org/oceanbeach**.

Color Our Bay & Ocean

Keeping key pollutants, like trash, pesticides, and oil from going down our storm drains helps the marine ecosystem stay healthy and safe.

Sharpen your pencils and color away!

CHECK OUT OUR COLORED VERSION AT:
SFPUCNEWSROOM.COM/BY-THE-NUMBERS/PUZZLE/

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

San Francisco Public Utilities Commission
525 Golden Gate Avenue
San Francisco, CA 94102

SFPUC.org

Customer Services **415-551-3000**
TDD Hearing/Speech Impaired **415-551-3052**
Citywide Customer Service **311**

Urban Water Management Plan

The Urban Water Management Planning Act (Water Code Section 10610-10657) requires urban water suppliers to update their Urban Water Management Plan (UWMP) and submit the completed plan to the California Department of Water Resources (DWR) every 5 years. The City and County of San Francisco is currently reviewing its UWMP and will be considering amendments or changes to the document. The 2020 update to the UWMP is due to DWR by July 1, 2021.

The UWMP will provide an overview of our water deliveries and uses, water supply sources, and water conservation programs. It will also include discussions on supply and demand projections over a 25-year planning horizon (from 2020 to 2045), available water supplies to meet existing and future demands under a range of water supply conditions, and our water demand management measures to reduce long-term water demand.

Proposed revisions to the UWMP will be available for public review and comment from April 5, 2021 to May 5, 2021. The Draft UWMP 2020 Update will be available here. Additional information on how to access the UWMP will be provided here prior to the start of the public review period.

Notice of Public Hearing

A public hearing will be held on April 13, 2021 at 1:30 pm at the meeting of the San Francisco Public Utilities Commission to allow interested members of the public to participate in the review process. All interested parties are invited to attend the public hearing and present their views. The hearing will be held virtually and can be accessed using the following information:

Watch the meeting live: https://www.sfgovtv.org/sfpuc (https://www.sfgovtv.org/sfpuc).
Call-in number: 1 (415) 655-0001 / MEETING ID: 146 929 4145 # #

The final 2020 UWMP will be adopted by the Commission in June.

Additional Public Meetings

The SFPUC will also be presenting on the draft UWMP to the SFPUC Citizens Advisory Committee (CAC) on April 20, 2021 and to the CAC Water Subcommittee on April 27, 2021. See the agendas and log in information, which are available approximately 72 hours prior to each meeting at www.sfpuc.org/cac (https://sfpuc.org/about-us/boards-commissions-committees/citizens-advisory-committee).

Interested stakeholders are invited to attend these meetings; however, please note that these meetings are for informational purposes only. To make public comments, please attend the public hearing on April 13th or submit comments as described below.

Submission of Comments

Any interested parties may also submit written comments to the City during the public comment period in one of three ways.

1. Written comments can be e-mailed to Sarah Triolo, **striolo@sfwater.org (mailto:striolo@sfwater.org)**.
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   San Francisco, CA 94102
3. Written comments can be deposited in the drop box at 525 Golden Gate Avenue. *Comments submitted via the drop box must be in an envelope with the following information clearly printed: "Urban Water Management Plan Comments, c/o Sarah Triolo".*

In the meantime, if you have any questions about our UWMP, or the process of updating it, please contact Sarah Triolo at striolo@sfwater.org (mailto:striolo@sfwater.org).

Other Documents

- 2020 Retail Conservation Plan (Draft)

2015 Urban Water Management Plan Documents:

- 2015 Urban Water Management Plan for San Francisco
- 2015 Urban Water Management Plan for San Francisco Appendices
- 2015 Urban Water Management Plan for San Francisco Errata
- 2009 Water Supply Agreement (/sites/default/files/programs/local-water/WholesaleAgreement_JUL2009.PDF)

Notice of plan availability for public inspection and reminder notice of public hearing - 04/05/2021

Gmail

Lara Egbeola-Martial <lara@srtconsultants.com>

2020 Urban Water Management Plan for the City and County of San Francisco Now Available for Public Review

Paula Kehoe <PKehoe@sfwater.org> Mon, Apr 5, 2021 at 9:00 AM
Reply-To: Betsy Lauppe Rhodes <reply-febb10777d650c75-160_HTML-129025369-7290453-1@sfwateroutreach.org>
To: lara@srtconsultants.com

Dear Stakeholders,

As previously noticed, the City and County of San Francisco has prepared a draft 2020 Urban Water Management Plan (UWMP). The draft 2020 UWMP is now available for public review and comment through May 5th, 2021. The document can be found on our website at sfpuc.org/uwmp. See below for additional details on how to learn more and provide your comments on the document.

Notice of Public Hearing

A public hearing will be held on April 13, 2021 at 1:30 pm at the meeting of the San Francisco Public Utilities Commission to allow interested members of the public to participate in the review process. All interested parties are invited to attend the public hearing and provide formal comment on the draft. The hearing will be held virtually and can be accessed using the following information:

WATCH LIVE MEETING

Call-in number: 1 (415) 655-0001 / **MEETING ID:** 146 929 4145 # #

Additional Public Meetings

The SFPUC will also be presenting on the draft UWMP to the SFPUC Citizens Advisory Committee (CAC) on April 20, 2021 and to the CAC Water Subcommittee on April 27, 2021. See the agendas and log in information at sfpuc.org/cac.

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   San Francisco, CA 94102

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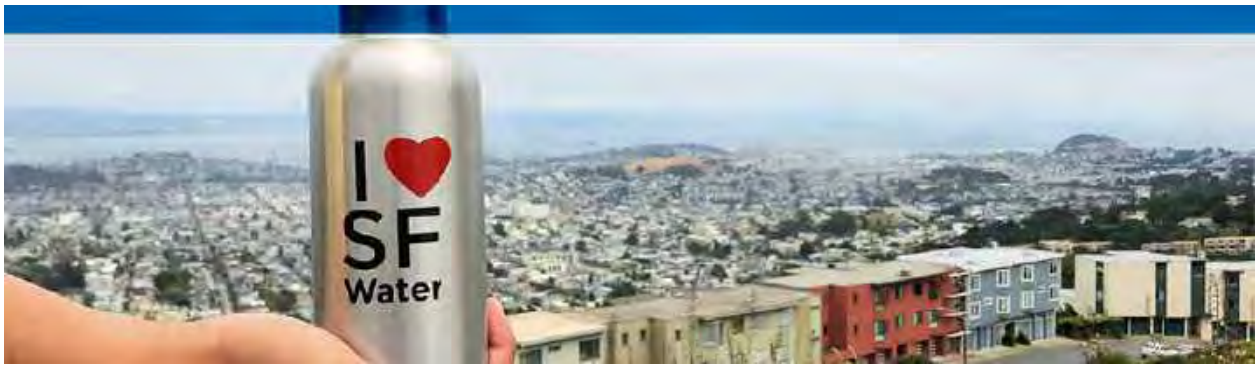
Sincerely,

Paula Kehoe

Director of Water Resources

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission



Facebook Twitter Instagram YouTube LinkedIn

This email was sent by: **San Francisco Public Utilities Commission**
525 Golden Gate Ave. San Francisco, CA, 94102, US

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Reminder notice of plan availability for public inspection - 04/19/2021

Gmail

Lara Egbeola-Martial <lara@srtconsultants.com>

Reminder: Draft 2020 Urban Water Management Plan for the City and County of San Francisco Now Available for Public Review

Paula Kehoe <PKehoe@sfwater.org> Mon, Apr 19, 2021 at 9:00 AM
Reply-To: Betsy Lauppe Rhodes <reply-febf107876650374-160_HTML-129025369-7290453-1@sfwateroutreach.org>
To: lara@srtconsultants.com

Dear Stakeholders,
As previously noticed, the City and County of San Francisco has prepared a draft 2020 Urban Water Management Plan (UWMP). The draft 2020 UWMP became available on April 5th, 2021 and remains available for public review and comment through May 5th, 2021. The document can be found on our website at **sfpuc.org/uwmp** . See below for additional details on how to learn more and provide your comments on the document

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information clearly printed: “Urban Water Management Plan Comments, c/o Sarah Triolo”.

Additional Public Meetings

The SFPUC will also be presenting on the draft UWMP to the SFPUC Citizens Advisory Committee (CAC) on April 20, 2021 and to the CAC Water Subcommittee on April 27, 2021. Agendas are generally made available on our website approximately 72 hours prior to the meeting date. See the agendas and log in information at **sfpuc.org/cac.**

Interested stakeholders are invited to attend these meetings; however, please note that these meetings are for informational purposes only. **To make public comments, please submit comments as described above.**

If you have any questions about our UWMP, or the process of updating it, please contact Sarah Triolo at **striolo@sfwater.org** .

Sincerely,

Paula Kehoe

Director of Water Resources

San Francisco Water Power Sewer

Services of the San Francisco Public Utilities Commission

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San Francisco Public Library Process due to COVID 19 pandemic

Urban Water Management Plan Update 2020

Note to file

March 31, 2021

Written by Betsy L. Rhodes

The San Francisco Public Library Government Section is the usual repository of hard copies of public documents that are under public review. This ensures that those without access to computers have access to the documents.

As of this writing, the San Francisco Public Library is closed until further notice due to the COVID 19 pandemic. Please find attached email from Library staff and SF Public Library public Website.

Therefore, SFPUC was not able to provide a hard copy document for public review at this writing.

Should members of the public request hard copies, SFPUC staff will respond on a case by case basis.

SAN FRANCISCO PUBLIC UTILITIES COMMISSION

City and County of San Francisco

London N. Breed
Mayor

REGULAR MEETING AGENDA
Tuesday, April 13, 2021
1:30 P.M.

This meeting is being held by Teleconference Pursuant to the Governor's Executive Order N-29-20 and the Twelfth Supplement to Mayoral Proclamation Declaring the Existence of a Local Emergency Dated February 25, 2020

WATCH LIVE:
https://www.sfgovtv.org/sfpuc

PUBLIC COMMENT CALL-IN:
1 (415) 655-0001 / MEETING ID: 146 758 0343 # #

During the Coronavirus Disease (COVID-19) emergency, the San Francisco Public Utilities Commission's (SFPUC) regular meeting room, City Hall, Room 400, is closed. Commissioners and SFPUC staff will convene Commission meetings remotely by teleconference.

Commissioners

Sophie Maxwell, President
Anson Moran, Vice President
Tim Paulson
Ed Harrington
Newsha Ajami

Michael Carlin
Acting General Manager

Donna Hood
Secretary

Accessible Meeting Policy: To obtain meeting materials in alternative format, please contact the Commission Secretary at 415-554-3165 or via email at Commission@sfwater.org. Providing at least 72 hours' notice will help to ensure availability. Written reports or background materials for calendar items are available on-line http://www.sfwater.org/index.aspx?page=167.

Know Your Rights Under the Sunshine Ordinance: Government's duty is to serve the public, reaching its decision in full view of the public. Commissions, boards, councils and other agencies of the City and County exist to conduct the people's business. This ordinance assures that deliberations are conducted before the people and that City operations are open to the people's review. For more information on your rights under the Sunshine Ordinance or to report a violation of the ordinance, contact Administrator, by mail to Sunshine Ordinance Task Force, 1 Dr. Carlton B. Goodlett Place, Room 244, San Francisco, CA 94102.4689; by phone at 554.7724; by fax at 554.7854; or by email at sotf@sfgov.org. Copies of the Sunshine Ordinance can be obtained from the Clerk of the Sunshine Task Force, the San Francisco Public Library and on the City's website at http://www.sfgov.org.

311 Free Language Assistance: 免費語言協助 / Ayuda gratuita con el idioma / Бесплатная помощь переводчиков / Trợ giúp Thông dịch Miễn phí / Assistance linguistique gratuite / 無料の言語支援 / 무료 언어 / 지원 / คว"มชว ่ ยเหลอ ื ท"งภ"ษ"โดยไม ่ ส'ยคาใชจ ้าย / Libreng tulong para sa wikang Tagalog ยเหลอ ื

Lobbyist Registration and Reporting Requirements: Individuals and entities that influence or attempt to influence local legislative or administrative action may be required by the San Francisco Lobbyist Ordinance [SF Campaign & Governmental Conduct Code §2.100] to register and report lobbying activity. For more information about the Lobbyist Ordinance, please contact the San Francisco Ethics Commission at 25 Van Ness Avenue, Suite 220, San Francisco, CA 94102; telephone (415) 252-3100; fax (415) 252-3112; web site at www.sfgov.org/ethics.

CEQA Appeal Rights under Chapter 31 of the San Francisco Administrative Code: If the Commission's action on a project constitutes the Approval Action for that project (as defined in S.F. Administrative Code Chapter 31, as amended, Board of Supervisors Ordinance Number 161-13), then the CEQA determination prepared in support of that Approval Action is thereafter subject to appeal within the time frame specified in S.F. Administrative Code Section 31.16. Typically, an appeal must be filed within 30 calendar days of the Approval Action for a project that has received an exemption or negative declaration pursuant to CEQA. For information on filing an appeal under Chapter 31, contact the Clerk of the Board of Supervisors at City Hall, 1 Dr. Carlton B. Goodlett Place, Room 244, San Francisco, CA 94102, or call (415) 554-5184. If the Planning Department's Environmental Review Officer has deemed a project to be exempt from further environmental review, an exemption determination has been prepared and can be obtained on-line at http://www.sf- planning.org/index.aspx?page=3447.Under CEQA, in a later court challenge, a litigant may be limited to raising only those issues previously raised at a hearing on the project or in written correspondence delivered to the Board of Supervisors, Planning Commission, Planning Department or San Francisco Public Utilities Commission at, or prior to, such hearing, or as part of the appeal hearing process on the CEQA decision.

ORDER OF BUSINESS

1. Call to Order

2. Roll Call

3. Approval of the Minutes:
   a) March 23, 2021 Regular Meeting
   b) March 23, 2021 Special Joint Meeting with the San Francisco Board of Supervisors
   c) March 26, 2021 Special Meeting

4. General Public Comment
   Members of the public may address the Commission on matters that are within the Commission's jurisdiction and are not on today's agenda

5. Communications (discussion only)
   a) Advance Calendar
   b) Contract Advertisement Report
   c) Correspondence Log
   d) Annual Electric Reliability Compliance Program Report
   e) Annual Power Risk Management Update
   f) Peninsula Watershed – Proposed Prescribed Burn Project Update
   g) SFPUC High-Efficiency Direct Toilet Install Map and Installation Totals
   h) Water Pipeline Assessment
   i) Water Supply Conditions Update

6. Report of the General Manager (discussion only)
   a) 2020 Retail Water Conservation Plan which provides a summary of planned conservation measures
   b) Wastewater Enterprise Racial Equity Plan
   c) Report on Recent San Francisco Public Utilities Commission Activities, Events and Announcements

7. New Commission Business (discussion only)

CONSENT CALENDAR

8. *All matters listed hereunder constitute a Consent Calendar are considered to be routine by the San Francisco Public Utilities Commission and will be acted upon by a single vote of the Commission. There will be no separate discussion of these items unless a member of the Commission or the public so requests, in which event the matter will be removed from the Calendar and considered as a separate item.*

   a) Approve an increase of 180 calendar days to the contract duration contingency for **Contract No. DB-129.1** Bay Corridor Transmission and Distribution Phase 2 (2019) North, with Mitchell Engineering; and authorize the General Manager to approve future modifications to the contract for a total contract duration of up to 615 consecutive calendar days (approximately one year and eight months), with no change to the contract amount. (How)

b) Approve an increase of 180 calendar days to the contract duration contingency for **Contract No. DB-129.2** Bay Corridor Transmission and Distribution Phase 2 (2019) South, with Anvil Builders, Inc.; and authorize the General Manager to approve future modifications to the contract for a total contract duration of up to 615 consecutive calendar days (approximately one year and eight months), with no change to contract amount. (How)

c) Approve an increase of 360 calendar days to the contract duration contingency for **Contract No. DB-130** Bay Corridor Transmission and Distribution Phase 3 (2019), with Beta Engineering California, LP.; and authorize the General Manager to approve future modifications to the contract for a total contract duration of up to 795 consecutive calendar days (approximately two years and three months), with no change to the contract amount. (How)

d) Approve the plans and specifications, and award **Contract No. HH-1003R** Moccasin Powerhouse Generator Step Up Transformer Installation, in the amount of $3,321,432, and with a duration of 716 consecutive calendar days (approximately two years), to the responsible bidder submitting the lowest responsive bid, Big Valley Electric, to make improvements to the two transformer bays and install two new City-furnished generator step-up transformers. This action constitutes the Approval Action for the project for the purposes of CEQA, pursuant to Section 31.04(h) of the San Francisco Administrative Code. (How)

e) Approve an increase of 273 calendar days to the contract duration contingency for **Contract No. WD-2729**, Fish Passage Facilities within the Alameda Creek Watershed, a sub-project of the Calaveras Dam Replacement Project; and authorize the General Manager to approve future modifications to the contract for a total duration of up to 1,991 consecutive calendar days (approximately five years and five months), with no change to the contract amount. (How)

REGULAR CALENDAR

9. Approve program rules for the **Customer Affordability and Arrearage Management Plan Pilot Program** and authorize the General Manager to implement the Pilot Program which will provide up to 150 low-income SFPUC residential water and wastewater customers residing in the 94112, 94124, and 94134 zip codes, who have accrued high levels of arrearages on their SFPUC accounts, with a combination of rate discounts and/or debt relief, with a not-to-exceed program budget of $110,000 from SFPUC funds. (Ordikhani/Sandler)

10. Adopt the **2021 Revised Baseline Scope, Schedule, and Budget for the Water Enterprise Capital Improvement Program**, consisting of 36 projects (25 Regional projects and 11 Local projects) within the adopted San Francisco Public Utilities Commission 10-Year Capital Plan for FY 2020-21 through FY 2029-30 that have budgets greater than $5 million and are currently active or intended to be initiated within FY 2020-21 or FY 2021-22. (How)

11. Presentation and discussion only of the **Draft 2020 Urban Water Management Plan**

(UWMP), including the Draft 2020 Water Shortage Contingency Plan, for the City and County of San Francisco pursuant to California Water Code Section 10642. The Commission will consider approval of a Final UWMP at the June 8, 2021 Commission meeting. (Ritchie)

12. Approve Amendment No. 2 to **Agreement No. PRO.0092**, Engineering Services for South Ocean Beach Coastal Erosion and Wastewater Protection, with Moffatt and Nichol-AGS Joint Venture to provide engineering design services for the Ocean Beach Climate Change Adaptation Long-term Improvements Project; and authorize the General Manager to execute this amendment, increasing the agreement amount by $2,000,000 and extending the agreement duration by four years, for a total not-to-exceed agreement amount of $5,750,000, and a total duration of nine years. (How)

13. Approve the selection of Kennedy/Jenks Consultants, Water Resources Engineering, Inc., AECOM Technical Services, Inc., and Hazen-LEE Joint Venture (JV); award **Agreement Nos. PRO.0172.A-D**, As-needed Engineering Design Services, to provide specialized engineering design services on an as-needed basis for SFPUC enterprises and bureaus; and authorize the General Manager to execute these four professional services agreements with Kennedy/Jenks Consultants (PRO.0172.A), Water Resources Engineering, Inc. (PRO.0172.B), AECOM Technical Services, Inc. (PRO.0172.C), and Hazen-LEE Joint Venture (PRO.0172.D), each in an amount not-to-exceed $4,500,000, and each with a term of five years. (How)

14. Approve the plans and specifications, and award **Contract No. WD-2825R**, Alameda Creek Recapture Project in the amount of $19,511,500 and with a duration of 547 consecutive calendar days (approximately one year and six months), to the responsible bidder submitting the lowest responsive bid, Anvil Builders, Inc. to install a barge and pump system, pipelines, valves and valve vault, and control building to recapture and transfer creek flows to the San Francisco Public Utilities Commission's Regional Water System. (How)

15. Approve the plans and specifications, and award **Contract No. WW-711**, Wawona Area Stormwater Improvement and Vicente Street Water Main Replacement Project, in the amount of $29,132,100 and with a duration of 987 consecutive calendar days (approximately two years and eight months), to the responsible bidder submitting the lowest responsive bid, KJ Woods Construction Inc., to construct a stormwater conveyance system in the Wawona area and replace the water mains on Vicente Street. This action constitutes the Approval Action for the project for the purposes of California Environmental Quality Act, pursuant to Section 31.04(h) of the San Francisco Administrative Code. (How)

16. Public comment on matters to be addressed during Closed Session.

17. Motion on whether to assert the attorney-client privilege regarding the matters listed below as Conference with Legal Counsel.

    The Commission will go into Closed Session to discuss the following items:

CLOSED SESSION

18. Conference with Legal Counsel – Pursuant to California Government Code, Section 54956.9(a), and San Francisco Administrative Code, Section 67.10(d)(1) (discussion only) (Mueller)

    Conferring with, or receiving advice from, the City Attorney regarding the following existing litigation in which the City is a petitioner and Pacific Gas & Electric Company is an adverse party: In re: PG&E Corporation and Pacific Gas & Electric Company, United States Bankruptcy Court, Northern District of California, Case No. 9-30088-DM, filed January 29, 2019; Federal Energy Regulatory Commission Case No. EL 19-38- 000, filed January 28, 2019; Federal Energy Regulatory Commission Case No. ER18- 1482-000, filed April 30, 2018; Federal Energy Regulatory Commission Case No. ER18-1102-000, filed March 15, 2018; Federal Energy Regulatory Commission Case No. ER18-790-000, filed, February 2, 2018; Federal Energy Regulatory Commission Case No. ER18-768-000, filed January 31, 2018; Federal Energy Regulatory Commission Case No. ER18-198-000, filed October 31, 2017; Federal Energy Regulatory Commission Case No. ER17-2406-000, filed August 31, 2017; Federal Energy Regulatory Commission Case No. ER17-2181-000, filed July 31, 2017; Federal Energy Regulatory Commission Case No. ER17-2204, filed July 31, 2017; Federal Energy Regulatory Commission Case No. ER17-1509-000, filed May 1, 2017; Federal Energy Regulatory Commission Case No. ER17-910-000, filed January 31, 2017; Federal Energy Regulatory Commission Case No. EL 15-3-000, filed October 10, 2014; Federal Energy Regulatory Commission Case No. ER15-702-000, filed December 23, 2014; Federal Energy Regulatory Commission Case No. ER15-703- 000, filed December 23, 2014; Federal Energy Regulatory Commission Case No. ER15-704-000, filed December 23, 2014; Federal Energy Regulatory Commission Case No. ER15-705-000, filed December 23, 2014; Federal Energy Regulatory Commission Case No. ER15-735-000, filed December 23, 2014; California Public Utilities Commission Case No. 1.15-08-019, filed February 25, 2015; California Public Utilities Commission Case No. R.18-10-007, filed October 25, 2018; California Public Utilities Commission Case No. R.19-01-006, filed January 10, 2019; and California Public Utilities Commission Case No. R.19-09-016, filed January 10, 2019.

19. Conference with Legal Counsel – Anticipated Litigation as Petitioner per California Government Code 54956.9(d)(4) and San Francisco Administrative Code Section 67.10(d)(2) (discussion only) (Whipps)

20. Conference with Legal Counsel – Pursuant to California Government Code Section 54965.9 (d)(1) and San Francisco Administrative Code Section 67.10 (d)(1) (discussion only) (Whipps)

    Existing Litigation
    San Joaquin Tributaries Authority, et al v. California State Water Resources Control Board
    Tuolumne Superior Court Case No. CV62094/Date Filed: January 10, 2019
    Coordinated as State Water Board Cases by order filed May 13, 2019 in Sacramento Superior Court, JCCP No. 5013

Following Closed Session, the Commission will reconvene in Open Session.

21. Announcement following Closed Session.

22. Motion regarding whether to disclose the discussions during Closed Session pursuant to San Francisco Administrative Code Section 67.12(a).

Adjournment.

SFPUC UWMP Public Comments

Name	Affiliation	Questions/Comments	Response
SFPUC 2020 UWMP Update - Comments Submitted at Public Hearing, April 13, 2021			
Tom Francis	Water Resources Manager at BAWSCA	Commenter acknowledged that both SFPUC and BAWSCA member agencies have low projected per capita usage but high projected population growth. Commenter expressed concern about the shortfalls created by the implementation of the Bay-Delta Plan, which may cause per capita water use for residents served by BAWSCA agencies to drop below 30 gpcd, which is below health and safety guidelines. Commenter asked that the Commission continue to fight the implementation of the Bay-Delta Plan and continue to move the Alternative Water Supply Program forward.	Comment noted.
Danielle Mcpherson	Senior Water Resources Specialist at BAWSCA	Commenter expressed appreciation for SFPUC staff for their high level of engagement and efforts on the development of the UWMP and the coordination with BAWSCA.	Comment noted.
John Stiefel	WASH Consultant and member of the SF Coalition on Homelessness Human Rights Working Group	Commenter expressed concern that the plan does not take into account the water demands of unhoused San Franciscans, and expressed concern about this population lacking access to water. Additional information is provided in response to the written comments on this topic.	Additional information is provided in response to the written comments on this topic.
Gary Welling	Director of Water and Sewer at the City of Santa Clara	Commenter expressed concern about the impacts resulting from the adoption of the Bay-Delta Plan and the scenarios presented in the UWMP, given that the information must be used for long-term planning including a major arena and housing requirements. Commenter asked the Commission to re-affirm its commitment to meet obligations to the Wholesale Customers and to take actions necessary, including the development of alternative water supply. Commenter also requested that the Commission make Santa Clara a permanent customer.	Comment noted.
Nicole Sandkulla	BAWSCA CEO	Commenter noted that the water supply scenarios with the Bay-Delta Plan involve significant impact to the wholesale water supplies, which would lead to a slow down in the economy, hinder job growth, and impact the health, safety, and economic risk for people and businesses. Commenter noted that BAWSCA supports the objectives of the Bay-Delta Plan and agrees that actions need to be taken to protect the fish and environment of the Tuolumne River. Commenter noted that the Tuolumne River Voluntary Agreement (TRVA) is a science-based alternative, and urged the SFPUC to continue its effort to secure the evaluation of the TRVA by the State Board. Commenter urged the SFPUC to identify additional water supply to meet its legal and contractual water supply reliability obligations to BAWSCA agencies.	Comment noted.
Francisco da Costa		Commenter noted that the SFPUC is supplying water to entities not prioritized in the Raker Act, and that the reservoir and its water belong to the First people. Commenter noted that the Commission is concerned about the degree to which conservation is impacting revenue.	Comment noted.
Peter Drekmeier	Tuolumne River Trust	Commenter asserted that the UWMP is a lobbying tool against the Bay-Delta Plan, showing 53% rationing in a single dry year. Commenter expressed disappointment that staff is trying to turn people against the Bay-Delta Plan. Commenter noted the possibility of shortening the design drought, adding alternative water supplies and getting more realistic about water demands. Commenter noted that the issues may not be able to be covered before the submission of the plan. Commenter noted that the SFPUC uses 5 years from the 8-year design drought, and that in their opinion SFPUC could get through a 5-year drought with no rationing with the Bay-Delta Plan.	The UWMP is prepared every five years and represents a snapshot of the SFPUC's long-term planning. The SFPUC is not precluded from making changes to policy between UWMPs; if the Commission adopts new policies that impact the water supply reliability assessment, new materials could be prepared to support Water Supply Assessments and other documents that rely on the UWMP.
Larry A.	Homeowner and volunteer with the Human Rights Working group of the SF Coalition on Homelessness	Commenter expressed concern about the unhoused population of San Francisco and their access to water. Commenter expressed a desire for the demand of the homeless population to be accounted for in the UWMP.	Additional information is provided in response to the written comments sent on this topic.

Batool Zaro	City of East Palo Alto	Commenter noted that the City of East Palo Alto (City) is almost 100% reliant on SFPUC's Regional Water Sustem supply fore their potable water supply. Commenter noted the City's low per capita water usage of 60 gpcd, and that 70% of the City's demand is residential, and 90% of residential demand is used to meet basic health and safety needs. Commenter noted that the City's contract with the SFPUC includes a Level of Service goal of no more than 20% cutback; in order to reach the projected cutbacks of up to 54%, the City's per capita usage would ahve to reach a dangerous level of 36 gpcd. Commenter noted that the City would have to consider harmful policies because of insufficient supply. Commenter noted that the City feels strongly that the SFPUC should do everything they can to ensure that its wholesale customers and residents have reliable water supply.	Comment noted. The SFPUC will be communicating with our Wholesale Customers collectively on this topic.
David Pilpel		- Does the plan incorporate the BAWSCA analysis that Nicole Sandkulla went through at the last workshop? - How do the UWMP population projections align with the estimates from the city's Planning Department and Plan bay Area? - Is there any additional public engagement planned prior to the Commission in June? Another meeting before the next commission meeting would be helpful. For the UWMP 15 to 20 years ago, there was an in-person meeting, where I met Steve Ritchie for the first time. Could there be a virtual meeting to discuss the UWMP with the public?	The Plan's supply reliability assessment is based on the wholesale customers' projected demands on the Regional Water System, after their local supplies have already been accounted for. The population projections presented in the Plan were provided by the Planning Department. Several notices were sent to stakeholders about the public hearing at the Commission meeting, as well as about SFPUC presentations made at its Citizens Advisory Committee meetings on April 20th and April 27th; this information was also on the SFPUC website.
SFPUC 2020 UWMP Update - Comments Submitted at SFPUC CAC, April 20, 2021			
Anietie Ekanem	SFPUC CAC	Clarification about the distinction between the residential water use, at the wholesale vs. municipal level?	The UWMP addresses residential, irrigation, commercial and instruction so in case of rationing, SFPUC would require rationing across all water usages. For the wholesale customers, the WSA defines how water would be allocated to the wholesale customers and the UWMP analysis does not change any of that.
Anietie Ekanem	SFPUC CAC	Will enforcement of rationing be the same in all districts?	Enforcement of mandatory rationing would be the same for all customers regardless of location in the City.
Eliahu Perszyk	SFPUC CAC	The energy intensity is a new requirement and the energy intensity value calculated is negative. Can you explain why that is?	In this calculation, we can account for the energy generated as part of the water supply, which in this case is hydropower produced by the RWS. Since the RWS is mostly gravity-fed, energy use is mainly for water treatment; our net energy balance is negative, as we are producing more energy than we use.
Jennifer Clary	SFPUC CAC	Largest water users are multi family residential and are the largest anticipated growth in water use. Is the per capita for multi family calculated separated from single family? I am surprised to see that the per capita water use is expected to plateau, if the number of multi family dwellings units will increase and their per capita water use is lower.	The current estimate for average single-family per capita use is about 50 gpcd, and for multi-family is about 36 gpcd. The single-family per capita usage is projected to decrease over the course of the planning horizon, while the multi-family is projected to increase slightly. One potential reason for this is that our estimates of active conservation savings are highest in the next 5-10 years before existing programs expire; there will likely be additional future savings past that as we implement new programs, but those savings are not yet estimated.
Anietie Ekanem	SFPUC CAC	How do you go about estimating water use and savings separately for multi family units? In multi family buildings, it is hard to change behaviors directly, because units don't get individual bills, so they don’t necessarily see directly the monetary consequences meant to deter people from maintaining high water usage.	Our work with conservation savings in multi-family buildings has shown that significant savings can be achieved at the property level; most of the savings come from activities such as maintaining plumbing fixtures, appliances, irrigation; fixing leaks; and replacing old fixtures and equipment.
Emily Agire	SFPUC CAC	You mentioned that rationing programs would be enforced first in the irrigation sector, then residential, then commercial sector. How was this order chosen, and what does an irrigation sector look like in San Francisco?	Irrigation accounts include customers such as large golf courses, HOAs with shared irrigation areas, and parks. The rationale behind asking irrigation customers to conserve first is to cut outdoor irrigation before asking residents to cut indoor water use, while trying to reduce impacts on businesses and economic growth. To maintain green space in the City, irrigation customers would not be asked to completely eliminate their water use. During a declared water shortage, SFPUC would be working with all large water users to help them reduce their water use.

Jennifer Clary	SFPUC CAC	Can you explain water loss - what it entails, how it is measured and why your report estimated no reduction in water loss, despite new state requirements to address this area of water waste. In addition, why is the 2020 value 7.2 mgd and the projections 6 mgd?	Water loss includes both real losses, i.e. physical losses through leaks, and apparent losses, i.e. errors in the metering equipment. SFPUC has an asset management program, as described in Section 10 of the UWMP, and is committed to reducing real and apparent losses. In addition, the 2020 water loss value includes both real and appaent losses; the projected values include real losses only, as we have no way to project apparent losses.
Jennifer Clary	SFPUC CAC	Does water loss include water used for fire fighting?	No; that would be categorized as a municipal water use.
Suki Kott	SFPUC CAC	What happens with population growth in cities like ours - is there ever a concern that the infrastructure won't support the population beyond a certain point? Does it ever get to a point that the water supply won't be able to support population over a certain number of people?	The goal of the UWMP is to describe SFPUC's strategy for long-term water supply planning to meet current and future water demands. This information is used in Water Supply Assessments for large development projects as part of their environmental review process, to evaluate whether there is sufficient water supply to meet future demands.
Amy Nagengast	SFPUC CAC	I am hoping you could frame the "purposes of the UWMP" in terms of how this UWMP impacts the consumer instead of the agency's use? How do I as a consumer relate that to my daily life?	The UWMP is prepared according to specific requirements laid out in the Water Code. It is intended as a high-level planning document; it serves as a roadmap for future planning and decision-making, but does not commit us to any specific project(s). The document can help consumers understand how we are thinking about planning and water supply reliability. It is an opportunity for the public to comment on our approach for rationing, conservation, and other elements of our planning.
SFPUC 2020 UWMP Update - Comments Submitted at SFPUC Water CAC, April 27, 2021			
Eliahu Perszyk	SFPUC CAC	What will happen if the Bay Delta Plan gets implemented? Are there other water supply projects that can be implemented? It seems there is a significant risk that if the Bay Delta Plan gets implemented and there is no additional water supply, SFPUC will get hit by the water surcharge, and will in turn increase water bills for consumers.	The goal is to plan so that we can avoid this situation. SFPUC is exploring all potential opportunities for alternative water supply projects.
Jennifer Clary	SFPUC CAC	The solution seems to be increasing water supply. How realistic is that? What happens on year 8 of a 10-year drought. We have to stop taking water away from nature. The Bay Delta Plan seems pretty reasonable to me right now. We are looking at all those options to get additional water supply, but shouldn't we focus on using the water we have as much as we can, i.e. focusing on direct potable reuse to have any kind of security. I regard the reservoir projects as less reliable than other projects that make the best use of the water we already have.	SFPUC is working on maximizing reuse, which includes direct potable reuse. The alternative water supply project with ACWD, the Crystal Springs project and some of the other options explored for reuse in the city all look at direct potable reuse as a potential alternative. One impediment is that the regulations are for direct potable reuse are not finalized; they are expected to come out in 2023.
Jennifer Clary	SFPUC CAC	Looking at the graphs and data developed by the Pacific institute, it looks like SFPUC is closer than any other agency at estimating water demands. SFPUC is still overestimating water demands, but not as much as other agencies. You want to be conservative in forecasting water demands, but you don't want to overestimate them and put pressure on the planned water supplies. Cost is a big piece of it, and how we charge water. We don't want to be in a position where we have to pay a drought surcharge, even though the Commission has already stated that they would authorize it.	Comment noted. See response to similar comments about demand projections for additional information.
SFPUC 2020 UWMP Update - Comments Submitted via Email between 04/05/2021 and 05/05/2021			
Dick Morten		It would be helpful for the table of content to have an electronic link to each section and Appendix of the plan.	Electronic links to each chapter and the appendices were added in the final PDF version of the document.
Steven Lawrence		The notes of Table 8-3 contain 2 broken section references "Error! Reference source not found" that need to be updated with the correct referenced section numbers.	These errors have been corrected.
Dick Allen	District 7	I strongly encourage the SFPUC staff and Commissioners to add an additional Section 12 to the UWMP, which could be entitled "Tuolumne River Environment". The SFPUC needs to make science-based decisions that comply with (a) the State of California Endangered Species Act, (b) the Federal Endangered Species Act, (c) Public Trust Doctrine, to be authorized to limit water diversions from the Tuolumne River during any year.	This is beyond the scope of the UWMP. The UWMP is structured to meet the requirements in the California Water Code. The SFPUC is engaged in several regulatory processes regarding the Tuolumne River and Bay-Delta environment, including the State Board's Bay-Delta Plan and the FERC relicensing of Don Pedro Dam. These processes have not yet reached conclusions.

Dick Allen	District 7	Will the SF City Attorney issue a legal ruling that the SFPUC UWMP complies with (a) the State of California Endangered Species Act, (b) the Federal Endangered Species Act, (c) Public Trust Doctrine, (d) The 9th Circuit Court of Appeals?	No. The California Water Code is the law that sets forth the requirements for UWMPs~~,~~. The Water Code does not contain a requirement for such a "ruling," nor does the City Attorney's Office issue "rulings." The UWMP is a planning document. The SFPUC consults with the City Attorney's Office as needed regarding compliance with federal and state laws. From time to time, the City Attorney's Office issues public legal opinions on specific matters. We do not see a basis to request that the City Attorney issue a public opinion regarding whether the UWMP complies with the four provisions that you cite in your letter. We also do not agree with your statement that the Mayor issued "conflicting environmental orders" to the SFPUC in 2018 or that she suggested Commissioners "be required to compromise or ignore" the federal or state laws cited in your letter. Of course, you are free to contact the Mayor's Office directly regarding her comments.
Dick Allen	District 7	If the City Attorney refuses to issue a legal ruling that the SFPUC UWMP is in compliance with (a)(b)(c)(d), (1) can the 5-year UWMP be trusted? (2) Should the UWMP be implemented by the SFPUC absent a City Attorney legal ruling that it supports (a)(b)(c)(d)? (3) Would the absence of a legal ruling by the City Attorney that the UWMP is in compliance with (a)(b)(c)(d) invite lawsuits against San Francisco? I would encourage the Commissioners to schedule a public hearing to allow the City Attorney to provide them with legal opinions to resolve the Mayor's November 2018 conflicting environmental orders to the SFPUC.	See response above.
Peter Drekmeier (Tuolumne River Trust), Eric Wesselman (Friends of the River), Heinrich Albert (Sierra Club SF), Chris Shutes (California Sportfishing Proection Alliance), Carol Steinfeld (Sierra Club Loma Prieta), Cindy Charles (Golden West Women Flyfishers), Kristina Pappas (SF League of Conservation Voters), Allison Boucher (Tuolumne River Conservancy), Jeff Miller (Alameda Creek Alliance), Mark Rockwell (Fly Fishers International, Northern California Council), Mike Conroy (Pacific Coast Federation of Fishermen's Associations, Institute for Fisheries Resources), Larry Collins (SF Community Fishing Association, SF Crab Board Owners Association), Dick Allen (Lake Merced Task Force), John Buckley (Central Sierra Environmental Resource Center), Lauren Wetson (Acterra: Action for a Healthy Planet), Stuart Gross (SF Herring Association), Greg Reis (The Bay Institute), Konrad Fisher (Water Climate Trust), Laura Allen (Greywater Action), Bill Uyeki (Peninsula Fly Fishers), Elizabeth Dougherty (Wholly H2O)	The following actions are immediately requested from the SFPUC Commissioners: - Direct staff to produce an appendix that analyzes the impact of reducing the Design Drought to 7.5 years.	The UWMP reflects the use of the 8.5-year design drought, which is what SFPUC currently uses for water supply planning purposes and has been adopted through the Water System Improvement Program. If the Commission adopts a different policy, the SFPUC will produce an updated supply reliability analysis which will then be used in Water Supply Assessments. This information would be clearly communicated and transmitted to the Wholesale Customers for their use as well.
	- Commit to developing alternative water supplies and incorporate approximate yield into the UWMP water supply projections (with a focus on recycled water).	The UWMP describes extensively the alternative water supply (AWS) projects that are currently in the planning stages in Section 7. Given the early stages of these projects, SFPUC has determined it would not be prudent to include the estimated yield of these projects in its supply modeling for the purposes of the supply and demand analysis presented in Section 8. However, that does not mean that SFPUC is not making significant investments in moving these projects forward. Feasibility studies are still underway and AWS projects have not yet been modeled alongside the RWS operations and assumptions. Staff also continue to identify and explore additional opportunities including local, regional and upcountry projects. The SFPUC has committed to developing an Alternative Water Supply Plan by 2023, which will contain additional information about these projects, their anticipated yields, and next steps. As planning analyses continue between now and June 2023, SFPUC staff will regularly update water supply benefit estimates on a project-by-project basis and share them periodically through the Alternative Water Supply Program Quarterly Report.

		- Commission a peer review of San Francisco's and BAWSCA's population and demand projections, which would explain how past over-projections have been corrected, explain why the UWMP population forecasts are so much higher than the California Dept. of Finance projections, and explain why the UWMP demand projections are higher than the SFPUC's financial department's forecasts.	Basis for UWMP Demand Projections: As required by Water Code section 10631(a), SFPUC coordinates with the San Francisco Planning Department to obtain information about housing and population growth projections for the City. As described in Section 3.2.2 of the Plan, SFPUC develops its demand projections based on projections of household water use, not per capita water use. The Planning Department is currently updating the city's General Plan Housing Element (Housing Element 2022 Update). The housing element update is required to be adopted by the city and submitted to the state Department of Housing and Community Development by January 2023. One of the primary goals of the Housing Element 2022 Update is to improve housing affordability by increasing the rate of housing production compared with the past several decades. The housing projections are based on the Housing Element 2022 Update objective of producing an average of 5,000 housing units per year with adjustments for certain large development plans. The population projections presented in the plan correspond to the housing growth scenario described above from the Housing Element 2022 Update. Additional description about the basis for the demand projections was added to Section 4 for clarity. Regarding the projected population and demand growth for the Wholesale Customers, that information is provided to the SFPUC by BAWSCA in their Regional Water Demands and Conservation Projections Report. This is consistent with Water Code section 10631(h), which directs water suppliers that rely on wholesale agencies to provide the wholesale agency (in this case the SFPUC) with water use projections for that source of water.Differences between UWMP and Finance projections: SFPUC's 10-Year Financial Plan contains projections for water sales, whereas the UWMP contains projections for total water demand. The UWMP projections include water loss, which accounts for 6 mgd; this figure is not included in the Finance projections because it is not part of water sales. Comparing the retail demands from these two sources without water loss, there is a less than 10% difference between the UWMP and Financial Plan projections. This difference is appropriate given the different goals of the two sets of projections; for the Water Enterprise, demand projections are relied upon for future water supply needs. The goal of the Financial Plan is to ensure sufficient revenue for continued operation. Because all demand projections are an estimate, it is not possible to achieve 100% accurate projections. Different assumptions and approaches are warranted for different divisions based on planning priorities.
Peter Drekmeier	Tuolumne River Trust	The population projections included in the UWMP are much higher than the population growth trends in recent years and we recommend using the projections developed by the California Dept. of Finance, for both retail and wholesale service areas, instead of the Plan Bay Area numbers.	See response above to similar comment.
Peter Drekmeier	Tuolumne River Trust	Demand projections in the UWMP are highly inflated, which has been shown by the comparison of previous projections vs. actual demand (2018 RWS projected demand was 285 mgd, while actual demand in 2018 was 196 mgd). The main reason water demand has been decreasing is the rising water rates, and the water demands included in the 10-year Financial Plan are 8% lower than the UWMP water demand projections. SFPUC predictions forecast that water rates are going to increase by 65% by 2036 and that the combined water/wastewater rates will increase by 91%, whereas the UWMP includes an increase of 50% by 2045. Has the SFPUC's financial department reviewed Appendix E, and do they agree that the increase in water rates will be only 50% over the next 25 years? We recommend that the SFPUC create a group of stakeholders to meet with the Brattle Group to go over Appendix E before submission of the Plan.	SFPUC's Finance Division provided the information about projected rate increases that was used for the demand projections. See response above for similar comment about differences between UWMP and Finance projections
Peter Drekmeier	Tuolumne River Trust	The Design Drought appears arbitrary and the UWMP doesn't explain how the Design Drought scenario was developed. We encourage SFPUC staff to include an appendix that analyzes a 7.5-year design drought scenario.	The design drought is a tool used by the SFPUC for water supply planning. See response to above similar comment about the inclusion of an additional appendix.

Peter Drekmeier	Tuolumne River Trust	Section 6.1.3 about climate change impacts focuses on the negative potential impacts. This section should include a discussion about the potential benefits of climate change to water supply from earlier runoff.	Climate change is being covered in our Long Term Vulnerability Assessment. As stated in the UWMP, this study has not been completed yet.
Peter Drekmeier	Tuolumne River Trust	The development of alternative water supplies has been lagging. 30 years after ordinances 390/391-91 were adopted, SFPUC is using 0.1 mgd of recycled water (while the Hetch Hetchy System was built over 20 years). The SFPUC has identified 35 mgd of alternative water supplies and it would be worthy to determine if some of these projects could be factored into the UWMP's future water supply.	See response above to similar comment.
Peter Drekmeier	Tuolumne River Trust	The UWMP should include a table similar to Table 8-3, which excludes the interruptible customers, to see how the decision regarding San Jose and Santa Clara might impact San Francisco's interests.	The SFPUC is in the process of determining whether to make the Cities of San Jose and Santa Clara permanent customers. The UWMP is not the vehicle that the SFPUC will use to present the analysis of this decision-making process.
Doug Obegi & Jon Rosenfield	NRDC & San Francisco Baykeeper	The draft UWMP significantly overestimates water demand, which is directly correlated to an overestimation of the retail and wholesale population projections. The UWMP plans for a 39% population increase in the City from 2020 to 2045, which is 3 X higher than the California Dept. of Finance projections, and is not in accordance with the population growth trends of the last 10 years. The wholesale population projections also don't match the trends of Dept. of Finance population growth for the utilities' respective counties. The NRDC strongly encourages the Commission to review the UWMP to incorporate current estimates of population growth and the resulting lower estimates of total water demand	See response above to similar comment in how our demand projections are developed.
Doug Obegi & Jon Rosenfield	NRDC & San Francisco Baykeeper	The draft UWMP significantly overestimates demand (by approximately 20-25%) compared to the Commission's financial planning projections in the 10-Year Financial Plan adopted in February 2021. The Commission's 10-year Financial Plan forecasts declining retail and wholesale water sales over the coming decade, based on the observed historical trend.	Please note that this comment incorrectly characterizes the projected demand from the UWMP; the plan projects a retail demand of 72.4 mgd in 2030 (the demand shown in the comment letter is 80.6 mgd, which is the 2045 projected demand). The 10-Year Financial Plan projects total sales of 60.5 mgd in 2030. Half of the difference in these two projections is from the fact that the UWMP demands include 6 mgd of water loss, which is not included in the financial plan sales projections. Comparing the retail demands without water loss, there is a less than 10% difference between the UWMP and Financial Plan projections. See additional information in response above to similar comment.
Doug Obegi & Jon Rosenfield	NRDC & San Francisco Baykeeper	The draft UWMP fails to demonstrate that there is a surplus of water available for new development, and should review the assumptions to determine the available supply under the Bay Delta Plan scenario, including (1) the overestimated population growth and water demands in the retail and wholesale service areas, (2) the 8.5-year design drought, which is significantly longer than is required by State law for UWMP, (a shorter design drought could result in less frequent and severe shortages), (3) the assumed allocation of responsibility from meeting reduced diversions from the Tuolumne River borne by the Commission vs. the other water rights holders.	(1) See response above to similar comment; (2) See response above to similar comment; (3) Allocations of responsibility for meeting Tuolumne River instream flow requirements are assumed to be in accordance with the Fourth Agreement.
Doug Obegi & Jon Rosenfield	NRDC & San Francisco Baykeeper	Despite identifying significant water shortages for retail and wholesale customers, the draft UWMP includes minimal investments in local and regional water supply projects in retail service area and diversify supply sources (with 91% of supply still coming from the Tuolumne River in 2045), and does not include analysis of local water supplies in the wholesale service area. San Francisco should intensify its efforts to incorporate water recycling, stormwater capture and improved water use efficiency, comparably to other cities in Southern California.	Regarding investments in alternative water supplies, see response to similar comment above.
Doug Obegi & Jon Rosenfield	NRDC & San Francisco Baykeeper	There is a lack of information regarding wholesale water use and potential local supplies expansion opportunities, which raises questions about the projected RWS water needs for the wholesale customers.	The projected Wholesale Customer purchase requests shown in Section 4, Table 4-3 of the plan are specifically demands on the Regional Water System after accounting for local supplies developed by the Wholesale Customers. Additional information about these supplies can be found in the Wholesale Customer agencies' individual UWMPs.

Heinrich Albert	Sierra Club San Francisco Bay Chapter Water Committee	The draft UWMP significantly overestimates future water demand. The retail and wholesale population growth projections are significantly higher than the population growth trends provided by the California Dept. of Finance. In addition, the UWMP water demand projections are 20-25% higher than the Commission's 2030 water demand projections included in the 10-Year Financial Plan.	See response above to similar comment.
Heinrich Albert	Sierra Club San Francisco Bay Chapter Water Committee	The draft UWMP includes limited alternative water supply sources (wastewater recycling, groundwater, stormwater capture, etc.) and does not plan for supply vulnerability. San Francisco plans for minimal investments in water recycling and other local supply projects, unlike other Southern California cities.	See response above to similar comment.
Nicole Sandkulla	BAWSCA	The SFPUC should reflect the additional purchase requests (above their existing contract limit) of the City of San Jose (4.5 mgd) and the City of Santa Clara (2 mgd) in its regional water planning efforts and in this UWMP.	The UWMP is not the vehicle that the SFPUC will use to make decisions about water supply requests from its Wholesale Customers.
Nicole Sandkulla	BAWSCA	The estimated yield for each individual AWS project should be included in Sections 7.2, 8.4 and Table 8-1, as presented at the March 26 workshop. This would characterize each project's contribution to narrowing the system-wide shortage identified under drought conditions.	See response above to similar comment.
Nicole Sandkulla	BAWSCA	Discussion of the Tuolumne River Voluntary Agreement (TRVA) and associated modeling results should be included in the UWMP, as presented in the March 26 workshop.	The TRVA has not been adopted by the State Water Resources Control Board, and as such remains subject to change. The information presented at the March 26th workshop was intended for illustrative purposes, and is not appropriate for inclusion in the UWMP at this time.
Nicole Sandkulla	BAWSCA	The cutbacks to the wholesale customers in drought years under the BDP scenarios indicate that the SFPUC will not meet its established Level of Service Goals to limit rationing to no more than 20% system-wide during droughts if the BDP is implemented.	Comment noted.
Dick Morten		Neither the State of California nor San Francisco provide sufficient consideration to the environmental, natural resources and wildlife habitat. The UWMP must be the basis for having a sustainable freshwater ecosystem throughout the entire Hetch Hetchy water system from the watershed to the drinking faucet.	This is beyond the scope of the UWMP. The UWMP is structured to meet the requirements in the California Water Code. The SFPUC is engaged in several regulatory processes regarding the Tuolumne River and Bay-Delta environment, including the State Board's Bay-Delta Plan and the FERC relicensing of Don Pedro Dam. These processes have not yet reached conclusions.
Dick Morten		The global warming impacts on Hetch Hetchy discussed may not fully reflect the potential water scarcity forecasts. The SFPUC must take into account more dynamic global warming conditions in the UWMP. Further analysis of climate change and the related impacts on drought are needed to reduce the vulnerability of our scarce water resources.	Climate change is being covered in our Long Term Vulnerability Assessment.
Dick Morten		I support the recommendation to add a Section 12 to the UWMP about the Tuolumne River Environment to detail the SFPUC's commitment to enhance the Tuolumne River flows and protect fish and wildlife habitat.	Comment noted.
Dick Morten		Is there way for San Francisco's LWMP to influence the development of its wholesale customer's plans, including conservation, leakage, groundwater management, consumer price signals, recycled water, new construction water standards, etc.? Would SFPUC be able to influence the river intake from the Turlock and Modesto Irrigation Districts to effectively manage the scarce Tuolumne River resources?	As a wholesale water supplier, SFPUC provides its wholesale customers with information about anticipated supply reliability as required by the Water Code. Each wholesale customer is responsible for the preparation of their own UWMP.
Dick Morten		The UWMP should not confine itself to freshwater, groundwater and recycled water supply sources, and should include the abundant saltwater sources, which will be critical to the City's response in the event of earthquakes/fires.	UWMP is not an emergency water supply planning document, it is a long-term water supply planning document. The Water Shortage Contingency Plan references relevant emergency planning documents.
Dick Morten		SFPUC must not ignore the State Water Code 73505, which states that in the event of a water emergency, the SFPUC is obligated to deliver water from University Mound, Sunset and Merced Manor reservoirs to its wholesale peninsula customers. This situation could tax San Francisco's domestic water supply and firefighting capability.	UWMP is not an emergency water supply planning document, it is a long-term water supply planning document. The Water Shortage Contingency Plan references relevant emergency planning documents.

Dick Morten		The UWMP identifies Lake Merced as a water resource. It should be clarified that the lake is designated by the state as a non-potable water to be utilized for firefighting. Unfortunately, as far as I am aware there are no pumps, manifolds and pipes that would enable the fire department to have easy and quick access to this abundant water resource.	Section 3.1.4 identified Lake Merced as a non-potable water source: "In addition, there is an emergency supply of existing non-potable water immediately available within the City at Lake Merced."
Dick Morten		Consumer price signals for San Franciscans are likely to be more affected by rapidly increasing sewer rates rather than water rates. Will these increased rates bring about larger reductions in water consumption? To offset the growing consumer cost impacts there should be strong incentives for water conservation through provision of water conserving devices, stepping up water pipe leakage repair, etc.	Regarding the impacts of wastewater rates on demand, see response to similar comment above. Regarding our conservation program, refer to our 2020 Retail Water Conservation Plan for additional detail on our extensive conservation activities and planning.
Nancy Wuerfel		I request that language be added in Section 1 to acknowledge the AWSS as a city asset, transferred under the SFPUC's jurisdiction in 2010, and that notes the distinction between the AWSS as the non-potable firefighting supply source) and the EFWS as the potable water delivery system for firefighting.	UWMP is not an emergency water supply planning document, it is a long-term water supply planning document. Collectively in early 2019, the City Administrator's Office, Office of Resilience and Capital Planning, Mayor's Office, SFPUC, SFFD, and Public Works all collaboratively decided to utilize the term "Emergency Firefighting Water System" (EFWS) instead of "Auxiliary Water Supply System" (AWSS).
Nancy Wuerfel		I request that language be added in Section 3 that describes the historical development of the AWSS, and includes a description of the transferred AWSS assets.	UWMP is not an emergency water supply planning document, it is a long-term water supply planning document, and does not need to address the historical development of the Emergency Firefighting Water System.
Nancy Wuerfel		I request that Figure 3-2 be updated as follows:- update the title to note "map of in-city distribution system for potable water delivery"- remove Lombard reservoir from Figure 3-2 (and from Table 3-2) because the SFPUC transferred the reservoir's jurisdiction to the Recreation and Park Department in 2014- remove Harding Park recycled water facility because it is not part of the potable water distribution system- Create a new Figure 3-2.1 "Map of in-city distribution system for non-potable water delivery through the AWSS"	Figure 3-2 correctly illustrates the components of the SFPUC in-City distribution system. Lombard Reservoir remains under SFPUC jurisdiction (Francisco Reservoir was transferred to Rec and Park).
Nancy Wuerfel		I request that Section 6 and the WSCP section "Preparation for catastrophic supply interruption" include reference to the Budget and Legislative Draft Policy Analysis Report of February 2021 and the updated conceptual plan to expand the EFWS using Lake Merced as a primary source and Sunset Reservoir as a secondary source. In addition, I request additional language about cross-connection control to prevent raw water in Lake Merced from entering the potable water system pumped separately at the Lake Merced site.	UWMP is not an emergency water supply planning document, it is a long-term water supply planning document. Additionally, it is not a technical cross-connection control document. The SFPUC follows all cross-connection control regulations to ensure our customers receive high quality safe drinking water. In 2019, the San Francisco Board of Supervisors, via Resolution 484-19, urged SFPUC, SFFD, and the Office of Resilience and Capital Planning to develop a comprehensive Citywide EFWS Plan by December 31, 2021. The three agencies are diligently developing this Plan and will bring it to the Board of Supervisors by December 31, 2021.
Nancy Wuerfel		I request that the WSCP annual water supply and demand assessment include the AWSS.	The intent of the Annual Water Supply and Demand Assessment (WSDA) is to compare projected retail and wholesale demands with supplies (Regional Water System and local supplies). The AWSS is not a supply that is used to meet these demands, and thus is not pertinent for the Annual WSDA.
Nancy Wuerfel		I request that the Plan include Water Code Section 73503 and the use of the City's terminal reservoirs - Sunset, University Mound and Merced Manor, for emergency supply to the wholesale customers.	UWMP is not an emergency water supply planning document, it is a long-term water supply planning document. Water Code Section 73503 states the following: (a) The city, in consultation with the association and the offices of emergency services in Alameda County, Santa Clara County, and San Mateo County, shall prepare an emergency response plan describing how water service will be restored to the area served by the bay area regional water system after an interruption caused by earthquake or other natural or manmade catastrophe, and thereafter shall be implemented. (b) During any interruption in supply caused by earthquake, or other natural or manmade catastrophe, a regional wholesale water supplier shall distribute water to customers on an equitable basis, to the extent feasible given physical damage to the regional water system, without preference or discrimination based on a customer's geographic location within or outside the boundary of the regional wholesale water supplier.

Dave Warner		The SFPUC has consistently overestimated retail water demand in its 2010 and 2015 UWMP projections (2010 projection for 2020 - 71.7 mgd, 2015 projection for 2020 - 72.5 mgd, actual 2020 in-city demand, 65.3 mgd). It would be great to have Brattle show a reconciliation of the projections and actual demand, and how the overestimates are addressed in the new demand forecast.	The projections developed for this 2020 UWMP are significantly lower than those presented in the 2015 plan. The methodology was updated significantly, as described in Appendix E of the plan. One key indicator of the changes is that the projected per capita demands decreased significantly between the 2015 and 2020 projections; in 2015, per capita residential demand was projected to remain at about 44 gpcd through 2040; in the new projections, per capita residential demand is projected to decrease to 38 gpcd.
Dave Warner		The water demand is not adjusted for economic activity, which would lead to the overestimation of the demand (ex: during the drought, there was a substantial increase in economic activity, and a substantial decrease in economic activity resulted from the COVID pandemic in 2020).	The demand forecasts were developed under the assumption that future years are 'normal', i.e. not experiencing a drought or anomolous event such as the COVID-19 pandemic. Although such anomolous events are likely to occur in the future, we don't have a way to predict their occurrence. Because anomolous events can impact demands in both directions (i.e. increase or decrease depending on the nature of the event), excluding such events does not create a clear bias in the demand projections. In developing the model, the impacts of these events in the past were accounted for when determining the impacts of other variables such as rates. See Appendix E for additional discussion and quantification of the impact of drought and COVID-19 on demands.
Dave Warner		The demand projections are not adjusted to account for infill development, which would lead to the overestimation of the demand, since the increase in housing and employment would lead to a decrease in outdoor water use.	The residential and commercial demand forecasts are based on the number of projected households and employees in the City; if new residential units are replacing old ones, that would be accounted for in the total number of residential units. The largest outdoor water users in the retail service area, e.g. Golden Gate Park, golf courses, are not being replaced by infill development. Thus it is not clear that infill development would lead to a significant reduction in outdoor water use.
Dave Warner		The water demand analysis doesn't take into consideration the changing income levels of the city's population. Given the high housing prices, it could be expected that income levels would increase over time, which would affect water demands, by accelerating increased access to conservation measures.	The Brattle Group determined that the income parameter was not statistically significant when they also controlled for other housing characteristics. Therefore it was not used as an explanatory variable for the demand forecasts.
Dave Warner		It appears counterintuitive to assume that the newly built multi-family units would consume more water than the old ones, as we'd expect that newer units have more conservation measures in place.	This is indeed counterintuitive, and we will be further investigating this phenomenon. Although these newer buildings certainly have the latest water saving fixtures, in many cases we are seeing additional water fixtures in unit rather than shared such as clothes washers while also seeing more shared water-using amenities such as pools and cooling towers. The projections included in this study are based on the actual water use of recently constructed multi-family units.
Dave Warner		When adjusting demand projections to offset the impact of COVID, adjusted residential demand drops 0.5 mgd while adjusted commercial and industrial demand increases 3.1 mgd, which sounds counterintuitive. Given the in-city population of employees is less than the in-city residential population, it would be good to explain why the expected commercial and industrial demand would increase much less than residential demand decreases (closer or below the absolute value of the 0.5 mgd residential adjustment), particularly as per capita commercial and industrial demand is a fraction of per capita residential demand.	The impacts of COVID were opposite in the residential and commercial sectors; it increased residential demand while decreasing commercial demand. The magnitude of impact on the commercial demand was greater than the magnitude of impact on the residential sector, likely due to the fact that commercial buildings were occupied pre-COVID by a significant proportion of employees commuting from outside the City. The portion of employees who also live in the City stayed home and increased their residential consumption; but the large portion of employees who reside outside the City did not come to the office. However, for the demand projections in the UWMP, the projections were built off of a 2020 demand level that was normalized to remove the effects of COVID in both sectors.

Carlos Wadkins	San Francisco Coalition on Homelessness Human Rights Working Group	- The UWMP does not adequately capture the water needs of thousands of unhoused San Franciscans, and only accounts for housed residents with a household water connection, including the section about lower-income households, which only accounts for lower-income San Franciscans who reside in homes. - The 2020 Draft UWMP does not include public water access facilities (public drinking water fountains and public restrooms), which are a significant water source among San Francisco's unhoused community, but still do not provide sufficient access to public water. According to the 2021 "Water for All" Report by San Francisco's Coalition on Homelessness, the overwhelming majority of unhoused San Franciscans fall below the international minimum standards for water access.	Although the residential sector water use and projections only capture water use associated with households, water use of unhoused populations may be captured within other water use categories. For example, drinking fountains would be captured in municipal usage or irrigation usage (if these fountains are located in parks); water usage of homeless shelters or other supportive services would be captured in municipal or commercial water usage. The SFPUC, working with RPD, SFUSD, and SFPW, has supported the installation of 173 drink-tap stations. 70 drink tap stations have been installed in the public realm (right of way, parks, plazas, etc.), with the remaining 103 stations installed at SFUSD schools. The SFPUC is actively working on installing 3 additional stations in the public realm in the Tenderloin.
Greg Gaar		Recycling and water reuse will result in conserving potable water. Commenter suggests SFPUC make it a simple process to collect and store rainwater. Commenter suggests expanding removal of asphalt and concrete to allow rainwater to enter the ground. Commenter asks about San Francisco's efforts with water recycling.	See Section 7 of the Plan for additional descriptions of recycled water projects being pursued. See the Retail Water Conservation Plan for additional information on our conservation programs.
Ginny Stearns		Commenter supports the increased development and use of recycled water and the Onsite Water Reuse program. Commenter also supports replenishment of groundwater with recycled water, and expressed desire to maintain sufficient water for City green spaces. Commenter expressed concern about potential presents of chemicals in recycled water.	Comments noted.
Steve Lawrence		In analyzing the scenario where the Bay Delta Plan (Amendment) is implemented, are San Jose and Santa Clara made permanent customers?	No assumption is made about the status of San Jose and Santa Clara in our supply modeling in the text of the UWMP. Their demands are included in the wholesale customer demand projections that are analyzed, and the total demands for the planning horizon never exceed our wholesale customer contractual obligation of 184 mgd. We provided the wholesale allocation that resulted from our supply modeling to BAWSCA, who then determined the allocation for each of their member agencies.
Steve Lawrence		Is 6 mgd a reasonable estimate of water losses? Page 38/432. I doubt it. Firstly, you state that 7.18 mgd was lost in the latest year, '19-20, but if one divides the loss figure for the year by 365 one gets 7.45. Secondly, you simply state that 6 mgd is "real" loss. Is there an explanation? Losses have been increasing 2016 on; makes sense, infrastructure ages, and much street work and other city construction shakes pipes loose. Drier periods, then wetter, will probably stress pipes as climate changes in upcoming years.	The water loss value has been corrected in the final document. 6 mgd of real losses is a conservative estimate, and we have several programs in place to reduce both real and apparent water losses moving forward. You can read more about these efforts in Chapter 10 of the plan.
Steve Lawrence		Single family residents are assumed not to increase use (in fact decrease over 10%) despite, and without consideration that I can find, of: 1) will residents per SFR remain the same, or will the average rise as housing becomes more expensive, e.g. with adult children returning to parents' home and with aging parents living in? 2) will ADUs, a state policy, add to single unit lots another housing unit? (Accessory dwelling unit)	Our assumptions about single family housing units are provided by the Planning Department; we do not make our own projections about housing changes in the City. Our projections do not make assumptions about the number of residents per unit; rather, the projections are based on consumption at the household level and the response to rates, temperature, and precipitation, as well as conservation. We currently have no basis for projecting changes in household occupancy into the future.
Steve Lawrence		At about 38/432 the draft appears to say that temperature and precipitation changes caused by climate change will not significantly affect demand. This surprises. I wonder.	This assertion is based on the trends observed in the 10 years of historical water use data that showed that over that period, changes in temperature and precipitation did not have large impacts on demand, likely due to limited outdoor water use by residential customers in the city. It is true that climate change could lead to more extreme changes; however, given the uncertainty about future climate scenarios, this plan evaluated a limited number of future temperature and precipitation conditions. We are currently in the process of finalizing our Long Term Vulnerability Study that will further examine the implications of a range of future climate scenarios.

Steve Lawrence		Are the draft's assumptions right re wholesale customers' assurances and how much water SF gets during droughts if the state's plan is implemented? I don't pretend to follow, but I fear that the 2009 WSA assured wholesale customers that rationing for them would not exceed 20%. If WCs stood firm, SF would be severely parched. The draft does admit that it makes assumptions about what happens if supply shortage exceeds 20%.	SFPUC has adopted a Level of Service objective to limit system-wide rationing to no greater than 20%. Per the WSA, the Supply Assurance to the Wholesale Customers is subject to reduction by water shortage, drought, emergencies, or malfunctioning/rehabilitation of Regional Water System facilities. The process for allocating water shortages between the retail and wholesale customers is defined in the WSA, however as stated in the plan, there are additional procedures and negotiations that would be undertaken in the event of a system-wide shortage greater than 20%.
Steve Lawrence		4.1.1 of App.K says that over ten percent supply shortage --> rationing, but Table 3.2 says otherwise; which is right? pg366-7/432	Section 4.1.1 states that SFPUC will likely use calls for voluntary reductions if the target water use reduction is 10% or less, however the SFPUC retains the flexibility to implement voluntary or mandatory calls for water use reduction as needed during a water shortage. Table 3.2 shows that in a Stage 4 shortage, a water use reduction of 5 - 18% would be targeted, and thus depending on where we landed in that range, the calls may be voluntary or mandatory.
SFPUC 2020 UWMP Update – Wholesale Customer Comments Received After 05/05/2021 Deadline			
Darryl Barrow	General Manager, Westborough Water District	The draconian cuts that implementation of the UWMP would require would have a devastating impact on the customers of the Westborough Water District. The District has made aggressive efforts to conserve water; current water usage is 66 gallons per capita per day. In order to implement additional cuts, while still protecting the health and safety of its customers, the District would need to prohibit a range of important uses, including the use of potable water for construction and dust control, the use of water by landscape accounts, the use of water for landscape irrigation, and the issuance of new water connections. The water supply shortages presented in the UWMP are not sustainable for the basic health and safety needs of the District customers. We urge you to redouble your efforts to secure a voluntary agreement in the Bay-Delta proceeding and urge you to support an effort to hammer out an arrangement among the BAWSCA members to address what will occur in the event of a supply shortage that exceeds 20%. We urge the SFPUC to expedite water supply projects to meet its supply assurance obligations.	Comment noted. The SFPUC will be communicating with our Wholesale Customers collectively on this topic.
Justin Chapel	Public Works Superintendent, City of Redwood City	Redwood City is expressing concern regarding the water supply reliability resulting from implementation of the Bay-Delta Plan. For Redwood City, which purchases all of its drinking water from the SFPUC, the cutbacks are expected to be as high as 49% of available supply in multiple dry year scenarios. If such a reduction in demand is required the City will be forced to impose severe measures, including prohibition on irrigation with potable water, suspension of distribution system flushing, cutbacks for CII customers by 30%, a moratorium on new development, and a reduction of residential indoor water use to 27 gallons per capita per day, which raises concerns about basic health and safety needs and the economic vitality of our community. Redwood City requests that the SFPUC fully commit to the voluntary agreement process and fund the Alternative Water Supply Program at levels necessary to meet its Level of Service Goals and contractual obligations to the Wholesale Customers. Redwood City has been and continues to be committed to conservation and development of recycled water. Redwood City is also a partner in the Crystal Springs Purified Water Project, and requests that the SFPUC prioritize this project.	Comment noted. The SFPUC will be communicating with our Wholesale Customers collectively on this topic.

Thomas J. Piccolotti	President, Board of Directors, North Coast County Water District	North Coast County Water District (NCCWD) relies solely on water provided by the SFPUC to meet the potable water needs of its customers. NCCWD was shocked when it saw the huge cutbacks that would be imposed in drought years with implementation of the Bay-Delta Plan. The potential cutbacks far exceed SFPUC's level of service goal. NCCWD urges the SFPUC to expedite water supply projects to meet its supply assurance obligations and Individual Supply Guarantee. NCCWD 2020 per capita water use was 60 gpcd, with a residential water use of 48 gpcd. NCCWD will not be able to reduce its water consumption by 54% without significant risks to the health and safety of its customers. NCCWD expects SFPUC will take the steps necessary to ensure it meets its Level of Service goal.	Comment noted. The SFPUC will be communicating with our Wholesale Customers collectively on this topic.

PUBLIC UTILITIES COMMISSION

City and County of San Francisco

RESOLUTION NO. **21-0100**

WHEREAS, The Urban Water Management Planning Act of 1983, as amended through 2020 (the Act), requires that an urban water supplier serving 3,000 customers or 3,000 acre-feet per year must prepare an Urban Water Management Plan (Plan or UWMP) update every five years; and

WHEREAS, On June 14, 2016, by Resolution No. 16-0118, the San Francisco Public Utilities Commission (SFPUC) adopted the 2015 Urban Water Management Plan; and

WHEREAS, The SFPUC, in compliance with the Act, has prepared a 2020 update to its Plan, including the 2020 Water Shortage Contingency Plan; and

WHEREAS, The preparation of the Plan update has been coordinated with the City's wholesale water customers and other public agencies to the extent practicable, and staff has encouraged the active involvement of diverse social, cultural and economic elements of the population within the SFPUC's retail water service area during preparation of the Plan; and

WHEREAS, At this Commission's regular public meeting on April 13, 2021, a Draft Plan was presented to the Commission and a Public Hearing was held during the Commission meeting in order to receive public comment on the Draft Plan; and

WHEREAS, Minor revisions to the Draft Plan have been made based on public comments received at the Public Hearing and during the public comment period of April 5, 2021 through May 5, 2021; and

WHEREAS, The San Francisco Planning Department issued a statutory exemption determination on May 25, 2021 under California Environmental Quality Act Guidelines section 15282(v), under Planning Department Case Number 2021-005261ENV; and

WHEREAS, This action constitutes the Approval Action for the project for the purposes of CEQA, pursuant to Section 31.04(h) of the San Francisco Administrative Code; and

WHEREAS, A Final 2020 Urban Water Management Plan was presented to the Commission at its public meeting on June 8, 2021 for consideration and adoption in advance of the July 1, 2021 deadline for submittal to the State and copy of the Final Plan is on file with the Commission Secretary; now, therefore, be it

RESOLVED, That this Commission hereby adopts the 2020 Urban Water Management Plan for the City and County of San Francisco, including the 2020 Water Shortage Contingency Plan, and directs the General Manager to submit it to the California Department of Water Resources by July 1, 2021.

I hereby certify that the foregoing resolution was adopted by the Public Utilities Commission at its meeting of June 11, 2021.

Secretary, Public Utilities Commission

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APPENDIX D

SB X7-7 Compliance Form

JUNE 2021
2020 URBAN WATER MANAGEMENT PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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SB X7-7 Table 0: Units of Measure Used in 2020 UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.*
NOTES: The units of measure used in the body of the UWMP are millions of gallons per day (mgd).

SB X7-7 Table 1 pertains to baselines and targets and is not used in the SB X7-7 2020 Compliance Form.

SB X7-7 Table 2: Method for 2020 Population Estimate	
Method Used to Determine 2020 Population (may check more than one)	
☑	**1. Department of Finance** (DOF) or **American Community Survey** (ACS)
☑	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☑	**4. Other** DWR recommends pre-review
NOTES:	

SB X7-7 Table 3: 2020 Service Area Population	
2020 Compliance Year Population	
2020	899,732
NOTES: Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is therefore excluded from SB X7-7 calculations.	

SB X7-7 Table 4: 2020 Gross Water Use

Compliance Year 2020	2020 Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.*	2020 Deductions					2020 Gross Water Use
		Exported Water *	Change in Dist. System Storage* (+/-)	Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.*	Water Delivered for Agricultural Use*	Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.*	
	76,730			-		-	**76,730**

*** Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.

NOTES: Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is therefore excluded from SB X7-7 calculations.

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment
Complete one table for each source.

Name of Source	Regional Water System

This water source is *(check one)*:

☑	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	74,260	-	74,260

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*
[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:
Per DWR direction, Groveland CSD is accounted for as a wholesale customer and is therefore excluded from SB X7-7 calculations.

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s) Meter Error Adjustment
Complete one table for each source.

Name of Source	Groundwater

This water source is *(check one)*:

☑	The supplier's own water source
☐	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	2,470		2,470

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*
[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES: Groundwater use has found to be constant throughout the years, which consists of 1.5 mgd (1,680 AF) of in-city irrigation use, another 0.4 mgd (450 AF) of in-city potable water production, and 0.3 mgd (340 AF) for Castlewood CSA.

SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD)		
2020 Gross Water *Fm SB X7-7 Table 4*	**2020 Population** *Fm SB X7-7 Table 3*	**2020 GPCD**
76,730	899,732	**76**
NOTES:		

SB X7-7 Table 6 pertains to baselines and targets and is not used in the SB X7-7 2020 Compliance Form.

SB X7-7 Table 7 applies to baselines and targets and is not used in the SB X7-7 2020 Compliance Form.

SB X7-7 Table 8 was used for the 2015 Interim Target and is not used in the 2020 UWMP.

SB X7-7 Table 9: 2020 Compliance

Actual 2020 GPCD[1]	Optional Adjustments to 2020 GPCD					2020 Confirmed Target GPCD [1, 2]	**Did Supplier Achieve Targeted Reduction for 2020?**
	Enter "0" if Adjustment Not Used			TOTAL Adjustments[1]	Adjusted 2020 GPCD [1] *(Adjusted if applicable)*		
	Extraordinary Events[1]	Weather Normalization[1]	Economic Adjustment[1]				
76	-	-	-	-	76	96	**YES**

[1] *All values are reported in GPCD*
[2] ***2020 Confirmed Target GPCD*** *is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.*

NOTES:

SFPUC RETAIL BASELINES AND TARGETS NARRATIVE

With the adoption of the Water Conservation Act of 2009, also known as SB X7-7, the State was required to set a goal of reducing urban water use by 20% by the year 2020. Each retail urban water supplier was required to determine its baseline water use, expressed in gallons per capita per day (GPCD) during its baseline period, as well as its target water use for the years 2015 and 2020 in order to help the State achieve the 20% reduction.

In its 2010 UWMP, the SFPUC first established the baseline per capita water use, as well as the interim (i.e. 2015) and 2020 water use targets. In the 2015 UWMP, the SFPUC performed a detailed analysis to update the baseline and target per capitas based on in-City retail service area population and water use. The 2015 UWMP analysis by (1) revising the population of the in-City retail service area to reflect the 2010 U.S. Census rather than the 2000 U.S. Census, and (2) including the population and water use of the suburban retail service area. The baseline and targets established in 2015 do not need to be updated. This section provides a summary of the 2015 analysis and shows the SFPUC's compliance with the 2020 target.

Note that water use presented in this section reflects gross water use (i.e., water use by all sectors, including water loss). A complete set of standardized SB X7-7 Verification Form tables prescribed by DWR is provided Appendix D. Additionally, Groveland CSD is not included in this section, as explained in Section 2.4.

1.1 PER CAPITA WATER USE BASELINE CALCULATIONS

As described in DWR's *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use For the Consistent Implementation of the Water Conservation Act of 2009*, the Water Conservation Act of 2009 requires that each urban retail water supplier include in its UWMP an estimate of base daily per capita water use, expressed in GPCD, for a continuous multi-year base period. The California Water Code (CWC) specifies two different base periods:

- A continuous 10-year period, used to calculate baseline per capita water use, which may be extended up to an additional 5 years to a maximum of a continuous 15-year period for an urban retail water supplier that meets at least 10 percent of its retail water demand through recycled water, per CWC Section 10608.12(b)(1) and (2).

- A continuous five-year period, used to determine whether the 2020 per capita water use target meets the legislation's minimum water use reduction requirement, per CWC Section 10608.12(b)(3).

Because the SFPUC's current and past recycled water use does not equal or exceed 10% of retail water demand, the 15-year period cannot be used to calculate baseline per capita water use. The SFPUC will utilize a 10-year baseline period. Water use data from 2001 to 2010 have been used for this analysis, which is consistent with the baseline period used in the previous analysis in the 2010 UWMP.

Base daily per capita water use has been calculated for the 10-year baseline period as follows:

- Step 1: Estimate Distribution System Area. The distribution system area refers to the in-City and suburban retail areas, as described in Section 3.2.

- Step 2: Estimate Service Area Population for Base Period. The retail population was estimated for the period of 2001 to 2010 based on various sources depending on data availability. For the in-City retail service area, population data were obtained from the California Department of Finance for the County of San Francisco. However, the same method could not be used for the suburban retail service area since the service area does not align with municipal boundaries. Therefore, the SFPUC consulted with DWR (i.e., pre-review) on an appropriate, alternate methodology based on U.S. Census data at the census block level and persons-per-household data. Use of persons-per-household data was deemed adequate since it is assumed that all residential accounts serve single family homes in the suburban retail service area,

and no multi-family residences are served. Therefore, the number of connections can be considered equivalent to number of households. For the Town of Sunol specifically, the SFPUC used the web-based DWR Population Tool since the corresponding service area was difficult to define at the census block level (output provided in Appendix H). The resulting retail population estimates are shown in Table 5-1.

- Step 3: Calculate Gross Water Use. Gross water use is summarized in
- Table 0-2. Gross water use is comprised of water from the SFPUC's own water supply sources delivered to all retail customers. Changes in storage were then factored in to develop gross water use. The SFPUC compiles daily flow data for the County-line, system input, and in-line meters, as well as daily reservoir water level data. The meters, water level sensors, and associated metering equipment are all inspected, tested, calibrated, and maintained according to the applicable meter calibration and maintenance frequency by an independent metering consultant. These include annual pitot tube tests, quarterly secondary meter equipment testing and calibration, cleaning, flushing, inspecting, and lubricating. The flow quantities are expected to be accurate and no meter error adjustment is necessary.

- Step 4: Calculate Annual Daily Per Capita Water Use. Annual daily per capita water use was calculated by dividing gross water use by population. Annual daily per capita water use is shown in Table 0-3.

- Step 5: Calculate Base Daily Per Capita Water Use. Base daily per capita water use is calculated as the average of per capita water use, or 107 GPCD as shown in Table 0-3.

Table 0-1. Retail Population for 10-Year and Five-Year Baselines
[SB X7-7 Verification Form Table 3: Service Area Population]

10-Year Baseline	Five-Year Baseline	Year	Service Area Population		
			In-City Retail[a]	Suburban Retail[c]	Total Retail
Year 1	—	2001	780,614	1,634	782,248
Year 2	—	2002	782,765	1,633	784,398
Year 3	—	2003	782,599	1,630	784,229
Year 4	—	2004	781,308	1,626	782,934
Year 5	—	2005	780,187	1,619	781,806
Year 6	Year 1	2006	781,295	1,611	782,906
Year 7	Year 2	2007	787,127	1,786	788,913
Year 8	Year 3	2008	795,002	1,773	796,775
Year 9	Year 4	2009	800,239	1,751	801,990
Year 10	Year 5	2010	805,235	1,747	806,982
2020 Compliance Year			897,806	1,926	899,732

a In-City population estimated as County of San Francisco population obtained from the California Department of Finance Report E-8: Historical Population and Housing Estimates for Cities, Counties, and the State, 2000-2010, released September 2012. Population data for 2001 through 2009 are for January 1 of the applicable year, whereas population data for 2010 is for April 1, 2010 per the revised 2010 decennial census count.

b In-City population estimated as County of San Francisco population obtained from the California Department of Finance Report E-5: Population and Housing Estimates for Cities, Counties, and the State, 2011-2020 with 2010 Census Benchmark, released May 2020. Population data corresponds to January 1, 2020.

c Suburban retail population based on estimates for the Town of Sunol, Redwood City, Daly City, Fremont, Millbrae, Castlewood CSA, and San Francisco County Jail #5. Groveland CSD is not included.

1) Population of retail customers in the Town of Sunol was estimated using the DWR Population Tool. Output from the tool is provided in Appendix H.
2) Populations of retail customers in Redwood City, Daly City, Fremont, Millbrae, and Castlewood were estimated using data from the 2000 and 2010 U.S. Census at the census block level.
3) Inmate population of the San Francisco County Jail #5 in San Bruno was provided by staff of the San Francisco Sheriff's Department.
4) Other suburban customers include individual research and commercial facilities, such as the Lawrence Livermore National Lab, San Francisco International Airport, National Aeronautics and Space Administration, etc. Because these are non-residential facilities, their population is assumed to be zero.

Table 0-2. Retail Gross Water Use for 10-Year and Five-Year Baselines

[SB X7-7 Verification Form Table 4: Annual Gross Water Use]

10-Year Baseline	Five-Year Baseline	Year	Volume Into Distribution System[a]	Deductions					Annual Gross Water Use [c]
				Exported Water	Change in Storage[b]	Indirect Recycled Water	Water Delivered for Agricultural Use	Process Water	
Year 1	—	2001	90.9	0	-0.01	0	0	0	91.0
Year 2	—	2002	91.2	0	0.00	0	0	0	91.2
Year 3	—	2003	88.0	0	0.15	0	0	0	87.9
Year 4	—	2004	85.6	0	0.02	0	0	0	85.6
Year 5	—	2005	85.6	0	-0.09	0	0	0	85.7
Year 6	Year 1	2006	83.9	0	0.00	0	0	0	84.0
Year 7	Year 2	2007	82.3	0	0.03	0	0	0	82.3
Year 8	Year 3	2008	80.6	0	0.00	0	0	0	80.6
Year 9	Year 4	2009	78.8	0	-0.01	0	0	0	78.8
Year 10	Year 5	2010	76.9	0	0.06	0	0	0	76.8
10-Year Baseline Average Gross Water Use									84.4
Five-Year Baseline Average Gross Water Use									80.5
2020 Compliance Year									68.5

a All sources are metered, and all meters are calibrated annually.

b Changes in distribution system storage were estimated based on storage records of all in-City storage. Most suburban retail systems do not have storage facilities or the changes in storage were found to be negligible.

c The annual gross water use does not include water supplied to Groveland CSD.

Table 0-3. Retail Gross Per Capita Water Use for 10-Year and Five-Year Baselines

[SB X7-7 Verification Form Table 5: Gallons Per Capita Per Day (GPCD)]

10-Year Baseline	Five-Year Baseline	Year	Service Area Population	Annual Gross Water Use (mgd)	Daily Per Capita Water Use (GPCD)
Year 1	—	2001	782,248	91.0	116
Year 2	—	2002	784,398	91.2	116
Year 3	—	2003	784,229	87.9	112
Year 4	—	2004	782,934	85.6	109
Year 5	—	2005	781,806	85.7	110
Year 6	Year 1	2006	782,906	84.0	107
Year 7	Year 2	2007	788,913	82.3	104
Year 8	Year 3	2008	796,775	80.6	101
Year 9	Year 4	2009	801,990	78.8	98
Year 10	Year 5	2010	806,982	76.8	95
10-Year Baseline Average GPCD					107
Five-Year Baseline Average GPCD					101
2020 Compliance Year					76

1.2 GROSS PER CAPITA WATER USE TARGETS CALCULATIONS

Consistent with its 2010 UWMP, the SFPUC used Method 3 of the four approved methods provided by the Water Conservation Act of 2009 for determining urban water use targets in 2015. The SFPUC's retail service area is contained entirely within the San Francisco Bay hydrologic region. The hydrologic region baseline, interim, and 2020 targets are 157, 144, and 131 GPCD, respectively. To calculate the urban water use targets using Method 3, 95% of the 2015 interim and 2020 targets are calculated, yielding 2015 interim and 2020 targets of 137 and 124 GPCD, respectively.

In the event that the five-year baseline exceeds the 100-GPCD threshold specified in CWC Section 10608.22, the 2015 and 2020 per capita water use targets shall be verified to determine whether they meet the minimum water use reduction requirements, which warrant that an urban retail water supplier's 2020 target shall be at least 95% of the five-year baseline per capita water use. The SFPUC's daily per capita water use for the five-year period from 2006 to 2010 is 101 GPCD. Because it is above the 100-GPCD threshold specified by the CWC, the 2020 target must be adjusted to reduce water use by a minimum of 5% of the five-year baseline, or 5 GPCD. As such, the SFPUC's highest allowable 2020 target is 96 GPCD (initial 2020 target of 101 GPCD minus the adjustment of 5 GPCD). Since the highest allowable 2020 target is less than the target calculated using Method 3, the SFPUC's 2020 target is adjusted to 96 GPCD. The resulting 2015 interim target was 102 GPCD (i.e., the midpoint between the 10-year baseline of 107 GPCD and the 2020 target of 96 GPCD) (see Table 0-4).

Table 0-4. Gross Per Capita Water Use Baselines and Targets Summary (GPCD)

[Standardized Table 5-1: Baselines and Targets Summary]

Baseline Period	Start Year	End Year	Average Baseline	Interim 2015 Target	Confirmed 2020 Target
10–Year Baseline	2001	2010	107	102	96
Five-Year Baseline	2006	2010	101	—	—

1.3 COMPLIANCE WITH 2020 DAILY PER CAPITA WATER USE TARGET

As shown in Table 0-3, with a 2020 per capita water use of 76 GPCD, the SFPUC is in compliance with its 2020 target of 96 GPCD. No adjustments were needed.

Taking into consideration the impact of population and employment growth, as well as passive and active conservation efforts, the SFPUC initially projected in 2015 that its 2020 daily per capita water use would be approximately 86 GPCD. With its continued water conservation program, the SFPUC has achieved a lower than initially predicted per capita water use with a 2020 per capita water use of 76 GPCD, in compliance with the final 2020 target of 96 GPCD.

1.4 ASSISTANCE TO WHOLESALE CUSTOMERS

As a wholesale supplier, the SFPUC is required to provide an assessment of present and proposed future measures, programs, and policies that will help the retail water suppliers in their wholesale service area to achieve their water use reduction targets. This is further discussed in Section 10.3.

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APPENDIX E

2020 Retail Demand Model and Projections Technical Memorandum

JUNE 2021

2020 URBAN WATER MANAGEMENT PLAN

for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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Water Demand Forecast for the City of San Francisco

2020-2045

PREPARED BY

David Sunding
Oliver Browne

PREPARED FOR

The San Francisco Public Utilities Commission

MARCH 26, 2021

Brattle

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

NOTICE

- This report was prepared for the San Francisco Public Utilities Commission, in accordance with The Brattle Group's engagement terms, and is intended to be read and used as a whole and not in parts.
- The report reflects the analyses and opinions of the authors and does not necessarily reflect those of The Brattle Group's clients or other consultants.
- There are no third party beneficiaries with respect to this report, and The Brattle Group does not accept any liability to any third party in respect of the contents of this report or any actions taken or decisions made as a consequence of the information set forth herein.

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TABLE OF CONTENTS

Executive Summary 3

I. Methodology 7

A. Data 7

1. Data Sources and Construction 7

2. Remove Water Conservation Policy from Raw Data 8

B. Econometric Model 9

C. Forecast Data 10

1. Forecast Assumptions 10

2. Econometric Projections 12

3. Add Water Conservation Estimates and Other Demands back into Forecast 12

II. Single-Family Residential Forecast 13

A. Model Estimates 13

B. Demand Forecast 14

III. Multiple-Family Residential Demand Forecast 15

A. Model Estimates 15

B. Demand Forecast 16

IV. Commercial and Industrial Demand Forecast 17

A. Model Estimates 17

B. Demand Forecast 19

TABLE OF TABLES

Table 1: Summary of Forecasts by Sector 5

Table 2: Forecast Assumptions – Housing Unit and Employment Growth 12

Table 3: Forecast Assumptions - Covariates 12

Table 4: Model Estimates – Single-Family Residential Sector 14

Table 5: Demand Forecast - Single-Family Residential Sector 15

Table 6: Model Estimates - Multiple-Family Residential Sector 16

Table 7: Demand Forecast – Multiple-Family Residential Sector 17

Table 8: Model Estimates- Commercial and Industrial Sector 18

Table 9: Demand Forecast - Commercial and Industrial Sector 19

Executive Summary

The San Francisco Public Utilities Commission (SFPUC) commissioned the Brattle Group to forecast water demand within SFPUC's in-City retail service area, encompassing the City and County of San Francisco (CCSF). We forecast demand for the following three types of accounts within the in-City retail service area:

- Single-Family Residential,
- Multi-Family Residential, and
- Commercial and Industrial.

To forecast future water demands, we obtained data on monthly water consumption and billing for each account of the above types in the City and County of San Francisco. We merged this data with property characteristics held by the Office of the Assessor-Recorder, demographic characteristics from the American Community Survey at the census block-group level, and historical climate data from the PRISM dataset.

We forecast account-level water demand based on each household's or business's historical average water consumption and statistical relationships between each household's water consumption and demand drivers such as water rates, weather, and other factors such drought and the COVID-19 pandemic. For each account, we estimate the relationship between water use and these demand factors using a multiple regression analysis. In a regression analysis, changes in the dependent variable, namely account-level water use, are explained by the control variables such as rates, climate, and macro-economic factors. The statistical estimates are not based on differences in the average level of water use between accounts, which we adjust for using as a statistical technique called 'fixed-effects'. Rather our estimates are based on the different trends in how each account's water use changes in response to changes in rates, climate and macro-economic factors.

The results of our statistical model are a set of "demand elasticities" with respect to water rates, average monthly average temperature, and monthly precipitation. These elasticities describe the percentage change in water consumption predicted in response to a one-percentage change in each of these control variables. The models also produce the estimated change in water use for each type of account during the COVID-19 pandemic and periods of drought.

For each account, future demand from 2020 to 2045 is forecast based on the historical aggregate water use for each account, and expected future changes in rates and climate. The assumptions for future rates and climate were developed in consultation with SFPUC. The forecasts assume that by 2045 water

rates increase by 50% in real terms (i.e., after controlling for inflation), average temperatures in San Francisco increase 1.1°C, and average precipitation is unchanged. We forecast demands for normal years by removing the estimated impact of drought and the ongoing COVID-19 pandemic.

Total demand for the in-city retail service area is calculated by aggregating the monthly account-level forecasts by the number of units and businesses. In addition to the existing stock of residential and commercial accounts, San Francisco's Urban Water Management Plan assumes significant growth in both the number of multiple-family homes and employment within the City based on housing and employment forecasts provided by the San Francisco Planning Department. The forecast incorporates approximately 5,100 new multi-family residential units each year with a simulation that assumes that newly built buildings have the same number of units and per-unit level of consumption as similar existing buildings that have been built in San Francisco since 1990. This approach implicitly assumes that these new multifamily units adopt the current standards in water-efficient plumbing fixtures. The forecast incorporates employment growth of approximately 5,000 jobs per year, split across five different land-use types.[1] The forecast assumes that new commercial and industrial accounts have the same water use patterns as similarly sized existing firms with the same land-use category.

Table 1 summarizes our forecasts. By 2045, single-family residential consumption is forecast to fall to 13.54 million gallons per day; multi-family residential consumption is forecast to grow to 33.03 million gallons per day; and commercial and industrial consumption will remain approximately flat at 18.00 million gallons per day. These forecasts account for all single-family, multi-family, and commercial/industrial water use in the SFPUC retail service area, including fire accounts and combination accounts. However, these forecasts do not include water losses or other account types such as suburban retail accounts, irrigation accounts, or municipal accounts.

In 2015, The Brattle Group produced demand forecasts for SFPUC as part of the previous Urban Water Management Planning process. The model in this memo departs in several important ways from the model that we previously used to forecast water demand in San Francisco. First, the previous model was calibrated to 2010 levels of demand, which are out of date and significantly higher than current consumption. Second, San Francisco's forecasts for future housing and employment growth have changed substantially; the San Francisco Planning Department now expects zero growth in single-family units, but significant growth in multi-family units and in-city employment. Third, our statistical model relies on different data and a different estimation strategy. The new model is estimated from variation over-time in consumption within each individual account in the SFPUC retail service area, whereas the previous model was estimated based on a cross-section of aggregated city-level observations across the

[1] Employment forecasts and the five different types of land-use categories come from the Plan Bay Area produced by the Association of Bay Area Governments. The five different types of land-use are: Office/Professional; Health/Education/Recreation; Manufacturing/Wholesale; Retail/Restaurants; and Other.

Regional Water System service area (i.e., the BAWSCA agencies and the City and County of San Francisco). Fourth, our model now explicitly adjusts for savings from active conservation programs and non-potable / onsite reuse in SFPUC's water conservation model.[2] Fifth, our previous model assumed that water consumption depends on household income levels as a proxy for each account's housing size and type, which we did not have individual-level data for our previous analysis. The model in this memo instead directly adjusts for every existing account's average water and forecasts the water use of homes built in the future.

TABLE 1: SUMMARY OF FORECASTS BY SECTOR

		FY2019-20 (Actual)	FY2019-20 (Forecast)	FY2024-25	FY2029-30	FY2034-35	FY2039-40	FY2044-45
				(millions of gallons per day)				
Single Family Residential								
Raw Prediction		14.45	14.32	13.83	13.63	13.60	13.63	13.65
Conservation:	*Active*	0.00	0.00	-0.15	-0.18	-0.17	-0.13	-0.11
Total		14.45	14.32	13.68	13.45	13.43	13.49	13.54
Multifamily Residential (5100 new units / year)								
Raw Prediction		22.91	22.47	24.03	26.14	28.65	31.32	33.99
Conservation:	Active	0.00	0.00	-0.15	-0.20	-0.18	-0.11	-0.06
	Non-Potable / Onsite Reuse	-0.07	-0.07	-0.21	-0.35	-0.63	-0.91	-0.91
Other Accounts:	*Fire*	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total		22.85	22.41	23.68	25.60	27.85	30.31	33.03
Commercial and Industrial								
Raw Prediction		14.70	17.81	17.25	17.33	17.49	17.93	18.38
Conservation:	*Active*	0.00	0.00	-0.28	-0.30	-0.30	-0.28	-0.23
	Non-Potable / Onsite Reuse	-0.03	-0.03	-0.09	-0.15	-0.27	-0.39	-0.39
Other Accounts:	*Docks / Ships*	0.01	0.02	0.02	0.02	0.02	0.02	0.02
	Builders / Contractors	0.14	0.18	0.18	0.18	0.18	0.18	0.18
	Fire	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Total		14.86	18.02	17.12	17.11	17.16	17.51	18.00
Grand Total		52.15	54.75	54.47	56.16	58.44	61.31	64.57

Notes:

The FY2019-20 (Actual): This column is a forecast that reflects actual demands under the prevailing COVID-19 and weather conditions and perfectly matches with realized demand.

The FY2019-20 (Forecast): This column is a forecast that assumes no COVID-19 pandemic and average weather conditions.

Raw Prediction: This is the raw output of Brattle's statistical forecast. In each sector, this category includes both standard accounts and combination-fire accounts.

[2] Onsite water reuse savings result from buildings installing and operating onsite water reuse systems. These systems involve the collection, treatment, and reuse of alternate water sources such as blackwater, graywater, and foundation drainage for non-potable end uses such as toilet flushing and irrigation. The water supplies produced by these systems are not municipally-supplied by the SFPUC and thus they serve to reduce demands on SFPUC's system.

Conservation Adjustment: This is the output of the SFPUC Conservation model. This value accounts for estimated water savings from the SFPUC's active conservation program and on-site and non-potable water reuse program. Passive conservation savings from plumbing code are already assumed/reflected in the raw demand projections.

Residential Fire Accounts: These values were supplied by SFPUC

Commercial and Industrial – Other: This category includes Docks and Ships; Builders/Contractors; and Non-Residential Fire Accounts. These values were supplied by SFPUC.

Grand Total: This row does not include water losses, suburban accounts, irrigation accounts or municipal accounts.

I. Methodology

Our estimation process has several steps that we discuss in the respective subsections below. First subsection discusses the raw data that we collect and how we pre-adjust our raw data to remove the impact of SFPUC's active water conservation programs, which we account for separately after forecasting future demand. The second section discusses the econometric model that we estimate. The third sub-section discusses the assumptions and calculations that we use to produce both individual-level and aggregate demand estimates from the econometric model.

A. Data

1. Data Sources and Construction

Our estimates rely on account-level data from SFPUC's retail service area, matched with data on parcel characteristics, and local weather fluctuations. We matched SFPUC's monthly billing data to publicly available data on land-use and building characteristics based on addresses provided in San Francisco's 2017 Tax Assessor and 2016 Land Use data. We then used these parcels to add characteristics about each meter from the public Tax Assessor, and Land Use data, as well historical weather data from the University of Oregon State's PRISM dataset, US Census block-group characteristics from the 2018 American Community Survey, US Census tract characteristics from the 2010-2019 American Community Survey, and Employment and Land Use forecasts provided by the SFPUC.

San Francisco's public agencies do not keep a data key that links information between the parcel identifiers in the Tax Assessor's records and the account numbers used in SFPUC's records. Therefore, to merge assessor information into our dataset, we matched accounts based on their reported addresses. Due to inconsistencies in address reporting between the two datasets, we could not match all records; however, we managed to match over 95% of all accounts. Based on a comparison of summary statistics between all accounts and only matched summary statistics, these accounts appear to be a representative sample, and therefore, we are confident using these data as the basis for our forecast model.

We use climate data from the University of Oregon State's PRISM Climate Group.[3] This dataset gathers climate observations from a wide range of monitoring networks, applies sophisticated quality control measures, and develops spatial climate datasets to reveal short- and long-term climate patterns. We use a dataset of monthly average temperature and precipitation at a resolution of 800m x 800m. These

[3] https://prism.oregonstate.edu/

datasets' spatial resolution allow us to identify microclimates at a high spatial resolution within San Francisco and identify how these microclimates affect water use.

From the assessor's parcel data, we can match each account up with the land-use category of the property on which it lies. The ABAG Plan Bay Area forecasts the total employment between 2005 and 2045 within each TAZ (transportation assessment zone), a unit of geography about the size of a zip-code. Within each TAZ, Plan Bay Area forecasts employment in each of five sectors: 1) Retail / Restaurants; 2) Financial and Professional Services; 3) Health, Education and Recreational Services; 4) Manufacturing, Wholesale Trade and Transportation; and 5) Other Categories.

Consumption data is also matched to past rate data and forecasted future rate increases out to 2045, which were provided to us by the finance department at SFPUC. All of the rates in our data are adjusted for inflation to 2020 dollars using CPI data from the St. Louis Federal Reserve's Economic Data (FRED).

2. Remove Water Conservation Policy from Raw Data

In addition to these fundamental determinants, we also explicitly adjust the forecast demand based on expected future water conservation from active water conservation programs run by SFPUC and from non-potable and onsite water reuse programs. This approach of explicitly accounting for active conservation programs in demand forecasts has been advocated as best practice by local researchers and advocacy groups[4]. However, explicitly adjusting for water conservation introduces some challenges into the demand estimation process. Specifically, care needs to be taken not to double-count savings from conservation programs with consumers' responses to rates, drought and climate. To do this, we adjust our historical data, by adding back in the savings that SFPUC estimates have been generated as a result of their active conservation programs. Savings for water conservation are calculated at an aggregate level, but we split these savings down to the household level by calculating the share of conservation attributable to each household and adding these savings back onto each household's daily water use.[5]

4 Diringer, Sarah E., Heather Cooley, Matthew Heberger, Rapichan Phurisamban, Andrea Turner, John McKibbin, and Mary Ann Dickinson. 2018. Integrating Water Efficiency Standards and Codes into Long-Term Demand Forecasting. Water Research Foundation.

Abraham, Sonali, Sarah Diringer, and Heather Cooley. 2020. An Assessment of Urban Water Demand Forecasts in California. Oakland, Calif.: Pacific Institute.

5 Although we make explicit adjustments for active water conservation programs, demand for which is driven my SFPUC outreach, we do not make a similar adjustment for passive water saving. Passive water savings are primarily driven consumers' changing their water consumption behavior to in response to changes in rates, and so are implicitly accounted for in our demand elasticity estimates. Including an explicit adjustment for these savings would risk double-counting and underestimating future water use.

After adding these savings back in, we arrive at an estimate of "pre-conservation" demand, which describes what demand would have been but-for SFPUC's conservation programs. We estimate our statistical demand model and predict demand based on this "pre-conservation" data.

Future demand reduction as a result of onsite water reuse systems was also incorporated into the multi-family and commercial sector models. Estimates of future reductions were provided by SFPUC staff and were subtracted off the raw demand forecasts. In the last step of our analysis, we add back in thedr active conservation savings and savings from reuse and non-potable water programs to generate the final demand estimate.

B. Econometric Model

To predict how water demand in SFPUC's retail service area will change over time, it is necessary to estimate a relationship between water use and the demand factors used in this analysis (e.g., rates and climate). Generally, water use and water price are negatively correlated. In other words, as water becomes more expensive, users will reduce their demands to offset the higher costs. As temperature increases or precipitation decreases, water demand is expected to increase.

For each account, we estimate the relationship between water use and these demand factors using a regression analysis with account-level fixed effects. In a regression analysis, changes in the explanatory variable, customer water use, are explained by the dependent variables, such as rates, climate, and macro-economic factors. In a regression with account-level fixed effects, we also control for the average level of water consumption for every premise in the retail service area. All explanatory variables in our empirical model are estimated in natural logarithms, which allows us to interpret their corresponding regression coefficients as elasticities.

An elasticity is the relationship between a variable, such as price, and water demand, which is calculated and interpreted as the percent change in water demand for a given percent change in the variable, water price. For example, a price elasticity of -0.2 implies that users reduce water demand by 0.2% for each 1% increase in price. We estimate similar elasticities with respect to elements of weather and climate such as temperature and precipitation. These elasticities can be used to estimate the impact of anticipated future climate change.

To estimate demand for single-family and multi-family water use, we estimate the follow equation, for multi-family homes q_{it} is the average water use per unit.

$$\ln(q_{it}) = \ln(rate_t)\beta^{rate} + \ln(temp_{it})\beta^{temp} + \ln(ppt_{it})\beta^{ppt} + \gamma^{COVID} + \gamma^{drght} + \gamma_i + \varepsilon_{it}$$

Where, the dependent variable, $\ln(q_{it})$, is the natural logarithm of household i's pre-conservation water consumption in month t. Dependent Variables:

- **Monthly Rate $rate_t$:** The volumetric rate paid by households in each month.
- **Weather $temp_{it}$** and **ppt_{it}:** We obtain panel of modelled 800m x 800m climate characteristics from PRISM[6]. We control for each months' average precipitation and mean temperature.
- **Drought and COVID-19 Emergencies γ^{drght} and γ^{COVID}:** We include fixed effects, dummy variables which take on the value 0 or 1, during the 2015 to 16 drought, and during the COVID-19 pandemic beginning March 2020. These coefficient estimates on these dummy variables can be interpreted as the average change in the natural logarithm of water use during periods of drought and COVID-19, relative to periods without these factors.
- **Individual Fixed Effects γ_i:** Using this high-resolution data, we can control for the average level of water use for each account in our data. Controlling for the average level of our water use within each household allows us to estimate how an individual account responds to changes in rates, rather than identifying our estimates based on a cross-sectional difference in water consumption.
- **Idiosyncratic error term ε_{it}**: This term is standard in statistical regression analysis and is used to rationalize unexplained variation in the model. The model coefficients β are chosen to minimize the idiosyncratic error. The variance of ε_{it} is a key factor that is used to calculate the 95% confidence interval that characterizes the uncertainty associated with the model's parameters estimates β. We adopt two-way cluster-robust method, clustered at the census block-group and year level to account for unexplained correlations in water use either within years or within neighborhoods.

To estimate demand for commercial and industrial accounts we use the following equation:

$$\ln(q_{ijt}) = \ln(rate_t)\beta_j^{rate} + \ln(temp_{it})\beta^{temp} + \ln(ppt_{it})\beta^{ppt} + \gamma_j^{COVID} + \gamma^{drght} + \gamma_i + \varepsilon_{it}$$

This specification is the same as for the residential model, except the key differences is that the parameter estimates for rates β_j^{rate} and for COVID-19 γ_j^{COVID} are allowed to vary by land-use with a different parameter being chosen in each different type of land-use in the commercial and industrial sector.

C. Forecast Data

1. Forecast Assumptions

Table 2 and Table 3 summarize the assumptions that we adopt in our forecast. Assumptions about growth in the number of single-family and multi-family units comes from the San Francisco Planning Department. Assumptions for the number of employees are from the Plan Bay Area out to the year 2045. Assumptions about future climate are based on the average of outcomes across multiple

[6] PRISM Climate Group, Oregon State University, http://prism.oregonstate.edu, accessed 20 October 2020.

profession elicitations and climate change models specific to the San Francisco Peninsula considered by SFPUC's Long Term Vulnerability Assessment.

For each existing account, we then forecast demand from 2020 to 2045 based on the historical aggregate water use for each account, and expected future changes in rates and climate. Our forecasts assume that by 2045 water rates increase by 50% in real terms; that average temperatures in San Francisco increase 1.1^{o}C, and that precipitation is unchanged.

In addition to our central climate forecast, we also tested the robustness of our results to two alternative climate-change scenarios. In footnotes, we have reported the unadjusted baseline demand per-unit, noting that these alternative scenarios did not substantially change the results.[7]

In addition to forecasting demand for existing accounts, we also need to account for growth from new accounts, including newly constructed multifamily units and employment growth in the non-residential sector. The forecast incorporates approximately 5,100 new multiple-family residential units each year with a simulation that assumes that newly built buildings have the same number of units and per-unit level of consumption as similar existing buildings that have been recently built since 1990. This approach implicitly assumes that these new multifamily units adopt the current standards in water-efficient plumbing fixtures. The forecast incorporates employment growth of approximately 5,100 jobs per year, split across five different land-use types[8]. The forecast assumes that new commercial and industrial accounts have the same water use patterns as similarly sized existing firms with the same land-use category.

[7] Specifically, we considered a "hot and dry" scenario, in which temperatures increase by 1.7 degrees Celsius and precipitation declines by 8.3% in 2045 relative to relative to 2020, and a "wet and slower warming" scenario where average temperatures increases by only 0.5 degrees Celsius and precipitation increases by 8.3% in 2045 relative to 2020. These scenarios reflect the expected range in climate trends, but do not reflect the expected range of year-to-year weather fluctuations.

[8] Employment forecasts and the five different types of land-use categories come from the Plan Bay Area produced by the Association of Bay Area Governments. The five different types of land-use are: Office/Professional; Health/Education/Recreation; Manufacturing/Wholesale; Retail/Restaurants; and Other.

TABLE 2: FORECAST ASSUMPTIONS – HOUSING UNIT AND EMPLOYMENT GROWTH

		FY2019-20 (Actual)	FY2019-20 (Forecast)	FY2024-25	FY2029-30	FY2034-35	FY2039-40	FY2044-45
No. Housing Units	Single-Family Residential	124,186	124,186	124,186	124,186	124,186	124,186	124,186
	Multi-Family Residential	275,127	275,127	300,932	326,737	352,542	378,347	404,152
	Total	399,313	399,313	425,118	450,923	476,728	502,533	528,338
No. Employees	Office/Professional	304,250	304,250	321,496	338,741	349,153	369,063	388,973
	Health/Education/Recreation	225,061	225,061	232,894	240,727	244,797	249,917	255,037
	Manufacturing/Wholesale	32,763	32,763	31,404	30,045	27,774	25,532	23,290
	Retail	50,541	50,541	52,208	53,875	54,979	56,479	57,979
	Other	160,952	160,952	164,819	168,686	169,471	170,885	172,299
	Total	773,567	773,567	802,821	832,074	846,174	871,876	897,578

TABLE 3: FORECAST ASSUMPTIONS - COVARIATES

	FY2019-20 (Actual)	FY2019-20 (Forecast)	FY2024-25	FY2029-30	FY2034-35	FY2039-40	FY2044-45
Average Real Marginal Rate (2020 Dollars / CCF)	9.2	9.2	12.1	13.6	14.0	14.0	14.0
Monthly Average Temperature (°C)	14.9	15.3	15.5	15.8	16.0	16.2	16.4
Monthly Average Precipitation (mm)	27.3	49.9	49.9	49.9	49.9	49.9	49.9
COVID-19	34%	0%	0%	0%	0%	0%	0%
Drought	0%	0%	0%	0%	0%	0%	0%

2. Econometric Projections

The econometric model that we use in the single-family and multi-family sectors is estimated on a per-unit basis, and our forecasts are also on a per-unit basis. Characteristics and fixed-effects for existing accounts are estimated from our data. For new multi-family residential and commercial and industrial accounts, we simulate firm fixed-effects. Then based on these individual fixed effects we estimate individual level demand using the following equation:

$$\hat{q}_{it} = e^{\ln(rate_t)\beta^{rate} + \ln(temp_{it})\hat{\beta}^{temp} + \ln(ppt_{it})\hat{\beta}^{ppt} + \hat{\gamma}^{COVID} + \hat{\gamma}^{drght} + \hat{\gamma}_i}$$

Once we have calculated individual-level demand for each account, we calculate total demand by aggregating each of the individual estimates in our data:

$$\hat{Q}_t^{Raw} = \sum_i \hat{q}_{it}$$

3. Add Water Conservation Estimates and Other Demands back into Forecast

The final step of the forecasting process is to subtract the estimated savings from active conservation programs and non-potable / onsite reuse programs based on SFPUC's water conservation model and the

additional demand from other sectors not covered in our model, specifically residential and non-residential fire accounts, docks and ship accounts, builder/contractors accounts back into our model to calculate total consumption in each sector. The forecasts for these accounts are outside of our model and were developed in consultation with SFPUC. Note that this memo does not address other sectors of water use, including losses, irrigation accounts, municipal accounts and suburban retail accounts.

$$\hat{Q}_t^{Final} = \hat{Q}_t^{Raw} - Q^{Conservation} + Q^{Other}$$

II. Single-Family Residential Forecast

A. Model Estimates

Table 4 summarizes the estimates of the demand model for the single-family residential sector. The model has good fit to the data due to account-level fixed effects that adjust for the average level of water use of every household. Specifically, the model has an R-squared of 0.72, implying that our estimate explains 72% of the total variation in demand.

Across all units in the sample, we estimate a price-elasticity of demand of -0.14. This elasticity implies that a 10% increase in rates will lead to a 1.4% reduction in demand. This estimate is statistically significant and has a confidence interval from -0.26 to -0.02. Note that SFPUC charges two tiers of variable rates and a fixed rate. The demand elasticity estimate is with respect to the two-tiers of rates variable rates but not the fixed rate. We estimate an elasticity of demand with respect to temperature of 0.13 and with respect to precipitation of -0.008. This estimate implies that a 10% increase in average temperature will lead to a 1.3% increase in demand, and that a 10% increase in precipitation will lead to a 0.08% decrease in demand. These estimates are also both statistically significant.

We estimate that the 2014-15 drought caused a 9% decline in demand for residential water use and that the COVID-19 pandemic caused a 12% increase in demand for residential water use.

TABLE 4: MODEL ESTIMATES – SINGLE-FAMILY RESIDENTIAL SECTOR

	Coefficient	95% Confidence Interval	Change in Consumption from 10% Predictor Change
log(Marginal Rates)	-0.14	[-0.26, -0.02]	-1.4%
log(Temperature)	0.13	[0.08, 0.18]	1.3%
log(Precipitation)	-0.008	[-0.01, -0.005]	-0.08%
			Change in Consumption from Predictor Event
COVID-19 (Starting 3/20)	0.09	[0.08, 0.10]	9.3%
Drought (Starting 4/14)	-0.13	[-0.21, -0.06]	-12.4%
Account Fixed-Effects	Yes		
R-squared	0.72		

B. Demand Forecast

Table 5: Demand Forecast - Single-Family Residential Sector summarizes our demand forecast for the single-family residential sector. Between today and FY2044-45, SFPUC does not forecast any growth in the existing stock of 124,186 single-family residential units in San Francisco. The forecast is calibrated to match total family single-family residential consumption in FY2019-20, which was 14.45 MGD or 116.4 gal/day for each unit. However, when we adjust prediction to remove the estimated impacts of COVID-19 and the relatively hot and dry weather in that year, we find that demand would have been slightly lower had 2019-20 been a `normal` year, with total consumption of 14.32 MGD or 115.3 gal/unit each day. Due to increasing rates and average temperatures, per-unit demand is forecast to decrease from 14.32 MGD or 115.3 gal/day per unit in FY2019-20 to 13.65 MGD or a daily 109.9 gal/unit in FY2044-45[9]. SFPUC's conservation model forecasts that active SFPUC conservation programs will lead to an estimated reduction in the total demand for water of 0.22 MGD or 0.9 gal/unit daily by 2045. After accounting for these conservation savings, our total demand is forecast to decrease to 13.54 MGD or 109.1 gal/unit daily in FY2044-45.

[9] We also forecast demand under two alternative climate scenarios: in the "hot and dry" scenario, we estimate unadjusted baseline demand per-unit of 110.3 gal/unit in 2045. In the "wet and slower warming" scenario, we estimate unadjusted baseline demand per-unit of 109.8 gal/unit in 2045.

TABLE 5: DEMAND FORECAST - SINGLE-FAMILY RESIDENTIAL SECTOR

	FY2019-20 (Actual)	FY2019-20 (Forecast)	FY2024-25	FY2029-30	FY2034-35	FY2039-40	FY2044-45
Number of Units	124,186	124,186	124,186	124,186	124,186	124,186	124,186
Residents per Unit	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Avg. Consumption per Capita (gal / day)							
Baseline Demand per Unit	50.6	50.1	48.4	47.7	47.6	47.7	47.8
Conservation - Active	-	-	-0.5	-0.6	-0.6	-0.5	-0.4
Demand per Capita	50.6	50.1	47.9	47.1	47.0	47.2	47.4
Avg. Consumption per Unit (gal / day)							
Baseline Demand per Unit	116.4	115.3	111.4	109.8	109.5	109.7	109.9
Conservation - Active	-	-	-1.2	-1.4	-1.4	-1.1	-0.9
Demand per Unit	116.4	115.3	110.1	108.3	108.2	108.7	109.1
Total Consumption (MGD)							
Baseline Demand	14.45	14.32	13.83	13.63	13.60	13.63	13.65
Conservation - Active	-	-	-0.15	-0.18	-0.17	-0.13	-0.11
Total Demand	14.45	14.32	13.68	13.45	13.43	13.49	13.54

III. Multiple-Family Residential Demand Forecast

A. Model Estimates

Table 6 summarizes the estimates of the demand model for the multiple-family residential sector. Note that forecasts are made on a per-unit rather than per-account basis, this distinction is important in the multiple-family rsidential sector, where many accounts serve multiple units. The model has good fit to the data due with an R-squared of 0.75, implying that our estimate explains 75% of the total variation in demand.

Across all units in the sample, we estimate a price-elasticity of demand of -0.2. This elasticity implies that a 10% increase in rates will lead to a 2.0% reduction in demand. This estimate is statistically significant and has a confidence interval from -0.30 to -0.10. Note that SFPUC charges two tiers of variable rates and a fixed rate. The demand elasticity estimate is with respect to the two-tiers of rates variable rates but not the fixed rate. We estimate an elasticity of demand with respect to temperature of 0.09 and with respect to precipitation of -0.002. This estimate implies that a 10% increase in average temperature will lead to a 0.9% increase in demand, and that a 10% increase in precipitation will lead to a 0.02% decrease in demand.

We find that drought caused a decline in water use of 7.4% and that the COVID-19 pandemic caused an increase in water use of 5.8%.

TABLE 6: MODEL ESTIMATES - MULTIPLE-FAMILY RESIDENTIAL SECTOR

	Coefficient	95% Confidence Interval	Change in Consumption from 10% Predictor Change
log(Marginal Price)	-0.20	[-0.30, -0.10]	-2.0%
log(Temperature)	0.09	[0.06, 0.12]	0.9%
log(Precipitation)	-0.002	[-0.004, -0.001]	0.0%
			Change in Consumption from Predictor Event
COVID-19 (Starting 3/20)	0.06	[0.05, 0.07]	5.8%
Drought (Starting 4/14)	-0.08	[-0.13, -0.02]	-7.4%
Account Fixed-Effects	Yes		
R-squared	0.75		

B. Demand Forecast

Table 7 summarizes the multi-family residential demand forecast. The San Francisco Planning Department forecasts significant growth in the stock of multi-family residential units in San Francisco at a rate of approximately 5,100 units per year from 275,000 units in FY2019-20 to 404,000 units in FY2044-45.

The forecast is calibrated to match total multi-family residential consumption in FY2019-20, which was 22.9 MGD or 83.3 gal/day for each unit.[10] However, when we adjust our estimate to consider a typical year, removing the impacts of COVID-19 and the relatively hot and dry weather in that year, we find that demand would have been slightly lower, a total of 22.5 MGD or a daily 81.7 gal/unit. Increasing rates will push consumption down, and increasing average temperatures which will drive consumption up. Consumption will also be affected by the composition of dwellings, with newly build units on average consuming more water than older ones. On net, per-unit demand is forecast to increase from 81.7 gal/day per unit in 2019-20 to 84.1 gal/unit primarily driven by higher per-unit consumption in new

[10] This total demand number includes combination residential and fire accounts.

buildings[11]. Due to the significant growth in the number of units, total consumption is forecast to increase from 22.5 MGD to 34.0 MGD. SFPUC's conservation model also forecasts that there will be a reduction in water use as a result of active SFPUC conservation programs, and the implementation of onsite reuse systems. These conservation programs are expected to account for a total of 1.0 MGD or 2.4 gal/unit daily by FY2044-45. After accounting for conservation savings, total demand is forecast to be 33.0 MGD or 81.7 gal/unit daily in FY2044-45.

TABLE 7: DEMAND FORECAST – MULTIPLE-FAMILY RESIDENTIAL SECTOR

	FY2019-20 (Actual)	FY2019-20 (Forecast)	FY2024-25	FY2029-30	FY2034-35	FY2039-40	FY2044-45
Number of Units	275,127	275,127	300,932	326,737	352,542	378,347	404,152
Residents per Unit	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Avg. Consumption per Capita (gal / day)							
Unadjusted Baseline Demand	36.2	35.5	34.7	34.8	35.3	36.0	36.6
Conservation: *Active*	-	-	-0.2	-0.3	-0.2	-0.1	-0.1
Non-Potable / Onsite Reuse	-0.1	-0.1	-0.3	-0.5	-0.8	-1.0	-1.0
Demand per Capita	36.1	35.4	34.2	34.0	34.3	34.8	35.5
Avg. Consumption per Unit (gal / day)							
Unadjusted Baseline Demand	83.3	81.7	79.8	80.0	81.3	82.8	84.1
Conservation: *Active*	-	-	-0.5	-0.6	-0.5	-0.3	-0.1
Non-Potable / Onsite Reuse	-0.3	-0.3	-0.7	-1.1	-1.8	-2.4	-2.3
Demand per Unit	83.0	81.4	78.7	78.3	79.0	80.1	81.7
Total Consumption (MGD)							
Unadjusted Baseline Demand	22.9	22.5	24.0	26.1	28.7	31.3	34.0
Conservation: *Active*	-	-	-0.1	-0.2	-0.2	-0.1	-0.1
Non-Potable / Onsite Reuse	-0.1	-0.1	-0.2	-0.4	-0.6	-0.9	-0.9
Total Demand	22.8	22.4	23.7	25.6	27.8	30.3	33.0

IV. Commercial and Industrial Demand Forecast

A. Model Estimates

Table 8 summarizes the estimates of the demand model for the commercial and industrial sector. Note that we estimate a model on a per-unit account, but we present our results on a per-employee basis, as this is the input data into our forecast model. Due to the substantial heterogeneity in the commercial and industrial sectors, we estimate a model that allows for different types of land-use to be differentially responsive to changes in rates and COVID-19. Specifically, we estimate different

[11] We also forecast demand under two alternative climate scenarios: in the "hot and dry" scenario, we estimate unadjusted baseline demand per-unit of 84.0 gal/unit in 2045. In the "wet and slower warming" scenario, we estimate unadjusted baseline demand per-unit of 84.3 gal/unit in 2045.

coefficients for different types of land-use. The model has good fit to the data due with an R-squared of 0.88 implying that our estimate explains 88% of the total variation in demand.

We estimate five price elasticities, which vary from -0.14 in the manufacturing/wholesale sector to -0.3 in the health/education/retail sector. These elasticities imply that a 10% increase in rates will lead to a reduction in demand of between 1.4 and 3.0 percent. We estimate that these demand elasticities are statistically significant in the Office / Professional, Health/Education/Recreation, and Other sectors, but not in the Retail and Manufacturing/Wholesale sectors[12]. We estimate an elasticity of demand with respect to temperature of 0.14 and with respect to precipitation of -0.002. This estimate implies that a 10% increase in average temperature will lead to a 1.4% increase in demand, and that a 10% increase in precipitation will lead to a 0.02% decrease in demand.

We estimate that the COVID-19 pandemic caused a substantial reduction in demand across all sectors of commercial and industrial accounts. This reduction in demand was smallest in the Manufacturing/Wholesale and Retail/Restaurant sectors at -39.6% and -41.9% respectively, and it was largest in the Office/Professional, Health/Education/Recreation, and Other sectors at -53.6%, -49.7% and -56.5% respectively. We do not find that drought caused a statistically significant change in commercial and industrial consumption.

TABLE 8: MODEL ESTIMATES- COMMERCIAL AND INDUSTRIAL SECTOR

	Coefficient	95% Confidence Interval	Change in Consumption from 10% Predictor Change
log(Marginal Price) : Office/Professional	-0.19	[-0.33, -0.05]	-1.9%
log(Marginal Price) : Health/Education/Recreation	-0.30	[-0.42, -0.17]	-3.0%
log(Marginal Price) : Manufacturing/Wholesale	-0.14	[-0.32, 0.04]	-1.4%
log(Marginal Price) : Retail	-0.19	[-0.50, 0.12]	-1.9%
log(Marginal Price) : Other	-0.22	[-0.35, -0.09]	-2.2%
log(Temperature)	0.14	[0.09, 0.18]	1.4%
log(Precipitation)	-0.002	[-0.003, -0.001]	0.0%
			Change in Consumption from Predictor Event
COVID-19 (Starting 3/20) : Office/Professional	-0.77	[-0.83, -0.71]	-53.6%
COVID-19 (Starting 3/20) : Health/Education/Recreation	-0.69	[-0.71, -0.66]	-49.7%
COVID-19 (Starting 3/20) : Manufacturing/Wholesale	-0.50	[-0.53, -0.48]	-39.6%
COVID-19 (Starting 3/20) : Retail	-0.54	[-0.61, -0.48]	-41.9%
COVID-19 (Starting 3/20) : Other	-0.83	[-0.86, -0.80]	-56.5%
Drought (Starting 4/14)	0.004	[-0.05, 0.05]	0.4%
Account Fixed-Effects	Yes		
R-squared	0.88		

[12] Our estimates are deemed be statistically significant if the estimated 95% confidence interval does not include zero. If the estimated 95% confidence interval does include zero, the estimates are considered to not be statistically significant. Note that to obtain the best fitting model, we include all variables in our forecasts regardless of whether or not they are statistically significant.

B. Demand Forecast

Table 9 summarizes the commercial and industrial demand forecast. The San Francisco Planning Department forecasts that the City will experience significant employment growth, of approximately 5,100 jobs per year, from 774,000 jobs in FY2019-20 to 898,000 jobs in FY2044-45.

The forecast is calibrated to match total multiple-family residential consumption in FY2019-20, which was 14.7 MGD or 19.0 gal/day for each employee. However, when we adjust our estimate to consider a typical year, removing the impacts of COVID-19 and the relatively hot and dry weather in that year, we find that demand would have been significantly higher, a total of 17.8 MGD or a daily 23.0 gal/employee. Per-employee demand is forecast to decrease from 23.0 gal/day per employee in 2019-20 to 20.5 gal/employee, driven primarily by increasing rates, and slightly offset by increasing temperatures[13]. However due to the significant growth in the number of employees, total consumption is forecast to increase from 17.8 MGD to 18.4 MGD. SFPUC's conservation model also forecasts that there will be a significant reduction in water use as a result of active SFPUC conservation programs and adoption of non-potable water and onsite reuse programs. These conservation programs are expected to reduce total water-use by 0.6 MGD or 0.7 gal/employee daily by FY2044-45. After accounting for conservation savings, total demand is forecast to be approximately flat, finishing at 17.8 MGD gal/employee daily in FY2044-45.

TABLE 9: DEMAND FORECAST - COMMERCIAL AND INDUSTRIAL SECTOR

	FY2019-20 (Actual)	FY2019-20 (Forecast)	FY2024-25	FY2029-30	FY2034-35	FY2039-40	FY2044-45
Number of Employees	773,567	773,567	802,821	832,074	846,174	871,876	897,578
Avg. Consumption per Employee (gal / day)							
Unadjusted Baseline Demand	19.0	23.0	21.5	20.8	20.7	20.6	20.5
Conservation: *Active*	0.0	0.0	-0.4	-0.4	-0.4	-0.3	-0.3
Non-Potable / Onsite Reuse	0.0	0.0	-0.1	-0.2	-0.3	-0.4	-0.4
Total Demand	19.0	23.0	21.0	20.3	20.0	19.8	19.8
Total Consumption (MGD)							
Unadjusted Baseline Demand	14.7	17.8	17.3	17.3	17.5	17.9	18.4
Conservation: *Active*	0.0	0.0	-0.3	-0.3	-0.3	-0.3	-0.2
Non-Potable / Onsite Reuse	0.0	0.0	-0.1	-0.2	-0.3	-0.4	-0.4
Total Demand	14.7	17.8	16.9	16.9	16.9	17.3	17.8

[13] We also forecast demand under two alternative climate scenarios: in the "hot and dry" scenario, we estimate unadjusted baseline demand per-unit of 20.6 gal/unit in 2045. In the "wet and slower warming" scenario, we estimate unadjusted baseline demand per-unit of 20.5 gal/unit in 2045.

APPENDIX F

In-City Retail Water Audit Worksheet (Draft)

JUNE 2021

2020 URBAN WATER MANAGEMENT PLAN

for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco Water Power Sewer

Services of the San Francisco Public Utilities Commission

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AWWA Free Water Audit Software v5.0

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This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format, and is not meant to take the place of a full-scale, comprehensive water audit format.

Auditors are strongly encouraged to refer to the most current edition of AWWA M36 Manual for Water Audits for detailed guidance on the water auditing process and targetting loss reduction levels

The spreadsheet contains several separate worksheets. Sheets can be accessed using the tabs towards the bottom of the screen, or by clicking the buttons below.

Please begin by providing the following information

Name of Contact Person:	Chris Hewes
Email Address:	chewes@sfwater.org
Telephone | Ext.:	4153213422
Name of City / Utility:	San Francisco Public Utilities Commission
City/Town/Municipality:	San Francisco
State / Province:	California (CA)
Country:	USA
Year:	2020 Financial Year
Start Date:	07/2019 Enter MM/YYYY numeric format
End Date:	06/2020 Enter MM/YYYY numeric format
Audit Preparation Date:	12/1/2020
Volume Reporting Units:	Million gallons (US)
PWSID / Other ID:	3810011

The following guidance will help you complete the Audit

All audit data are entered on the ***Reporting Worksheet***

- Value can be entered by user
- Value calculated based on input data
- These cells contain recommended default values

Use of Option (Radio) Buttons: Pcnt: 0.25% Value:

Select the default percentage by choosing the option button on the left

To enter a value, choose this button and enter a value in the cell to the right

The following worksheets are available by clicking the buttons below or selecting the tabs along the bottom of the page

Instructions
The current sheet. Enter contact information and basic audit details (year, units etc)

Reporting Worksheet
Enter the required data on this worksheet to calculate the water balance and data grading

Comments
Enter comments to explain how values were calculated or to document data sources

Performance Indicators
Review the performance indicators to evaluate the results of the audit

Water Balance
The values entered in the Reporting Worksheet are used to populate the Water Balance

Dashboard
A graphical summary of the water balance and Non-Revenue Water components

Grading Matrix
Presents the possible grading options for each input component of the audit

Service Connection Diagram
Diagrams depicting possible customer service connection line configurations

Definitions
Use this sheet to understand the terms used in the audit process

Loss Control Planning
Use this sheet to interpret the results of the audit validity score and performance indicators

Example Audits
Reporting Worksheet and Performance Indicators examples are shown for two validated audits

Acknowledgements
Acknowledgements for the AWWA Free Water Audit Software v5.0

If you have questions or comments regarding the software please contact us via email at: wlc@awwa.org

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association.
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? Click to access definition
+ Click to add a comment

Water Audit Report for: San Francisco Public Utilities Commission (3810011)
Reporting Year: 2020 | 7/2019 - 6/2020

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: MILLION GALLONS (US) PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

<---------- Enter grading in column 'E' and 'J' ----------> | Master Meter and Supply Error Adjustments

WATER SUPPLIED

					Pcnt:	Value:	
Volume from own sources:	10	23,139.650	MG/Yr	8		-49.147	MG/Yr
Water imported:	n/a	0.000	MG/Yr				MG/Yr
Water exported:	n/a	0.000	MG/Yr				MG/Yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 23,188.797 MG/Yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:	
Billed metered:	9	20,229.578	MG/Yr			
Billed unmetered:	n/a	0	MG/Yr			
Unbilled metered:	10	260.321	MG/Yr			
Unbilled unmetered:	8	70.753	MG/Yr		70.753	MG/Yr

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION: ? 20,560.652 MG/Yr

WATER LOSSES (Water Supplied - Authorized Consumption) 2,628.145 MG/Yr

Apparent Losses

				Pcnt:	Value:	
Unauthorized consumption:	6	28.986	MG/Yr		28.986	MG/Yr
Customer metering inaccuracies:	7	391.905	MG/Yr		391.905	MG/Yr
Systematic data handling errors:	9	12.806	MG/Yr		12.806	MG/Yr

Apparent Losses: ? 433.698 MG/Yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? 2,194.447 MG/Yr

WATER LOSSES: 2,628.145 MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: ? 2,959.219 MG/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	1,275.2	miles
Number of active AND inactive service connections:	9	179,156	
Service connection density:		140	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: + ? (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure: + ? 7 76.1 psi

COST DATA

Total annual cost of operating water system:	10	$379,126,174	$/Year	
Customer retail unit cost (applied to Apparent Losses):	10	$21.13	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	5	$294.10	$/Million gallons	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 89 out of 100 ***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Variable production cost (applied to Real Losses)
2: Customer metering inaccuracies
3: Unauthorized consumption

AWWA Free Water Audit Software:
System Attributes and Performance Indicators

WAS v5.0
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Water Audit Report for: San Francisco Public Utilities Commission (3810011)
Reporting Year: 2020 | 7/2019 - 6/2020

*** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 89 out of 100 ***

System Attributes:

	Apparent Losses:	433.698	MG/Yr
+	Real Losses:	2,194.447	MG/Yr
=	Water Losses:	2,628.145	MG/Yr
?	Unavoidable Annual Real Losses (UARL):	938.07	MG/Yr
	Annual cost of Apparent Losses:	$12,250,527	
	Annual cost of Real Losses:	$645,387	Valued at Variable Production Cost

Return to Reporting Worksheet to change this assumpiton

Performance Indicators:

Financial:	Non-revenue water as percent by volume of Water Supplied:	12.8%	
	Non-revenue water as percent by cost of operating system:	3.4%	Real Losses valued at Variable Production Cost
Operational Efficiency:	Apparent Losses per service connection per day:	6.63	gallons/connection/day
	Real Losses per service connection per day:	33.56	gallons/connection/day
	Real Losses per length of main per day*:	N/A	
	Real Losses per service connection per day per psi pressure:	0.44	gallons/connection/day/psi
	From Above, Real Losses = Current Annual Real Losses (CARL):	2,194.45	million gallons/year
?	Infrastructure Leakage Index (ILI) [CARL/UARL]:	2.34	

* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline

AWWA Free Water Audit Software:
User Comments

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Use this worksheet to add comments or notes to explain how an input value was calculated, or to document the sources of the information used.

General Comment:	

Audit Item	Comment
Volume from own sources:	
Vol. from own sources: Master meter error adjustment:	
Water imported:	
Water imported: master meter error adjustment:	
Water exported:	
Water exported: master meter error adjustment:	
Billed metered:	
Billed unmetered:	
Unbilled metered:	

Audit Item	Comment
Unbilled unmetered:	
Unauthorized consumption:	
Customer metering inaccuracies:	
Systematic data handling errors:	
Length of mains:	
Number of active AND inactive service connections:	
Average length of customer service line:	
Average operating pressure:	
Total annual cost of operating water system:	
Customer retail unit cost (applied to Apparent Losses):	
Variable production cost (applied to Real Losses):	

AWWA Free Water Audit Software: Water Balance

WAS v5.0

American Water Works Association.

Water Audit Report for:	San Francisco Public Utilities Commission (3810011)
Reporting Year:	2020 — 7/2019 - 6/2020
Data Validity Score:	89

Own Sources (Adjusted for known errors)
23,188.797

Water Imported
0.000

System Input
23,188.797

Water Exported
0.000

Water Supplied
23,188.797

Authorized Consumption
20,560.652

Billed Authorized Consumption
20,229.578

Billed Water Exported
20,229.578

Billed Metered Consumption (water exported is removed)
20,229.578

Billed Unmetered Consumption
0.000

Unbilled Authorized Consumption
331.074

Unbilled Metered Consumption
260.321

Unbilled Unmetered Consumption
70.753

Water Losses
2,628.145

Apparent Losses
433.698

Unauthorized Consumption
28.986

Customer Metering Inaccuracies
391.905

Systematic Data Handling Errors
12.806

Real Losses
2,194.447

Leakage on Transmission and/or Distribution Mains
Not broken down

Leakage and Overflows at Utility's Storage Tanks
Not broken down

Leakage on Service Connections
Not broken down

Revenue Water
0.000

Revenue Water
20,229.578

Non-Revenue Water (NRW)
2,959.219

AWWA Free Water Audit Software:
Dashboard

WAS v5.0

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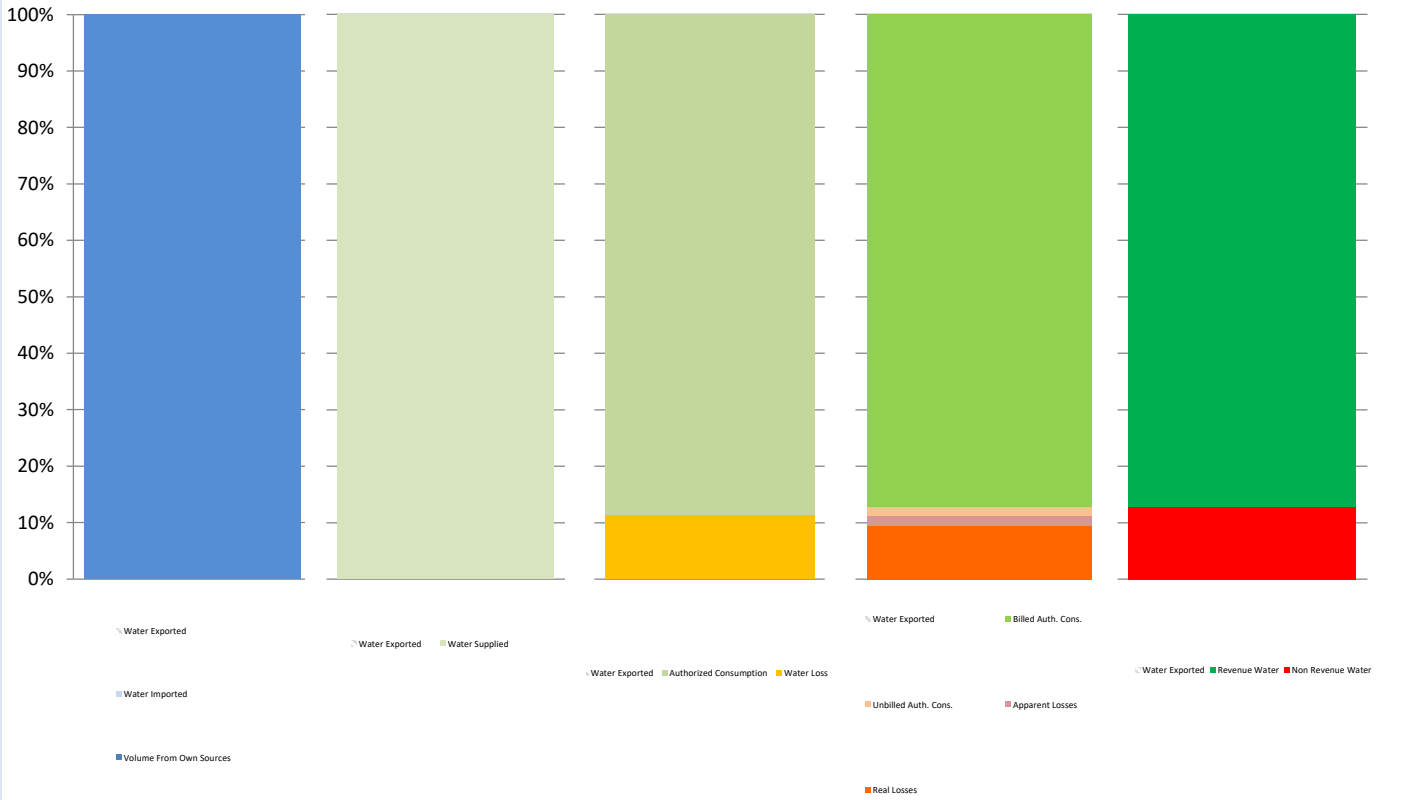
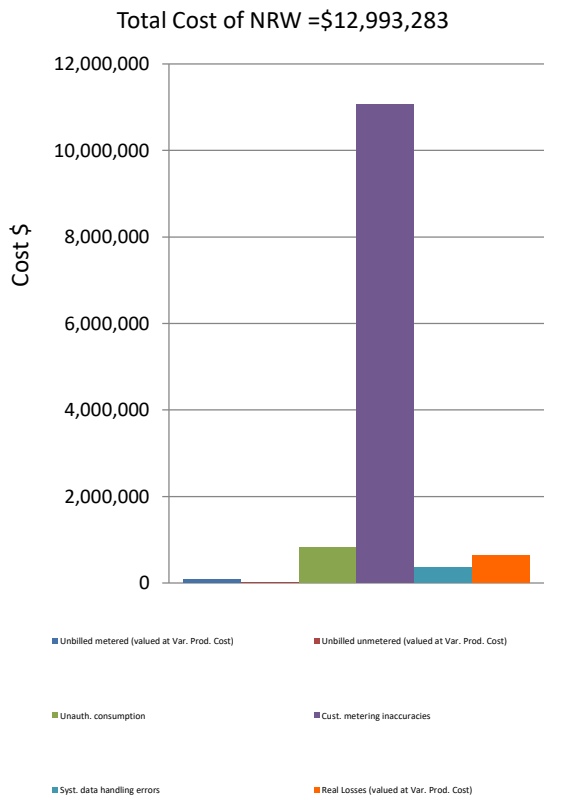
The graphic below is a visual representation of the Water Balance with bar heights propotional to the volume of the audit components

Water Audit Report for:	**San Francisco Public Utilities Commission (3810011)**	
Reporting Year:	**2020**	**7/2019 - 6/2020**
Data Validity Score:	**89**	

○ Show me the VOLUME of Non-Revenue Water

◉ Show me the COST of Non-Revenue Water





AWWA Free Water Audit Software: Grading Matrix

WAS 5.0

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The grading assigned to each audit component and the corresponding recommended improvements and actions are highlighted in yellow. Audit accuracy is likely to be improved by prioritizing those items shown in red

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
WATER SUPPLIED											
Volume from own sources:	Select this grading only if the water utility purchases/imports all of its water resources (i.e. has no sources of its own)	Less than 25% of water production sources are metered, remaining sources are estimated. No regular meter accuracy testing or electronic calibration conducted.	25% - 50% of treated water production sources are metered; other sources estimated. No regular meter accuracy testing or electronic calibration conducted.	Conditions between 2 and 4	50% - 75% of treated water production sources are metered, other sources estimated. Occasional meter accuracy testing or electronic calibration conducted.	Conditions between 4 and 6	At least 75% of treated water production sources are metered, or at least 90% of the source flow is derived from metered sources. Meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of treated water production sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually, with less than 10% found outside of +/- 3% accuracy. Procedures are reviewed by a third party knowledgeable in the M36 methodology.
Improvements to attain higher data grading for "Volume from own Sources" component:		to qualify for 2: Organize and launch efforts to collect data for determining volume from own sources	to qualify for 4: Locate all water production sources on maps and in the field, launch meter accuracy testing for existing meters, begin to install meters on unmetered water production sources and replace any obsolete/defective meters.		to qualify for 6: Formalize annual meter accuracy testing for all source meters; specify the frequency of testing. Complete installation of meters on unmetered water production sources and complete replacement of all obsolete/defective meters.		to qualify for 8: Conduct annual meter accuracy testing and calibration of related instrumentation on all meter installations on a regular basis. Complete project to install new, or replace defective existing, meters so that entire production meter population is metered. Repair or replace meters outside of +/- 6% accuracy.		to qualify for 10: Maintain annual meter accuracy testing and calibration of related instrumentation for all meter installations. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to further improve meter accuracy.		to maintain 10: Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.
Volume from own sources master meter and supply error adjustment:	Select n/a only if the water utility fails to have meters on its sources of supply	Inventory information on meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined	No automatic datalogging of production volumes; daily readings are scribed on paper records without any accountability controls. Flows are not balanced across the water distribution system: tank/storage elevation changes are not employed in calculating the "Volume from own sources" component and archived flow data is adjusted only when grossly evident data error occurs.	Conditions between 2 and 4	Production meter data is logged automatically in electronic format and reviewed at least on a monthly basis with necessary corrections implemented. "Volume from own sources" tabulations include estimate of daily changes in tanks/storage facilities. Meter data is adjusted when gross data errors occur, or occasional meter testing deems this necessary.	Conditions between 4 and 6	Hourly production meter data logged automatically & reviewed on at least a weekly basis. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and/or error is confirmed by meter accuracy testing. Tank/storage facility elevation changes are automatically used in calculating a balanced "Volume from own sources" component, and data gaps in the archived data are corrected on at least a weekly basis.	Conditions between 6 and 8	Continuous production meter data is logged automatically & reviewed each business day. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and/or results of meter accuracy testing. Tank/storage facility elevation changes are automatically used in "Volume from own sources" tabulations and data gaps in the archived data are corrected on a daily basis.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically balances flows from all sources and storages; results are reviewed each business day. Tight accountability controls ensure that all data gaps that occur in the archived flow data are quickly detected and corrected. Regular calibrations between SCADA and sources meters ensures minimal data transfer error.
Improvements to attain higher data grading for "Master meter and supply error adjustment" component:		to qualify for 2: Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature.	to qualify for 4: Install automatic datalogging equipment on production meters. Complete installation of level instrumentation at all tanks/storage facilities and include tank level data in automatic calculation routine in a computerized system. Construct a computerized listing or spreadsheet to archive input volumes, tank/storage volume changes and import/export flows in order to determine the composite "Water Supplied" volume for the distribution system. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps.		to qualify for 6: Refine computerized data collection and archive to include hourly production meter data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Use daily net storage change to balance flows in calculating "Water Supplied" volume. Necessary corrections to data errors are implemented on a weekly basis.		to qualify for 8: Ensure that all flow data is collected and archived on at least an hourly basis. All data is reviewed and detected errors corrected each business day. Tank/storage levels variations are employed in calculating balanced "Water Supplied" component. Adjust production meter data for gross error and inaccuracy confirmed by testing.		to qualify for 10: Link all production and tank/storage facility elevation change data to a Supervisory Control & Data Acquisition (SCADA) System, or similar computerized monitoring/control system, and establish automatic flow balancing algorithm and regularly calibrate between SCADA and source meters. Data is reviewed and corrected each business day.		to maintain 10: Monitor meter innovations for development of more accurate and less expensive flowmeters. Continue to replace or repair meters as they perform outside of desired accuracy limits. Stay abreast of new and more accurate water level instruments to better record tank/storage levels and archive the variations in storage volume. Keep current with SCADA and data management systems to ensure that archived data is well-managed and error free.
Water Imported:	Select n/a if the water utility's supply is exclusively from its own water resources (no bulk purchased/ imported water)	Less than 25% of imported water sources are metered, remaining sources are estimated. No regular meter accuracy testing.	25% - 50% of imported water sources are metered; other sources estimated. No regular meter accuracy testing.	Conditions between 2 and 4	50% - 75% of imported water sources are metered, other sources estimated. Occasional meter accuracy testing conducted.	Conditions between 4 and 6	At least 75% of imported water sources are metered, meter accuracy testing and/or electronic calibration of related instrumentation is conducted annually for all meter installations. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of imported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of imported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually for all meter installations, with less than 10% of accuracy tests found outside of +/- 3% accuracy.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Water Imported Volume" component: (*Note: usually the water supplier selling the water - "the Exporter" - to the utility being audited is responsible to maintain the metering installation measuring the imported volume. The utility should coordinate carefully with the Exporter to ensure that adequate meter upkeep takes place and an accurate measure of the Water Imported volume is quantified.*)		<u>to qualify for 2:</u> Review bulk water purchase agreements with partner suppliers; confirm requirements for use and maintenance of accurate metering. Identify needs for new or replacement meters with goal to meter all imported water sources.	<u>To qualify for 4</u>: Locate all imported water sources on maps and in the field, launch meter accuracy testing for existing meters, begin to install meters on unmetered imported water interconnections and replace obsolete/defective meters.		<u>to qualify for 6</u>: Formalize annual meter accuracy testing for all imported water meters, planning for both regular meter accuracy testing and calibration of the related instrumentation. Continue installation of meters on unmetered imported water interconnections and replacement of obsolete/defective meters.		<u>to qualify for 8</u>: Complete project to install new, or replace defective, meters on all imported water interconnections. Maintain annual meter accuracy testing for all imported water meters and conduct calibration of related instrumentation at least annually. Repair or replace meters outside of +/- 6% accuracy.		<u>to qualify for 10:</u> Conduct meter accuracy testing for all meters on a semi-annual basis, along with calibration of all related instrumentation. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to improve meter accuracy.		<u>to maintain 10</u>: Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Continue to conduct calibration of related instrumentation on a semi-annual basis. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.
Water imported master meter and supply error adjustment:	Select n/a if the Imported water supply is unmetered, with Imported water quantities estimated on the billing invoices sent by the Exporter to the purchasing Utility.	Inventory information on imported meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined Written agreement(s) with water Exporter(s) are missing or written in vague language concerning meter management and testing.	No automatic datalogging of imported supply volumes; daily readings are scribed on paper records without any accountability controls to confirm data accuracy and the absence of errors and data gaps in recorded volumes. Written agreement requires meter accuracy testing but is vague on the details of how and who conducts the testing.	Conditions between 2 and 4	Imported supply metered flow data is logged automatically in electronic format and reviewed at least on a monthly basis by the Exporter with necessary corrections implemented. Meter data is adjusted by the Exporter when gross data errors are detected. A coherent data trail exists for this process to protect both the selling and the purchasing Utility. Written agreement exists and clearly states requirements and roles for meter accuracy testing and data management.	Conditions between 4 and 6	Hourly Imported supply metered data is logged automatically & reviewed on at least a weekly basis by the Exporter. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and to correct for error confirmed by meter accuracy testing. Any data gaps in the archived data are detected and corrected during the weekly review. A coherent data trail exists for this process to protect both the selling and the purchasing Utility.	Conditions between 6 and 8	Continuous Imported supply metered flow data is logged automatically & reviewed each business day by the Exporter. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and/or results of meter accuracy testing. Any data errors/gaps are detected and corrected on a daily basis. A data trail exists for the process to protect both the selling and the purchasing Utility.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically records data which is reviewed each business day by the Exporter. Tight accountability controls ensure that all error/data gaps that occur in the archived flow data are quickly detected and corrected. A reliable data trail exists and contract provisions for meter testing and data management are reviewed by the selling and purchasing Utility at least once every five years.
Improvements to attain higher data grading for "Water imported master meter and supply error adjustment" component:		<u>to qualify for 2:</u> Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature. Review the written agreement between the selling and purchasing Utility.	<u>to qualify for 4</u>: Install automatic datalogging equipment on Imported supply meters. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps. Launch discussions with the Exporters to jointly review terms of the written agreements regarding meter accuracy testing and data management; revise the terms as necessary.		<u>to qualify for 6</u>: Refine computerized data collection and archive to include hourly Imported supply metered flow data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Make necessary corrections to errors/data errors on a weekly basis.		<u>to qualify for 8</u>: Ensure that all Imported supply metered flow data is collected and archived on at least an hourly basis. All data is reviewed and errors/data gaps are corrected each business day.		<u>to qualify for 10</u>: Conduct accountability checks to confirm that all Imported supply metered data is reviewed and corrected each business day by the Exporter. Results of all meter accuracy tests and data corrections should be available for sharing between the Exporter and the purchasing Utility. Establish a schedule for a regular review and updating of the contractual language in the written agreement between the selling and the purchasing Utility; at least every five years.		<u>to maintain 10</u>: Monitor meter innovations for development of more accurate and less expensive flowmeters; work with the Exporter to help identify meter replacement needs. Keep communication lines with Exporters open and maintain productive relations. Keep the written agreement current with clear and explicit language that meets the ongoing needs of all parties.
Water Exported:	Select n/a if the water utility sells no bulk water to neighboring water utilities (no exported water sales)	Less than 25% of exported water sources are metered, remaining sources are estimated. No regular meter accuracy testing.	25% - 50% of exported water sources are metered; other sources estimated. No regular meter accuracy testing.	Conditions between 2 and 4	50% - 75% of exported water sources are metered, other sources estimated. Occasional meter accuracy testing conducted.	Conditions between 4 and 6	At least 75% of exported water sources are metered, meter accuracy testing and/or electronic calibration conducted annually. Less than 25% of tested meters are found outside of +/- 6% accuracy.	Conditions between 6 and 8	100% of exported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted annually, less than 10% of meters are found outside of +/- 6% accuracy	Conditions between 8 and 10	100% of exported water sources are metered, meter accuracy testing and electronic calibration of related instrumentation is conducted semi-annually for all meter installations, with less than 10% of accuracy tests found outside of +/- 3% accuracy.
Improvements to attain higher data grading for "Water Exported Volume" component: (*Note: usually, if the water utility being audited sells (Exports) water to a neighboring purchasing Utility, it is the responsibility of the utility exporting the water to maintain the metering installation measuring the Exported volume. The utility exporting the water should ensure that adequate meter upkeep takes place and an accurate measure of the Water Exported volume is quantified.*)		<u>to qualify for 2:</u> Review bulk water sales agreements with purchasing utilities; confirm requirements for use & upkeep of accurate metering. Identify needs to install new, or replace defective meters as needed.	<u>To qualify for 4</u>: Locate all exported water sources on maps and in field, launch meter accuracy testing for existing meters, begin to install meters on unmetered exported water interconnections and replace obsolete/defective meters		<u>to qualify for 6</u>: Formalize annual meter accuracy testing for all exported water meters. Continue installation of meters on unmetered exported water interconnections and replacement of obsolete/defective meters.		<u>to qualify for 8</u>: Complete project to install new, or replace defective, meters on all exported water interconnections. Maintain annual meter accuracy testing for all exported water meters. Repair or replace meters outside of +/- 6% accuracy.		<u>to qualify for 10:</u> Maintain annual meter accuracy testing for all meters. Repair or replace meters outside of +/- 3% accuracy. Investigate new meter technology; pilot one or more replacements with innovative meters in attempt to improve meter accuracy.		<u>to maintain 10</u>: Standardize meter accuracy test frequency to semi-annual, or more frequent, for all meters. Repair or replace meters outside of +/- 3% accuracy. Continually investigate/pilot improving metering technology.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Water exported master meter and supply error adjustment:	Select n/a only if the water utility fails to have meters on its exported supply interconnections.	Inventory information on exported meters and paper records of measured volumes exist but are incomplete and/or in a very crude condition; data error cannot be determined Written agreement(s) with the utility purchasing the water are missing or written in vague language concerning meter management and testing.	No automatic datalogging of exported supply volumes; daily readings are scribed on paper records without any accountability controls to confirm data accuracy and the absence of errors and data gaps in recorded volumes. Written agreement requires meter accuracy testing but is vague on the details of how and who conducts the testing.	Conditions between 2 and 4	Exported metered flow data is logged automatically in electronic format and reviewed at least on a monthly basis, with necessary corrections implemented. Meter data is adjusted by the utility selling (exporting) the water when gross data errors are detected. A coherent data trail exists for this process to protect both the utility exporting the water and the purchasing Utility. Written agreement exists and clearly states requirements and roles for meter accuracy testing and data management.	Conditions between 4 and 6	Hourly exported supply metered data is logged automatically & reviewed on at least a weekly basis by the utility selling the water. Data is adjusted to correct gross error when meter/instrumentation equipment malfunction is detected; and to correct for error found by meter accuracy testing. Any data gaps in the archived data are detected and corrected during the weekly review. A coherent data trail exists for this process to protect both the selling (exporting) utility and the purchasing Utility.	Conditions between 6 and 8	Continuous exported supply metered flow data is logged automatically & reviewed each business day by the utility selling (exporting) the water. Data is adjusted to correct gross error from detected meter/instrumentation equipment malfunction and any error confirmed by meter accuracy testing. Any data errors/gaps are detected and corrected on a daily basis. A data trail exists for the process to protect both the selling (exporting) Utility and the purchasing Utility.	Conditions between 8 and 10	Computerized system (SCADA or similar) automatically records data which is reviewed each business day by the utility selling (exporting) the water. Tight accountability controls ensure that all error/data gaps that occur in the archived flow data are quickly detected and corrected. A reliable data trail exists and contract provisions for meter testing and data management are reviewed by the selling Utility and purchasing Utility at least once every five years.
Improvements to attain higher data grading for "Water exported master meter and supply error adjustment" component:		to qualify for 2: Develop a plan to restructure recordkeeping system to capture all flow data; set a procedure to review flow data on a daily basis to detect input errors. Obtain more reliable information about existing meters by conducting field inspections of meters and related instrumentation, and obtaining manufacturer literature. Review the written agreement between the utility selling (exporting) the water and the purchasing Utility.	to qualify for 4: Install automatic datalogging equipment on exported supply meters. Set a procedure to review this data on a monthly basis to detect gross anomalies and data gaps. Launch discussions with the purchasing utilities to jointly review terms of the written agreements regarding meter accuracy testing and data management; revise the terms as necessary.		to qualify for 6: Refine computerized data collection and archive to include hourly exported supply metered flow data that is reviewed at least on a weekly basis to detect specific data anomalies and gaps. Make necessary corrections to errors/data errors on a weekly basis.		to qualify for 8: Ensure that all exported metered flow data is collected and archived on at least an hourly basis. All data is reviewed and errors/data gaps are corrected each business day.		to qualify for 10: Conduct accountability checks to confirm that all exported metered flow data is reviewed and corrected each business day by the utility selling the water. Results of all meter accuracy tests and data corrections should be available for sharing between the utility and the purchasing Utility. Establish a schedule for a regular review and updating of the contractual language in the written agreements with the purchasing utilities; at least every five years.		to maintain 10: Monitor meter innovations for development of more accurate and less expensive flowmeters; work with the purchasing utilities to help identify meter replacement needs. Keep communication lines with the purchasing utilities open and maintain productive relations. Keep the written agreement current with clear and explicit language that meets the ongoing needs of all parties.
AUTHORIZED CONSUMPTION											
Billed metered:	n/a (not applicable). Select n/a only if the entire customer population is not metered and is billed for water service on a flat or fixed rate basis. In such a case the volume entered must be zero.	Less than 50% of customers with volume-based billings from meter readings; flat or fixed rate billing exists for the majority of the customer population	At least 50% of customers with volume-based billing from meter reads; flat rate billing for others. Manual meter reading is conducted, with less than 50% meter read success rate, remainding accounts' consumption is estimated. Limited meter records, no regular meter testing or replacement. Billing data maintained on paper records, with no auditing.	Conditions between 2 and 4	At least 75% of customers with volume-based, billing from meter reads; flat or fixed rate billing for remaining accounts. Manual meter reading is conducted with at least 50% meter read success rate; consumption for accounts with failed reads is estimated. Purchase records verify age of customer meters; only very limited meter accuracy testing is conducted. Customer meters are replaced only upon complete failure. Computerized billing records exist, but only sporadic internal auditing conducted.	Conditions between 4 and 6	At least 90% of customers with volume-based billing from meter reads; consumption for remaining accounts is estimated. Manual customer meter reading gives at least 80% customer meter reading success rate; consumption for accounts with failed reads is estimated. Good customer meter records eixst, but only limited meter accuracy testing is conducted. Regular replacement is conducted for the oldest meters. Computerized billing records exist with annual auditing of summary statistics conducting by utility personnel.	Conditions between 6 and 8	At least 97% of customers exist with volume-based billing from meter reads. At least 90% customer meter reading success rate; or at least 80% read success rate with planning and budgeting for trials of Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) in one or more pilot areas. Good customer meter records. Regular meter accuracy testing guides replacement of statistically significant number of meters each year. Routine auditing of computerized billing records for global and detailed statistics occurs annually by utility personnel, and is verified by third party at least once every five years.	Conditions between 8 and 10	At least 99% of customers exist with volume-based billing from meter reads. At least 95% customer meter reading success rate; or minimum 80% meter reading success rate, with Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) trials underway. Statistically significant customer meter testing and replacement program in place on a continuous basis. Computerized billing with routine, detailed auditing, including field investigation of representative sample of accounts undertaken annually by utility personnel. Audit is conducted by third party auditors at least once every three years.
Improvements to attain higher data grading for "Billed Metered Consumption" component:	If n/a is selected because the customer meter population is unmetered, consider establishing a new policy to meter the customer population and employ water rates based upon metered volumes.	to qualify for 2: Conduct investigations or trials of customer meters to select appropriate meter models. Budget funding for meter installations. Investigate volume based water rate structures.	to qualify for 4: Purchase and install meters on unmetered accounts. Implement policies to improve meter reading success. Catalog meter information during meter read visits to identify age/model of existing meters. Test a minimal number of meters for accuracy. Install computerized billing system.		to qualify for 6: Purchase and install meters on unmetered accounts. Eliminate flat fee billing and establish appropriate water rate structure based upon measured consumption. Continue to achieve verifiable success in removing manual meter reading barriers. Expand meter accuracy testing. Launch regular meter replacement program. Launch a program of annual auditing of global billing statistics by utility personnel.		to qualify for 8: Purchase and install meters on unmetered accounts. If customer meter reading success rate is less than 97%, assess cost-effectiveness of Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) system for portion or entire system; or otherwise achieve ongoing improvements in manual meter reading success rate to 97% or higher. Refine meter accuracy testing program. Set meter replacement goals based upon accuracy test results. Implement annual auditing of detailed billing records by utility personnel and implement third party auditing at least once every five years.		to qualify for 10: Purchase and install meters on unmetered accounts. Launch Automatic Meter Reading (AMR) or Advanced Metering Infrastructure (AMI) system trials if manual meter reading success rate of at least 99% is not achieved within a five-year program. Continue meter accuracy testing program. Conduct planning and budgeting for large scale meter replacement based upon meter life cycle analysis using cumulative flow target. Continue annual detailed billing data auditing by utility personnel and conduct third party auditing at least once every three years.		to maintain 10: Continue annual internal billing data auditing, and third party auditing at least every three years. Continue customer meter accuracy testing to ensure that accurate customer meter readings are obtained and entered as the basis for volume based billing. Stay abreast of improvements in Automatic Meter Reading (AMR) and Advanced Metering Infrastructure (AMI) and information management. Plan and budget for justified upgrades in metering, meter reading and billing data management to maintain very high accuracy in customer metering and billing.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Billed unmetered:	Select n/a if it is the policy of the water utility to meter all customer connections and it has been confirmed by detailed auditing that all customers do indeed have a water meter; i.e. no intentionally unmetered accounts exist	Water utility policy does not require customer metering; flat or fixed fee billing is employed. No data is collected on customer consumption. The only estimates of customer population consumption available are derived from data estimation methods using average fixture count multiplied by number of connections, or similar approach.	Water utility policy does not require customer metering; flat or fixed fee billing is employed. Some metered accounts exist in parts of the system (pilot areas or District Metered Areas) with consumption read periodically or recorded on portable dataloggers over one, three, or seven day periods. Data from these sample meters are used to infer consumption for the total customer population. Site specific estimation methods are used for unusual buildings/water uses.	Conditions between 2 and 4	Water utility policy does require metering and volume based billing in general. However, a liberal amount of exemptions and a lack of clearly written and communicated procedures result in up to 20% of billed accounts believed to be unmetered by exemption; or the water utility is in transition to becoming fully metered, and a large number of customers remain unmetered. A rough estimate of the annual consumption for all unmetered accounts is included in the annual water audit, with no inspection of individual unmetered accounts.	Conditions between 4 and 6	Water utility policy does require metering and volume based billing but established exemptions exist for a portion of accounts such as municipal buildings. As many as 15% of billed accounts are unmetered due to this exemption or meter installation difficulties. Only a group estimate of annual consumption for all unmetered accounts is included in the annual water audit, with no inspection of individual unmetered accounts.	Conditions between 6 and 8	Water utility policy does require metering and volume based billing for all customer accounts. However, less than 5% of billed accounts remain unmetered because meter installation is hindered by unusual circumstances. The goal is to minimize the number of unmetered accounts. Reliable estimates of consumption are obtained for these unmetered accounts via site specific estimation methods.	Conditions between 8 and 10	Water utility policy does require metering and volume based billing for all customer accounts. Less than 2% of billed accounts are unmetered and exist because meter installation is hindered by unusual circumstances. The goal exists to minimize the number of unmetered accounts to the extent that is economical. Reliable estimates of consumption are obtained at these accounts via site specific estimation methods.
Improvements to attain higher data grading for "Billed Unmetered Consumption" component:		to qualify for 2: Conduct research and evaluate cost/benefit of a new water utility policy to require metering of the customer population; thereby greatly reducing or eliminating unmetered accounts. Conduct pilot metering project by installing water meters in small sample of customer accounts and periodically reading the meters or datalogging the water consumption over one, three, or seven day periods.	to qualify for 4: Implement a new water utility policy requiring customer metering. Launch or expand pilot metering study to include several different meter types, which will provide data for economic assessment of full scale metering options. Assess sites with access difficulties to devise means to obtain water consumption volumes. Begin customer meter installation.		to qualify for 6: Refine policy and procedures to improve customer metering participation for all but solidly exempt accounts. Assign staff resources to review billing records to identify errant unmetered properties. Specify metering needs and funding requirements to install sufficient meters to significant reduce the number of unmetered accounts		to qualify for 8: Push to install customer meters on a full scale basis. Refine metering policy and procedures to ensure that all accounts, including municipal properties, are designated for meters. Plan special efforts to address "hard-to-access" accounts. Implement procedures to obtain a reliable consumption estimate for the remaining few unmetered accounts awaiting meter installation.		to qualify for 10: Continue customer meter installation throughout the service area, with a goal to minimize unmetered accounts. Sustain the effort to investigate accounts with access difficulties, and devise means to install water meters or otherwise measure water consumption.		to maintain 10: Continue to refine estimation methods for unmetered consumption and explore means to establish metering, for as many billed remaining unmetered accounts as is economically feasible.
Unbilled metered:	select n/a if all billing-exempt consumption is unmetered.	Billing practices exempt certain accounts, such as municipal buildings, but written policies do not exist; and a reliable count of unbilled metered accounts is unavailable. Meter upkeep and meter reading on these accounts is rare and not considered a priority. Due to poor recordkeeping and lack of auditing, water consumption for all such accounts is purely guesstimated.	Billing practices exempt certain accounts, such as municipal buildings, but only scattered, dated written directives exist to justify this practice. A reliable count of unbilled metered accounts is unavailable. Sporadic meter replacement and meter reading occurs on an as-needed basis. The total annual water consumption for all unbilled, metered accounts is estimated based upon approximating the number of accounts and assigning consumption from actively billed accounts of same meter size.	Conditions between 2 and 4	Dated written procedures permit billing exemption for specific accounts, such as municipal properties, but are unclear regarding certain other types of accounts. Meter reading is given low priority and is sporadic. Consumption is quantified from meter readings where available. The total number of unbilled, unmetered accounts must be estimated along with consumption volumes.	Conditions between 4 and 6	Written policies regarding billing exemptions exist but adherence in practice is questionable. Metering and meter reading for municipal buildings is reliable but sporadic for other unbilled metered accounts. Periodic auditing of such accounts is conducted. Water consumption is quantified directly from meter readings where available, but the majority of the consumption is estimated.	Conditions between 6 and 8	Written policy identifies the types of accounts granted a billing exemption. Customer meter management and meter reading are considered secondary priorities, but meter reading is conducted at least annually to obtain consumption volumes for the annual water audit. High level auditing of billing records ensures that a reliable census of such accounts exists.	Conditions between 8 and 10	Clearly written policy identifies the types of accounts given a billing exemption, with emphasis on keeping such accounts to a minimum. Customer meter management and meter reading for these accounts is given proper priority and is reliably conducted. Regular auditing confirms this. Total water consumption for these accounts is taken from reliable readings from accurate meters.
Improvements to attain higher data grading for "Unbilled Metered Consumption" component:		to qualify for 2: Reassess the water utility's policy allowing certain accounts to be granted a billing exemption. Draft an outline of a new written policy for billing exemptions, with clear justification as to why any accounts should be exempt from billing, and with the intention to keep the number of such accounts to a minimum.	to qualify for 4: Review historic written directives and policy documents allowing certain accounts to be billing-exempt. Draft an outline of a written policy for billing exemptions, identify criteria that grants an exemption, with a goal of keeping this number of accounts to a minimum. Consider increasing the priority of reading meters on unbilled accounts at least annually.		to qualify for 6: Draft a new written policy regarding billing exemptions based upon consensus criteria allowing this occurrence. Assign resources to audit meter records and billing records to obtain census of unbilled metered accounts. Gradually include a greater number of these metered accounts to the routes for regular meter reading.		to qualify for 8: Communicate billing exemption policy throughout the organization and implement procedures that ensure proper account management. Conduct inspections of accounts confirmed in unbilled metered status and verify that accurate meters exist and are scheduled for routine meter readings. Gradually increase the number of unbilled metered accounts that are included in regular meter reading routes.		to qualify for 10: Ensure that meter management (meter accuracy testing, meter replacement) and meter reading activities for unbilled accounts are accorded the same priority as billed accounts. Establish ongoing annual auditing process to ensure that water consumption is reliably collected and provided to the annual water audit process.		to maintain 10: Reassess the utility's philosophy in allowing any water uses to go "unbilled". It is possible to meter and bill all accounts, even if the fee charged for water consumption is discounted or waived. Metering and billing all accounts ensures that water consumption is tracked and water waste from plumbing leaks is detected and minimized.
Unbilled unmetered:		Extent of unbilled, unmetered consumption is unknown due to unclear policies and poor recordkeeping. Total consumption is quantified based upon a purely subjective estimate.	Clear extent of unbilled, unmetered consumption is unknown, but a number of events are randomly documented each year, confirming existence of such consumption, but without sufficient documentation to quantify an accurate estimate of the annual volume consumed.	Conditions between 2 and 4	Extent of unbilled, unmetered consumption is partially known, and procedures exist to document certain events such as miscellaneous fire hydrant uses. Formulae is used to quantify the consumption from such events (time running multiplied by typical flowrate, multiplied by number of events).	Default value of 1.25% of system input volume is employed	Coherent policies exist for some forms of unbilled, unmetered consumption but others await closer evaluation. Reasonable recordkeeping for the managed uses exists and allows for annual volumes to be quantified by inference, but unsupervised uses are guesstimated.	Conditions between 6 and 8	Clear policies and good recordkeeping exist for some uses (ex: water used in periodic testing of unmetered fire connections), but other uses (ex: miscellaneous uses of fire hydrants) have limited oversight. Total consumption is a mix of well quantified use such as from formulae (time running multiplied by typical flow, multiplied by number of events) or temporary meters, and relatively subjective estimates of less regulated use.	Conditions between 8 and 10	Clear policies exist to identify permitted use of water in unbilled, unmetered fashion, with the intention of minimizing this type of consumption. Good records document each occurrence and consumption is quantified via formulae (time running multiplied by typical flow, multiplied by number of events) or use of temporary meters.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Unbilled Unmetered Consumption" component:		to qualify for 5: Utilize the accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of this use. to qualify for 2: Establish a policy regarding what water uses should be allowed to remain as unbilled and unmetered. Consider tracking a small sample of one such use (ex: fire hydrant flushings).	to qualify for 5: Utilize accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of this use. to qualify for 4: Evaluate the documentation of events that have been observed. Meet with user groups (ex: for fire hydrants - fire departments, contractors to ascertain their need and/or volume requirements for water from fire hydrants).		to qualify for 5: Utilize accepted default value of 1.25% of the volume of water supplied as an expedient means to gain a reasonable quantification of all such use. This is particularly appropriate for water utilities who are in the early stages of the water auditing process, and should focus on other components since the volume of unbilled, umetered consumption is usually a relatively small quatity component, and other larger-quantity components should take priority.	to qualify for 6 or greater: Finalize policy and begin to conduct field checks to better establish and quantify such usage. Proceed if top-down audit exists and/or a great volume of such use is suspected.	to qualify for 8: Assess water utility policy and procedures for various unmetered usages. For example, ensure that a policy exists and permits are issued for use of fire hydrants by persons outside of the utility. Create written procedures for use and documentation of fire hydrants by water utility personnel. Use same approach for other types of unbilled, unmetered water usage.		to qualify for 10: Refine written procedures to ensure that all uses of unbilled, unmetered water are overseen by a structured permitting process managed by water utility personnel. Reassess policy to determine if some of these uses have value in being converted to billed and/or metered status.		to maintain 10: Continue to refine policy and procedures with intention of reducing the number of allowable uses of water in unbilled and unmetered fashion. Any uses that can feasibly become billed and metered should be converted eventually.
APPARENT LOSSES											
Unauthorized consumption:		Extent of unauthorized consumption is unknown due to unclear policies and poor recordkeeping. Total unauthorized consumption is guesstimated.	Unauthorized consumption is a known occurrence, but its extent is a mystery. There are no requirements to document observed events, but periodic field reports capture some of these occurrences. Total unauthorized consumption is approximated from this limited data.	conditions between 2 and 4	Procedures exist to document some unauthorized consumption such as observed unauthorized fire hydrant openings. Use formulae to quantify this consumption (time running multiplied typical flowrate, multiplied by number of events).	Default value of 0.25% of volume of water supplied is employed	Coherent policies exist for some forms of unauthorized consumption (more than simply fire hydrant misuse) but others await closer evaluation. Reasonable surveillance and recordkeeping exist for occurrences that fall under the policy. Volumes quantified by inference from these records.	Conditions between 6 and 8	Clear policies and good auditable recordkeeping exist for certain events (ex: tampering with water meters, illegal bypasses of customer meters); but other occurrences have limited oversight. Total consumption is a combination of volumes from formulae (time x typical flow) and subjective estimates of unconfirmed consumption.	Conditions between 8 and 10	Clear policies exist to identify all known unauthorized uses of water. Staff and procedures exist to provide enforcement of policies and detect violations. Each occurrence is recorded and quantified via formulae (estimated time running multiplied by typical flow) or similar methods. All records and calculations should exist in a form that can be audited by a third party.
Improvements to attain higher data grading for "Unauthorized Consumption" component:		to qualify for 5: Use accepted default of 0.25% of volume of water supplied. to qualify for 2: Review utility policy regarding what water uses are considered unauthorized, and consider tracking a small sample of one such occurrence (ex: unauthorized fire hydrant openings)	to qualify for 5: Use accepted default of 0.25% of system input volume to qualify for 4: Review utility policy regarding what water uses are considered unauthorized, and consider tracking a small sample of one such occurrence (ex: unauthorized fire hydrant openings)		to qualify for 5: Utilize accepted default value of 0.25% of volume of water supplied as an expedient means to gain a reasonable quantification of all such use. This is particularly appropriate for water utilities who are in the early stages of the water auditing process.	to qualify for 6 or greater: Finalize policy updates to clearly identify the types of water consumption that are authorized from those usages that fall outside of this policy and are, therefore, unauthorized. Begin to conduct regular field checks. Proceed if the top-down audit already exists and/or a great volume of such use is suspected.	to quality for 8: Assess water utility policies to ensure that all known occurrences of unauthorized consumption are outlawed, and that appropriate penalties are prescribed. Create written procedures for detection and documentation of various occurrences of unauthorized consumption as they are uncovered.		to qualify for 10: Refine written procedures and assign staff to seek out likely occurrences of unauthorized consumption. Explore new locking devices, monitors and other technologies designed to detect and thwart unauthorized consumption.		to maintain 10: Continue to refine policy and procedures to eliminate any loopholes that allow or tacitly encourage unauthorized consumption. Continue to be vigilant in detection, documentation and enforcement efforts.
Customer metering inaccuracies:	select n/a only if the entire customer population is unmetered. In such a case the volume entered must be zero.	Customer meters exist, but with unorganized paper records on meters; no meter accuracy testing or meter replacement program for any size of retail meter. Metering workflow is driven chaotically with no proactive management. Loss volume due to aggregate meter inaccuracy is guesstimated.	Poor recordkeeping and meter oversight is recognized by water utility management who has allotted staff and funding resources to organize improved recordkeeping and start meter accuracy testing. Existing paper records gathered and organized to provide cursory disposition of meter population. Customer meters are tested for accuracy only upon customer request.	Conditions between 2 and 4	Reliable recordkeeping exists; meter information is improving as meters are replaced. Meter accuracy testing is conducted annually for a small number of meters (more than just customer requests, but less than 1% of inventory). A limited number of the oldest meters are replaced each year. Inaccuracy volume is largely an estimate, but refined based upon limited testing data.	Conditions between 4 and 6	A reliable electronic recordkeeping system for meters exists. The meter population includes a mix of new high performing meters and dated meters with suspect accuracy. Routine, but limited, meter accuracy testing and meter replacement occur. Inaccuracy volume is quantified using a mix of reliable and less certain data.	Conditions between 6 and 8	Ongoing meter replacement and accuracy testing result in highly accurate customer meter population. Testing is conducted on samples of meters of varying age and accumulated volume of throughput to determine optimum replacement time for various types of meters.	Ongoing meter replacement and accuracy testing result in highly accurate customer meter population. Statistically significant number of meters are tested in audit year. This testing is conducted on samples of meters of varying age and accumulated volume of throughput to determine optimum replacement time for these meters.	Good records of all active customer meters exist and include as a minimum: meter number, account number/location, type, size and manufacturer. Ongoing meter replacement occurs according to a targeted and justified basis. Regular meter accuracy testing gives a reliable measure of composite inaccuracy volume for the customer meter population. New metering technology is embraced to keep overall accuracy improving. Procedures are reviewed by a third party knowledgeable in the M36 methodology.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Customer meter inaccuracy volume" component:	If n/a is selected because the customer meter population is unmetered, consider establishing a new policy to meter the customer population and employ water rates based upon metered volumes.	to qualify for 2: Gather available meter purchase records. Conduct testing on a small number of meters believed to be the most inaccurate. Review staffing needs of the metering group and budget for necessary resources to better organize meter management.	to qualify for 4: Implement a reliable record keeping system for customer meter histories, preferably using electronic methods typically linked to, or part of, the Customer Billing System or Customer Information System. Expand meter accuracy testing to a larger group of meters.		to qualify for 6: Standardize the procedures for meter recordkeeping within an electronic information system. Accelerate meter accuracy testing and meter replacements guided by testing results.		to qualify for 8: Expand annual meter accuracy testing to evaluate a statistically significant number of meter makes/models. Expand meter replacement program to replace statistically significant number of poor performing meters each year.		to qualify for 9: Continue efforts to manage meter population with reliable recordkeeping. Test a statistically significant number of meters each year and analyze test results in an ongoing manner to serve as a basis for a target meter replacement strategy based upon accumulated volume throughput.	to qualify for 10: Continue efforts to manage meter population with reliable recordkeeping, meter testing and replacement. Evaluate new meter types and install one or more types in 5-10 customer accounts each year in order to pilot improving metering technology.	to maintain 10: Increase the number of meters tested and replaced as justified by meter accuracy test data. Continually monitor development of new metering technology and Advanced Metering Infrastructure (AMI) to grasp opportunities for greater accuracy in metering of water flow and management of customer consumption data.
Systematic Data Handling Errors:	Note: all water utilities incur some amount of this error. Even in water utilities with unmetered customer populations and fixed rate billing, errors occur in annual billing tabulations. Enter a positive value for the volume and select a grading.	Policies and procedures for activation of new customer water billing accounts are vague and lack accountability. Billing data is maintained on paper records which are not well organized. No auditing is conducted to confirm billing data handling efficiency. An unknown number of customers escape routine billing due to lack of billing process oversight.	Policy and procedures for activation of new customer accounts and oversight of billing records exist but need refinement. Billing data is maintained on paper records or insufficiently capable electronic database. Only periodic unstructured auditing work is conducted to confirm billing data handling efficiency. The volume of unbilled water due to billing lapses is a guess.	Conditions between 2 and 4	Policy and procedures for new account activation and oversight of billing operations exist but needs refinement. Periodic, limited internal audits conducted and confirm with approximate accuracy the consumption volumes lost to billing lapses.	Conditions between 4 and 6	Policy and procedures for new account activation and oversight of billing operations is adequate and reviewed periodically. Computerized billing system is in use with basic reporting available. Any effect of billing adjustments on measured consumption volumes is well understood. Internal checks of billing data error conducted annually. Reasonably accurate quantification of consumption volume lost to billing lapses is obtained.	Conditions between 6 and 8	New account activation and billing operations policy and procedures are reviewed at least biannually. Computerized billing system includes an array of reports to confirm billing data and system functionality. Checks are conducted routinely to flag and explain zero consumption accounts. Annual internal checks conducted with third party audit conducted at least once every five years. Accountability checks flag billing lapses. Consumption lost to billing lapses is well quantified and reducing year-by-year.	Conditions between 8 and 10	Sound written policy and procedures exist for new account activation and oversight of customer billing operations. Robust computerized billing system gives high functionality and reporting capabilities which are utilized, analyzed and the results reported each billing cycle. Assessment of policy and data handling errors are conducted internally and audited by third party at least once every three years, ensuring consumption lost to billing lapses is minimized and detected as it occurs.
Improvements to attain higher data grading for "Systematic Data Handling Error volume" component:		to qualify for 2: Draft written policy and procedures for activating new water billing accounts and oversight of billing operations. Investigate and budget for computerized customer billing system. Conduct initial audit of billing records by flow-charting the basic business processes of the customer account/billing function.	to qualify for 4: Finalize written policy and procedures for activation of new billing acocunts and overall billing operations management. Implement a computerized customer billing system. Conduct initial audit of billing records as part of this process.		to qualify for 6: Refine new account activation and billing operations procedures and ensure consistency with the utility policy regarding billing, and minimize opportunity for missed billings. Upgrade or replace customer billing system for needed functionality - ensure that billing adjustments don't corrupt the value of consumption volumes. Procedurize internal annual audit process.		to qualify for 8: Formalize regular review of new account activation process and general billing practices. Enhance reporting capability of computerized billing system. Formalize regular auditing process to reveal scope of data handling error. Plan for periodic third party audit to occur at least once every five years.		to qualify for 10: Close policy/procedure loopholes that allow some customer accounts to go unbilled, or data handling errors to exist. Ensure that billing system reports are utilized, analyzed and reported every billing cycle. Ensure that internal and third party audits are conducted at least once every three years.		to maintain 10: Stay abreast of customer information management developments and innovations. Monitor developments of Advanced Metering Infrastructure (AMI) and integrate technology to ensure that customer endpoint information is well-monitored and errors/lapses are at an economic minimum.
SYSTEM DATA											
Length of mains:		Poorly assembled and maintained paper as-built records of existing water main installations makes accurate determination of system pipe length impossible. Length of mains is guesstimated.	Paper records in poor or uncertain condition (no annual tracking of installations & abandonments). Poor procedures to ensure that new water mains installed by developers are accurately documented.	Conditions between 2 and 4	Sound written policy and procedures exist for documenting new water main installations, but gaps in management result in a uncertain degree of error in tabulation of mains length.	Conditions between 4 and 6	Sound written policy and procedures exist for permitting and commissioning new water mains. Highly accurate paper records with regular field validation; or electronic records and asset management system in good condition. Includes system backup.	Conditions between 6 and 8	Sound written policy and procedures exist for permitting and commissioning new water mains. Electronic recordkeeping such as a Geographical Information System (GIS) and asset management system are used to store and manage data.	Conditions between 8 and 10	Sound written policy exists for managing water mains extensions and replacements. Geographic Information System (GIS) data and asset management database agree and random field validation proves truth of databases. Records of annual field validation should be available for review.
Improvements to attain higher data grading for "Length of Water Mains" component:		to qualify for 2: Assign personnel to inventory current as-built records and compare with customer billing system records and highway plans in order to verify poorly documented pipelines. Assemble policy documents regarding permitting and documentation of water main installations by the utility and building developers; identify gaps in procedures that result in poor documentation of new water main installations.	to qualify for 4: Complete inventory of paper records of water main installations for several years prior to audit year. Review policy and procedures for commissioning and documenting new water main installation.		to qualify for 6: Finalize updates/improvements to written policy and procedures for permitting/commissioning new main installations. Confirm inventory of records for five years prior to audit year; correct any errors or omissions.		to qualify for 8: Launch random field checks of limited number of locations. Convert to electronic database such as a Geographic Information System (GIS) with backup as justified. Develop written policy and procedures.		to qualify for 10: Link Geographic Information System (GIS) and asset management databases, conduct field verification of data. Record field verification information at least annually.		to maintain 10: Continue with standardization and random field validation to improve the completeness and accuracy of the system.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Number of active AND inactive service connections:		Vague permitting (of new service connections) policy and poor paper recordkeeping of customer connections/billings result in suspect determination of the number of service connections, which may be 10-15% in error from actual count.	General permitting policy exists but paper records, procedural gaps, and weak oversight result in questionable total for number of connections, which may vary 5-10% of actual count.	Conditions between 2 and 4	Written account activation policy and procedures exist, but with some gaps in performance and oversight. Computerized information management system is being brought online to replace dated paper recordkeeping system. Reasonably accurate tracking of service connection installations & abandonments; but count can be up to 5% in error from actual total.	Conditions between 4 and 6	Written new account activation and overall billing policies and procedures are adequate and reviewed periodically. Computerized information management system is in use with annual installations & abandonments totaled. Very limited field verifications and audits. Error in count of number of service connections is believed to be no more than 3%.	Conditions between 6 and 8	Policies and procedures for new account activation and overall billing operations are written, well-structured and reviewed at least biannually. Well managed computerized information management system exists and routine, periodic field checks and internal system audits are conducted. Counts of connections are no more than 2% in error.	Conditions between 8 and 10	Sound written policy and well managed and audited procedures ensure reliable management of service connection population. Computerized information management system, Customer Billing System, and Geographic Information System (GIS) information agree; field validation proves truth of databases. Count of connections recorded as being in error is less than 1% of the entire population.
Improvements to attain higher data grading for "Number of Active and Inactive Service Connections" component:	**Note: The number of Service Connections does <u>not</u> include fire hydrant leads/lines connecting the hydrant to the water main**	<u>to qualify for 2</u>: Draft new policy and procedures for new account activation and overall billing operations. Research and collect paper records of installations & abandonments for several years prior to audit year.	<u>to qualify for 4</u>: Refine policy and procedures for new account activation and overall billing operations. Research computerized recordkeeping system (Customer Information System or Customer Billing System) to improve documentation format for service connections.		<u>to qualify for 6</u>: Refine procedures to ensure consistency with new account activation and overall billing policy to establish new service connections or decommission existing connections. Improve process to include all totals for at least five years prior to audit year.		<u>to qualify for 8</u>: Formalize regular review of new account activation and overall billing operations policies and procedures. Launch random field checks of limited number of locations. Develop reports and auditing mechanisms for computerized information management system.		<u>to qualify for 10</u>: Close any procedural loopholes that allow installations to go undocumented. Link computerized information management system with Geographic Information System (GIS) and formalize field inspection and information system auditing processes. Documentation of new or decommissioned service connections encounters several levels of checks and balances.		<u>to maintain 10</u>: Continue with standardization and random field validation to improve knowledge of system.
Average length of customer service line:	Note: if customer water meters are located outside of the customer building next to the curb stop or boundary separating utility/customer responsibility, then the auditor should answer "Yes" to the question on the Reporting Worksheet asking about this. If the answer is Yes, the grading description listed under the Grading of 10(a) will be followed, with a value of zero automatically entered at a Grading of 10. See the Service Connection Diagram worksheet for a visual presentation of this distance.	Gradings 1-9 apply if customer properties are unmetered, if customer meters exist and are located inside the customer building premises, or if the water utility owns and is responsible for the entire service connection piping from the water main to the customer building. In any of these cases the average distance between the curb stop or boundary separating utility/customer responsibility for service connection piping, and the typical first point of use (ex: faucet) or the customer meter must be quantified. Gradings of 1-9 are used to grade the validity of the means to quantify this value. (See the "Service Connection Diagram" worksheet)									<u>Either of two conditions can be met for a grading of 10</u>: a) Customer water meters exist outside of customer buildings next to the curb stop or boundary separating utility/customer responsibility for service connection piping. If so, answer "Yes" to the question on the Reporting Working asking about this condition. A value of zero and a Grading of 10 are automatically entered in the Reporting Worksheet . b). Meters exist inside customer buildings, or properties are unmetered. In either case, answer "No" to the Reporting Worksheet question on meter location, and enter a distance determined by the auditor. For a Grading of 10 this value must be a very reliable number from a Geographic Information System (GIS) and confirmed by a statistically valid number of field checks.
		Vague policy exists to define the delineation of water utility ownership and customer ownership of the service connection piping. Curb stops are perceived as the breakpoint but these have not been well-maintained or documented. Most are buried or obscured. Their location varies widely from site-to-site, and estimating this distance is arbitrary due to the unknown location of many curb stops.	Policy requires that the curb stop serves as the delineation point between water utility ownership and customer ownership of the service connection piping. The piping from the water main to the curb stop is the property of the water utility; and the piping from the curb stop to the customer building is owned by the customer. Curb stop locations are not well documented and the average distance is based upon a limited number of locations measured in the field.	Conditions between 2 and 4	Good policy requires that the curb stop serves as the delineation point between water utility ownership and customer ownership of the service connection piping. Curb stops are generally installed as needed and are reasonably documented. Their location varies widely from site-to-site, and an estimate of this distance is hindered by the availability of paper records of limited accuracy.	Conditions between 4 and 6	Clear written policy exists to define utility/customer responsibility for service connection piping. Accurate, well-maintained paper or basic electronic recordkeeping system exists. Periodic field checks confirm piping lengths for a sample of customer properties.	Conditions between 6 and 8	Clearly worded policy standardizes the location of curb stops and meters, which are inspected upon installation. Accurate and well maintained electronic records exist with periodic field checks to confirm locations of service lines, curb stops and customer meter pits. An accurate number of customer properties from the customer billing system allows for reliable averaging of this length.	Conditions between 8 and 10	
Improvements to attain higher data grading for "Average Length of Customer Service Line" component:		<u>to qualify for 2</u>: Research and collect paper records of service line installations. Inspect several sites in the field using pipe locators to locate curb stops. Obtain the length of this small sample of connections in this manner.	<u>to qualify for 4</u>: Formalize and communicate policy delineating utility/customer responsibilities for service connection piping. Assess accuracy of paper records by field inspection of a small sample of service connections using pipe locators as needed. Research the potential migration to a computerized information management system to store service connection data.		<u>to qualify for 6</u>: Establish coherent procedures to ensure that policy for curb stop, meter installation and documentation is followed. Gain consensus within the water utility for the establishment of a computerized information management system.		<u>to qualify for 8</u>: Implement an electronic means of recordkeeping, typically via a customer information system, customer billing system, or Geographic Information System (GIS). Standardize the process to conduct field checks of a limited number of locations.		<u>to qualify for 10</u>: Link customer information management system and Geographic Information System (GIS), standardize process for field verification of data.		<u>to maintain 10</u>: Continue with standardization and random field validation to improve knowledge of service connection configurations and customer meter locations.
Average operating pressure:		Available records are poorly assembled and maintained paper records of supply pump characteristics and water distribution system operating conditions. Average pressure is guesstimated based upon this information and ground elevations from crude topographical maps. Widely varying distribution system pressures due to undulating terrain, high system head loss and weak/erratic pressure controls further compromise the validity of the average pressure calculation.	Limited telemetry monitoring of scattered pumping station and water storage tank sites provides some static pressure data, which is recorded in handwritten logbooks. Pressure data is gathered at individual sites only when low pressure complaints arise. Average pressure is determined by averaging relatively crude data, and is affected by significant variation in ground elevations, system head loss and gaps in pressure controls in the distribution system.	Conditions between 2 and 4	Effective pressure controls separate different pressure zones; moderate pressure variation across the system, occasional open boundary valves are discovered that breech pressure zones. Basic telemetry monitoring of the distribution system logs pressure data electronically. Pressure data gathered by gauges or dataloggers at fire hydrants or buildings when low pressure complaints arise, and during fire flow tests and system flushing. Reliable topographical data exists. Average pressure is calculated using this mix of data.	Conditions between 4 and 6	Reliable pressure controls separate distinct pressure zones; only very occasional open boundary valves are encountered that breech pressure zones. Well-covered telemetry monitoring of the distribution system (not just pumping at source treatment plants or wells) logs extensive pressure data electronically. Pressure gathered by gauges/dataloggers at fire hydrants and buildings when low pressure complaints arise, and during fire flow tests and system flushing. Average pressure is determined by using this mix of reliable data.	Conditions between 6 and 8	Well-managed, discrete pressure zones exist with generally predictable pressure fluctuations. A current full-scale SCADA System or similar realtime monitoring system exists to monitor the water distribution system and collect data, including real time pressure readings at representative sites across the system. The average system pressure is determined from reliable monitoring system data.	Conditions between 8 and 10	Well-managed pressure districts/zones, SCADA System and hydraulic model exist to give very precise pressure data across the water distribution system. Average system pressure is reliably calculated from extensive, reliable, and cross-checked data. Calculations are reported on an annual basis as a minimum.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
Improvements to attain higher data grading for "Average Operating Pressure" component:		to qualify for 2: Employ pressure gauging and/or datalogging equipment to obtain pressure measurements from fire hydrants. Locate accurate topographical maps of service area in order to confirm ground elevations. Research pump data sheets to find pump pressure/flow characteristics	to qualify for 4: Formalize a procedure to use pressure gauging/datalogging equipment to gather pressure data during various system events such as low pressure complaints, or operational testing. Gather pump pressure and flow data at different flow regimes. Identify faulty pressure controls (pressure reducing valves, altitude valves, partially open boundary valves) and plan to properly configure pressure zones. Make all pressure data from these efforts available to generate system-wide average pressure.		to qualify for 6: Expand the use of pressure gauging/datalogging equipment to gather scattered pressure data at a representative set of sites, based upon pressure zones or areas. Utilize pump pressure and flow data to determine supply head entering each pressure zone or district. Correct any faulty pressure controls (pressure reducing valves, altitude valves, partially open boundary valves) to ensure properly configured pressure zones. Use expanded pressure dataset from these activities to generate system-wide average pressure.		to qualify for 8: Install a Supervisory Control and Data Acquisition (SCADA) System, or similar realtime monitoring system, to monitor system parameters and control operations. Set regular calibration schedule for instrumentation to insure data accuracy. Obtain accurate topographical data and utilize pressure data gathered from field surveys to provide extensive, reliable data for pressure averaging.		to qualify for 10: Annually, obtain a system-wide average pressure value from the hydraulic model of the distribution system that has been calibrated via field measurements in the water distribution system and confirmed in comparisons with SCADA System data.		to maintain 10: Continue to refine the hydraulic model of the distribution system and consider linking it with SCADA System for real-time pressure data calibration, and averaging.

Grading >>>	n/a	1	2	3	4	5	6	7	8	9	10
COST DATA											
Total annual cost of operating water system:		Incomplete paper records and lack of financial accounting documentation on many operating functions makes calculation of water system operating costs a pure guesstimate	Reasonably maintained, but incomplete, paper or electronic accounting provides data to estimate the major portion of water system operating costs.	Conditions between 2 and 4	Electronic, industry-standard cost accounting system in place. However, gaps in data are known to exist, periodic internal reviews are conducted but not a structured financial audit.	Conditions between 4 and 6	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited periodically by utility personnel, but not a Certified Public Accountant (CPA).	Conditions between 6 and 8	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited at least annually by utility personnel, and at least once every three years by third-party CPA.	Conditions between 8 and 10	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Data audited annually by utility personnel and annually also by third-party CPA.
Improvements to attain higher data grading for "Total Annual Cost of Operating the Water System" component:		<u>to qualify for 2</u>: Gather available records, institute new financial accounting procedures to regularly collect and audit basic cost data of most important operations functions.	<u>to qualify for 4</u>: Implement an electronic cost accounting system, structured according to accounting standards for water utilities		<u>to qualify for 6</u>: Establish process for periodic internal audit of water system operating costs; identify cost data gaps and institute procedures for tracking these outstanding costs.		<u>to qualify for 8</u>: Standardize the process to conduct routine financial audit on an annual basis. Arrange for CPA audit of financial records at least once every three years.		<u>to qualify for 10</u>: Standardize the process to conduct a third-party financial audit by a CPA on an annual basis.		<u>to maintain 10</u>: Maintain program, stay abreast of expenses subject to erratic cost changes and long-term cost trend, and budget/track costs proactively
Customer retail unit cost (applied to Apparent Losses):	Customer population unmetered, and/or only a fixed fee is charged for consumption.	Antiquated, cumbersome water rate structure is used, with periodic historic amendments that were poorly documented and implemented; resulting in classes of customers being billed inconsistent charges. The actual composite billing rate likely differs significantly from the published water rate structure, but a lack of auditing leaves the degree of error indeterminate.	Dated, cumbersome water rate structure, not always employed consistently in actual billing operations. The actual composite billing rate is known to differ from the published water rate structure, and a reasonably accurate estimate of the degree of error is determined, allowing a composite billing rate to be quantified.	Conditions between 2 and 4	Straight-forward water rate structure in use, but not updated in several years. Billing operations reliably employ the rate structure. The composite billing rate is derived from a single customer class such as residential customer accounts, neglecting the effect of different rates from varying customer classes.	Conditions between 4 and 6	Clearly written, up-to-date water rate structure is in force and is applied reliably in billing operations. Composite customer rate is determined using a weighted average residential rate using volumes of water in each rate block.	Conditions between 6 and 8	Effective water rate structure is in force and is applied reliably in billing operations. Composite customer rate is determined using a weighted average composite consumption rate, which includes residential, commercial, industrial, institutional (CII), and any other distinct customer classes within the water rate structure.	Conditions between 8 and 10	Current, effective water rate structure is in force and applied reliably in billing operations. The rate structure and calculations of composite rate - which includes residential, commercial, industrial, institutional (CII), and other distinct customer classes - are reviewed by a third party knowledgeable in the M36 methodology at least once every five years.
Improvements to attain higher data grading for "Customer Retail Unit Cost" component:		<u>to qualify for 2</u>: Formalize the process to implement water rates, including a secure documentation procedure. Create a current, formal water rate document and gain approval from all stakeholders.	<u>to qualify for 4</u>: Review the water rate structure and update/formalize as needed. Assess billing operations to ensure that actual billing operations incorporate the established water rate structure.		<u>to qualify for 6</u>: Evaluate volume of water used in each usage block by residential users. Multiply volumes by full rate structure.	<u>Launch effort to fully meter the customer population and charge rates based upon water volumes</u>	<u>to qualify for 8</u>: Evaluate volume of water used in each usage block by all classifications of users. Multiply volumes by full rate structure.		<u>to qualify for 10</u>: Conduct a periodic third-party audit of water used in each usage block by all classifications of users. Multiply volumes by full rate structure.		<u>to maintain 10</u>: Keep water rate structure current in addressing the water utility's revenue needs. Update the calculation of the customer unit rate as new rate components, customer classes, or other components are modified.
Variable production cost (applied to Real Losses):	Note: if the water utility purchases/imports its entire water supply, then enter the unit purchase cost of the bulk water supply in the Reporting Worksheet with a grading of 10	Incomplete paper records and lack of documentation on primary operating functions (electric power and treatment costs most importantly) makes calculation of variable production costs a pure guesstimate	Reasonably maintained, but incomplete, paper or electronic accounting provides data to roughly estimate the basic operations costs (pumping power costs and treatment costs) and calculate a unit variable production cost.	Conditions between 2 and 4	Electronic, industry-standard cost accounting system in place. Electric power and treatment costs are reliably tracked and allow accurate weighted calculation of unit variable production costs based on these two inputs and water imported purchase costs (if applicable). All costs are audited internally on a periodic basis.	Conditions between 4 and 6	Reliable electronic, industry-standard cost accounting system in place, with all pertinent water system operating costs tracked. Pertinent additional costs beyond power, treatment and water imported purchase costs (if applicable) such as liability, residuals management, wear and tear on equipment, impending expansion of supply, are included in the unit variable production cost, as applicable. The data is audited at least annually by utility personnel.	Conditions between 6 and 8	Reliable electronic, industry-standard cost accounting system in place, with all pertinent primary and secondary variable production and water imported purchase (if applicable) costs tracked. The data is audited at least annually by utility personnel, and at least once every three years by a third-party knowledgeable in the M36 methodology.	Conditions between 8 and 10	Either of two conditions can be met to obtain a grading of 10: 1) Third party CPA audit of all pertinent primary and secondary variable production and water imported purchase (if applicable) costs on an annual basis. or: 2) Water supply is entirely purchased as bulk water imported, and the unit purchase cost - including <u>all</u> applicable marginal supply costs - serves as the variable production cost. If <u>all</u> applicable marginal supply costs are not included in this figure, a grade of 10 should <u>not</u> be selected.
Improvements to attain higher data grading for "Variable Production Cost" component:		<u>to qualify for 2</u>: Gather available records, institute new procedures to regularly collect and audit basic cost data and most important operations functions.	<u>to qualify for 4</u>: Implement an electronic cost accounting system, structured according to accounting standards for water utilities		<u>to qualify for 6</u>: Formalize process for regular internal audits of production costs. Assess whether additional costs (liability, residuals management, equipment wear, impending infrastructure expansion) should be included to calculate a more representative variable production cost.		<u>to qualify for 8</u>: Formalize the accounting process to include direct cost components (power, treatment) as well as indirect cost components (liability, residuals management, etc.) Arrange to conduct audits by a knowledgable third-party at least once every three years.		<u>to qualify for 10</u>: Standardize the process to conduct a third-party financial audit by a CPA on an annual basis.		<u>to maintain 10</u>: Maintain program, stay abreast of expenses subject to erratic cost changes and budget/track costs proactively

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Average Length of Customer Service Line

The three figures shown on this worksheet display the assignment of the Average Length of Customer Service Line, Lp, for the three most common piping configurations.

Figure 1 shows the configuration of the water meter outside of the customer building next to the curb stop valve. In this configuration Lp = 0 since the distance between the curb stop and the customer metering point is essentially zero.

Figure 2 shows the configuration of the customer water meter located inside the customer building, where Lp is the distance from the curb stop to the water meter.

Figure 3 shows the configuration of an unmetered customer building , where Lp is the distance from the curb stop to the first point of customer water consumption, or, more simply, the building line.

In any water system the Lp will vary notably in a community of different structures, therefore the average Lp value is used and this should be approximated or calculated if a sample of service line measurements has been gathered.

Click for more information

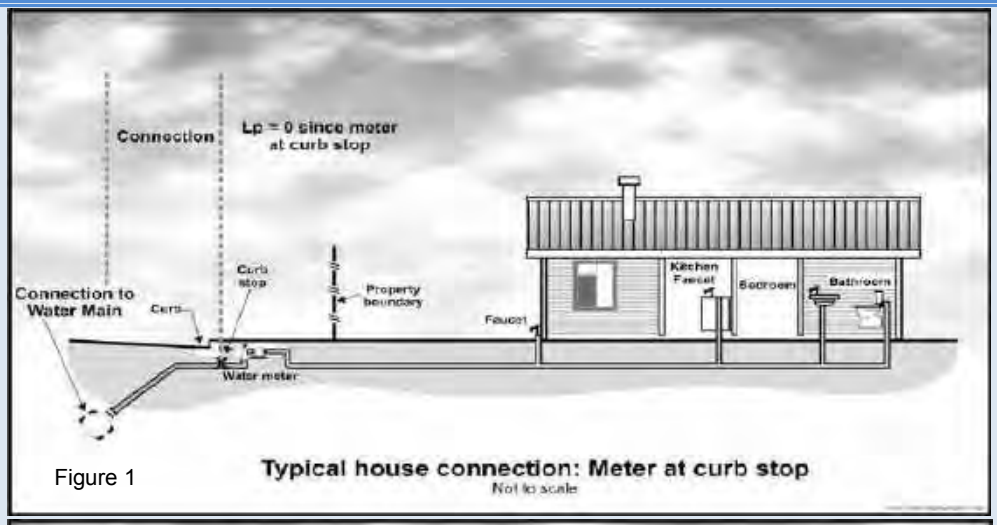

Figure 1 **Typical house connection: Meter at curb stop**
Not to scale

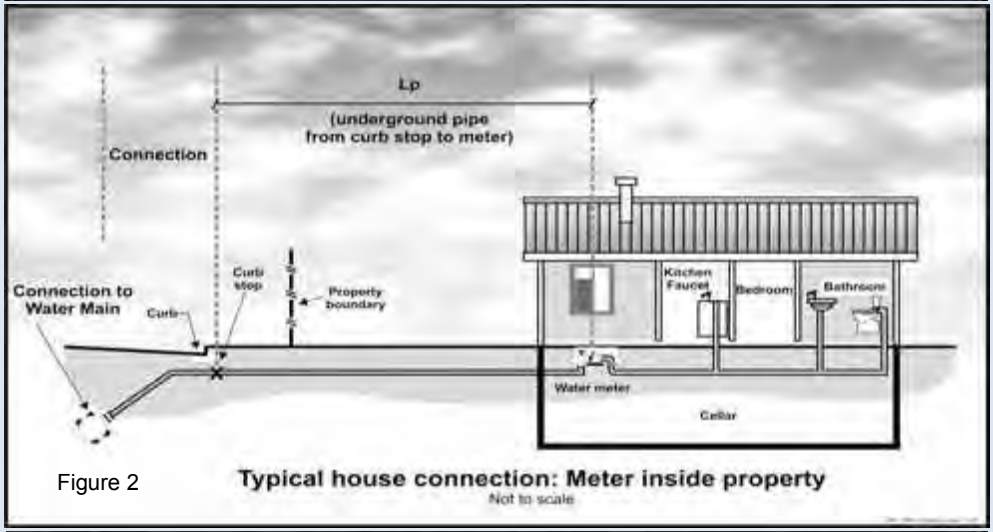

Figure 2 **Typical house connection: Meter inside property**
Not to scale

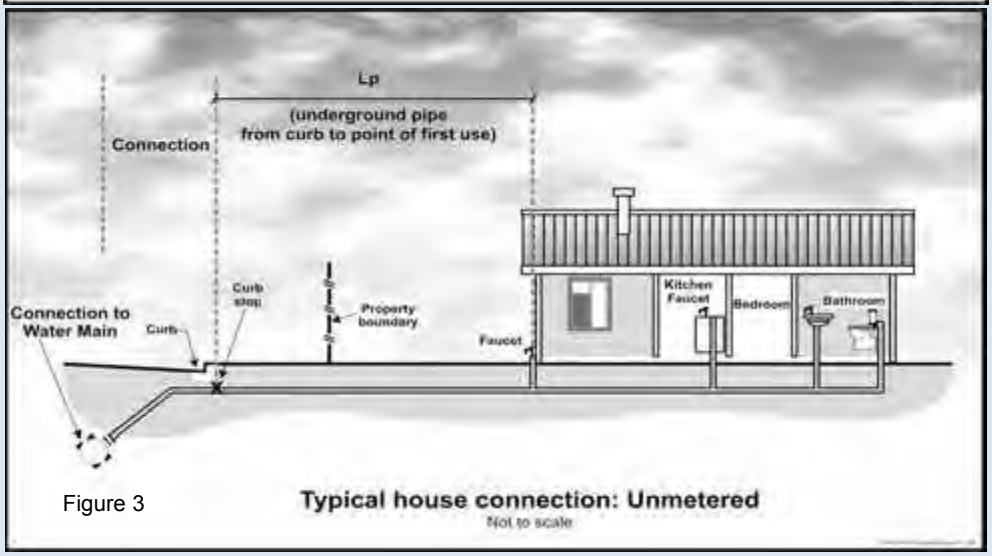

Figure 3 **Typical house connection: Unmetered**
Not to scale

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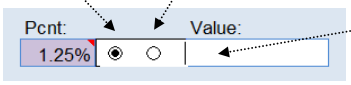
Item Name	Description
Apparent Losses Find	= unauthorized consumption + customer metering inaccuracies + systematic data handling errors Apparent Losses include all types of inaccuracies associated with customer metering (worn meters as well as improperly sized meters or wrong type of meter for the water usage profile) as well as systematic data handling errors (meter reading, billing, archiving and reporting), plus unauthorized consumption (theft or illegal use). NOTE: Over-estimation of Apparent Losses results in under-estimation of Real Losses. Under-estimation of Apparent Losses results in over-estimation of Real Losses.
AUTHORIZED CONSUMPTION Find	= billed water exported + billed metered + billed unmetered + unbilled metered + unbilled unmetered consumption The volume of metered and/or unmetered water taken by registered customers, the water utility's own uses, and uses of others who are implicitly or explicitly authorized to do so by the water utility; for residential, commercial, industrial and public-minded purposes. Typical retail customers' consumption is tabulated usually from established customer accounts as billed metered consumption, or - for unmetered customers - billed unmetered consumption. These types of consumption, along with billed water exported, provide revenue potential for the water utility. **Be certain to tabulate the water exported volume as a separate component and do not "double-count" it by including in the billed metered consumption component as well as the water exported component.** Unbilled authorized consumption occurs typically in non-account uses, including water for fire fighting and training, flushing of water mains and sewers, street cleaning, watering of municipal gardens, public fountains, or similar public-minded uses. Occasionally these uses may be metered and billed (or charged a flat fee), but usually they are unmetered and unbilled. In the latter case, the water auditor may use a default value to estimate this quantity, or implement procedures for the reliable quantification of these uses. This starts with documenting usage events as they occur and estimating the amount of water used in each event. (See Unbilled unmetered consumption)
View Service Connection Diagram **Average length of customer service line** Find	This is the average length of customer service line, Lp, that is owned and maintained by the customer; from the point of ownership transfer to the customer water meter, or building line (if unmetered). The quantity is one of the data inputs for the calculation of Unavoidable Annual Real Losses (UARL), which serves as the denominator of the performance indicator: Infrastructure Leakage Index (ILI). The value of Lp is multiplied by the number of customer service connections to obtain a total length of customer owned piping in the system. The purpose of this parameter is to account for the unmetered service line infrastructure that is the responsibility of the customer for arranging repairs of leaks that occur on their lines. In many cases leak repairs arranged by customers take longer to be executed than leak repairs arranged by the water utility on utility-maintained piping. Leaks run longer - and lose more water - on customer-owned service piping, than utility owned piping. If the customer water meter exists near the ownership transfer point (usually the curb stop located between the water main and the customer premises) this distance is zero because the meter and transfer point are the same. This is the often encountered configuration of customer water meters located in an underground meter box or "pit" outside of the customer's building. The Free Water Audit Software asks a "Yes/No" question about the meter at this location. If the auditor selects "Yes" then this distance is set to zero and the data grading score for this component is set to 10. If water meters are typically located inside the customer premise/building, or properties are unmetered, it is up to the water auditor to estimate a system-wide average Lp length based upon the various customer land parcel sizes and building locations in the service area. Lp will be a shorter length in areas of high density housing, and a longer length in areas of low density housing and varied commercial and industrial buildings. General parcel demographics should be employed to obtain a composite average Lp length for the entire system. Refer to the "Service Connection Diagram" worksheet for a depiction of the service line/metering configurations that typically exist in water utilities. This worksheet gives guidance on the determination of the Average Length, Lp, for each configuration.
Average operating pressure Find	This is the average pressure in the distribution system that is the subject of the water audit. Many water utilities have a calibrated hydraulic model of their water distribution system. For these utilities, the hydraulic model can be utilized to obtain a very accurate quantity of average pressure. In the absence of a hydraulic model, the average pressure may be approximated by obtaining readings of static water pressure from a representative sample of fire hydrants or other system access points evenly located across the system. A weighted average of the pressure can be assembled; but be sure to take into account the elevation of the fire hydrants, which typically exist several feet higher than the level of buried water pipelines. If the water utility is compiling the water audit for the first time, the average pressure can be approximated, but with a low data grading. In subsequent years of auditing, effort should be made to improve the accuracy of the average pressure quantity. This will then qualify the value for a higher data grading.
Billed Authorized Consumption	All consumption that is billed and authorized by the utility. This may include both metered and unmetered consumption. See "Authorized Consumption" for more information.
Billed metered consumption Find	All metered consumption which is billed to retail customers, including all groups of customers such as domestic, commercial, industrial or institutional. **It does NOT include water supplied to neighboring utilities (water exported) which is metered and billed. Be sure to subtract any consumption for exported water sales that may be included in these billing roles. Water supplied as exports to neighboring water utilities should be included only in the Water Exported component.** The metered consumption data can be taken directly from billing records for the water audit period. The accuracy of yearly metered consumption data can be refined by including an adjustment to account for customer meter reading lag time since not all customer meters are read on the same day of the meter reading period. However additional analysis is necessary to determine the lag time adjustment value, which may or may not be significant.
Billed unmetered consumption Find	All billed consumption which is calculated based on estimates or norms from water usage sites that have been determined by utility policy to be left unmetered. This is typically a very small component in systems that maintain a policy to meter their customer population. However, this quantity can be the key consumption component in utilities that have not adopted a universal metering policy. **This component should NOT include any water that is supplied to neighboring utilities (water exported) which is unmetered but billed. Water supplied as exports to neighboring water utilities should be included only in the Water Exported component.**

Item Name	Description
Customer metering inaccuracies Find	Apparent water losses caused by the collective under-registration of customer water meters. Many customer water meters gradually wear as large cumulative volumes of water are passed through them over time. This causes the meters to under-register the flow of water. This occurrence is common with smaller residential meters of sizes 5/8-inch and 3/4 inch after they have registered very large cumulative volumes of water, which generally occurs only after periods of years. For meters sized 1-inch and larger - typical of multi-unit residential, commercial and industrial accounts - meter under-registration can occur from wear or from the improper application of the meter; i.e. installing the wrong type of meter or the wrong size of meter, for the flow pattern (profile) of the consumer. For instance, many larger meters have reduced accuracy at low flows. If an oversized meter is installed, most of the time the routine flow will occur in the low flow range of the meter, and a significant portion of it may not be registered. It is important to properly select and install all meters, but particularly large customer meters, size 1-inch and larger. The auditor has two options for entering data for this component of the audit. The auditor can enter a percentage under-registration (typically an estimated value), this will apply the selected percentage to the two categories of metered consumption to determine the volume of water not recorded due to customer meter inaccuracy. Note that this percentage is a composite average inaccuracy for all customer meters in the entire meter population. The percentage will be multiplied by the sum of the volumes in the Billed Metered and Unbilled Metered components. Alternatively, if the auditor has substantial data from meter testing activities, he or she can calculate their own loss volumes, and this volume may be entered directly. Note that a value of zero will be accepted but an alert will appear asking if the customer population is unmetered. Since all metered systems have some degree of inaccuracy, a positive value should be entered. A value of zero in this component is valid only if the water utility does not meter its customer population.
Customer retail unit cost Find	The Customer Retail Unit Cost represents the charge that customers pay for water service. This unit cost is applied routinely to the components of Apparent Loss, since these losses represent water reaching customers but not (fully) paid for. Since most water utilities have a rate structure that includes a variety of different costs based upon class of customer, a weighted average of individual costs and number of customer accounts in each class can be calculated to determine a single composite cost that should be entered into this cell. Finally, the weighted average cost should also include additional charges for sewer, storm water or biosolids processing, but only if these charges are based upon the volume of potable water consumed. For water utilities in regions with limited water resources and a questionable ability to meet the drinking water demands in the future, the Customer Retail Unit Cost might also be applied to value the Real Losses; instead of applying the Variable Production Cost to Real Losses. In this way, it is assumed that every unit volume of leakage reduced by leakage management activities will be sold to a customer. Note: the Free Water Audit Software allows the user to select the units that are charged to customers (either $/1,000 gallons, $/hundred cubic feet, or $/1,000 litres) and automatically converts these units to the units that appear in the "WATER SUPPLIED" box. The monetary units are United States dollars, $.
Infrastructure Leakage Index (ILI) Find	The ratio of the Current Annual Real Losses (Real Losses) to the Unavoidable Annual Real Losses (UARL). The ILI is a highly effective performance indicator for comparing (benchmarking) the performance of utilities in operational management of real losses.
Length of mains Find	Length of all pipelines (except service connections) in the system starting from the point of system input metering (for example at the outlet of the treatment plant). It is also recommended to include in this measure the total length of fire hydrant lead pipe. Hydrant lead pipe is the pipe branching from the water main to the fire hydrant. Fire hydrant leads are typically of a sufficiently large size that is more representative of a pipeline than a service connection. The average length of hydrant leads across the entire system can be assumed if not known, and multiplied by the number of fire hydrants in the system, which can also be assumed if not known. This value can then be added to the total pipeline length. Total length of mains can therefore be calculated as: Length of Mains, miles = (total pipeline length, miles) + [{(average fire hydrant lead length, ft) x (number of fire hydrants)} / 5,280 ft/mile] or Length of Mains, kilometres = (total pipeline length, kilometres) + [{(average fire hydrant lead length, metres) x (number of fire hydrants)} / 1,000 metres/kilometre]
NON-REVENUE WATER Find	= Apparent Losses + Real Losses + Unbilled Metered Consumption + Unbilled Unmetered Consumption. This is water which does not provide revenue potential to the utility.
Number of active AND inactive service connections Find	Number of customer service connections, extending from the water main to supply water to a customer. Please note that this includes the actual number of distinct piping connections, including fire connections, whether active or inactive. This may differ substantially from the number of customers (or number of accounts). **Note: this number does not include the pipeline leads to fire hydrants - the total length of piping supplying fire hyrants should be included in the "Length of mains" parameter.**
Real Losses Find	Physical water losses from the pressurized system (water mains and customer service connections) and the utility's storage tanks, up to the point of customer consumption. In metered systems this is the customer meter, in unmetered situations this is the first point of consumption (stop tap/tap) within the property. The annual volume lost through all types of leaks, breaks and overflows depends on frequencies, flow rates, and average duration of individual leaks, breaks and overflows.
Revenue Water	Those components of System Input Volume that are billed and have the potential to produce revenue.
Service Connection Density Find	=number of customer service connections / length of mains

Item Name	Description
Systematic data handling errors Find	Apparent losses caused by accounting omissions, errant computer programming, gaps in policy, procedure, and permitting/activation of new accounts; and any type of data lapse that results in under-stated customer water consumption in summary billing reports. **Systematic Data Handling Errors result in a direct loss of revenue potential. Water utilities can find "lost" revenue by keying on this component.** Utilities typically measure water consumption registered by water meters at customer premises. The meter should be read routinely (ex: monthly) and the data transferred to the Customer Billing System, which generates and sends a bill to the customer. Data Transfer Errors result in the consumption value being less than the actual consumption, creating an apparent loss. Such error might occur from illegible and mis-recorded hand-written readings compiled by meter readers, inputting an incorrect meter register unit conversion factor in the automatic meter reading equipment, or a variety of similar errors. Apparent losses also occur from Data Analysis Errors in the archival and data reporting processes of the Customer Billing System. Inaccurate estimates used for accounts that fail to produce a meter reading are a common source of error. Billing adjustments may award customers a rightful monetary credit, but do so by creating a negative value of consumption, thus under-stating the actual consumption. Account activation lapses may allow new buildings to use water for months without meter readings and billing. Poor permitting and construction inspection practices can result in a new building lacking a billing account, a water meter and meter reading; i.e., the customer is unknown to the utility's billing system. Close auditing of the permitting, metering, meter reading, billing and reporting processes of the water consumption data trail can uncover data management gaps that create volumes of systematic data handling error. Utilities should routinely analyze customer billing records to detect data anomalies and quantify these losses. For example, a billing account that registers zero consumption for two or more billing cycles should be checked to explain why usage has seemingly halted. Given the revenue loss impacts of these losses, water utilities are well-justified in providing continuous oversight and timely correction of data transfer errors & data handling errors. If the water auditor has not yet gathered detailed data or assessment of systematic data handling error, it is recommended that the auditor apply the default value of 0.25% of the the Billed Authorized Consumption volume. However, if the auditor has investigated the billing system and its controls, and has well validated data that indicates the volume from systematic data handling error is substantially higher or lower than that generated by the default value, then the auditor should enter a quantity that was derived from the utility investigations and select an appropriate grading. Note: negative values are not allowed for this audit component. If the auditor enters zero for this component then a grading of 1 will be automatically assigned.
Total annual cost of operating the water system Find	These costs include those for operations, maintenance and any annually incurred costs for long-term upkeep of the drinking water supply and distribution system. It should include the costs of day-to-day upkeep and long-term financing such as repayment of capital bonds for infrastructure expansion or improvement. Typical costs include employee salaries and benefits, materials, equipment, insurance, fees, administrative costs and all other costs that exist to sustain the drinking water supply. Depending upon water utility accounting procedures or regulatory agency requirements, it may be appropriate to include depreciation in the total of this cost. This cost should not include any costs to operate wastewater, biosolids or other systems outside of drinking water.
Unauthorized consumption Find	Includes water illegally withdrawn from fire hydrants, illegal connections, bypasses to customer consumption meters, or tampering with metering or meter reading equipment; as well as any other ways to receive water while thwarting the water utility's ability to collect revenue for the water. Unauthorized consumption results in uncaptured revenue and creates an error that understates customer consumption. In most water utilities this volume is low and, if the water auditor has not yet gathered detailed data for these loss occurrences, it is recommended that the auditor apply a default value of 0.25% of the volume of water supplied. However, if the auditor has investigated unauthorized occurrences, and has well validated data that indicates the volume from unauthorized consumption is substantially higher or lower than that generated by the default value, then the auditor should enter a quantity that was derived from the utility investigations. Note that a value of zero will not be accepted since all water utilities have some volume of unauthorized consumption occurring in their system. Note: if the auditor selects the default value for unauthorized consumption, a data grading of 5 is automatically assigned, but not displayed on the Reporting Worksheet.
Unavoidable Annual Real Losses (UARL) Find	UARL (gallons)=(5.41Lm + 0.15Nc + 7.5Lc) xP, or UARL (litres)=(18.0Lm + 0.8Nc + 25.0Lc) xP where: Lm = length of mains (miles or kilometres) Nc = number of customer service connections Lp = the average distance of customer service connection piping (feet or metres) (see the Worksheet "Service Connection Diagram" for guidance on deterring the value of Lp) Lc = total length of customer service connection piping (miles or km) Lc = Nc X Lp (miles or kilometres) P = Pressure (psi or metres) The UARL is a theoretical reference value representing the technical low limit of leakage that could be achieved if all of today's best technology could be successfully applied. It is a key variable in the calculation of the Infrastructure Leakage Index (ILI). Striving to reduce system leakage to a level close to the UARL is usually not needed unless the water supply is unusually expensive, scarce or both. NOTE: The UARL calculation has not yet been proven as fully valid for very small, or low pressure water distribution systems. If, in gallons: (Lm x 32) + Nc < 3000 or P <35psi in litres: (Lm x 20) + Nc < 3000 or P < 25m then the calculated UARL value may not be valid. The software does not display a value of UARL or ILI if either of these conditions is true.

Item Name	Description
Unbilled Authorized Consumption	All consumption that is unbilled, but still authorized by the utility. This includes Unbilled Metered Consumption + Unbilled Unmetered Consumption. See "Authorized Consumption" for more information. For Unbilled Unmetered Consumption, the Free Water Audit Software provides the auditor the option to select a default value if they have not audited unmetered activities in detail. The default calculates a volume that is 1.25% of the Water Supplied volume. If the auditor has carefully audited the various unbilled, unmetered, authorized uses of water, and has established reliable estimates of this collective volume, then he or she may enter the volume directly for this component, and not use the default value.
Unbilled metered consumption Find	Metered consumption which is authorized by the water utility, but, for any reason, is deemed by utility policy to be unbilled. This might for example include metered water consumed by the utility itself in treatment or distribution operations, or metered water provided to civic institutions free of charge. **It does not include water supplied to neighboring utilities (water exported) which may be metered but not billed.**
Unbilled unmetered consumption Find	Any kind of Authorized Consumption which is neither billed or metered. This component typically includes water used in activities such as fire fighting, flushing of water mains and sewers, street cleaning, fire flow tests conducted by the water utility, etc. In most water utilities it is a small component which is very often substantially overestimated. **It does NOT include water supplied to neighboring utilities (water exported) which is unmetered and unbilled – an unlikely case.** This component has many sub-components of water use which are often tedious to identify and quantify. Because of this, and the fact that it is usually a small portion of the water supplied, it is recommended that the auditor apply the default value, which is 1.25% of the Water Supplied volume. Select the default percentage to enter this value. If the water utility has carefully audited the unbilled, unmetered activities occurring in the system, and has well validated data that gives a value substantially higher or lower than the default volume, then the auditor should enter their own volume. However the default approach is recommended for most water utilities. Note that a value of zero is not permitted, since all water utilities have some volume of water in this component occurring in their system.
Units and Conversions	The user may develop an audit based on one of three unit selections: 1) Million Gallons (US) 2) Megalitres (Thousand Cubic Metres) 3) Acre-feet Once this selection has been made in the instructions sheet, all calculations are made on the basis of the chosen units. Should the user wish to make additional conversions, a unit converter is provided below (use drop down menus to select units from the yellow unit boxes): Enter Units: 1 — Convert From… Million Gallons (US) = **Converts to…..** 3.06888329 Acre-feet (conversion factor = 3.06888328973723)
Use of Option Buttons	To use the default percent value choose this button To enter a value choose this button and enter the value in the cell to the right  **NOTE:** For Unbilled Unmetered Consumption, Unauthorized Consumption and Systematic Data Handling Errors, a recommended default value can be applied by selecting the Percent option. The default values are based on fixed percentages of Water Supplied or Billed Authorized Consumption and are recommended for use in this audit unless the auditor has well validated data for their system. Default values are shown by purple cells, as shown in the example above. If a default value is selected, the user does not need to grade the item; a grading value of 5 is automatically applied (howe ver, this grade will not be displayed).
Variable production cost (applied to Real Losses) Find	The cost to produce and supply the next unit of water (e.g., $/million gallons). This cost is determined by calculating the summed unit costs for ground and surface water treatment and all power used for pumping from the source to the customer. It may also include other miscellaneous unit costs that apply to the production of drinking water. It should also include the unit cost of bulk water purchased as an import if applicable. It is common to apply this unit cost to the volume of Real Losses. However, if water resources are strained and the ability to meet future drinking water demands is in question, then the water auditor can be justified in applying the Customer Retail Rate to the Real Loss volume, rather than applying the Variable Production Cost. The Free Water Audit Software applies the Variable Production costs to Real Losses by default. However, the auditor has the option on the Reporting Worksheet to select the Customer Retail Cost as the basis for the Real Loss cost evaluation if the auditor determines that this is warranted.
Volume from own sources Find	The volume of water withdrawn (abstracted) from water resources (rivers, lakes, streams, wells, etc) controlled by the water utility, and then treated for potable water distribution. Most water audits are compiled for utility retail water distribution systems, so this volume should reflect the amount of treated drinking water that entered the distribution system. Often the volume of water measured at the effluent of the treatment works is slightly less than the volume measured at the raw water source, since some of the water is used in the treatment process. Thus, it is useful if flows are metered at the effluent of the treatment works. If metering exists only at the raw water source, an adjustment for water used in the treatment process should be included to account for water consumed in treatment operations such as filter backwashing, basin flushing and cleaning, etc. If the audit is conducted for a wholesale water agency that sells untreated water, then this quantity reflects the measure of the raw water, typically metered at the source.

Item Name	Description
Volume from own sources: Master meter and supply error adjustment Find	An estimate or measure of the degree of inaccuracy that exists in the master (production) meters measuring the annual Volume from own Sources, and any error in the data trail that exists to collect, store and report the summary production data. This adjustment is a weighted average number that represents the collective error for all master meters for all days of the audit year and any errors identified in the data trail. Meter error can occur in different ways. A meter or meters may be inaccurate by under-registering flow (did not capture all the flow), or by over-registering flow (overstated the actual flow). Data error can occur due to data gaps caused by temporary outages of the meter or related instrumentation. All water utilities encounter some degree of inaccuracy in master meters and data errors in archival systems are common; thus a value of zero should not be entered. Enter a negative percentage or value for metered data under-registration; or, enter a positive percentage or value for metered data over-registration.
Water exported Find	The Water Exported volume is the bulk water conveyed and sold by the water utility to neighboring water systems that exists outside of their service area. Typically this water is metered at the custody transfer point of interconnection between the two water utilities. Usually the meter(s) are owned by the water utility that is selling the water: i.e. the exporter. If the water utility who is compiling the annual water audit sells bulk water in this manner, they are an exporter of water. Note: The Water Exported volume is sold to wholesale customers who are typically charged a wholesale rate that is different than retail rates charged to the retail customers existing within the service area. Many state regulatory agencies require that the Water Exported volume be reported to them as a quantity separate and distinct from the retail customer billed consumption. For these reasons - and others - the Water Exported volume is always quantified separately from Billed Authorized Consumption in the standard water audit. **Be certain not to "double-count" this quantity by including it in both the Water Exported box and the Billed Metered Consumption box of the water audit Reporting Worksheet. This volume should be included only in the Water Exported box.**
Water exported: Master meter and supply error adjustment Find	An estimate or measure of the volume in which the Water Exported volume is incorrect. This adjustment is a weighted average that represents the collective error for all of the metered and archived exported flow for all days of the audit year. Meter error can occur in different ways. A meter may be inaccurate by under-registering flow (did not capture all the flow), or by over-registering flow (overstated the actual flow). Error in the metered, archived data can also occur due to data gaps caused by temporary outages of the meter or related instrumentation. All water utilities encounter some degree of error in their metered data, particularly if meters are aged and infrequently tested. Occasional errors also occur in the archived data. Thus, a value of zero should not be entered. Enter a negative percentage or value for metered data under-registration; or enter a positive percentage or value for metered data over-registration. If regular meter accuracy testing is conducted on the meter(s) - which is usually conducted by the water utility selling the water - then the results of this testing can be used to help quantify the meter error adjustment. Corrections to data gaps or other errors found in the archived data should also be included as a portion of this meter error adjustment.
Water imported Find	The Water Imported volume is the bulk water purchased to become part of the Water Supplied volume. Typically this is water purchased from a neighboring water utility or regional water authority, and is metered at the custody transfer point of interconnection between the two water utilities. Usually the meter(s) are owned by the water supplier selling the water to the utility conducting the water audit. The water supplier selling the bulk water usually charges the receiving utility based upon a wholesale water rate.
Water imported: Master meter and supply error adjustment Find	An estimate or measure of the volume in which the Water Imported volume is incorrect. This adjustment is a weighted average that represents the collective error for all of the metered and archived imported flow for all days of the audit year. Meter error can occur in different ways. A meter may be inaccurate by under-registering flow (did not capture all the flow), or by over-registering flow (overstated the actual flow). Error in the metered, archived data can also occur due to data gaps caused by temporary outages of the meter or related instrumentation. All water utilities encounter some level of meter inaccuracy, particularly if meters are aged and infrequently tested. Occasional errors also occur in the archived metered data. Thus, a value of zero should not be entered. Enter a negative percentage or value for metered data under-registration; or, enter a positive percentage or value for metered data over-registration. If regular meter accuracy testing is conducted on the meter(s) - which is usually conducted by the water utility selling the water - then the results of this testing can be used to help quantify the meter error adjustment.
WATER LOSSES Find	= apparent losses + real losses Water Losses are the difference between Water Supplied and Authorized Consumption. Water losses can be considered as a total volume for the whole system, or for partial systems such as transmission systems, pressure zones or district metered areas (DMA); if one of these configurations are the basis of the water audit.

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Water Audit Report for: San Francisco Public Utilities Commission (3810011)
Reporting Year: 2020 7/2019 - 6/2020
Data Validity Score: 89

Water Loss Control Planning Guide

	Water Audit Data Validity Level / Score				
Functional Focus Area	**Level I** (0-25)	**Level II** (26-50)	**Level III** (51-70)	**Level IV** (71-90)	**Level V** (91-100)
Audit Data Collection	Launch auditing and loss control team; address production metering deficiencies	Analyze business process for customer metering and billing functions and water supply operations. Identify data gaps.	Establish/revise policies and procedures for data collection	Refine data collection practices and establish as routine business process	Annual water audit is a reliable gauge of year-to-year water efficiency standing
Short-term loss control	Research information on leak detection programs. Begin flowcharting analysis of customer billing system	Conduct loss assessment investigations on a sample portion of the system: customer meter testing, leak survey, unauthorized consumption, etc.	Establish ongoing mechanisms for customer meter accuracy testing, active leakage control and infrastructure monitoring	Refine, enhance or expand ongoing programs based upon economic justification	Stay abreast of improvements in metering, meter reading, billing, leakage management and infrastructure rehabilitation
Long-term loss control		Begin to assess long-term needs requiring large expenditure: customer meter replacement, water main replacement program, new customer billing system or Automatic Meter Reading (AMR) system.	Begin to assemble economic business case for long-term needs based upon improved data becoming available through the water audit process.	Conduct detailed planning, budgeting and launch of comprehensive improvements for metering, billing or infrastructure management	Continue incremental improvements in short-term and long-term loss control interventions
Target-setting			Establish long-term apparent and real loss reduction goals (+10 year horizon)	Establish mid-range (5 year horizon) apparent and real loss reduction goals	Evaluate and refine loss control goals on a yearly basis
Benchmarking			Preliminary Comparisons - can begin to rely upon the Infrastructure Leakage Index (ILI) for performance comparisons for real losses (see below table)	Performance Benchmarking - ILI is meaningful in comparing real loss standing	Identify Best Practices/ Best in class - the ILI is very reliable as a real loss performance indicator for best in class service

For validity scores of 50 or below, the shaded blocks should not be focus areas until better data validity is achieved.

Once data have been entered into the Reporting Worksheet, the performance indicators are automatically calculated. How does a water utility operator know how well his or her system is performing? The AWWA Water Loss Control Committee provided the following table to assist water utilities is gauging an approximate Infrastructure Leakage Index (ILI) that is appropriate for their water system and local conditions. The lower the amount of leakage and real losses that exist in the system, then the lower the ILI value will be.

Note: this table offers an approximate guideline for leakage reduction target-setting. The best means of setting such targets include performing an economic assessment of various loss control methods. However, this table is useful if such an assessment is not possible.

General Guidelines for Setting a Target ILI (without doing a full economic analysis of leakage control options)

Target ILI Range	Financial Considerations	Operational Considerations	Water Resources Considerations
1.0 - 3.0	Water resources are costly to develop or purchase; ability to increase revenues via water rates is greatly limited because of regulation or low ratepayer affordability.	Operating with system leakage above this level would require expansion of existing infrastructure and/or additional water resources to meet the demand.	Available resources are greatly limited and are very difficult and/or environmentally unsound to develop.
>3.0 -5.0	Water resources can be developed or purchased at reasonable expense; periodic water rate increases can be feasibly imposed and are tolerated by the customer population.	Existing water supply infrastructure capability is sufficient to meet long-term demand as long as reasonable leakage management controls are in place.	Water resources are believed to be sufficient to meet long-term needs, but demand management interventions (leakage management, water conservation) are included in the long-term planning.
>5.0 - 8.0	Cost to purchase or obtain/treat water is low, as are rates charged to customers.	Superior reliability, capacity and integrity of the water supply infrastructure make it relatively immune to supply shortages.	Water resources are plentiful, reliable, and easily extracted.
Greater than 8.0	Although operational and financial considerations may allow a long-term ILI greater than 8.0, such a level of leakage is not an effective utilization of water as a resource. Setting a target level greater than 8.0 - other than as an incremental goal to a smaller long-term target - is discouraged.		
Less than 1.0	If the calculated Infrastructure Leakage Index (ILI) value for your system is 1.0 or less, two possibilities exist. a) you are maintaining your leakage at low levels in a class with the top worldwide performers in leakage control. b) A portion of your data may be flawed, causing your losses to be greatly understated. This is likely if you calculate a low ILI value but do not employ extensive leakage control practices in your operations. In such cases it is beneficial to validate the data by performing field measurements to confirm the accuracy of production and customer meters, or to identify any other potential sources of error in the data.		

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Example 1a: Million Gallons: | **Example 1b**: Million Gallons: Performance Indicators | **Example 2a**: Megalitres: Reporting Worksheet | **Example 2b**: Megalitres: Reporting Worksheet

Example Audit 1a:

AWWA Free Water Audit Software:
Reporting Worksheet

WAS v5.0
American Water Works Association.
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? Click to access definition
\+ Click to add a comment

Water Audit Report for: City of Asheville (01-11-010)
Reporting Year: 2013 7/2012 - 6/2013

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: MILLION GALLONS (US) PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter Error Adjustments

WATER SUPPLIED

<---------- Enter grading in column 'E' and 'J' ----------> Pcnt: Value:

Volume from own sources:	7	7,352.880	MG/Yr	3			285.450	MG/Yr
Water imported:	n/a	0.000	MG/Yr					MG/Yr
Water exported:	n/a	0.000	MG/Yr					MG/Yr
WATER SUPPLIED:		**7,067.430**	MG/Yr					

Enter negative % or value for under-registration
Enter positive % or value for over-registration

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

Pcnt: Value:

Billed metered:	8	4,782.250	MG/Yr			
Billed unmetered:	n/a	0.000	MG/Yr			
Unbilled metered:	7	27.757	MG/Yr			
Unbilled unmetered:	8	157.790	MG/Yr		157.790	MG/Yr

Unbilled Unmetered volume entered is greater than the recommended default value

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION:		**4,967.797**	MG/Yr		
WATER LOSSES (Water Supplied - Authorized Consumption)		**2,099.633**	MG/Yr		
Apparent Losses				Pcnt:	Value:
Unauthorized consumption:		17.669	MG/Yr	0.25%	MG/Yr
Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed					
Customer metering inaccuracies:	7	111.220	MG/Yr	2.26%	MG/Yr
Systematic data handling errors:	5	11.956	MG/Yr	0.25%	MG/Yr
Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed					
Apparent Losses:		**140.844**	MG/Yr		
Real Losses (Current Annual Real Losses or CARL)					
Real Losses = Water Losses - Apparent Losses:		**1,958.789**	MG/Yr		
WATER LOSSES:		**2,099.633**	MG/Yr		

NON-REVENUE WATER

NON-REVENUE WATER:		**2,285.180**	MG/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	4	1,236.5	miles
Number of active AND inactive service connections:	7	55,256	
Service connection density:		45	conn./mile main
Are customer meters typically located at the curbstop or property line?		Yes	
Average length of customer service line:			(length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

Average operating pressure:	4	145.3	psi

COST DATA

Total annual cost of operating water system:	10	$33,630,676	$/Year	
Customer retail unit cost (applied to Apparent Losses):	10	$3.22	$/100 cubic feet (ccf)	
Variable production cost (applied to Real Losses):	6	$335.94	$/Million gallons	☐ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 72 out of 100 ***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Variable production cost (applied to Real Losses)
3: Unauthorized consumption

Example Audit 1b:

AWWA Free Water Audit Software:
System Attributes and Performance Indicators

WAS v5.0
American Water Works Association.
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Water Audit Report for: City of Asheville (01-11-010)
Reporting Year: 2013 7/2012 - 6/2013

*** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 72 out of 100 ***

System Attributes:

	Apparent Losses:	140.844	MG/Yr
+	Real Losses:	1,958.789	MG/Yr
=	Water Losses:	2,099.633	MG/Yr
?	Unavoidable Annual Real Losses (UARL):	794.34	MG/Yr
	Annual cost of Apparent Losses:	$606,265	
	Annual cost of Real Losses:	$658,036	Valued at Variable Production Cost

Return to Reporting Worksheet to change this assumpiton

Performance Indicators:

Financial:	Non-revenue water as percent by volume of Water Supplied:	32.3%	
	Non-revenue water as percent by cost of operating system:	3.9%	Real Losses valued at Variable Production Cost
Operational Efficiency:	Apparent Losses per service connection per day:	6.98	gallons/connection/day
	Real Losses per service connection per day:	97.12	gallons/connection/day
	Real Losses per length of main per day*:	N/A	
	Real Losses per service connection per day per psi pressure:	0.67	gallons/connection/day/psi

	From Above, Real Losses = Current Annual Real Losses (CARL):	1,958.79	million gallons/year
?	Infrastructure Leakage Index (ILI) [CARL/UARL]:	2.47	

* This performance indicator applies for systems with a low service connection density of less than 32 service connections/mile of pipeline

Example Audit 2a:

AWWA Free Water Audit Software: Reporting Worksheet

WAS v5.0

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+ Click to add a comment

Water Audit Report for: The City of Calgary
Reporting Year: 2013 (1/2013 - 12/2013)

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: MEGALITRES (THOUSAND CUBIC METRES) PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

<----------- Enter grading in column 'E' and 'J' ----------> Master Meter Error Adjustments

WATER SUPPLIED

				Pcnt:	Value:	
Volume from own sources:	7	174,324.000	ML/Yr	1.00%		ML/Yr
Water imported:	n/a	0.000	ML/Yr			ML/Yr
Water exported:	7	8,190.131	ML/Yr	1.00%		ML/Yr

Enter negative % or value for under-registration
Enter positive % or value for over-registration

WATER SUPPLIED: 164,488.979 ML/Yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

			Pcnt:	Value:	
Billed metered:	6	125,111.268	ML/Yr			
Billed unmetered:	8	3,503.386	ML/Yr			
Unbilled metered:	7	166.157	ML/Yr			
Unbilled unmetered:	6	1,444.000	ML/Yr		1,444.000	ML/Yr

Use buttons to select percentage of water supplied **OR** value

AUTHORIZED CONSUMPTION: 130,224.811 ML/Yr

WATER LOSSES (Water Supplied - Authorized Consumption)

34,264.168 ML/Yr

Apparent Losses

			Pcnt:	Value:	
Unauthorized consumption:		411.222	ML/Yr	0.25%		ML/Yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	6	1,265.429	ML/Yr	1.00%	ML/Yr
Systematic data handling errors:		312.778	ML/Yr	0.25%	ML/Yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: 1,989.429 ML/Yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: 32,274.739 ML/Yr

WATER LOSSES: 34,264.168 ML/Yr

NON-REVENUE WATER

NON-REVENUE WATER: 35,874.325 ML/Yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	8	4,945.0	kilometers
Number of active AND inactive service connections:	8	312,075	
Service connection density:		63	conn./km main
Are customer meters typically located at the curbstop or property line?		No	
Average length of customer service line:	8	12.0	metres (length of service line, beyond the property boundary, that is the responsibility of the utility)
Average operating pressure:	8	50.8	metres (head)

COST DATA

Total annual cost of operating water system:	9	$169,973,759	$/Year	
Customer retail unit cost (applied to Apparent Losses):	9	$2.35	$/1000 litres	
Variable production cost (applied to Real Losses):	9	$73.54	$/Megalitre	☑ Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 72 out of 100 ***

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources
2: Billed metered
3: Customer metering inaccuracies

Example Audit 2b:

AWWA Free Water Audit Software:
System Attributes and Performance Indicators

WAS v5.0

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Water Audit Report for: The City of Calgary
Reporting Year: 2013 1/2013 - 12/2013

*** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 72 out of 100 ***

System Attributes:

	Apparent Losses:	1,989.429	ML/Yr
+	Real Losses:	32,274.739	ML/Yr
=	Water Losses:	34,264.168	ML/Yr
?	Unavoidable Annual Real Losses (UARL):	8,015.57	ML/Yr
	Annual cost of Apparent Losses:	$4,675,159	
	Annual cost of Real Losses:	$75,845,637	Valued at Customer Retail Unit Cost

Return to Reporting Worksheet to change this assumpiton

Performance Indicators:

Financial:	Non-revenue water as percent by volume of Water Supplied:	21.8%	
	Non-revenue water as percent by cost of operating system:	49.6%	Real Losses valued at Customer Retail Unit Cost
Operational Efficiency:	Apparent Losses per service connection per day:	17.47	litres/connection/day
	Real Losses per service connection per day:	283.34	litres/connection/day
	Real Losses per length of main per day*:	N/A	
	Real Losses per service connection per day per meter (head) pressure:	5.58	litres/connection/day/m
	From Above, Real Losses = Current Annual Real Losses (CARL):	32,274.74	ML/year
?	Infrastructure Leakage Index (ILI) [CARL/UARL]:	4.03	

* This performance indicator applies for systems with a low service connection density of less than 20 service connections/kilometre of pipeline

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AWWA Water Audit Software Version 5.0 Developed by the Water Loss Control Committee of the American Water Works Association August, 2014

This software is intended to serve as a basic tool to compile a preliminary, or "top-down", water audit. It is recommended that users also refer to the current edition of the AWWA M36 Publication, Water Audits and Loss Control Programs, for detailed guidance on compiling a comprehensive, or "bottom-up", water audit using the same water audit methodology.

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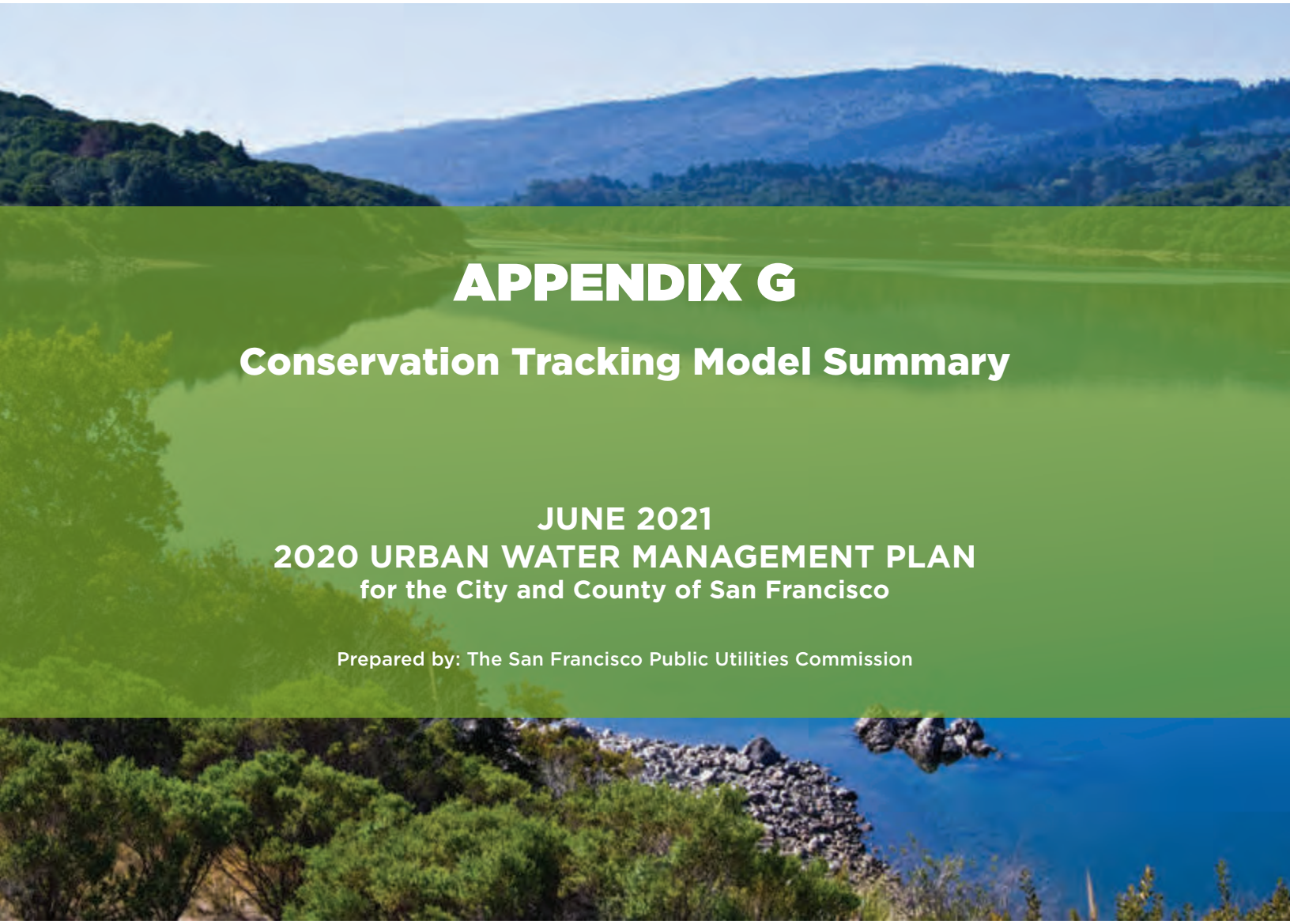
- AWWA Water Audits and Loss Control Programs, M36 Publication, 3rd Edition, 2009

- Service Connection Diagrams courtesy of Ronnie McKenzie, WRP Pty Ltd.

VERSION HISTORY:

Version:	Release Date:	Number of Worksheets:	Key Features and Developments
v1	2005/ 2006	5	The AWWA Water Audit Software was piloted in 2005 (v1.0 beta). The early versions (1.x) of the software restricted data entry to units of Million Gallons per year. For each entry into the audit, users identified whether the input was measured or estimated.
v2	2006	5	The most significant enhancement in v2 of the software was to allow the user to choose the volumetric units to be used in the audit, Million Gallons or Thousand Cubic Metres (megalitres) per year. Two financial performance indicators were added to provide feedback to the user on the cost of Real and Apparent losses.
v3	2007	7	In v3, the option to report volumetric units in acre-feet was added. Another new feature in v3 was the inclusion of default values for two water audit components (unbilled unmetered and unauthorized consumption). v3 also included two examples of completed audits in units of million gallons and Megalitres. Several checks were added into v3 to provide instant feedback to the user on common data entry problems, in order to help the user complete an accurate water audit.
v4 - v4.2	2010	10	v4 (and versions 4.x) of the software included a new approach to data grading. The simple "estimated" or "measured" approach was replaced with a more granular scale (typically 1-10) that reflected descriptions of utility practices and served to describe the confidence and accuracy of the input data. Each input value had a corresponding scale fully described in the Grading Matrix tab. The Grading Matrix also showed the actions required to move to a higher grading score. Grading descriptions were available on the Reporting Worksheet via a pop-up box next to each water audit input. A water audit data validity score is generated (max = 100) and priority areas for attention (to improve audit accuracy) are identified, once a user completes the requied data grading. A service connection diagram was also added to help users understand the impact of customer service line configurations on water losses and how this information should be entered into the water audit software. An acknoweldgements section was also added. Minor bug fixes resulted in the release of versions 4.1 and 4.2. A French language version was also made available for v4.2.
v5	2014	12	In v5, changes were made to the way Water Supplied information is entered into software, with each major component having a corresponding Master Meter Error Adjustment entry (and data grading requirement). This required changes to the data validity score calculation; v5 of the software uses a weighting system that is, in part, proportional to the volume of input components. The Grading Matrix was updated to reflect the new audit inputs and also to include clarifications and additions to the scale descriptions. The appearance of the software was updated in v5 to make the software more user-friendly and several new features were added to provide more feedback to the user. Notably, a dashboard tab has been added to provide more visual feedback on the water audit results and associated costs of Non-Revenue Water. A comments sheet was added to allow the user to track notes, comments and to cite sources used.



APPENDIX G

Conservation Tracking Model Summary

JUNE 2021
2020 URBAN WATER MANAGEMENT PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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SFPUC Conservation Tracking Model

Water and Energy Savings Specifications for Conservation Program Measures

David Mitchell, M.Cubed

Last Updated: 03-08-2021

Overview

The SFPUC Conservation Tracking Model is a tool developed to track conservation program activity, water savings, and costs and benefits for SFPUC's retail service area conservation programs. The model is a customized version of the Alliance for Water Efficiency's (AWE) Water Conservation Tracking Tool, an Excel-based water conservation tracking model with more than four hundred registered water utility users throughout North America. In 2014, the SFPUC customized the AWE Conservation Tracking Tool for its retail service area and began using it to forecast water savings from conservation measures.

The purpose of this Water and Energy Savings Specifications for Conservation Program Measures Technical Memorandum is to document the assumptions and methodologies used to estimate water savings for every measure in the SFPUC's Conservation Tracking Model and key updates made over time. This document reflects all measures with modeled water savings included in the Conservation Tracking Model, including measures the SFPUC implements now or plans to in the next five years, implemented in the past, and ones SFPUC has evaluated and not implemented and may or may not do so in the future. It does not reflect conservation measures the SFPUC provides or provided in the past that don't have established or sufficient water-savings methodologies.

History of SFPUC Conservation Forecast Modelling

The SFPUC developed its first model in 2004 to forecast both in-City retail water demands and water savings from conservation measures. The SFPUC used estimated conservation water savings generated by this model to develop its 2004 and 2011 conservation plans. The SFPUC migrated from using this combined demand/forecast model in 2014, and started using a separate econometric demand model developed by Brattle Group to estimate retail demands and to the SFPUC Conservation Tracking Model to estimate water savings from conservation measures. In 2020, the SFPUC updated its econometric demand model for its retail service area for use in preparing its 2020 Urban Water Management Plan and for providing updated demand estimates for its 2020 Retail Conservation Plan.

Model Structure

The Conservation Tracking Model is an Excel-based model with an extensive Visual Basic backend. Using the model requires completing Model Setup, Program Specification, and Annual Activity data input tasks. Each data input task is contained on a separate worksheet in the model.

Model Setup consists of providing the model with the baseline forecasts of population, housing units, and water demand, as well as other basic system information the model uses to calculate the costs and benefits of conservation programs. The baseline water demand forecast comes from the Brattle Group econometric demand models. The baseline population forecast is from the Association of Bay Area Governments (ABAG).

Program Specification consists of parameterizing the conservation programs in the model. The model can hold up to 75 separate programs. The model can be extended to hold more than 75 programs if needed. Program parameters are grouped into five categories: water saving parameters, utility cost parameters, participant cost parameters, participant non water benefits parameters, and plumbing code parameters. The latter are used to specify interaction effects with plumbing codes to avoid double counting water savings jointly produced by plumbing codes and conservation programs. In terms of forecasting conservation program water savings, the most important parameters are the water savings parameters and the plumbing code interaction parameters.

Annual Activity is simply the number of units of activity that have been done (in the case of historical years) or are expected to be done (in the case of future years). The user enters historical and projected annual activity for each conservation program that was specified during the Program Specification step. For toilets, urinals, and clothes washers, the model includes fixture inventory modules to keep track of how many fixtures have been converted to efficient fixtures due to plumbing codes and conservation programs to ensure the user does not specify levels of fixture replacement that are physically infeasible.

Once the three data input tasks have been completed the model results can be reviewed. Model results are summarized into three categories: (1) program water savings, (2) retail water demand, and (3) costs and benefits.

- Program water savings are the projected annual water savings from each specified conservation program through 2045. Results can be grouped by program category and customer class or shown individually.

- Retail demand results summarize the baseline annual demand forecast with plumbing code and conservation program adjustments through 2045. It is grouped by customer class and shown separately for the in-city and suburban parts of SFPUC's retail service area. Results can be shown in MGD or acre-feet. Gross per capita and residential per capita water use are also reported. In addition, projected per capita water use is compared to per capita water use targets under SBx7-7 and the MOU.

- Costs and benefits of conservation are reported for the utility and program participant perspectives. Unit costs, net present value, and benefit-cost ratios can be reported for the totality of all programs, for individual program categories (e.g. toilet replacement programs), or for individual programs. In addition to financial benefits and costs, the model calculates expected reductions in associated energy use and greenhouse gas emissions.

Model inputs can be saved as scenarios. This allows the model to simultaneously hold more than one set of data inputs. For example, a user could specify scenarios for alternative baseline population and demand forecasts or for alternative levels of conservation program investment. There is no practical limit to the number of scenarios the model can hold.

Summary of Key Updates since 2015

2015 Updates
The conservation program savings presented in SFPUC's 2011 Conservation Plan were developed with the SFPUC's original Retail Demand Model not the Conservation Tracking Model. While the Conservation Tracking Model can be calibrated to replicate the 2011 estimates, the final estimates developed for the 2015 Conservation Plan, which were developed with the Conservation Tracking Model, were generally lower after 2020 than what was presented in the 2011 Plan for three main reasons:

- The SFPUC undertook a review of the water saving estimates and assumptions and made several adjustments, including to savings estimates for clothes washers and toilets, both of which were lowered to account for new efficiency standards affecting the long-term savings potential of these programs.

- The 2015 Plan updated the end dates for toilet and clothes washer incentives due to high fixture saturation levels.
- The 2015 Plan focused mainly on the next five years, reflecting that beyond that horizon, there is much less certainty regarding what conservation programs SFPUC will find most beneficial and cost-effective to implement.

2020 Updates
In 2020, the SFPUC made the following changes to the model:

- Revised future participation levels for several measures to better reflect current trends.
- Added several new conservation measures.
- Adjusted the water savings assumptions of several existing measures.
- Updated the water savings module for clothes washer efficiency standards to align it with the approach used in Version 4 of the Alliance for Water Efficiency's Water Conservation Tracking Tool.
- Incorporated the City of San Francisco Planning Department's current population and housing estimates and projections.
- Removed the calculation of plumbing code water savings for new development (post 2020) because they are already embedded in SFPUC's updated retail demand projections.

These updates were based on analysis of historical program participation, updated fixture saturation rates, and new empirical and other water-savings studies and data available since 2015. This document reflects the assumptions and specifications used in the SFPUC's Conservation Tracking Model for purposes of estimating water savings for the SFPUC's 2020 Retail Conservation plan.

Updated Population and Housing Projections

Both population and housing estimates have changed since the 2015 version of the conservation model due to new assumptions about growth in the City of San Francisco. The City has a goal of increased housing development on the order of 5,000 new units per year. However, as described elsewhere in this TM, SFPUC expects new construction to be built at code and generate no additional passive savings. All future passive savings will come from existing stock. As such, population and housing estimates for 2020 were updated, as described below, and then held constant for the remainder of the planning horizon.

Population Projection Update

The City of San Francisco Planning Department provided an updated 2020 population of 941,269. Residential population in 2020 was estimated from total population by subtracting 3%, which represents population housed in group quarters. This value is based on historical estimates from 2011-2020 from Department of Finance E-5 Housing and Population Estimates (dated May 2020), as well as P-4 Household Projections for California Counties for 2020-2030 (dated June 2020).

The conservation model's original and updated population projections are shown in Table 1. As shown in this table, the population stops growing after 2020 to reflect no additional passive savings to be generated from future growth.

Table 1: Population Projection Update

Year	Total Population			Residential Population		
	2015 Model	2020 Model	% Difference	2015 Model	2020 Model	% Difference
2005	780,187	780,187	0.0%	756,678	756,678	0.0%
2010	805,235	805,235	0.0%	780,971	780,971	0.0%
2015	857,508	857,508	0.0%	831,995	831,995	0.0%
2020	890,400	941,269	5.7%	863,800	913,031	5.7%
2025	934,800	941,269	0.7%	906,800	913,031	0.7%
2030	981,800	941,269	-4.1%	952,500	913,031	-4.1%
2035	1,032,500	941,269	-8.8%	1,000,800	913,031	-8.8%
2040	1,085,700	941,269	-13.3%	1,051,100	913,031	-13.1%
2045	1,085,700	941,269	-13.3%	1,051,100	913,031	-13.1%
2050	1,085,700	941,269	-13.3%	1,051,100	913,031	-13.1%

Source: 2020 total population from San Francisco Planning Department, adjusted to residential population based on 3% group quarters (DOF E-5 and P-4)

Household Projection Update

The City of San Francisco Planning Department provided an estimate of total housing units as of 2020 to the SFPUC in October 2020. This value is assumed to be a projection of total constructed housing units as opposed to occupied housing units.

Occupied single-family housing units in 2020 were set equal to the number of single-family residential accounts in the SFPUC's billing system as of August 2020. This includes the number of accounts with the service agreement type residential single family (RES-SWTR), regardless of dwelling unit count, and the service agreement type of residential combination service (COMBO-R) with 1 dwelling unit. Occupied single-family housing units for 2025 and beyond were kept the same as 2020.

Total 2020 housing units from the Planning Department were adjusted to estimate occupied housing units using a vacancy rate of 8.26%, which is an average of the last five estimates provided by the ACS 5-year estimates for the City of San Francisco from 2015-2019 (ranging 7.7% to 8.9%). Total occupied multi-family housing units in 2020 were estimated by subtracting the number of occupied single-family housing units in 2020 from the total 2020 occupied housing units.

2015 housing units for both single- and multi-family were interpolated between values used previously for 2010 and the updated inputs for 2020.

The conservation model's original and updated projections for total, single-, and multi-family housing units are shown in Table 2. As shown in this table, the 2020 housing units stop growing after 2020 to reflect no additional passive savings to be generated from future growth.

Table 2: Housing Projection Update

Year	Total Occupied Housing Units			Occupied Single-Family Housing Units			Occupied Multi-Family Housing Units		
	2015 Model	2020 Model	% Difference	2015 Model	2020 Model	% Difference	2015 Model	2020 Model	% Difference
2005	335,054	335,054	0.0%	109,500	109,500	0.0%	225,554	225,554	0.0%
2010	345,811	345,811	0.0%	110,759	110,759	0.0%	235,052	235,052	0.0%
2015	366,540	356,070	-2.9%	113,687	111,231	-2.2%	252,853	244,840	-3.2%
2020	377,684	366,330	-3.0%	115,073	111,702	-2.9%	262,611	254,628	-3.0%
2025	393,630	366,330	-6.9%	116,475	111,702	-4.1%	277,155	254,628	-8.1%
2030	410,227	366,330	-10.7%	117,894	111,702	-5.3%	292,333	254,628	-12.9%
2035	426,235	366,330	-14.1%	119,331	111,702	-6.4%	306,904	254,628	-17.0%
2040	442,905	366,330	-17.3%	120,785	111,702	-7.5%	322,120	254,628	-21.0%
2045	442,905	366,330	-17.3%	120,785	111,702	-7.5%	322,120	254,628	-21.0%
2050	442,905	366,330	-17.3%	120,785	111,702	-7.5%	322,120	254,628	-21.0%

Source: 2020 total housing units provided by San Francisco Planning Department and adjusted to account for occupancy using average vacancy rate from ACS 5-year estimates from 2015-2019. Count of single-family units equal to 2020 count of SFPUC single-family water accounts served with remainder allocated to multi-family units.

Calculation of Plumbing Code Water Savings

The Conservation Tracking Model calculates the water savings associated with plumbing codes and appliance efficiency standards using models of fixture inventory coupled with usage assumptions. These savings are commonly referred to as passive water savings because they occur regardless of actions taken by the utility. The Tracking Model includes passive savings models for residential toilets, showerheads, and clothes washers, and non-residential toilets, urinals, hotel showerheads, and coin-op clothes washers.

It is important to emphasize that the passive savings estimates do not actually impact the model's estimates of final water demand. This is because the Brattle Group's baseline demand forecasts used in the Tracking Model are net of passive water savings. However, the Brattle forecast does not generate an explicit forecast of passive water savings because the adjustment for passive savings is enacted through the model's trend term. Because SFPUC desired explicit estimates of passive water savings, modules for estimating these savings were included in the Conservation Tracking Model. These estimates are added to the Brattle Group's baseline forecast before it is used in the model so that they can be represented explicitly. It is the Brattle Group's baseline forecast adjusted for passive savings that is entered on the Model Setup worksheet. The adjusted baseline forecast is:[1]

Adjusted Baseline Forecast = Brattle Baseline Forecast + Passive Water Savings

The final demand forecast generated by the Conservation Tracking Model is then:

[1] The passive water savings adjustment also includes water savings expected to be realized after 2015 from the historical implementation of SFPUC conservation programs prior to the start of the Brattle Group's baseline forecast. This is done to prevent the model from double counting these water savings.

Final Demand Forecast = Adjusted Baseline Forecast – Passive Water Savings – Program Water Savings

This is also equal to:

Final Demand Forecast = Brattle Baseline Forecast – Program Water Savings

This means the only determinants of the final demand forecast are the Brattle Baseline Forecast and the forecast of programmatic water savings from future implementation of SFPUC conservation programs. While the passive savings forecast is useful because it provides an estimate of how much demand reduction can be ascribed to plumbing codes and appliance standards, it does not actually affect the final estimate of future demand.

Following are descriptions of how passive savings are calculated for each fixture/appliance category. The SFPUC Plumbing Fixture Population and Efficiency Saturation Estimates Technical Memorandum issued on January 13, 2014 and included in Appendix A of the 2015 Retail Conservation Plan and the updated saturation estimates memo dated August 19, 2019, and included in appendices of the 2020 Retail Conservation Plan provide more details on fixture population and saturation estimates.

Residential Toilets

The population of residential toilets is based on SFPUC's forecasts of single and multi-family housing units. These forecasts are multiplied by the average number of toilets per dwelling unit, which are estimated from recent American Housing Survey data. The model uses an average of 2.22 and 1.26 toilets per dwelling unit for single and multi-family housing, respectively. Toilets installed in new housing constructed between 1991 and 2013 are assumed to be ULFT (1.6 gpf). Toilets installed in new housing constructed after 2013 are assumed to be HET (1.28 gpf). Toilets in existing housing constructed before 1991 are assumed to have an average flush volume of 3.5 gpf. Toilets in existing housing are assumed to be replaced at an annual rate of 3.1% per year. This is the average rate of residential toilet replacement reported in studies done by EBMUD and SCVWD. Existing toilets replaced between 1991 and 2013 are assumed to be replaced by ULFTs. Existing toilets replaced after 2013 are assumed to be replaced by HETs. Using this information, the model calculates the average flush volume for the inventory of new and existing toilets for each year between 1990 and 2064. Water savings per flush is calculated relative to the average flush volume in 1990. Average savings per flush is equal to the average flush volume in 1990 less the average flush volume in each year after 1990. Average savings per flush is multiplied by the estimated number of flushes per year to estimate annual water savings. The estimated number of flushes per year is equal to the residential population multiplied by the average daily per capita flush rate multiplied by 365. The residential population is derived from SFPUC's service area population forecasts. The average daily per capita flush rate of 4.8 is taken from the San Francisco Residential End Uses of Water Study.

Non-Residential Toilets

The population of non-residential toilets for the period 1990-2012 is taken from the Fixture Saturation Task Memo. The population of non-residential toilets for the period 2013-2064 is a linear extrapolation based on the forecast of service area population. The same assumptions used for residential toilets regarding flush volume of new toilets and replacement rate of existing toilets are used for non-residential toilets. The average flush volume of the toilet inventory and the water savings per flush relative to 1990 are calculated the same way as for residential toilets. Average savings per flush is multiplied by the estimated number of flushes per year to estimate annual water savings. Vickers (2001)

estimates annual flushes by multiplying daily flushes by a 260-day work year. Male workers are assumed to flush toilets (as opposed to urinals) an average of one time per day while female workers are assumed to flush toilets an average of three times per day. Male workers are assumed to comprise 54% of the labor force, per City of San Francisco (2009). Total employment is taken from SFPUC's employment forecast.

Non-Residential Urinals

Based on an analysis of DBI data, the ratio of urinals to toilets is estimated to be 0.15. This ratio is applied to the estimated stock of non-residential toilets to estimate the stock of urinals. Urinals installed before 1992 are assumed to have an average flush volume of 2 gpf. Urinals installed between 1992 and 2013 are assumed to have an average flush volume of 1 gpd. Urinals installed in 2014 are assumed to have a flush volume of 0.5 gpf. Urinals installed after 2014 are assumed to have a flush volume of 0.125 gpf. Urinals are assumed to have the same replacement rate as toilets. The average flush volume of the urinal inventory and the water savings per flush relative to 1990 are calculated the same way as for residential and commercial toilets. Average savings per flush is multiplied by the estimated number of flushes per year to estimate annual water savings. To calculate total flushes per year, male workers are assumed to have a daily flush rate of 2, per Vickers (2001). Male workers are assumed to comprise 54% of the labor force, per City of San Francisco (2009). Total employment is taken from SFPUC's employment forecast.

Residential Showerheads

The population of residential showerheads is based on SFPUC's forecasts of single and multi-family housing units. These forecasts are multiplied by the average number of showerheads per dwelling unit, which are estimated from recent American Housing Survey data. The model uses an average of 1.34 and 1.21 showerheads per dwelling unit for single and multi-family housing, respectively. Showerheads installed in new housing constructed before 2005 are assumed to have an average flow rate of 2.3 gpm. Showerheads installed in new housing constructed between 2005 and 2017 are assumed to have an average flow rate of 2.0 gpm. Showerheads installed after 2017 are assumed to have an average flow rate of 1.8 gpm. Showerheads in existing housing are assumed to be replaced at an annual rate of 12% per year, per the Alliance for Water Efficiency. Using this information, the model calculates the average showerhead flow rate for the inventory of new and existing showerheads for each year between 2005 and 2064. Average savings per minute is equal to the average flow rate in 2005 less the average flow rate in each year after 2005. Annual water savings is calculated as the product of the average flow rate and the annual number of minutes for showering. The annual number of minutes for showering is equal to the average number of shower events per household per day multiplied by the average shower duration in minutes multiplied by the number of households multiplied by 365. An average of 2 shower events per day and an average duration of 9 minutes per shower event are taken from the San Francisco Residential End Uses of Water Study.[2] The number of residential housing units is taken from SFPUC's housing forecast.

Hotel Showerheads

The population of hotel showerheads is based on an estimate of the total number of hotel rooms in San Francisco. The model assumes one showerhead per room. Showerheads installed before 2005 are

[2] The estimate of average number of shower events per day from the San Francisco Residential End Uses of Water Study is used directly in the single-family residential calculation. For the multi-family calculation, it is scaled by the ratio of multi-family to single-family persons per household to take into account the lower density in multi-family housing.

assumed to have an average flow rate of 2.5 gpm. Showerheads installed between 2005 and 2017 are assumed to have an average flow rate of 2.2 gpm. Showerheads installed after 2017 are assumed to have an average flow rate of 1.8 gpm. Showerheads are assumed to be replaced at an annual rate of 12% per year, per the Alliance for Water Efficiency. Using this information, the model calculates the average showerhead flow rate for the inventory of new and existing showerheads for each year between 2005 and 2064. Average savings per minute is equal to the average flow rate in 2005 less the average flow rate in each year after 2005. Annual water savings is calculated as the product of the average flow rate and the annual number of minutes for showering. The annual number of minutes for showering is equal to the average number of shower events per occupied room per day multiplied by the average shower duration in minutes multiplied by the number of occupied rooms multiplied by 365. An average of 1.34 shower events per day per occupied room and an average duration of 10 minutes per shower event are taken from the AWWARF Commercial End Uses of Water Study. The average hotel occupancy rate is based on a review of various estimates published on the internet of hotel occupancy in San Francisco.

Residential Clothes Washers

The stock of residential clothes washers is based on SFPUC's housing forecast and the average number of washers per dwelling unit. The average number of washers per dwelling unit is 0.937 for single-family and 0.41 for multi-family. The multi-family estimate includes both in-unit and common room washers. Existing washers are replaced at an annual rate of 9%, which is equivalent to assuming washers have an average useful life of 11 years, which is consistent with industry estimates. When a washer is replaced, it is replaced with either a conventional or high-efficiency (Energy Star) washer according to a forecast of market shares informed by market analyses done to support the setting of federal efficiency standards for washers. Water factors for new conventional and high-efficiency washers change over time in the model. Water factors for conventional washers are based on federal energy standards while water factors for high-efficiency washers are based on EPA Energy Star specifications. The average water factor for the stock of residential washers adjusts over the course of the forecast based upon the rate at which existing washers are replaced and new washers are added to the inventory. The model's accuracy in predicting water use by clothes washers is checked against water use benchmarks for 1997, 2007, and 2012 taken from residential end use studies. Washer utilization in single-family households is drawn from the San Francisco End Use of Water Study. Washer utilization in multi-family households scales down the single-family estimate to account for smaller average household size. Water savings are calculated relative to 2005 and are equal to the difference in water use assuming average washer efficiency in 2005 versus average washer efficiency in the forecast year.

Coin-op Clothes Washers

Estimates of passive water savings for coin-op clothes washers use the same methodology used for residential clothes washers. The natural replacement rate for coin-op washers is the average of estimates developed by the Alliance for Water Efficiency (11.1%) and the Department of Energy (13.3%). The stock of coin-op clothes washers is based on an internet search of coin-op washer facilities in San Francisco. The average number of washers per coin-op facility is taken from the Fixture Saturation Task Memo. The average number of loads per day is taken from a PG&E study of coin-op washer water and energy consumption. The water factors for new and replaced washers are based on existing federal efficiency regulations for commercial clothes washers.

Calculation of Programmatic Water Savings

The Conservation Tracking Model calculates the water savings associated with a program as the product of the estimated water savings per unit of activity and the amount of activity completed. These savings are commonly referred to as active water savings because they result from the utility's direct investment in conservation programs intended to reduce demand. In other words, the savings result from the utility's active pursuit of demand reduction.

In the Tracking Model, the user specifies a starting unit water savings for each program. The behavior and duration of the unit savings overtime can then be adjusted with the useful life, annual decay, and plumbing code interaction parameters. When the annual decay and plumbing code interaction parameters are both set to 0, annual savings is equal to the product of the initial unit savings and the amount of activity. Annual savings accrue until the measure's useful life is reached, after which annual savings are assumed to be zero. Thus given initial unit savings S_0, measure useful life u, and activity of A_s in year s, water savings in any year t ≥ s are:

$$S_t = A_s S_0 \; if \; t - s + 1 \leq u, 0 \; otherwise$$

When the annual decay parameter takes a value d in the range (0, 1], annual water savings in any year t ≥ s are:

$$S_t = A_s S_0 (1-d)^{t-s} \; if \; t - s + 1 \leq u, 0 \; otherwise$$

When the plumbing code interaction parameter takes a value p in the range (0, 1] and the plumbing code is in effect for any year t ≥ v, annual water savings in any year t ≥ s are:

$$S_t = \begin{cases} A_s S_0 \; if \; u \geq t - s + 1 \; and \; t < v \\ A_s (1-p)^{t-s} S_0 \; if \; t - s + 1 \leq u \; and \; t \geq v \\ 0 \; if \; t - s + 1 > u \end{cases}$$

When the plumbing code interaction parameter takes a value p in the range (0, 1], the plumbing code is in effect for any year t ≥ v, and the annual decay parameter takes a value d in the range (0, 1], annual water savings in any year t ≥ s are:

$$S_t = \begin{cases} A_s S_0 (1-d)^{t-s} \; if \; t - s + 1 \leq u \; and \; t < v \\ A_s (1-p)^{t-s} S_0 (1-d)^{t-s} \; if \; t - s + 1 \leq u \; and \; t \geq v \\ 0 \; if \; \; t - s + 1 > u \end{cases}$$

The specification of these parameters are based on current state and federal plumbing codes and appliance standards and findings from empirical evaluations of conservation program performance, as compiled by the California Urban Water Conservation Council (CUWCC) and Alliance for Water Efficiency (AWE). The specific data sources and assumptions used to create the water savings and plumbing code specifications for each program are provided in the remainder of this document.

The model's toilet fixture inventory modules for single- and multi-family toilets also estimate water savings from the City's toilet retrofit-on-resale ordinance that started in 2009. These estimates rest on two simplifying assumptions: (1) 3.5+ gpf toilets are uniformly distributed across the housing stock and

(2) each housing unit is equally likely to be put on the market for sale each year. Given these two assumptions, ROR toilet replacements in any year t ≥ 2009 are calculated as:

(Stock of 3.5+ gpf toilets at beginning of year – SFPUC toilet replacements) x housing resale rate

The model assumes ROR toilets are replaced with ULFTs prior to 2014 and HETs thereafter.

Program Water Savings Specifications

The remainder of this document presents the water savings specifications for each conservation measure included in the Conservation Tracking Model. Program specifications are grouped first by customer class and second by programs type.

Confidence in Estimates

The program water savings specifications utilize the best available information on water savings. Only measures with a sufficient level of confidence in the approach to estimating water-savings are included in the Tracking Model. The SFPUC implements a number of measures that are not included in the model that are likely to generate some water savings but for which there are insufficient empirical studies or standard engineering estimates to generate estimates with a reasonable level of confidence. For the measures included in the model there is a range of reliability of savings estimates. While all measures in the tool meet a base level of confidence, for established and widely deployed measures – e.g. toilet replacements -- there is strong empirical evidence on water savings from multiple empirical program evaluations. In other cases, less data is available or the program is so new that empirical performance data is limited or nonexistent. In these cases, the water savings estimates may be based on results of a single evaluation done elsewhere or they may be built up from utilization and flow rate assumptions – commonly referred to as engineering estimates.

A confidence score of 1, 2 and 3 is assigned to each program specification to indicate the level of confidence in the water savings specification. The confidence scores are subjective in the sense that they rely on professional judgement as to the quality and applicability of the data underlying the water savings specification.

Confidence Score	**Criteria**
1	Savings are based on well-designed empirical evaluations of program performance. The program is widely deployed by other water suppliers and water savings have been evaluated in multiple locations and contexts. Savings estimates are directly applicable or can reasonably be re-scaled to be applicable to SFPUC's service area.
2	Savings are based on simple empirics of program performance (e.g. a simple difference in means or difference-in-differences analysis). The program may not be widely deployed by other water suppliers and may not have been evaluated in multiple locations and contexts.
3	Empirical estimates of program performance are not available or are limited in their applicability to SFPUC's service area. Savings are based on engineering estimates relying on general

assumptions about water use with and without the program intervention

Measure Summary Tables

The following tables summarize the measures in the model at the time of this update (August 2020). The tables provides:

- A brief description of each measure
- The unit savings estimate for the measure
- The basis for the estimate
- The expected annual water savings at the planned level of activity
- The confidence score for the water savings estimate

Link to Detailed Specifications

The measure IDs in the summary tables are hyperlinked to the measure's detailed specification. Ctr-clicking the specification ID will take the reader to the measure's detailed specification. Ctr-clicking the ID the detailed specification will take the reader back to the summary table.

Basis for Savings Estimates

The basis for the savings estimate is either:

Empirical Program Evaluations – the savings estimate is based on results from one or more empirical evaluations of water savings for similar programs. The empirical estimate may be adjusted to account for differences between the location(s) where the empirical evaluation was completed and SFPUC's service area. Such adjustments are explained in the measure's detailed specification.

Engineering Estimate – the savings estimate is based on assumptions about fixture/device utilization and the water-using properties of the existing and new fixture/device. Engineering estimates are generally less reliable than estimates based on empirical program evaluations.

Annual Savings Estimates

The annual savings estimates show the expected water savings from one year of planned annual activity. These savings would be expected to persist over the useful life of the measure. Savings for most measures are assumed to be stationary, meaning the model does not assume the savings will change significantly over its useful life. However, this assumption is not adopted for every measure. For example, the model assumes savings from surveys are not constant, but rather decrease with time. The estimates in the summary tables do not reflect these adjustments. Therefore, the estimates should be viewed as upper-bounds for measures whose savings are expected to decrease over time.

Single-Family Measures

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
S1	Mandatory CAP Audit	Free site evaluation required for single-family residents to participate in the SFPUC's Community Assistance Program (CAP) for discounted water and sewer rates. Identify inefficient plumbing fixtures and leaks and suggest improvements.	17.5 gpd	0	NA	Empirical Program Evaluations	Savings assumed to decay by 20% per year	2
S2	WaterWise Evaluation	Free indoor and outdoor site consultation: review consumption history, check plumbing fixtures and irrigation system components for leaks, determine fixture flow rates, recommend improvements, identify fixtures eligible for replacement through rebate programs, and provide standard repair parts for faulty toilets and free water-saving devices and materials. Customized report of findings sent to customer after visit.	17.5 gpd	500	9.8	Empirical Program Evaluations	Savings assumed to decay by 20% per year	2
S3a	Leak Alerts	SFPUC uses its AMI data to flag accounts that trigger continuous usage thresholds and alerts customers if a leak is suspected. SFPUC provides alerted customers with information on	0.7 gpd	109,000	85.5	Empirical Program Evaluations	Unit savings is per active Single-Family account	1

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
		how to check for and repair common leaks						
S3b	Custom Water Use Report	Report with customers' water use information, comparison of water to similar properties, and customized information on ways to save.	8.4 gpd	0	NA	Empirical Program Evaluations	Multiple empirical evaluations have found home water reports reduce water use by 5-6%. The model assumes 5.5%.	1
S4	1.5 GPM Showerhead Distribution	Up to two free showerheads (as part of measure S2 or in-person pickup from SFPUC) per household.	6.8 gpd	500	3.6	Empirical Program Evaluations	Based on empirical evaluation of bathroom retrofit programs completed in 2018. Assumes 54% installation rate	2
S5	1.5 GPM Showerhead Direct Install	Provides free installation of 1.5 gpm showerheads to single family residents. WaterWise Evaluation (S2) is a pre-requisite to this measure.	12.6 gpd	100	1.4	Empirical Program Evaluations	Based on empirical evaluation of bathroom retrofit programs completed in 2018	1

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
S6	HET Rebate	Cash rebates of up to $125 to replace old toilets (3.5 gpf or more) with approved HETs (1.28 gpf or less).	20.9 gpd	0	NA	Empirical Program Evaluations	Based on empirical evaluation of bathroom retrofit programs completed in 2018. Direct install savings reduced by 25% to account for rebates used to replace ULF toilets and program free-riders	2
S7	CAP Direct Install thru SFPUC Funding	Free installation of HETs (1.28 gpf) for single-family residents who are also CAP participants. Only 3.5 gpf toilets replaced except a small number of old, poorly performing 1.6s. **Pre-requisite:** Mandatory CAP Audits (Measure S1).	27.8 gpd	0	NA	Empirical Program Evaluations	Based on empirical evaluation of bathroom retrofit programs completed in 2018	1
S8	HET Direct Install (Non-CAP)	Same as measure S7 but is open to single-family residents who are not a CAP participant. Program did not start until 2016	27.8 gpd	206	6.4	Empirical Program Evaluations	Based on empirical evaluation of bathroom retrofit	1

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
							programs completed in 2018	
S9	HET Voucher	A voucher issued to eligible residents to replace their older toilets with HETs.	20.9 gpd	0	NA	Empirical Program Evaluations	Based on empirical evaluation of bathroom retrofit programs completed in 2018. Direct install savings reduced by 25% to account for rebates used to replace ULF toilets and program free-riders	2
S11	CEE Tier 3 Washer Rebate (WF 4.0)	Up to $100 rebate from SFPUC and $50 rebate from PG&E for a combined $150 rebate for a washer with 4 WF or lower.	10.2 gpd	0	NA	Engineering Estimate	Engineering estimate based on limited data on clothes washer market shares	3
S12	Energy Star Most Efficient Washer	Up to $100 rebate from SFPUC and $50 rebate from PG&E for a combined $150 rebate for a washer with 3.5 WF or lower.	11.6 gpd	80	1.0	Engineering Estimate	Engineering estimate based on limited data on clothes	3

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
	Rebate (WF 3.5)						washer market shares	
S16a	Rain Barrel Rebate	Subsidy program that discounts the purchase cost of rain barrel and provides training.	0.8 gpd	30	0.03	Engineering Estimate	60 gal capacity. Estimated with AWE Rain Barrel Harvest & Application Model	3
S16b	Rain Cistern Rebate	Subsidy program that discounts the purchase cost of cisterns and provides training.	2.4 gpd	15	0.04	Engineering Estimate	205 gal capacity. Estimated with AWE Rain Barrel Harvest & Application Model	3
S18	Weather-Based Irrigation Controller Rebate	Financial rebate towards purchase and installation of a weather-based irrigation controller that uses site specific data and adjusts the irrigation time depending on the local weather.	3.7 gpd	50	0.2	Empirical Program Evaluations	Estimate is based on review of empirical evaluations of WBIC savings in Southern and Northern CA	2
S20	Device Distribution	Various water-efficient fixtures: bathroom aerators (0.5/1.0/1.5 gpm), kitchen/bathroom laminar (1.5 gpm), kitchen aerators (1.5/2.2 gpm), utility aerators (1.5/2.0/2.2), pre-rinse spray nozzles, garden spray hose nozzles, toilet flappers, toilet fill valves, and soil moisture meters.	3.3 gpd	1600	5.9	Engineering Estimate	Based on review of end use studies and engineering estimates of savings potential of	3

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
							aerators and other devices	

Multi-Family Measures

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
M1	WaterWise Direct Installation Evaluation	Free, required site evaluation for multi-family residents to participate in the SFPUC's HET/Urinal Direct Install Program). Identify inefficient plumbing fixtures and leaks and suggest improvements.	10.6 gpd	206	2.4	Empirical Program Evaluations	Equal to indoor savings for S1 and S2. Savings assumed to decay by 20% per year	2
M2	WaterWise Evaluation	Free site consultation: review consumption history, check toilets for leaks, determine fixture flow rates, recommend improvements, identify fixtures eligible for replacement through rebate programs, provide standard repair parts for faulty toilets and free water-saving devices and materials.	10.6 gpd	500	5.9	Empirical Program Evaluations	Equal to indoor savings for S1 and S2. Savings assumed to decay by 20% per year	2
M3	Leak Alert	SFPUC uses its AMI data to flag 2-5 dwelling unit multi-family accounts that trigger continuous usage thresholds and alerts customers if a leak is suspected. SFPUC provides alerted customers with information on how to check for and repair common leaks	2 gpd	27,000	60.5	Empirical Program Evaluations	Unit savings applies to all Multi-Family customers with 2-5 dwelling units	1
M4	Showerhead Distribution	Buildings with 10 or less units are limited to one showerhead per unit. These buildings can pick up showerheads at the customer service counter. Also includes	6.8 gpd	700	5.3	Empirical Program Evaluations	Based on empirical evaluation of bathroom	2

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
		buildings that receive showerheads that are not installed during a Water Wise Evaluation. Buildings with over 10 units must schedule a WaterWise Evaluation (measure M2) in order to receive the free devices					retrofit programs completed in 2018. Assumes 54% installation rate	
M5	Showerhead Direct Install	Free installation of showerheads. **Pre-requisite:** WaterWise Direct Install Evaluations (Measure M1)	12.6 gpd	200	2.8	Empirical Program Evaluations	Based on empirical evaluation of bathroom retrofit programs completed in 2018	1
M6	HET Rebate	Cash rebates of up to $125 per tank-style HET or up to $300 per flushometer valve HET to replace a high-flow toilet (3.5 gpf or more).	30 gpd	0	NA	Empirical Program Evaluations	Based on empirical evaluation of bathroom retrofit programs completed in 2018. Direct install savings reduced by 25% to account for rebates used to replace ULF toilets and	2

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
							program free-riders	
M7	HET Direct Install	Free installation of tank-style (T) or flushometer valve (F) HETs. **Pre-requisite:** WaterWise Direct Install Evaluation (Measure M1)	38.6 gpd	300	13.0	Empirical Program Evaluations	Based on empirical evaluation of bathroom retrofit programs completed in 2018	1
M8	HET Voucher	A voucher issued to eligible residents to replace their older toilets with HETs	30 gpd	0	NA	Empirical Program Evaluations	Based on empirical evaluation of bathroom retrofit programs completed in 2018. Direct install savings reduced by 25% to account for rebates used to replace ULF toilets and program free-riders	2
M9	HET Install thru On-Bill Financing	Partner with third-party vendors to find customers with remaining savings opportunity, sell them the	38.6 gpd	0	NA	Empirical Program Evaluations	Based on empirical evaluation of	1

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
		program, and conduct the installation. The customer pays for the program through savings received through their water bill.					bathroom retrofit programs completed in 2018	
M10	CEE Tier 3 Washer Rebate (WF 4.0)	Rebate for coin-op, common area clothes washer with WF of 4 or lower. (multi-family in-unit residential style washers are covered under SF measure)	126 gpd	80	11.3	Engineering Estimate	Engineering estimate based on limited data on clothes washer market shares	3
M20	Device Distribution	Various water-efficient fixtures: bathroom aerators (0.5/1.0/1.5 gpm), kitchen/bathroom laminar (1.5 gpm), kitchen aerators (1.5/2.2 gpm), utility aerators (1.5/2.0/2.2), pre-rinse spray nozzles, garden spray hose nozzles, toilet flappers, toilet fill valves, and soil moisture meters.	3.3 gpd	2750	10.2	Engineering Estimate	Based on review of end use studies and engineering estimates of savings potential of aerators and other devices	3

Non-Residential Measures

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
N1	WaterWise Evaluations for Commercial Buildings	Free site consultation: review consumption history, check toilets for leaks, determine fixture flow rates, recommend improvements, identify fixtures eligible for replacement through incentive programs, provide standard repair parts for faulty toilets and free water-saving devices and materials. Customized report of findings sent after visit.	215 gpd	50	12.0	Empirical Program Evaluations	Based on empirical evaluations of CII surveys done in Southern California in the 1990s	3
N2	Commercial Direct Install Audits	Free site consultation similar to measure N1. Required for commercial buildings that applied for direct install programs.	215 gpd	0	NA	Empirical Program Evaluations	Based on empirical evaluations of CII surveys done in Southern California in the 1990s	3
N3	Surveys – Hospitals, Hotels, Schools	Free site consultation for hospitals, hotels, and schools	837 gpd	16	15.0	Empirical Program Evaluations	Based on empirical evaluations of CII surveys done in Southern California in the 1990s	3
N4	Surveys – Large Landscape by Contractors	Free landscape survey provided to eligible customers (0.5 acres or more of irrigated landscapes) under the Landscape Technical Assistance Program. Survey	161 gpd	30	5.4	Engineering Estimate	Unit savings per acre surveyed. Assumes 10% reduction in average landscape	3

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
		will evaluate the water delivery system to check for inefficiencies that lead to water losses, Surveyors will also determine the site's water budget by cataloguing plant type and will create site-specific recommendations and a cost estimate for improving irrigation efficiency.					site water use of 1.8 AF/Acre	
N5	Surveys – CII Facilities by Contractors	Free site consultation for other types of non-residential customers provided by third-party consultant or other funding sources.	5120 gpd	3	17.2	Engineering Estimate	SFPUC staff estimate of water savings from consultant audits	2
N7	1.5 GPM Showerhead Giveaway	Provides free, high-efficiency 1.5 gpm showerheads for San Francisco businesses.	5.6 gpd	300	1.9	Engineering Estimate	Based on review of hotel end use studies and engineering estimates of hotel showerhead savings potential. Assumes 54% installation rate	3
N8	1.5 GPM Showerhead Direct Install	Free installation of high-efficiency 1.5 gpm showerheads for San Francisco businesses. **Pre-requisite:** Direct Install Audit (Measure N2)	10.4 gpd	100	1.2	Engineering Estimate	Based on review of hotel end use studies and engineering estimates of hotel showerhead savings potential.	3
N9	Device Distribution	Various water-efficient fixtures: bathroom aerators (0.5/1.0/1.5 gpm),	3.3 gpd	700	2.6	Engineering Estimate	Based on review of end use studies and	3

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
		kitchen/bathroom laminar (1.5 gpm), kitchen aerators (1.5/2.2 gpm), utility aerators (1.5/2.0/2.2), pre-rinse spray nozzles, garden spray hose nozzles, toilet flappers, toilet fill valves, and soil moisture meters.					engineering estimates of savings potential of aerators and other devices	
N10	HET Rebate	Cash rebates of up to $125 per tank style toilet and up to $300 per flushometer valve toilet for replacing high-flow toilets (3.5 gpf or more) with approved HET models (1.28 gpf or less).	28.4 gpd	0	NA	Empirical Program Evaluations	Based on CUWCC CII Toilet Savings Study. Estimate scales-up ULFT savings to account for improved efficiency of HET	2
N11	HET Rebate – Schools, Hotels, Muni	Cash rebates of up to $125 per tank style toilet and up to $300 per flushometer valve toilet for replacing high-flow toilets (3.5 gpf or more) with approved HET models (1.28 gpf or less).	20.6 gpd	0	NA	Empirical Program Evaluations	Based on CUWCC CII Toilet Savings Study. Estimate scales-up ULFT savings to account for improved efficiency of HET	2
N12	HET Direct Install	Free installation of High-Efficiency Toilets for businesses in SF **Pre-requisite:** Direct Install Audit (Measure N2)	29 gpd	0	NA	Empirical Program Evaluations	Based on CUWCC CII Toilet Savings Study. Estimate scales-up ULFT savings to account for improved efficiency of HET	2

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
N13	HET Direct Install – Schools, Hotels	Free installation of HETs for schools or hotels in SF. **Pre-requisite:** Direct Install Audit (Measure N2)	19.6 gpd	0	NA	Empirical Program Evaluations	Based on CUWCC CII Toilet Savings Study. Estimate scales-up ULFT savings to account for improved efficiency of HET	2
N14	HET Voucher	A voucher for HET purchase.	28.4 gpd	0	NA	Empirical Program Evaluations	Based on CUWCC CII Toilet Savings Study. Estimate scales-up ULFT savings to account for improved efficiency of HET	2
N15	HET Voucher – Schools, Hotels	Same as N14 but directed at schools and hotels	17.8 gpd	0	NA	Empirical Program Evaluations	Based on CUWCC CII Toilet Savings Study. Estimate scales-up ULFT savings to account for improved efficiency of HET	2
N16	HET Install thru On-Bill Financing	Partner with third-party vendors to find customers with savings opportunity, sell them the program, and conduct the installation. The customer pays for the program through savings received through their water bill.	29 gpd	0	NA	Empirical Program Evaluations	Based on CUWCC CII Toilet Savings Study. Estimate scales-up ULFT savings to account for improved efficiency of HET	2

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
N17	HEU Rebate	Cash rebates of up to $300 per urinal for eligible commercial businesses when high flow urinals (1.5 gpf or more) are replaced with High-Efficiency Urinal (HEU) models that are 0.125 gpf or less.	16.2 gpd	0	NA	Empirical Program Evaluations	Based on CUWCC Urinal Savings Potential PBMP Study	3
N18	HEU Direct Install	A program for replacing 1.5 gallons per flush (gpf) high efficiency urinals with pint flush urinals.	16.2 gpd	0	NA	Engineering Estimate	Based on CUWCC Urinal Savings Potential PBMP Study	3
N20	Energy Star Washer Rebate (WF 4.5)	Measure has been discontinued. Cash rebates for commercial high-efficiency clothes washers with a water factor of 4.5 or below.	39 gpd	0	NA	Engineering Estimate	Engineering estimate based on limited data on clothes washer market shares and coin-op washer utilization rates	3
N21	Energy Star Washer Rebate (WF 4)	Cash rebates of up to $200 for commercial high-efficiency clothes washers with a water factor of 4.0 or below. For any business where 10 or more washers are being installed, a pre-purchase inspection must be scheduled.	45 gpd	40	2.0	Engineering Estimate	Engineering estimate based on limited data on clothes washer market shares and coin-op washer utilization rates	3
N22	Landscape Grants	Under Landscape Grant Program, landscapes with over 0.5 acre of irrigated areas are eligible to receive funding to implement retrofits and install	446 gpd/acre	11.2 acres (2 projects per year)	5.6	Empirical Program Evaluations	Based on SFPUC staff estimates of water savings for 11 large	2

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
		fixtures to facilitate water conservation.					landscape grant projects	
N24	Equipment Retrofit Rebate	Incentives to businesses to upgrade indoor equipment. Projects must achieve an annual water savings of 200 ccf or more to qualify. SFPUC will provide qualifying projects incentives of $0.50 per ccf over a 10-year lifespan up to 50% of the equipment costs. Program includes customized incentives as well as standard incentives for equipment with predictable water savings, such as water efficient ice machines, and connectionless food steamers.	2 gpd per dollar of grant funding	1 project (200 ccf/yr)	0.5		Minimum required savings per $1 of grant funding – e.g. if $100K awarded, expected savings would be 200,000 gpd	1
N25	Custom Equipment Retrofit Rebate	Similar to Measure N24, but allows applicants to create customized project tailored toward their specific business needs and water use patterns.	2 gpd per dollar of grant funding	1 project (200 ccf/yr)	0.5		Minimum required savings per $1 of grant funding – e.g. if $100K awarded, expected savings would be 200,000 gpd	1
N27	Kitchen Low Flow Spray Valves	Rebate or giveaway of high-efficiency kitchen spray valves used primarily by dishwashing stations	30 gpd	10	0.3	Empirical Program Evaluations	Based on multiple empirical evaluations of savings from kitchen spray-valve retrofits. Estimate assumes 50%	1

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings (AF)	Basis for Savings Estimate	Notes on Savings Estimate	Water Savings Estimate Confidence Score
							installation/retention rate	

Measures Applicable to All Customers

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings	Notes on Savings Estimate	Water Savings Estimate Confidence Score
A3	Irrigation Customer Large Landscape Budget	The SFPUC calculates how water use for irrigated landscape sites that received an irrigation or landscape grant or were required to comply with San Francisco's Water Efficient Irrigation Ordinance (WEIO) compares to the maximum allowable water use (MAWA) recommended for the plant types per state calculations. Staff are exploring how to potentially expand the program to all sites served by dedicated irrigation meters	357 gpd	TBD	Engineering Estimate	Unit savings per acre surveyed. Assumes 10% reduction in average pre-grant water use of 4 AF/Acre for 9 large landscapes enrolled in SFPUC landscape grant program	3
S16a	Rain Barrel Rebate	Subsidy program that discounts the purchase cost of rain barrel and provides training.	0.8 gpd	See Single-Family Table	Engineering Estimate	Originally specified as a single-family measure, multi-family and non-residential customers also can participate in the program. Currently single-family customer account for about 80% of program participants with the	3

ID	Measure Name	Measure Description	Expected Unit Water Savings (GPD)	Planned Annual Activity Level	Annual Water Savings	Notes on Savings Estimate	Water Savings Estimate Confidence Score
						other 20% split more or less evenly between multi-family and non-residential customers	
S16b	Rain Cistern Rebate	Subsidy program that discounts the purchase cost of cisterns and provides training.	2.4 gpd	See Single-Family Table	Engineering Estimate	See previous note	3

ID	Name	Class	Category
A3	Irrigation Customer Landscape Budgets	Non Residential	Audits & Reports

Water Savings: Many water suppliers have adopted water budgets for their large landscapes, which provides an effective way for both managing and evaluating large landscape programs. Landscape budgets are a form of customer education/information designed to help customers irrigate landscape efficiently. The effectiveness of this intervention can vary significantly depending on existing water use practices, types of landscapes subject to budgets, types of customers receiving budgets, cost of water, etc. There have been several empirical evaluations of landscape budget performance. Cal WEP provides a good summary of these studies.

The impact of landscape education on compliance with water budgets was evaluated in Orange County, California in a 2004 study. The education component was targeted at landscape contractors and property managers at home-owner associations (HOAs). The results were based on the experience of 47 HOAs that had participated in the program up to that point. The impact evaluation concluded that early participants in the program reduced their water demand by 9%, later participants by 20% (the difference between early and later participants was not explained).

Several studies are available that examine the impact of budget-based rates on large landscape water use. An early study, published in 1997 showed that tiered rates tied to landscape water budgets can reduce irrigation demand by about 20-25%.

Cal WEP compiled data from 12 Bay Area retailers on actual water use versus budget for a sample of large landscapes. On average, actual use exceeded budgeted use by 33%. Cal WEP also compared budget exceedence by type of customer. It found budget exceedence was greatest for HOAs and commercial properties (excluding gold courses) and lowest for parks and schools. The average exceedence for HOAs and commercial was 23% and 34%, respectively; for parks and schools it was 10% and 5%, respectively.

This measure assumes budgets would reduce large landscape water use by 10%, on average. This is at the lower-end of the savings range from empirical studies and significantly less than the average budget exceedence for the sample of 12 Bay Area water agencies. A conservative savings assumption is deemed appropriate because:

- Parks and schools, which tend to have lower budge exceedence, comprise most of the large landscape area in SFPUC's retail service area.
- SFPUC's high retail water rates already discourage wasteful irrigation and landscape water use.
- SFPUC's cool summer climate results in lower irrigation application rates relative to other parts of California with dryer, hotter summer climates.

The average pre-grant irrigation application rate at large landscape sites participating in SFPUC's large landscape grant program is 4 AF/acre (see N22).

Savings = 4 AF/acre x 0.1 = 0.4 AF/acre (130,340 gpy/acre)

Plumbing Code Savings: NA

Plumbing Code NRR: NA

Annual Decay Rate: NA

Useful Life: 1 year

Peak Period Savings Percent: 100%

Unit Sewer Savings: 0

Unit Electricity Savings: NA

Unit Gas Savings: NA

Confidence Score: 3

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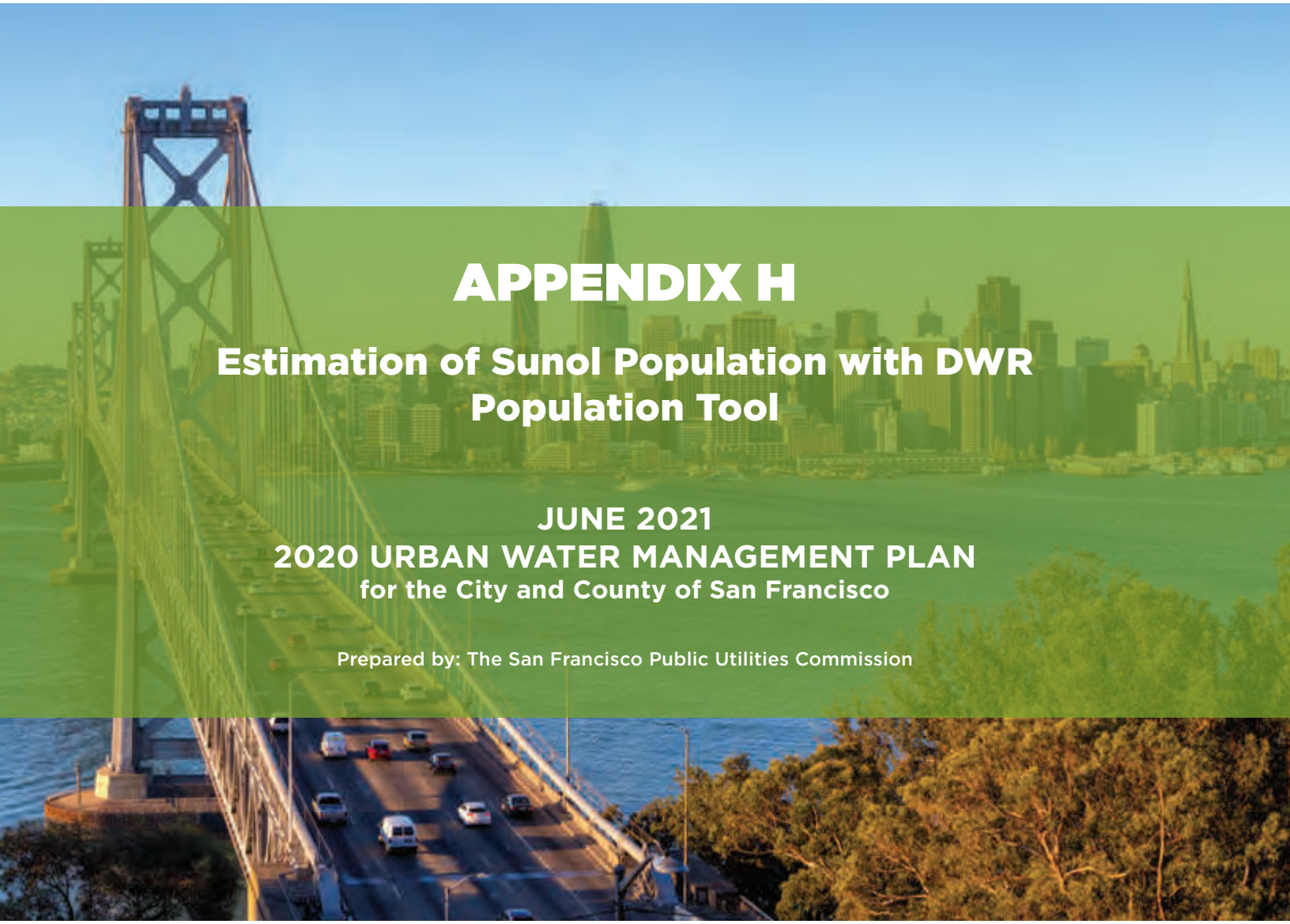

APPENDIX H

Estimation of Sunol Population with DWR Population Tool

JUNE 2021
2020 URBAN WATER MANAGEMENT PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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SFPUC 2020 UWMP Update

Population Estimate for the Town of Sunol

Appendix H

The DWR Population Tool was used in the development of the 2015 UWMP in order to estimate the population of the Town of Sunol, one of SFPUC's suburban retail customer. However, the results from the Population Tool in 2015 showed that the linear interpolation process of the tool was underestimating the population of the area. The Population Tool (see Population Tool results below) showed that estimated a 1.08 persons-per-connection in 2015, which is not representative of the area, based on the historical persons-per-connection of 4.75 in 2000 and of 2.30 in 2010. Based on SFPUC's understanding of the local population density, SFPUC consulted with DWR and it was determined that the 2010 persons-per-connection value could be applied to estimate the 2015 population.

For the 2020 UWMP, SFPUC sought guidance from DWR staff and since the local population density in the Town of Sunol has not changed significantly since 2015, DWR informed SFPUC that the use of the 2010 persons-per-connection value, previously used in the 2015 UWMP, was appropriate the 2020 UWMP. The 2010 persons-per-connection value is therefore applied to the updated 2020 number of connections to estimate the population for the Town of Sunol, for the calculation of the 2020 per capita water use target.
The 2020 population estimate is therefore 141 * 2.30 = 324.

This appendix includes the email correspondence with DWR about the 2020 UWMP and the results of the Population Tool analysis obtained during the preparation of the 2015 UWMP.

Gmail Lara Egbeola-Martial <lara@srtconsultants.com>

Population Tool Estimates

Huff, Gwen@DWR <Gwen.Huff@water.ca.gov> Mon, Dec 14, 2020 at 12:21 PM
To: "lara@srtconsultants.com" <lara@srtconsultants.com>
Cc: "Ekstrom, Julia@DWR" <Julia.Ekstrom@water.ca.gov>

Lara -

Yes, you may modify the persons per connec on for the current year based on local knowledge of the popula on.

In the UWMP, please describe the modifica ons made and a jus fica on for the change.

Feel free to contact me if you have addi onal ques ons.

Sincerely,

Gwen

Gwen Huff
Re red Annuitant - Senior Environmental Scien st (Specialist)
gwen.huff@water.ca.gov
(916) 873-5923

From: Lara Egbeola-Mar al <lara@srtconsultants.com>
Sent: Friday, December 11, 2020 2:33 PM
To: DWR Water Use Efficiency <wue@water.ca.gov>
Cc: Triolo, Sarah <STriolo@sfwater.org>; Lisa Pezzino <lisa@srtconsultants.com>
Subject: UWMP Update Ques on - Popula on Tool Es mates

Hi WUE Team,

My team and I at SRT Consultants are currently suppor ng the San Francisco Public U li es Commission (SFPUC) with the update of their 2020 UWMP.
I a ended the training session about the Popula on Tool on Tuesday this week and wanted to ask a case-specific ques on regarding the use of the tool.
The Popula on Tool facilitates the es ma on of the popula on for SFPUC's suburban retail customers that are located in the Town of Sunol. However, for the 2015 UWMP, the results from the Popula on Tool showed that the linear interpola on process of the tool was underes ma ng the popula on of the area (see document a ached - with a historical persons-per-connec on of 4.75 in 2000 and of 2.30 in 2010, the results showed an es mate of 1.08 persons-per-connec on for 2015, which is not representa ve of the area).
In 2015, SFPUC consulted with DWR staff, and it was determined that the 2010 persons-per-connec on value could be applied to es mate the 2015 popula on, considering the fact that the local popula on density had not changed much since 2010.

We are now in a similar situa on for the 2020 UWMP. It is my understanding that with the same input data, the popula on es mates results from the tool for year 2020 are likely to underes mate the popula on again.
Since SFPUC expects that the local popula on density in the Town of Sunol has not changed significantly since 2015, we are considering using the same persons-per-connec on used in the 2015 Plan (based on the 2010 es mate) and apply it to the updated 2020 number of connec ons to determine the popula on. We were hoping to get your feedback on this approach to es mate the popula on of a specific subset of SFPUC's retail customers for Chapter 5.

Thank you for your guidance,

Best,

--

Lara Egbeola-Martial, P.E.
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WUEdata - San Francisco City And County

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Confirmation Information

Generated By	Water Supplier Name	Confirmation #	Generated On
Winola Cheong	San Francisco City And County	8639310538	1/19/2016 9:11:45 PM

Boundary Information

Census Year	Boundary Filename	Internal Boundary ID
1990	Sunol_11Jan2016.kml	457
2000	Sunol_11Jan2016.kml	457
2010	Sunol_11Jan2016.kml	457

Baseline Period Ranges

10 to 15-year baseline period

2008 total water deliveries[1]:	425311	Hundred Cubic Feet (CCF)
2008 total volume of delivered recycled water[1]:	0	Hundred Cubic Feet (CCF)
2008 recycled water as a percent of total deliveries:	0.00%	
Number of years in baseline period[2]:	10	
Year beginning baseline period range:	2001	
Year ending baseline period range[3]:	2010	

5-year baseline period

Year beginning baseline period range:	2006
Year ending baseline period range[4]:	2010

[1] The selected units of measure must apply to both the 2008 total water deliveries and the 2008 total volume of delivered recycled water. If the water supplier records use different units of measure for these volumes, the user must make a conversion so that both volumes are in the same units of measure.

[2] If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period.

[3] The ending year must be between December 31, 2004 and December 31, 2010.

[4] The ending year must be between December 31, 2007 and December 31, 2010.

Persons per Connection

Year	Census Block Level Total Population	Number of Connections *	Persons per Connection
1990	198	69	2.87
1991	-	-	3.06
1992	-	-	3.25
1993	-	-	3.43
1994	-	-	3.62
1995	-	-	3.81
1996	-	-	4.00
1997	-	-	4.19
1998	-	-	4.37
1999	-	-	4.56
2000	328	69	4.75
2001	-	-	4.50
2002	-	-	4.26
2003	-	-	4.01
2004	-	-	3.77
2005	-	-	3.52
2006	-	-	3.28
2007	-	-	3.04
2008	-	-	2.79
2009	-	-	2.54
2010	237	103	2.30
2015	-	-	1.08

** Number of Connections may be either All Residential Connections (Single Family and Multi-Family combined) or All Service Connections. This will depend on the data available from the water supplier's records, but must remain consistent throughout the table.*

Population Using Persons-Per-Connection

Year		Number of Connections *	Persons per Connection	Total Population
10 to 15 Year Baseline Population Calculations				
Year 1	2001	63	4.50	**284**
Year 2	2002	67	4.26	**285**
Year 3	2003	71	4.01	**285**
Year 4	2004	75	3.77	**283**
Year 5	2005	79	3.52	**278**
Year 6	2006	83	3.28	**272**
Year 7	2007	89	3.04	**270**
Year 8	2008	93	2.79	**259**
Year 9	2009	94	2.54	**239**
Year 10	2010	103	2.30	**237**
5 Year Baseline Population Calculations				
Year 1	2006	83	3.28	**272**
Year 2	2007	89	3.04	**270**
Year 3	2008	93	2.79	**259**
Year 4	2009	94	2.54	**239**
Year 5	2010	103	2.30	**237**
2015 Compliance Year Population Calculations				
2015		112	1.08	**121**

** Number of Connections may be either All Residential Connections (Single Family and Multi-Family combined) or All Service Connections. This will depend on the data available from the water supplier's records, but must remain consistent throughout the table.*

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APPENDIX I

Energy Intensity Analysis

JUNE 2021
2020 URBAN WATER MANAGEMENT PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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Urban Water Supplier: *San Francisco Public Utilities Commission*

Water Delivery Product (If delivering more than one type of product use Table O-1C)

Other

Table O-1B: Recommended Energy Reporting - Total Utility Approach				
Enter Start Date for Reporting Period	7/1/2019	**Urban Water Supplier Operational Control**		
End Date	6/30/2020			
☐ Is upstream embedded in the values reported?		**Sum of All Water Management Processes**	**Non-Consequential Hydropower**	
Water Volume Units Used	*MG*	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process (volume unit)		*74132*		*74132*
Energy Consumed (kWh)		*-1242727474*		*-1242727474*
Energy Intensity (kWh/vol. converted to MG)		*-16763.7*	*#DIV/0!*	*-16763.7*

Quantity of Self-Generated Renewable Energy

kWh

Data Quality *(Estimate, Metered Data, Combination of Estimates and Metered Data)*

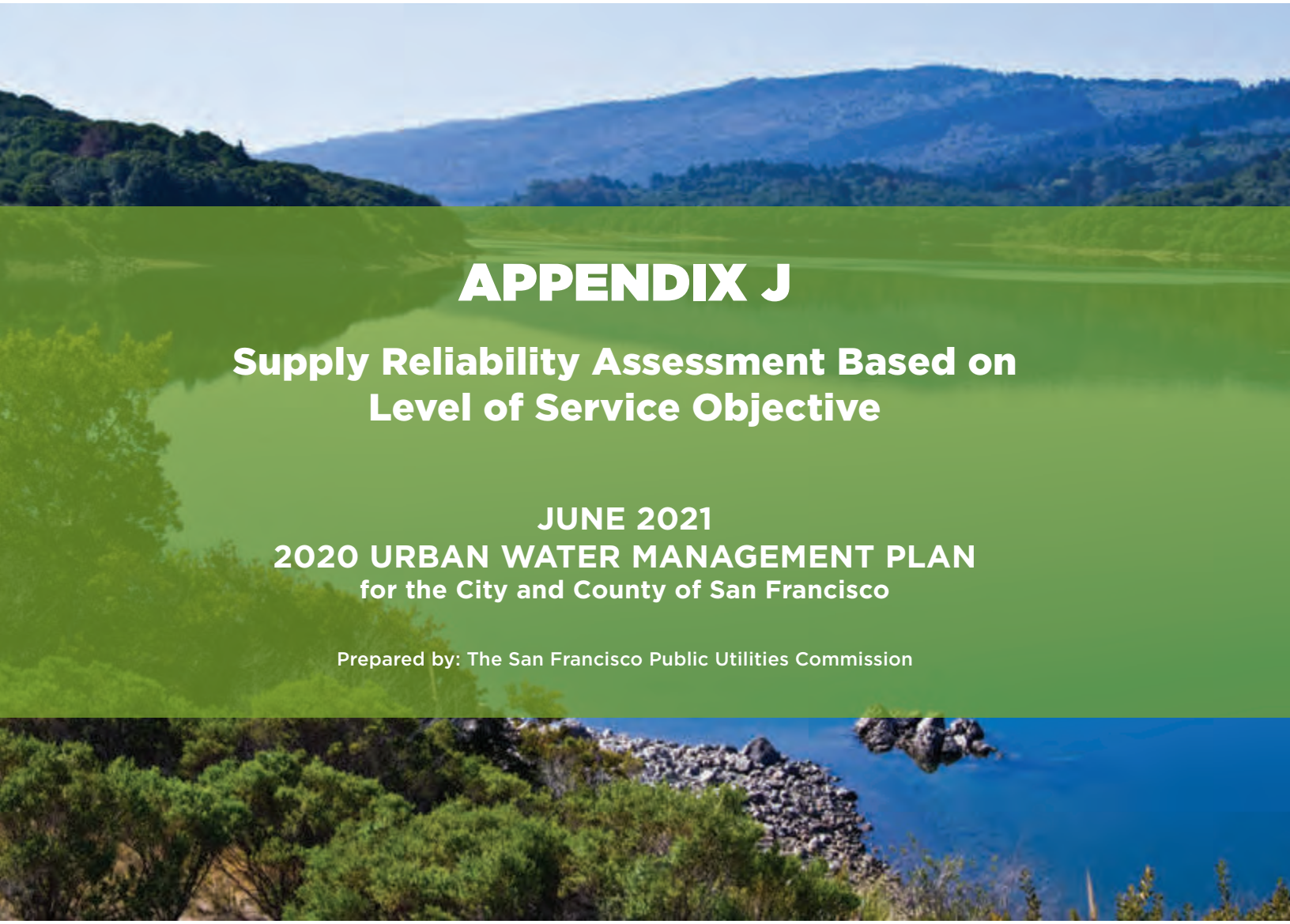
Metered Data

Data Quality Narrative:

The data reported covers FY2019-2020 (July 2019 to June 2020). The water production metering data includes the water supplied by the Regional Water System (RWS) to both retail and wholesale customers. The electricity usage data is based on billing records from meter data. The consequential hydroelectricity production data is based on metered data at the respective hydroelectric power houses. The energy intensity calculation focuses on water supplied by the RWS, since it is the main source of water supplied by SPFUC. In addition, the electricity consumed by other entities to produce recycled water is not included.
While the total volume of water delivered includes both retail and wholesale usage, SFPUC does not have access to electricity meter records for the electricity usage of its wholesale customers to distribute water within their own service areas, and is therefore not included in this analysis.
The data reported covers FY2019-2020 (July 2019 to June 2020). The water production metering data includes the water supplied by the Regional Water System (RWS) to both retail and wholesale customers. The electricity usage data is based on billing records from meter data. The consequential hydroelectricity production data is based on metered data at the respective hydroelectric power houses. The energy intensity calculation focuses on water supplied by the RWS, since it is the main source of water supplied by SPFUC. In addition, the electricity consumed by other entities to produce recycled water is not included.
While the total volume of water delivered includes both retail and wholesale usage, SFPUC does not have access to electricity meter records for the electricity usage of its wholesale customers to distribute water within their own service areas, and is therefore not included in this analysis.

Narrative: - - - -

As required, the amount of energy estimated includes the energy used to extract, convey, store, treat and distribute water, and also includes the consequential hydropower produced as a result of the water delivery. The Regional Water System (RWS) is almost entirely gravity-driven from its Sierra Reservoir to the Bay Area; no electricity is used for pumping at wholesale customer turnouts. Electricity usage taken into account in this analysis primarily represents pumping to off-stream storage in the Bay Area, in-city pumping for water distribution, and usage at the SFPUC's two water treatment plants (Sunol and Harry Tracy WTPs). The electricity usage also includes administrative and support facilities. The Hetch Hetchy Regional Power System is composed of three (3) hydroelectric powerhouses, which account of a total hydroelectric generating capacity of 385 MW: Moccasin Powerhouse, Kirkwood Powerhouse and Holm Powerhouse.



APPENDIX J

Supply Reliability Assessment Based on Level of Service Objective

JUNE 2021

2020 URBAN WATER MANAGEMENT PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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The SFPUC has a Level of Service objective to provide an annual average of 265 mgd in normal years, as well as a contractual obligation to provide 184 mgd to the Wholesale Customers in accordance with the Supply Assurance. In addition to the supply modeling presented in the main body of this UWMP, supply modeling was conducted to assess the SFPUC's ability to meet its Level of Service objective and contractual obligations.

As discussed in Section 7.1 of the UWMP, deliveries from the Regional Water System (RWS) to both retail and wholesale customers are limited to an average annual of 265 mgd for the watersheds. Current and projected supply available from the RWS is presented in Table J-1.

Table J-1. Regional Water System Supply Availability in Normal Years (mgd)

RWS Supply Allocation	Actual	Projected				
	2020	2025	2030	2035	2040	2045
Retail Customers[a, b]	81	81	81	81	81	81
Wholesale Customers[c, d]	184	184	184	184	184	184
Total RWS Supplies	265	265	265	265	265	265

a Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if these alternative supplies are not available, up to 81 mgd of RWS supply could be used in normal years.

b Groveland CSD is reported as a wholesale customer for the purposes of this 2020 UWMP, but it is considered a retail customer of the SFPUC solely for purposes of allocating RWS supplies between retail customers and Wholesale Customers. Its demands would be met by the retail supply allocation of 81 mgd.

c Projected Wholesale Customer deliveries are limited to 184 mgd. 184 mgd includes the demands of the Cities of San Jose and Santa Clara, which are supplied on a temporary and interruptible basis, with their total supply not exceeding 9 mgd assuming supply is available (decision to be made by end of 2028).

d Cordilleras MWC is not a party to the WSA, and it is not included in the wholesale supply allocation of 184 mgd. The demands of Cordilleras MWC are minor (projected to be less than 0.01 mgd) and are anticipated to be met with RWS supplies through 2045.

Supply modeling to assess whether SFPUC can meet its Level of Service objective of providing an annual average of 265 mgd in normal years, with no greater than 20% rationing in extended droughts, was conducted using the same methodology described in Section 8.2. The level of demand assumed for the HHLSM model was 265 mgd. For RWS supplies, supply modeling both with and without the implementation of the Bay-Delta Plan Amendment is included here. The two modeled scenarios show significantly different supply reliability projections for the RWS:

- With Full Implementation of the Bay-Delta Plan Amendment: Under the Bay-Delta Plan Amendment conditions, it is anticipated that the RWS supplies will experience a reduction of up to 55% through the multiple dry-year sequence. The implementation of the Alternative Water Supply Program and associated potential projects will help reduce the anticipated supply shortfalls.
- Without Implementation of the Bay-Delta Plan Amendment: In this scenario, the SFPUC system can expect to experience RWS supply reductions of at least 10% to 20% in a sequence of multiple dry years. Implementation of WSIP dry-year supply projects (see Section 7.1.2) will improve the SFPUC's water supply reliability, particularly in the earlier years of the design drought. However, in extended drought periods, the SFPUC will continue to experience multiple years of 10% to 20% reductions in RWS supply.

The supply modeling results are compared to retail demand projections and Wholesale Customer contractual obligations in Table J-3 through J-6 below.

Table J-2. Water Supply Availability During Normal and Dry Years – With and Without Bay-Delta Plan Amendment

Water Supply	Normal Year[a]	Single Dry Year	Multiple Dry Years				
			Year 1	Year 2	Year 3	Year 4	Year 5
Projected Years 2025 through 2045 (post-WSIP completion) – **With** Bay-Delta Plan Amendment							
RWS[b]	100%	50%	50%	45%	45%	45%	45%
Local Groundwater[c]	100%	100%	100%	100%	100%	100%	100%
Local Recycled Water[c]	100%	100%	100%	100%	100%	100%	100%
Projected Years 2025 through 2045 (post-WSIP completion) – **Without** Bay-Delta Plan Amendment							
RWS[b]	100%	90%	90%	90%	90%	80%	80%
Local Groundwater[c]	100%	100%	100%	100%	100%	100%	100%
Local Recycled Water[c]	100%	100%	100%	100%	100%	100%	100%

Normal, single dry, and multiple dry year conditions are on a water year basis. Dry year availability is presented in terms of percentage of normal year availability.

a For RWS, normal year is defined relative to Table J-1 above, in which 265 mgd of RWS supply is available.

b RWS supplies are available to meet both retail and wholesale demands.

c Local supplies are available only to meet retail demands.

Table J-3. Retail Supply and Demand Comparison for Projected Normal and Dry Year Scenarios, With Bay-Delta Plan Amendment

Year	Retail Supply and Demand	Normal Year	Single Dry Year[a]	Multiple Dry Years				
				Year 1[a]	Year 2[b]	Year 3[b]	Year 4[b]	Year 5[b]
2025	Total Retail Demand	70.7	70.7	70.7	70.7	70.7	70.7	70.7
	Baseline Retail Demand[c]	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*
	WSA 5% Demand Reduction Requirement[d]	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	84.5	53.2	53.2	48.2	48.2	48.2	48.2
	Retail Groundwater[e]	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*
	Retail Recycled Water[f]	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*
	RWS Supply Available to Retail[g]	*81.0*	*49.7*	*49.7*	*44.7*	*44.7*	*44.7*	*44.7*
	Difference (Supply Surplus or Shortfall)	13.8	-17.5	-17.5	-22.5	-22.5	-22.5	-22.5
	Difference as Percentage of Demand	19.5%	-24.8%	-24.8%	-31.8%	-31.8%	-31.8%	-31.8%
2030	Total Retail Demand	72.4	72.4	72.4	72.4	72.4	72.4	72.4
	Baseline Retail Demand[c]	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*
	WSA 5% Demand Reduction Requirement[d]	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	87.9	56.6	56.6	51.6	51.6	51.6	51.6
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Available to Retail[g]	*81.0*	*49.7*	*49.7*	*44.7*	*44.7*	*44.7*	*44.7*
	Difference (Supply Surplus or Shortfall)	15.5	-15.8	-15.8	-20.8	-20.8	-20.8	-20.8
	Difference as Percentage of Demand	21.4%	-21.8%	-21.8%	-28.7%	-28.7%	-28.7%	-28.7%
2035	Total Retail Demand	74	74	74	74	74	74	74

	Baseline Retail Demand[c]	*74.4*	*74.4*	*74.4*	*74.4*	*74.4*	*74.4*	*74.4*
	WSA 5% Demand Reduction Requirement[d]	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	87.9	56.6	56.6	51.6	51.6	51.6	51.6
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Available to Retail[g]	*81.0*	*49.7*	*49.7*	*44.7*	*44.7*	*44.7*	*44.7*
	Difference (Supply Surplus or Shortfall)	13.5	-17.8	-17.8	-22.8	-22.8	-22.8	-22.8
	Difference as Percentage of Demand	18.1%	-23.9%	-23.9%	-30.6%	-30.6%	-30.6%	-30.6%
2040	Total Retail Demand	77.3	77.3	77.3	77.3	77.3	77.3	77.3
	Baseline Retail Demand[c]	*77.3*	*77.3*	*77.3*	*77.3*	*77.3*	*77.3*	*77.3*
	WSA 5% Demand Reduction Requirement[d]	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	87.9	56.6	56.6	51.6	51.6	51.6	51.6
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Available to Retail[g]	*81.0*	*49.7*	*49.7*	*44.7*	*44.7*	*44.7*	*44.7*
	Difference (Supply Surplus or Shortfall)	10.6	-20.7	-20.7	-25.7	-25.7	-25.7	-25.7
	Difference as Percentage of Demand	13.7%	-26.8%	-26.8%	-33.2%	-33.2%	-33.2%	-33.2%
2045	Total Retail Demand	80.6	80.6	80.6	80.6	80.6	80.6	80.6
	Baseline Retail Demand[c]	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*
	WSA 5% Demand Reduction Requirement[d]	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
	Total Retail Supply	87.9	56.6	56.6	51.6	51.6	51.6	51.6
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Available to Retail[g]	*81.0*	*49.7*	*49.7*	*44.7*	*44.7*	*44.7*	*44.7*
	Difference (Supply Surplus or Shortfall)	7.3	-24.0	-24.0	-29.0	-29.0	-29.0	-29.0
	Difference as Percentage of Demand	9.1%	-29.8%	-29.8%	-36.0%	-36.0%	-36.0%	-36.0%

Normal, single dry, and multiple dry year conditions are on a water year basis.

a During a single dry year and multiple dry year 1, a system-wide shortage of 50% is in effect. For this analysis, a 50% shortage is considered equivalent to the maximum Stage 4, 16-20% system-wide shortage. Under the WSAP, the retail supply allocation at this stage of shortage is 36.0% of available RWS supply, or 49.7 mgd.

b During multiple dry years 2 to 5, a system-wide shortage of 55% is in effect. For this analysis, a 55% shortage is considered equivalent to the maximum Stage 4, 16-20% system-wide shortage. Under the WSAP, the retail supply allocation at this stage of shortage is 37.5% of available RWS supply, or 44.7 mgd.

c Total retail demands correspond to those in Table 4-1, and reflect active conservation, onsite water reuse savings as well as water loss. Demands for Groveland CSD is included in the table above. However, in the corresponding standardized tables in Appendix B, Groveland CSD is accounted for as a wholesale customer instead of a retail customer, as explained in Section 2.4.

d As amended in 2018, the WSAP Tier One Allocation Plan requires retail customers to conserve a minimum of 5% during droughts. If retail demands on the Regional Water System are lower than the retail allocation in a dry year, retail demands on the RWS will be reduced by 5%. An N/A on this row means that either this 5% rationing requirement doesn't apply, or retail customers are already rationing greater than 5%.

e Groundwater supplies are assumed to be equivalent to projected demands for the San Francisco Groundwater Supply Project (4.0 mgd by 2030) and Castlewood CSA (0.4 mgd). Groundwater availability would not be affected by dry year conditions.

f Recycled water supplies are assumed to be equivalent to projected demands related to the Westside Recycled Water Project (1.6 mgd by 2021 and 1.8 mgd by 2030), Harding Park and Fleming Golf Courses (0.23 mgd), and Sharp Park Golf Course (up to 0.1 mgd) and Treasure Island (0.2 mgd by 2025 and 0.4 mgd by 2030). Recycled water availability would not be affected by dry year conditions.

g Procedures for RWS allocations and the WSAP are described in Section 8.3. Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, in normal years, if groundwater and recycled water supplies are not available, up to 81 mgd of RWS supply could be used.

Table J-4. Retail Supply and Demand Comparison for Projected Normal and Dry Year Scenarios, Without Bay-Delta Plan Amendment

Year	Retail Supply and Demand	Normal Year	Single Dry Year[a]	Multiple Dry Years				
				Year 1[a]	Year 2[b]	Year 3[b]	Year 4[b]	Year 5[b]
2025	Total Retail Demand	70.7	67.2	67.2	67.2	67.2	67.2	67.2
	Baseline Retail Demand[c]	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*	*70.7*
	WSA 5% Demand Reduction Requirement[d]	*N/A*	*-3.5*	*-3.5*	*-3.5*	*-3.5*	*-3.5*	*-3.5*
	Total Retail Supply	84.5	84.5	84.5	84.5	84.5	83.0	83.0
	Retail Groundwater[e]	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*
	Retail Recycled Water[f]	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*	*2.1*
	RWS Supply Available to Retail[g]	*81.0*	*81.0*	*81.0*	*81.0*	*81.0*	*79.5*	*79.5*
	Difference (Supply Surplus or Shortfall)	13.8	17.3	17.3	17.3	17.3	15.8	15.8
	Difference as Percentage of Demand	19.5%	25.8%	25.8%	25.8%	25.8%	23.6%	23.6%
2030	Total Retail Demand	72.4	68.8	68.8	68.8	68.8	68.8	68.8
	Baseline Retail Demand[c]	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*	*72.4*
	WSA 5% Demand Reduction Requirement[d]	*0*	*-3.6*	*-3.6*	*-3.6*	*-3.6*	*-3.6*	*-3.6*
	Total Retail Supply	87.9	87.9	87.9	87.9	87.9	86.4	86.4
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Available to Retail[g]	*81.0*	*81.0*	*81.0*	*81.0*	*81.0*	*79.5*	*79.5*
	Difference (Supply Surplus or Shortfall)	15.5	19.1	19.1	19.1	19.1	17.6	17.6
	Difference as Percentage of Demand	21.4%	27.8%	27.8%	27.8%	27.8%	25.6%	25.6%
2035	Total Retail Demand	74	71	71	71	71	71	71
	Baseline Retail Demand[c]	*74.4*	*74.4*	*74.4*	*74.4*	*74.4*	*74.4*	*74.4*
	WSA 5% Demand Reduction Requirement[d]	*0*	*-3.7*	*-3.7*	*-3.7*	*-3.7*	*-3.7*	*-3.7*
	Total Retail Supply	87.9	87.9	87.9	87.9	87.9	86.4	86.4
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Available to Retail[g]	*81.0*	*81.0*	*81.0*	*81.0*	*81.0*	*79.5*	*79.5*
	Difference (Supply Surplus or Shortfall)	13.5	17.2	17.2	17.2	17.2	15.7	15.7
	Difference as Percentage of Demand	18.1%	24.4%	24.4%	24.4%	24.4%	22.2%	22.2%
2040	Total Retail Demand	77.3	73.4	73.4	73.4	73.4	73.4	73.4
	Baseline Retail Demand[c]	*77.3*	*77.3*	*77.3*	*77.3*	*77.3*	*77.3*	*77.3*
	WSA 5% Demand Reduction Requirement[d]	*0*	*-3.9*	*-3.9*	*-3.9*	*-3.9*	*-3.9*	*-3.9*
	Total Retail Supply	87.9	87.9	87.9	87.9	87.9	86.4	86.4
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Available to Retail[g]	*81.0*	*81.0*	*81.0*	*81.0*	*81.0*	*79.5*	*79.5*
	Difference (Supply Surplus or Shortfall)	10.6	14.5	14.5	14.5	14.5	13.0	13.0
	Difference as Percentage of Demand	13.7%	19.7%	19.7%	19.7%	19.7%	17.7%	17.7%

2045	Total Retail Demand	80.6	76.6	76.6	76.6	76.6	76.6	76.6
	Baseline Retail Demand[c]	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*	*80.6*
	WSA 5% Demand Reduction Requirement[d]	*0*	*-4.0*	*-4.0*	*-4.0*	*-4.0*	*-4.0*	*-4.0*
	Total Retail Supply	87.9	87.9	87.9	87.9	87.9	86.4	86.4
	Retail Groundwater[e]	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*	*4.4*
	Retail Recycled Water[f]	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*	*2.5*
	RWS Supply Available to Retail[g]	*81.0*	*81.0*	*81.0*	*81.0*	*81.0*	*79.5*	*79.5*
	Difference (Supply Surplus or Shortfall)	7.3	11.3	11.3	11.3	11.3	9.8	9.8
	Difference as Percentage of Demand	9.1%	14.8%	14.8%	14.8%	14.8%	12.8%	12.8%

Normal, single dry, and multiple dry year conditions are on a water year basis.

a During a single dry year and multiple dry years 1 to 3, a system-wide shortage of 10% is in effect. Under the WSAP, the retail supply allocation at this stage of shortage is 36.0% of available RWS supply, or 85.9 mgd. However, due to the Phased WSIP Variant, only 81 mgd of RWS supply can be delivered.

b During multiple dry years 4 and 5, a system-wide shortage of 20% is in effect. Under the WSAP, the retail supply allocation at this stage of shortage is 37.5% of available RWS supply, or 79.5 mgd. RWS supply is capped at this amount.

c Total retail demands correspond to those in Table 4-1, and reflect active conservation, onsite water reuse savings as well as water loss. Demands from Groveland CSD are included in the table above. However, in the corresponding standardized tables in Appendix B, Groveland CSD is accounted for as a wholesale customer instead of a retail customer, as explained in Section 2.4.

d As amended in 2018, the WSAP Tier One Allocation Plan requires retail customers to conserve a minimum of 5% during droughts. If retail demands on the Regional Water System are lower than the retail allocation in a dry year, retail demands on the RWS will be reduced by 5%. An N/A on this row means that either this 5% rationing requirement doesn't apply, or retail customers are already rationing greater than 5%.

e Groundwater supplies are assumed to be equivalent to projected demands for the San Francisco Groundwater Supply Project (4.0 mgd by 2030) and Castlewood CSA (0.4 mgd). Groundwater availability would not be affected by dry year conditions.

f Recycled water supplies are assumed to be equivalent to projected demands related to the Westside Recycled Water Project (1.6 mgd by 2021 and 1.8 mgd by 2030), Harding Park and Fleming Golf Courses (0.23 mgd), and Sharp Park Golf Course (up to 0.1 mgd) and Treasure Island (0.2 mgd by 2025 and 0.4 mgd by 2030). Recycled water availability would not be affected by dry year conditions.

g Procedures for RWS allocations and the WSAP are described in Section 8.3. Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if groundwater and recycled water supplies are not available, up to 81 mgd of RWS supply could be used.

Table J-5. Wholesale Supply and Demand Comparison for Projected Normal and Dry Year Scenarios with Bay-Delta Plan Amendment (mgd)

Year	Wholesale Supply and Demand	Normal Year	Single Dry Year[a]	Multiple Dry Years[a]				
				Year 1	Year 2	Year 3	Year 4	Year 5
2025	Total Wholesale Demand[b]	184.0	184.0	184.0	184.0	184.0	184.0	184.0
	Total Wholesale RWS Supply[c]	184.0	82.8	82.8	74.5	74.5	74.5	74.5
	Difference (Surplus or Shortfall)	-0.0	-101.2	-101.2	-109.5	-109.5	-109.5	-109.5
	Difference as % of Demand	0.0%	-55.0%	-55.0%	-59.5%	-59.5%	-59.5%	-59.5%
2030	Total Wholesale Demand[b]	184.0	184.0	184.0	184.0	184.0	184.0	184.0
	Total Wholesale RWS Supply[c]	184.0	82.8	82.8	74.5	74.5	74.5	74.5
	Difference (Surplus or Shortfall)	-0.0	-101.2	-101.2	-109.5	-109.5	-109.5	-109.5
	Difference as % of Demand	0.0%	-55.0%	-55.0%	-59.5%	-59.5%	-59.5%	-59.5%
2035	Total Wholesale Demand[b]	184.0	184.0	184.0	184.0	184.0	184.0	184.0
	Total Wholesale RWS Supply[c]	184.0	82.8	82.8	74.5	74.5	74.5	74.5
	Difference (Surplus or Shortfall)	-0.0	-101.2	-101.2	-109.5	-109.5	-109.5	-109.5
	Difference as % of Demand	0.0%	-55.0%	-55.0%	-59.5%	-59.5%	-59.5%	-59.5%
2040	Total Wholesale Demand[b]	184.0	184.0	184.0	184.0	184.0	184.0	184.0
	Total Wholesale RWS Supply[c]	184.0	82.8	82.8	74.5	74.5	74.5	74.5
	Difference (Surplus or Shortfall)	-0.0	-101.2	-101.2	-109.5	-109.5	-109.5	-109.5
	Difference as % of Demand	0.0%	-55.0%	-55.0%	-59.5%	-59.5%	-59.5%	-59.5%
2045	Total Wholesale Demand[b]	184.0	184.0	184.0	184.0	184.0	184.0	184.0
	Total Wholesale RWS Supply[c]	184.0	82.8	82.8	74.5	74.5	74.5	74.5
	Difference (Surplus or Shortfall)	-0.0	-101.2	-101.2	-109.5	-109.5	-109.5	-109.5
	Difference as % of Demand	0.0%	-55.0%	-55.0%	-59.5%	-59.5%	-59.5%	-59.5%

Normal, single dry, and multiple dry year conditions are on a water year basis.

Groveland CSD is not accounted for as a wholesale customer for the purpose of this table.

a The WSA does not define a percentage split above a 20% shortage level. The same split as a 20% shortage level is assumed, and the Wholesale Customers are therefore allocated 62.5%.

b Total wholesale demands correspond to those in Table 4-3 of the UWMP. It is assumed that projected Wholesale Customer demands are limited to the Supply Assurance of 184 mgd. The 184 mgd assumes that San Jose and Santa Clara remain temporary, interruptible customers.

c Procedures for RWS allocations and the WSAP are described in Section 8.3.

Table J-6. Wholesale Supply and Demand Comparison for Projected Normal and Dry Year Scenarios Without Bay Delta Plan (mgd)

Year	Wholesale Supply and Demand	Normal Year	Single Dry Year[a]	Multiple Dry Years				
				Year 1[a]	Year 2[a]	Year 3[a]	Year 4[b]	Year 5[b]
2025	Total Wholesale Demand[c]	184.0	184.0	184.0	184.0	184.0	184.0	184.0
	Total Wholesale RWS Supply[d]	184.0	157.5	157.5	157.5	157.5	132.5	132.5
	Difference (Surplus or Shortfall)	-0.0	-26.5	-26.5	-26.5	-26.5	-51.5	-51.5
	Difference as % of Demand	0.0%	-14.4%	-14.4%	-14.4%	-14.4%	-28.0%	-28.0%
2030	Total Wholesale Demand[c]	184.0	184.0	184.0	184.0	184.0	184.0	184.0
	Total Wholesale RWS Supply[d]	184.0	157.5	157.5	157.5	157.5	132.5	132.5
	Difference (Surplus or Shortfall)	-0.0	-26.5	-26.5	-26.5	-26.5	-51.5	-51.5
	Difference as % of Demand	0.0%	-14.4%	-14.4%	-14.4%	-14.4%	-28.0%	-28.0%
2035	Total Wholesale Demand[c]	184.0	184.0	184.0	184.0	184.0	184.0	184.0
	Total Wholesale RWS Supply[d]	184.0	157.5	157.5	157.5	157.5	132.5	132.5
	Difference (Surplus or Shortfall)	-0.0	-26.5	-26.5	-26.5	-26.5	-51.5	-51.5
	Difference as % of Demand	0.0%	-14.4%	-14.4%	-14.4%	-14.4%	-28.0%	-28.0%
2040	Total Wholesale Demand[c]	184.0	184.0	184.0	184.0	184.0	184.0	184.0
	Total Wholesale RWS Supply[d]	184.0	157.5	157.5	157.5	157.5	132.5	132.5
	Difference (Surplus or Shortfall)	-0.0	-26.5	-26.5	-26.5	-26.5	-51.5	-51.5
	Difference as % of Demand	0.0%	-14.4%	-14.4%	-14.4%	-14.4%	-28.0%	-28.0%
2045	Total Wholesale Demand[c]	184.0	184.0	184.0	184.0	184.0	184.0	184.0
	Total Wholesale RWS Supply[d]	184.0	157.5	157.5	157.5	157.5	132.5	132.5
	Difference (Surplus or Shortfall)	-0.0	-26.5	-26.5	-26.5	-26.5	-51.5	-51.5
	Difference as % of Demand	0.0%	-14.4%	-14.4%	-14.4%	-14.4%	-28.0%	-28.0%

Normal, single dry, and multiple dry year conditions are on a water year basis.

Groveland CSD is not accounted for as a wholesale customer for the purpose of this table.

a Single dry year and multiple dry years 1 to 3 reflect a system-wide shortage of 10%. Under the WSAP, the wholesale supply allocation at this stage of shortage is 64.0% of available RWS supply, or 152.6 mgd. Retail allocation is 36%, or 85.9 mgd; retail allocations above 81 mgd are re-allocated to Wholesale Customers, per the 2018 WSA. 4.9 mgd is added to the wholesale allocation, bringing it to 157.5 mgd.

b Multiple dry years 4 and 5 reflect a system-wide shortage of 20%. Under the WSAP, wholesale supply allocation at this stage of shortage is 62.5% of available RWS supply, or 132.5 mgd.

c Total wholesale demands correspond to those in Table 4-3 of the UWMP. It is assumed that projected Wholesale Customer demands are limited to the Supply Assurance of 184 mgd. The 184 mgd assumes that San Jose and Santa Clara remain temporary, interruptible customers.

d Procedures for RWS allocations and the WSAP are described in Section 8.3.

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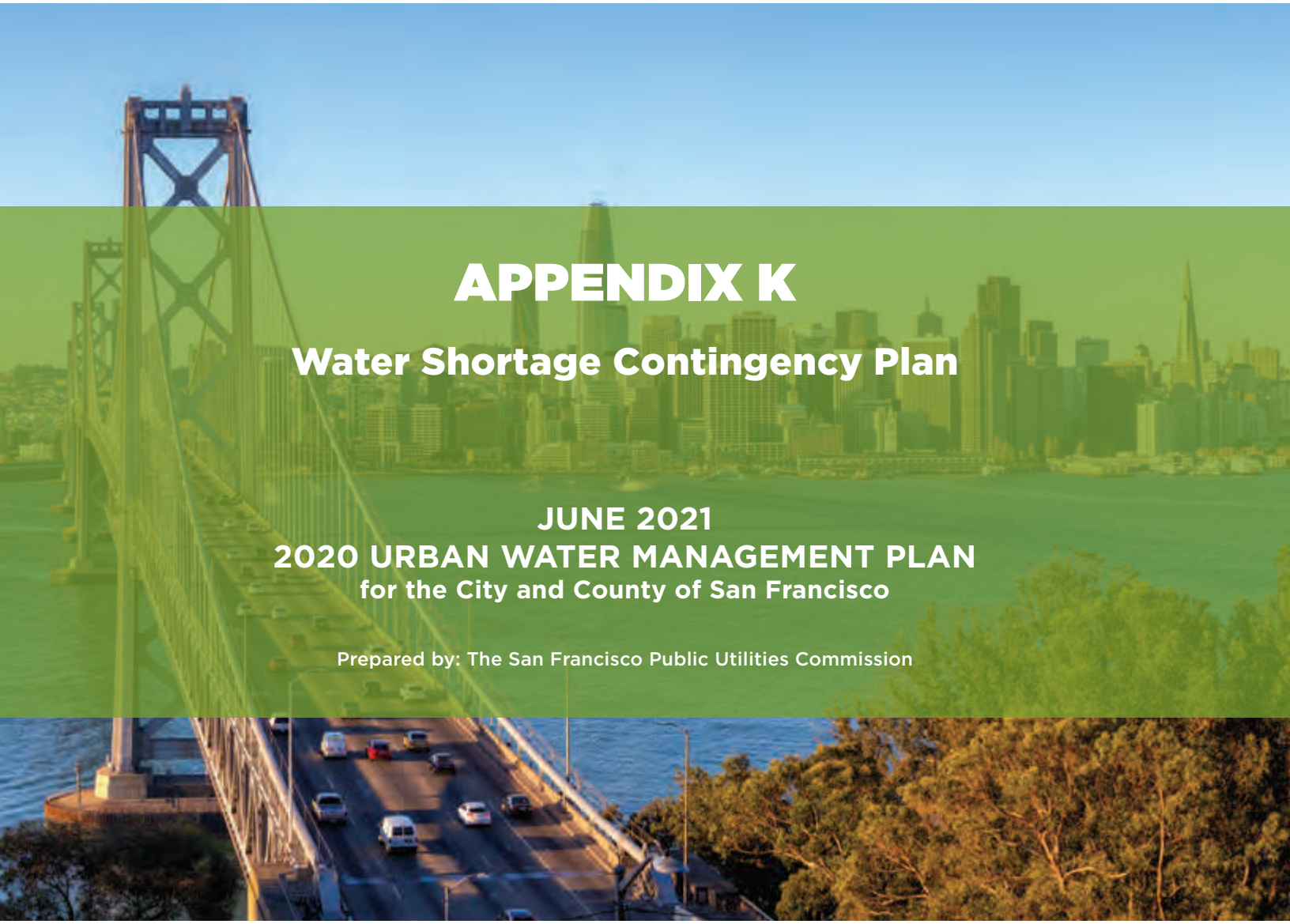

APPENDIX K

Water Shortage Contingency Plan

JUNE 2021
2020 URBAN WATER MANAGEMENT PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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2020 WATER SHORTAGE CONTINGENCY PLAN

for the City and County of San Francisco

June 2021

Prepared by:

The San Francisco
Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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TABLE OF CONTENTS

Section 1 Introduction 1

1.1 Experience with Water Shortages pre-2010 1

1.2 Experience with the 2012-2016 Drought 2

Section 2 Annual Water Supply and Demand Assessment Procedures 3

2.1 Demand Assessment [Water Code Section 10632(a)(2)(B)(i)] 3

2.2 Supply Assessment [Water Code SectionS 10632(a)(2)(B)(ii) and 10632(a)(2)(B)(V)] 3

2.3 Infrastructure Considerations [Water Code Section 10632(a)(2)(B)(ili)] 5

2.4 System Modeling [Water Code Section 10632(a)(2)(B)(iv)] 6

2.5 Decision-Making Process [Water Code Section 10632(a)(2)(A)] 6

Section 3 Water Shortage Levels 8

3.1 Water Shortage Allocation Plan (WSAP) and Associated Water Shortage Levels 8

3.2 Retail Water Shortage Levels 9

Section 4 Retail Water Shortage Response Actions 11

4.1 Retail Water Shortage Allocation Plan (RWSAP) 11

4.1.1 Voluntary vs. Mandatory Demand Reduction 11

4.1.2 Types of Allocation Methods for Mandatory Demand Reduction 11

4.1.3 Per Capita Residential Water Use Floor 12

4.1.4 Water Shortage Allocation Process 12

4.1.5 Appeal Process 13

4.2 Water Waste Prohibitions 13

4.3 Demand Reduction Actions 14

4.4 Operational Changes 15

4.5 Supply Augmentation Actions 16

4.6 Summary of Retail Shortage Response Actions 16

Section 5 Communication Protocols 18

5.1 Communications about Voluntary Reductions 18

5.2 Communications About Mandatory Demand Reduction 18

5.3 Communications Related to Wholesale Customers 19

Section 6 Enforcement and Penalties 19

6.1 Enforcement of Water Use Allocations 19

6.2 Enforcement of Water Waste Prohibitions 20

Section 7 Legal Authorities 21

Section 8 Financial Consequences of WSCP 21

Section 9 Monitoring and Reporting 22

Section 10 Preparation for Catastrophic Supply Interruption 22

10.1 Emergency Preparedness Plans 22

10.2 Emergency Drinking Water Planning 23

10.3 Power Outage Preparedness and Response 24

10.4 Seismic Risk Assessment and Mitigation Plan 24

Section 11 WSCP Refinement Procedures 26

Section 12 Plan Adoption, Submittal, and Availability 26

APPENDICES

Appendix A	Water Shortage Allocation Plan (Attachment H of Water Supply Agreement Between the City and County of San Francisco and with Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County)
Appendix B	Summary of San Francisco's Response to 1987-92 Drought Experience
Appendix C	Summary of San Francisco's Response to 2012-2016 Drought Experience
Appendix D	San Francisco Public Utilities Commission Resolution Adopting 2020 Water Shortage Contingency Plan

LIST OF FIGURES

Figure 2-1: Water Supply and Demand Assessment Process 7

LIST OF TABLES

Table 2-1. Regional Water System Supply Availability in Normal Years (mgd) 5

Table 2-2. Regional Water System Supply Utilized in Normal Years (mgd) 5

Table 3-1. Retail and Wholesale RWS Allocations during System-wide Shortage 9

Table 3-2. Retail Water Shortage Levels of Action 10

Table 4-1. Water Use Restrictions and Prohibitions 14

Table 4-2. Shortage Response Actions (Demand Reduction Actions) 17

ACRONYMS AND ABBREVIATIONS

AF	acre-feet (volume of water, equivalent to 325,851 gallons)
ASO	airborne snow observatory
AWIA	2018 America's Water Infrastructure Act
BAWSCA	Bay Area Water Supply and Conservation Agency
CCF	hundred cubic feet (volume of water, equivalent to 748 gallons)
City	City and County of San Francisco
CWC	California Water Code
DEOP	Division Emergency Operations Plan
DMM	Demand Management Measure
DWR	California Department of Water Resources
EBMUD	East Bay Municipal Utility District
EDRP	Emergency Disinfection and Recovery Plan
EOP	Emergency Operations Plan
ERAP	Emergency Response Action Plan
ERP	Emergency Response Plan
ERRP	Emergency Response and Recovery Plan
GPCD	gallons per capita per day
Groveland CSD	Groveland Community Services District
HTWTP	Harry Tracy Water Treatment Plant
ISL	Interim Supply Limitation
LOS	levels of service
MG	million gallons
mgd	million gallons per day (flow or usage rate of water)
RWS	San Francisco Regional Water System,
RWSAP	Retail Water Shortage Allocation Plan
SCVWD	Santa Clara Valley Water District
SFPUC	San Francisco Public Utilities Commission
State	State of California
SVWTP	Sunol Valley Water Treatment Plant
SWRCB	State Water Resources Control Board
UWMP	Urban Water Management Plan
WPCP	water pollution control plant
WSA	Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County
WSAP	Water Shortage Allocation Plan
WSCP	Water Shortage Contingency Plan
WSDA	Water Supply and Demand Assessment
WSIP	Water System Improvement Program

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SECTION 1 INTRODUCTION

The San Francisco Public Utilities Commission (SFPUC) is pleased to present this Water Shortage Contingency Plan (WSCP or Plan) for the City and County of San Francisco (City).

The City owns and operates the San Francisco Regional Water System (RWS), a public asset that plays a key role in delivering high-quality drinking water to more than 2.7 million residents and businesses in the San Francisco Bay Area. The system collects water from the Tuolumne River in the Sierra Nevada and from protected local watersheds in the East Bay and Peninsula.

The SFPUC operates the RWS to deliver water to 27 wholesale customers in Alameda, Santa Clara, and San Mateo Counties, as well as the Groveland Community Services District (Groveland CSD) in Tuolumne County. The Bay Area Water Supply and Conservation Agency (BAWSCA) represents the interests of 26 of the wholesale customers in Alameda, Santa Clara, and San Mateo Counties (collectively, Wholesale Customers) and coordinates their water conservation programming. The SFPUC also provides retail water service to customers in San Francisco (generally referred to as in-City retail customers) and a small number of customers outside of San Francisco that are located along the RWS transmission system (generally referred to as suburban retail customers). Additionally, some retail customers are supplied with local groundwater and recycled water supplies. The SFPUC also has a robust retail conservation program, as well as an Onsite Water Reuse program to reduce water demands and use water more efficiently.

This WSCP presents the latest information about the SFPUC's annual water supply and demand assessment (WSDA) procedures and describes the SFPUC's water shortage contingency planning. This WSCP coincides with additional planning efforts conducted by the SFPUC, including its urban water management planning.

This introduction section provides background on the SFPUC's response to past water shortage experiences pre-2010 (Section 1.1, described in more detail in Appendix B) as well as the most recent 2012-2016 drought (Section 1.2, described in more detail in Appendix C).

1.1 EXPERIENCE WITH WATER SHORTAGES PRE-2010

Every water system has vulnerabilities in terms of its ability to provide a safe and reliable supply of water. Water shortages can occur in a number of ways. Very localized shortages can occur due to distribution system problems, and system shortages can occur due to major facility failures. Apart from system facility contingencies, potential drought periods may limit the amount of water that is available over a series of years. Drought contingency planning is not necessarily caused by physical facility limitations. Within the past 30 years, San Francisco has experienced both localized shortages due to earthquakes and system-wide shortages due to drought.

The SFPUC's past experiences with water shortages during drought and following major earthquakes have shaped its current water shortage preparedness plans and response policies:

- In 1987-92 San Francisco experienced a serious drought. During 6-year drought the SFPUC adopted various levels of action in response to the main Hetch Hetchy source of water available to the SFPUC being taxed to the point of running out of water.

- Following the October 17, 1989 Loma Prieta earthquake, the SFPUC worked with the Mayor's Office of Emergency Response to reconnect water service to retail customers impacted by the earthquake. Most of the homes that lost water service were reconnected within 72 hours.

- In April 2007, below normal precipitation and snow pack caused the SFPUC to initiate a 10% voluntary reduction in water use in the service area. The call for a voluntary reduction continued through 2009.

The 1987-92 drought illustrated the deficit between the SFPUC's supplies and its customers' demands. Other than the 1976-77 drought, drought sequences in the past did not seriously affect the ability of the SFPUC to maintain full deliveries to its customers. As the SFPUC progressed into the 1987-92 drought and reservoir storage continued to decline, it became evident that full deliveries could not be sustained without the risk of running out of water before the drought ended. This circumstance became a reality in early 1991 when the Hetch Hetchy Reservoir became so depleted (less than 25,000 AF of storage in a reservoir with over 360,000 AF of capacity) that minimum instream flow releases and anticipated demands required the SFPUC to initiate programs to achieve a 45% reduction in system-wide water deliveries to balance water supplies with deliveries. Fortunately, unexpected runoff in March 1991 provided relief from the severity of that instance of water shortage; however, the drought was far from over.

Appendix B provides a more detailed summary of San Francisco's 1987-92 drought experience and the actions taken at the time.

1.2 EXPERIENCE WITH THE 2012-2016 DROUGHT

From 2012-2016, California experienced a severe drought which included the driest four consecutive water years based on statewide precipitation (2012-2015) and the lowest April 1 statewide snowpack water equivalent (5 percent in 2015). The unprecedented dry weather conditions prompted then-Governor Jerry Brown to declare a drought State of Emergency in January 2014, which remained in effect for most of California until 2017. The SFPUC took the following actions in response to the drought:

- **Voluntary call for water use reduction:** Spurred by the declaration of a State of Emergency in January 2014, the SFPUC requested that all customers of the RWS voluntarily reduce water use by at least 10 percent. Soon after, the San Francisco Mayor's Office issued a formal executive directive requiring all City departments to develop individual water conservation plans and take immediate steps to achieve a mandatory 10 percent reduction in water consumption. Ultimately, no water shortage emergency was declared, and no subsequent mandatory system-wide demand reductions and shortage allocations were imposed because customers exceeded the 10 percent voluntary system-wide reduction in conjunction with the Statewide mandatory reductions assigned by the State Water Resources Control Board (SWRCB) (see below). The SFPUC lifted the call for a voluntary 10 percent reduction in April 2017.
- **Statewide mandatory reductions:** In July 2014, new emergency conservation regulations issued by the SWRCB prompted the SFPUC to implement outdoor water waste restrictions and require a mandatory 10 percent reduction in outdoor water use. Additional emergency conservation regulations issued by the SWRCB in the spring of 2015 established more Statewide water use restrictions, a mandatory Statewide water reduction of 25 percent compared to 2013 water use, and conservation standards for individual urban water suppliers to meet the Statewide 25 percent reduction. These emergency conservation regulations were the first of their kind, indicative of the State's desire for swift and substantial action to cope with the drought. The State's these regulations assigned the SFPUC retail service area a conservation standard of 8 percent in recognition of its low residential per capita water use. In the SFPUC wholesale service area, conservation standards assigned to the Wholesale Customers ranged from 8 percent to 36 percent. The conservation standards took effect in June 2015 and remained in effect through April 2017.
- **Mandatory reduction of outdoor water use:** In addition to the State mandates, the SFPUC imposed a mandatory 10% reduction on outdoor irrigation along with water use allocations and excess use charges for all retail irrigation customers starting in August 2014. Following the additional SWRCB regulations in the spring of 2015, the SFPUC increased the mandatory reduction on retail outdoor irrigation from 10 percent to 25 percent starting in July 2015. The SFPUC lifted the mandatory reduction on outdoor irrigation in July 2016.

Appendix C provides a more detailed overview of San Francisco's response to the 2012-2016 drought.

SECTION 2 ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

Each year the SFPUC evaluates the amount of total water storage expected to occur throughout the RWS and compares it to expected demands. This annual Water Supply and Demand Assessment (WSDA) is described in the subsections below, which are organized by the sequential steps the SFPUC takes to conduct the assessment each year and reference the relevant California Water Code requirements for a WSDA.[1]

The SFPUC's annual WSDA is a robust planning system that considers a range of input factors unique to the SFPUC's water supplies and system configuration while also providing the flexibility to consider new factors. Traditional surface water supplies from the SFPUC's up country, East Bay, and Peninsula reservoirs are the backbone of the water supply, but the SFPUC extends and protects those supplies in many additional ways by: (1) partnering with the community to help save water through robust conservation programs; (2) minimizing the need for additional water to serve new developments through an onsite water reuse program; (3) recycling wastewater resources to deliver water for large non-potable uses; (4) utilizing local groundwater supplies to supplement surface water supplies; (5) investigating new, alternative water supply options such as purified water and desalination; and (6) investing in innovations that allow for creative solutions to meet diverse needs. These efforts help the SFPUC conserve water and diversify supplies to reduce likelihood of a water shortage condition.

2.1 DEMAND ASSESSMENT [WATER CODE SECTION 10632(A)(2)(B)(I)]

To calculate unconstrained customer demand for the purpose of an annual WSDA, the SFPUC collects information on both the retail and wholesale system demands. Retail customer demand is estimated based on the best available information to date, and typically includes the previous year's demands as well as consideration of current demand use patterns or other conditions impacting demands, such as weather and growth. Each year, in February, the SFPUC receives from BAWSCA a report of estimated Wholesale Customer demand for the upcoming year. Estimates of projected demands are provided to BAWSCA by each Wholesale Customer. Relatively small demands from the two additional wholesale customers not part of the WSA are estimated based on the best available information to date, and typically includes the previous year's demands as well as consideration of current demand use patterns or other conditions impacting demands, such as weather and growth.

2.2 SUPPLY ASSESSMENT [WATER CODE SECTIONS 10632(A)(2)(B)(II) AND 10632(A)(2)(B)(V)]

The RWS collects water from the Tuolumne River watershed in the Sierra Nevada and from local reservoirs in the Alameda and Peninsula watersheds. The RWS draws an average of 85 percent of its supply from the Tuolumne River watershed. This water feeds into an aqueduct system delivering water 167 miles by gravity to Bay Area reservoirs and customers. The remaining RWS supply is drawn from local surface waters in the Alameda and Peninsula watersheds. The split between these resources varies from year to year depending on the water year hydrology and operational circumstances.

To project and evaluate water supply conditions, the SFPUC uses measurements of precipitation and snowpack in the watersheds above Hetch Hetchy, Cherry, and Eleanor Reservoirs. Snowpack conditions are evaluated regularly by the Cooperative Snow Survey (conducted by the SFPUC in partnership with state and federal agencies) beginning in late January of each year. The SFPUC also estimates snowpack conditions using information from airborne snow observatory (ASO) and other sources. The SFPUC maintains a hydrologic model of the watersheds that uses this information to

[1] California Water Code section 10632(a)(1) requires "*the analysis of water supply reliability conducted pursuant to Section 10635.*" Additional information about the SFPUC's water supply reliability analysis can be found in Chapter 7 of the SFPUC's 2020 UWMP.

project expected runoff for the coming year. This process also includes a statistical analysis of additional expected precipitation. In addition to projected runoff, the determination of projected available water supply also takes into account stored water throughout the RWS, water acquired by the SFPUC from non-SFPUC sources, inactive storage, reservoir losses, and allowances for carryover storage.

Additionally, the SFPUC accounts for groundwater provided by the San Francisco Groundwater Supply Project for the in-City retail system and recycled water provided for irrigation at Harding Park, Fleming and Sharp Park Golf Courses.

The RWS relies on precipitation and snowmelt captured and stored in its reservoirs. During droughts, water supply deliveries can exceed inflows, such that water stored in previous years is relied upon to meet demands. Because of the importance of carry-over storage, the SFPUC constantly monitors and evaluates water supply conditions in the RWS. Look-ahead forecasts are updated as a year's hydrology and operations change. Generally, in early winter of any year, SFPUC staff can begin providing a forecast of water supply conditions for the upcoming year based on known and anticipated winter and spring precipitation and snowpack. The predictive power of this forecast improves greatly through the spring. The annual precipitation, snowmelt, and carry-over storage together constitute the SFPUC's reservoir storage condition. Using data for each of these factors, the SFPUC can determine whether the reservoir system will be capable of serving full deliveries to its customers. Section 2.3 describes the system modeling SFPUC conducts.

Table 2-1 shows the availability of RWS supplies for retail customers and Wholesale Customers in normal years. Table 2-2 shows the current and projected RWS supply needs to meet retail and wholesale demands based on information and projections presented in the SFPUC's 2020 UWMP.

The SFPUC sells water to 26 of its 28 wholesale customers under the terms of the 25-year contract known as the Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County (WSA) and associated individual water sales contracts with each Wholesale Customer. The WSA carries forward the SFPUC's "Supply Assurance" of 184 million gallons per day (mgd) to the Wholesale Customers. The SFPUC has agreed to deliver water to the Wholesale Customers up to the amount of the Supply Assurance, and this agreement is perpetual and survives the expiration of the WSA. The Supply Assurance is, however, subject to reduction due to water shortage, drought, scheduled RWS maintenance activities, and emergencies. As part of the Phased Water System Improvement Plan (WSIP) in 2008, the SFPUC established a temporary 265 mgd annual average limitation on water deliveries from RWS watersheds, the "Interim Supply Limitation" (ISL). The SFPUC has allocated the ISL between the retail customers and Wholesale Customers as follows:

- Wholesale supply allocation: 184 mgd
- Retail supply allocation: 81 mgd[2]

[2] Groveland CSD is considered a retail customer of the SFPUC. Thus, RWS supplies to Groveland CSD are accounted for in the retail supply allocation of 81 mgd.

Table 2-1. Regional Water System Supply Availability in Normal Years (mgd)

RWS Supply Allocation	Actual	Projected				
	2020	2025	2030	2035	2040	2045
Retail Customers[a, b]	81	81	81	81	81	81
Wholesale Customers[c, d]	184	184	184	184	184	184
Total RWS Supplies	265	265	265	265	265	265

a Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if these alternative supplies are not available, up to 81 mgd of RWS supply could be used in normal years.

b Groveland CSD is reported as a wholesale customer for the purposes of this 2020 UWMP, but it is considered a retail customer of the SFPUC solely for purposes of allocating RWS supplies between retail and Wholesale Customers. Its demands would be met by the retail supply allocation of 81 mgd.

c Projected Wholesale Customer deliveries are limited to 184 mgd, including the demands of the Cities of San Jose and Santa Clara, which are supplied on a temporary and interruptible basis, with their total supply not exceeding 9 mgd assuming supply is available (decision to be made by end of 2028).

d Cordilleras MWC is not a party to the WSA, and it is not included in the wholesale supply allocation of 184 mgd. The demands of Cordilleras MWC are minor (projected to be less than 0.01 mgd) and are anticipated to be met with RWS supplies through 2045.

Table 2-2. Regional Water System Supply Utilized in Normal Years (mgd)

RWS Supply Allocation	Actual	Projected				
	2020	2025	2030	2035	2040	2045
Retail Customers[a, b]	66.5	67.2	67.5	68.6	70.5	73.7
Wholesale Customers[c, d]	132.1	146.0	147.9	151.9	156.3	162.8
Total RWS Supplies	198.6	213.2	215.4	220.5	226.8	236.5

a Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if these alternative supplies are not available, up to 81 mgd of RWS supply could be used in normal years.

b Groveland CSD is reported as a wholesale customer for the purposes of this 2020 UWMP, but it is considered a retail customer of the SFPUC solely for purposes of allocating RWS supplies between retail and Wholesale Customers. Its demands would be met by the retail supply allocation of 81 mgd.

c Projected Wholesale Customer deliveries are limited to 184 mgd, including the demands of the Cities of San Jose and Santa Clara, which are supplied on a temporary and interruptible basis, with their total supply not exceeding 9 mgd assuming supply is available (decision to be made by end of 2028).

d Cordilleras MWC is not a party to the WSA, and it is not included in the wholesale supply allocation of 184 mgd. The demands of Cordilleras MWC are minor (projected to be less than 0.01 mgd) and are anticipated to be met with RWS supplies through 2045.

2.3 INFRASTRUCTURE CONSIDERATIONS [WATER CODE SECTION 10632(A)(2)(B)(III)]

On an ongoing basis, the SFPUC's Hetch Hetchy Water and Power, Water Supply and Treatment Division, and Hydrology and Water Systems group conduct analyses of the RWS that incorporate planned facility outages and multiple levels of projected system demands to evaluate and plan for potential water delivery constraints. These groups meet quarterly to share plans and coordinate how facility outages, changes in service area demand, wet or dry weather, and other variables shape the operating plans each year. Facility outages due to maintenance or upgrades are coordinated in an adaptive manner to respond to changes as they occur. For new water supplies or new capital projects related to supply distribution, impacts on the system are evaluated extensively prior to initiation of any changes. Results from these modeling efforts are considered in the annual WSDA.

2.4 SYSTEM MODELING [WATER CODE SECTION 10632(A)(2)(B)(IV)]

To proactively plan for conditions that would result in a shortage of water supplies, the SFPUC models conditions using a hypothetical drought that is more severe than what the RWS has historically experienced. This drought sequence is referred to as the "design drought" and serves as the basis for planning and modeling of future scenarios. The design drought consists of an 8.5-year sequence of dry conditions.

In applying its water supply planning methodology, the SFPUC performs an initial model simulation of the system for the design drought sequence and then reviews the ability of the system to deliver water to the service area through the entire design drought sequence. If the projected water supply runs out before the end of the design drought sequence in the initial model run, system-wide water use reduction is added and the scenario is re-run. This process continues iteratively until a model simulation of the system is achieved in which the water supply in storage at the end of the design drought sequence is brought to the system "dead pool," where no additional storage is available for delivery (currently simulated as 96,775 acre-feet). Drawing system storage down to the dead pool without going below it indicates that water supply delivery, including the adjusted amount of water use, is maintained through the design drought sequence.

Estimated reduced water use levels and corresponding storage threshold values can then be used to simulate the operation of the system through the historical record of hydrology, or to evaluate system water supply conditions during an ongoing drought. While the design drought sequence does not occur in the historical hydrology, the reduced water use and storage threshold values that are adjusted to allow a system configuration to maintain water delivery through the design drought sequence can be used to evaluate system performance in the historical record, or as a comparison for real-time system conditions. Through use of this planning method, the SFPUC can simulate a response to declining water supply in storage that is appropriate for the system conditions being evaluated.

The SFPUC plans its water deliveries using indicators for water use reduction that are developed through analysis with the design drought sequence. As a result, the SFPUC system operations are designed to provide sufficient carry-over water in SFPUC reservoirs to continue delivering water, although at reduced levels, during multiple-year droughts.

2.5 DECISION-MAKING PROCESS [WATER CODE SECTION 10632(A)(2)(A)]

Regardless of the expectation of shortage conditions, as part of the normal course of business, the SFPUC provides a water supply condition update to its executive team every two weeks throughout the year. The SFPUC also provides water supply estimates to its Wholesale Customers on a monthly basis beginning February 1. A Wholesale Customer Annual Meeting is held in the latter portion of February at which the SFPUC makes a presentation on current water supply conditions and forecasts. The last snow survey of the season typically occurs within the first week of April, followed by a runoff forecast to determine total system storage expected as of July 1. By the middle of April, the SFPUC sends a formal letter to the Wholesale Customers summarizing the water supply availability for the coming year.

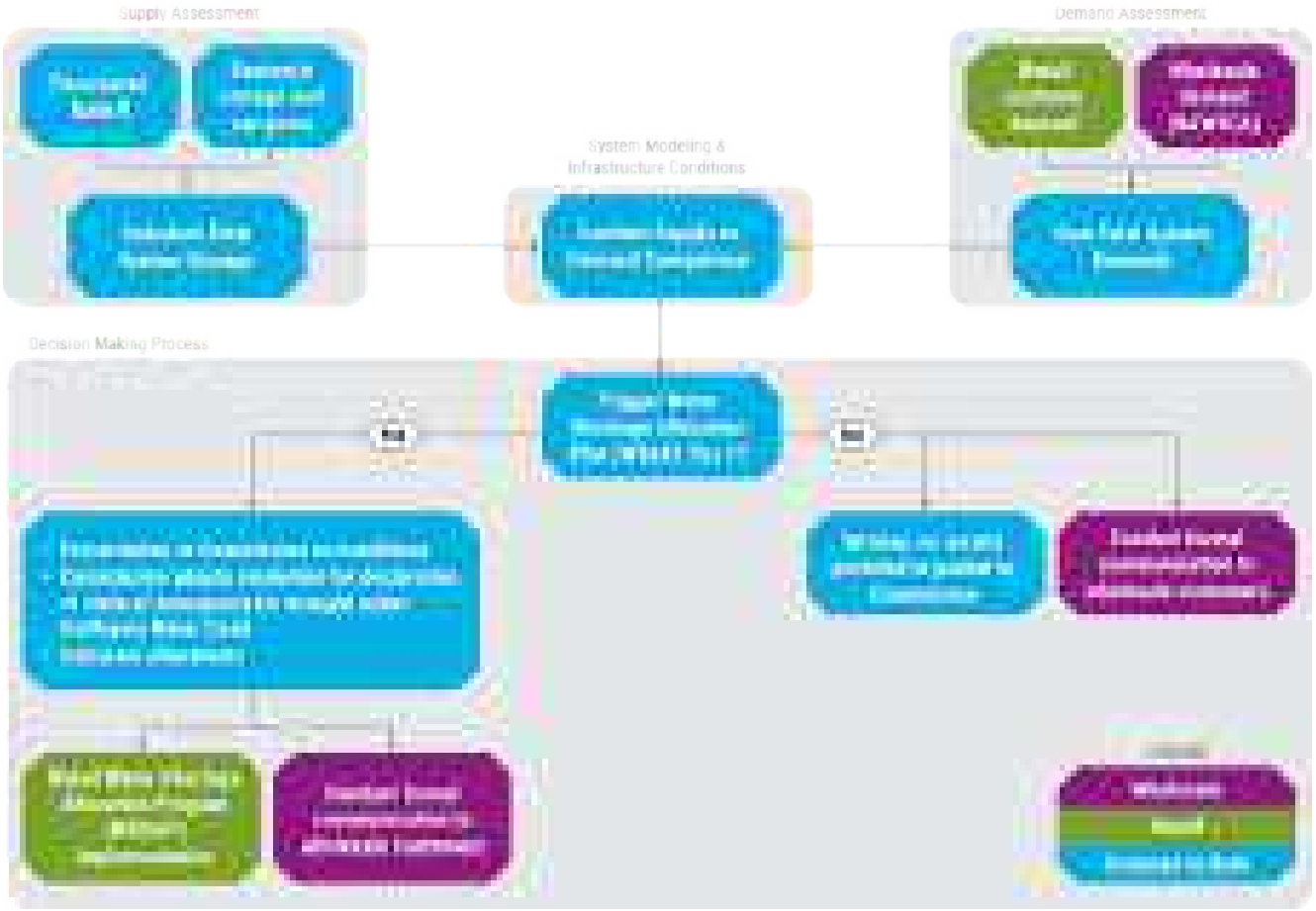
If the RWS appears incapable of meeting system-wide demand due to drought, the SFPUC is expected to declare a water shortage by March 31 of that drought year. The General Manager, or designee, is responsible for declaring such a shortage. A presentation would be made to the Commission as part of the General Manager's report, showing conditions of precipitation to date, snowpack, and storage levels with more information as necessary depending on the particulars of the supply forecast. Depending on the level of shortage, the Commission may adopt a resolution declaring a water shortage emergency under the California Water Code, or lesser actions such as a call for voluntary conservation efforts.

Prior to the initiation of any water delivery reductions to its retail customers, whether it be initial implementation of delivery reductions or implementing a different water shortage level, the SFPUC will outline a drought response plan to address the following: the water supply situation; proposed water use reduction objectives; alternatives to water use reductions;

methods to calculate water use allocations and adjustments; compliance methodology and enforcement measures; and budget considerations. Details on the expected allocation program are described further in Section 4.1. This drought response plan will be presented at a regularly scheduled SFPUC Commission meeting and advertised in accordance with the requirements of Section 6066 of the California Government Code.

The overall WSDA process is described visually in the flowchart presented in Figure 2-1.

Figure 2-1: Water Supply and Demand Assessment Process



SECTION 3 WATER SHORTAGE LEVELS

The SFPUC has two plans that determine how to allocate RWS supplies in the event of a water shortage condition: (1) the Water Shortage Allocation Plan (WSAP) defines how RWS supplies will be split between the SFPUC's retail customers and the Wholesale Customers collectively (see Section 3.1), and (2) the Retail Water Shortage Allocation Plan (RWSAP) defines how a retail water shortage will be allocated amongst the retail customers (see Section 3.2). The WSAP is also used for allocating the total wholesale supply allocation amongst the respective Wholesale Customers (see Appendix A). These two plans, and their associated water shortage levels, are described further below and in Section 4.1.

3.1 WATER SHORTAGE ALLOCATION PLAN (WSAP) AND ASSOCIATED WATER SHORTAGE LEVELS

The WSAP (see Appendix A) is an attachment to the Water Supply Agreement between the City and the Wholesale Customers described above. The WSAP describes the method for allocating water between the SFPUC's retail customers and the Wholesale Customers collectively during shortages caused by drought. The WSAP applies only when the SFPUC determines that a system-wide water shortage due to drought exists.

The WSAP includes specific allocations of the available water supply between the SFPUC's retail customers and the Wholesale Customers collectively for varying system-wide shortages of up to 20 percent, as shown in Table 3-1. In the event that the retail customer percentage share of the available water supply in Table 3-1 results in retail customers having a positive allocation (i.e., a supply of additional water rather than a required percentage reduction in water use), then the retail customer percentage share of the available water supply would be reduced to eliminate any positive allocation to retail customers, with a corresponding increase in the percentage share of the available water supply allocated to the Wholesale Customers. For any level of required reduction in system-wide water use during shortages, the SFPUC shall require retail customers to conserve a minimum of 5 percent, with any resulting reallocated supply credited to storage for inclusion in calculation of projected available RWS water supply in a subsequent year.

Note that the WSAP does not define allocations between the SFPUC's retail customers and the Wholesale Customers above shortage levels of 20 percent. For the purposes of this WSCP, the SFPUC assumes that the allocations for the 16-20 percent shortage level would apply to all higher shortage levels. In practice, the WSAP defines a process for the SFPUC and the Wholesale Customers to determine whether the application of this allocation to shortage levels greater than 20 percent is appropriate or whether a change is required (for further information about this process, see Appendix A).

The SFPUC's shortage response actions as they relate to the Wholesale Customers are defined in the WSAP (see Appendix A) and are included in this WSCP by reference.

Table 3-1. Retail and Wholesale RWS Allocations during System-wide Shortage

Shortage Level	Required Level of System-wide Reduction in Water Use	SFPUC Retail Share of Available RWS Supply[a]	Collective Wholesale Customers' Share of Available RWS Supply
1	5% or less	35.5%	64.5%
1	6 – 10%	36.0%	64.0%
2	11 – 15%	37.0%	63.0%
2	16 – 20%	37.5%	62.5%
3[b]	Up to 30%	37.5%	62.5%
4[b]	Up to 40%	37.5%	62.5%
5[b]	Up to 50%	37.5%	62.5%
6[b]	>50%	37.5%	62.5%

a While Groveland CSD is reported in the 2020 UWMP as a wholesale customer, it is considered a retail customer of the SFPUC solely for purposes of allocating RWS supplies between retail customers and Wholesale Customers. Thus, RWS supplies to Groveland CSD are accounted for in the retail supply allocation.

b Note that the WSAP does not define allocations between the SFPUC's retail customers and the Wholesale Customers above RWS shortage levels of 20%. The WSAP defines a process for the SFPUC and the Wholesale Customers to determine whether the application of the 16-20% allocation to shortage levels greater than 20% is appropriate or whether a change is required.

3.2 RETAIL WATER SHORTAGE LEVELS

The Retail Water Shortage Allocation Plan (RWSAP) (see Section 4.1 below), which pertains to retail customers only, outlines how any retail water shortages, after the application of the WSAP described above, will be allocated among the retail customers. Table 3-2 identifies the water shortage levels on a system-wide basis, and the corresponding retail water shortage condition that would need to be addressed at each shortage level under the RWSAP.

For the purposes of this analysis, system-wide shortages are expressed with respect to a normal year supply, i.e. 265 mgd, as shown above in Table 2-1. System-wide shortages are applied to this baseline supply of 265 mgd; subsequently, the WSAP allocation process described in Section 3.1 is applied to the actual RWS supply that is available to determine the shares of that supply that are available to the retail customers and the Wholesale Customers, respectively. The resulting share of RWS supply available for use by the retail customers, along with the retail groundwater and recycled water supplies that are projected to be available, are compared with the retail customers' demands to determine the level of retail shortage that would result.

The retail water shortage condition under the RWSAP may be different from the system-wide water shortage level. For example, in a 10 percent system-wide shortage of the Regional Water System, SFPUC would receive an allocation of 81 mgd.[3] Given that retail demands are projected to reach only 80.6 in 2045, there would not be an expected retail shortage

[3] 265 mgd of supply is first reduced by 10%, which results in an available supply of 238.5 mgd. Based on Table 3-1, the SFPUC retail share of available RWS supply is 36.0% under a 10% system-wide shortage: 238.5 mgd * 36.0% = 85.9 mgd. This results in retail customers having a positive allocation (i.e., a supply of additional

under that condition within the planning horizon of 2045. Under the terms of the Water Supply Agreement, as amended and restated in 2018, SFPUC has agreed to require 5 percent conservation in the event of any declared water shortage; thus in this scenario SFPUC would implement a voluntary reduction in water use of 5 percent.

At higher shortage levels, the retail allocation from the RWS results in a retail water shortage that varies depending on the retail demand levels. The ranges specified in Table 3-2 represent the expected water shortage conditions over the planning horizon from 2020 to 2045, over which time retail demands are increasing.

Table 3-2. Retail Water Shortage Levels of Action

[Standardized UWMP Table 8-1: Water Shortage Contingency Plan Levels]

Shortage Level	Required Level of System-wide Reduction in Water Use	Shortage Response Action
1	Up to 10%	Voluntary retail water use reduction of 5%
2	Up to 20%	Voluntary retail water use reduction of 5%
3	Up to 30%	Voluntary retail water use reduction of 5%
4	Up to 40%	Voluntary or mandatory retail water use reduction of 5% to 18%
5	Up to 50%	Mandatory retail water use reduction of 18% to 32%
6	>50%	Mandatory retail water use reduction of >32%

water rather than a required percentage reduction in water use), thus the retail customer percentage share of the available water supply is reduced to the normal retail supply allocation of 81 mgd to eliminate any positive allocation to retail customers.

SECTION 4 RETAIL WATER SHORTAGE RESPONSE ACTIONS

Once a water shortage has been identified, the SFPUC will implement its Retail Water Shortage Allocation Plan (RWSAP) to allocate available water supplies among the SFPUC's retail customers (see Section 4.1). The SFPUC also maintains several permanent restrictions on retail customer water use as well as potential prohibitions related to water use that may be enforced during a drought (see Section 4.2) and implements several other programs and activities that assist customers with reducing demands (see Section 4.3). The SFPUC may also, depending on the extent of water shortage, implement operational changes (see Section 4.4) or pursue the development of emergency water supplies (see Section 4.5).

4.1 RETAIL WATER SHORTAGE ALLOCATION PLAN (RWSAP)

The RWSAP was initially adopted in 2001 to formalize a program of action to be taken in the retail service area to reduce water use during a drought. This WSCP updates and replaces the standalone RWSAP. The new, updated RWSAP described herein outlines the actions the SFPUC may take in response to a declaration of a water shortage. The actions taken depend on the applicable retail water shortage level, as described in Table 3-2. The declared retail water shortage level determines the total level of retail customer demand reduction that the SFPUC may require; demand reduction begins as a voluntary measure and advances to a mandatory measure in higher retail water shortage levels.

4.1.1 Voluntary vs. Mandatory Demand Reduction

During a declared water shortage emergency, the SFPUC may implement either voluntary or mandatory demand reductions, depending on the retail water shortage condition. Based on experience in previous droughts, the SFPUC will likely use voluntary calls for demand reduction if the target retail water use reduction is 10% or less. If the target retail water use reduction is greater than 10%, the SFPUC will likely implement mandatory demand reduction as described further in the sections below.

4.1.2 Types of Allocation Methods for Mandatory Demand Reduction

In the event of a mandatory demand reduction program, the SFPUC must adopt a system for allocating water amongst its retail customers. During a water shortage emergency, multiple allocation methods may be needed for different customer types. During the 1987-1992 drought, four allocation methods were considered: (1) the per capita allocation method, (2) the inside/outside or seasonal allocation method, (3) the uniform allocation method, and (4) the percentage allocation method. The following provides a description of each method and the potential advantages or disadvantages of applying each method.

Per capita allocation method. The per capita allocation method, which is only applicable for residential customer types, assigns each residential occupant a fixed daily amount of water. To implement this method, an accurate count of the number of occupants per metered account is required. Currently, customers can self-report this information, and the SFPUC has collected self-reported occupancy data for the majority of residential accounts. The method does not take into account differences in dwelling type, existing landscaping needs, or special individual circumstances. Implementing a per capita allocation is not possible with commercial and industrial customers; those customers would require a different method for determining allocations.

Inside/Outside allocation method. The inside/outside method, also referred to as the seasonal method, applies a percent reduction to both indoor and outdoor use. To determine an individual customer's allocation, a base year of water use is selected and reductions are applied to both inside and outside use. Water use during the winter season is identified as reflecting typical "inside use". The average water use by a customer during the winter months

(November, December, January, February) of the base year is used as the baseline for determining inside use for all 12 months. Water use in excess of the baseline during other months of the year is considered "outside use". The monthly inside/outside allocation is a sum of the inside use and the outside use reduced by their respective percentages. This method is used to distribute water equitably and in previous decades was proven effective in achieving system-wide consumption goals. However, San Francisco's residential water use patterns have changed significantly in the last decade, showing very little seasonal use and limited savings to be achieved by focusing on outdoor use only. Additionally, because this method reduces water allocations for all customers regardless of their current use, there is concern that the individual water users who are already consuming very low amounts of water will be affected disproportionately compared to individual water users consuming larger amounts of water.

Uniform allocation method. The uniform allocation method applies a fixed daily amount per dwelling unit for all residential customers. This method does not distribute water equitably to all customers, especially since it does not take into consideration the number of individuals living in each dwelling unit. As with the per capita allocation method, this method could not be applied to commercial and industrial customers.

Percentage allocation method. The percentage allocation method requires water allocation to be based on a straight percent reduction of past use. As an example, to achieve a specified reduction goal, all customers would be allotted a specific percentage of the amount of water that they used in each billing period in the base year. The method requires a much greater reduction in inside use and could cause hardship on both residential and commercial customers.

During the 1987-92 drought, the inside/outside method was implemented because it was found to be the most fair and reasonable method amongst the alternatives. At that time, for those customers that appealed their allocations, a per capita allocation was applied to the account. Since then, SFPUC's residential water consumption patterns have changed significantly, reflecting less seasonality and less outdoor use overall. The SFPUC has also improved its collection of occupancy data per metered account, allowing use of the per capita method as the preferred allocation method for residential accounts. The preferred allocation method for non-residential accounts (i.e. irrigation-only, commercial, industrial, and municipal) is the percentage allocation method.

4.1.3 Per Capita Residential Water Use Floor

SFPUC retail customers already have one of the lowest residential per-capita water use rates in California, with an average water use rate of 42 gallons per capita per day (GPCD) in Fiscal Year 2019-2020. In the event that mandatory demand reduction is instituted during a water shortage emergency, the SFPUC will adopt a minimum per-capita residential allocation, or water use "floor" to ensure a sufficient amount of water is available to its customers for basic health and safety needs. The appropriate floor will be determined by the General Manager or designee at the time a water shortage emergency is declared and will be specified in the drought response plan, as further described in Section 5.

4.1.4 Water Shortage Allocation Process

If a water shortage emergency is declared that results in the need for mandatory demand reduction, the SFPUC will allocate shortages to different customer types in an effort to minimize the economic impacts of mandatory demand reductions. An example of how shortages may be allocated by customer type is as follows:

1. The SFPUC will apply reductions for *irrigation-only* accounts; different levels of reduction may be required depending on whether the irrigation-only account is a residential, commercial, or municipal account type. Note that customers using recycled water for irrigation will not be required to ration their use of recycled water.

2. If there is still a shortage remaining, the SFPUC will apply reductions to *single-family and multi-family residential* accounts, up to 30% or down to the per capita water use floor, whichever occurs first
3. If there is still a shortage remaining, the SFPUC will apply reductions to *commercial and industrial* accounts, up to 30%
4. If there is still a shortage remaining, the SFPUC will apply reductions to *municipal and other* accounts, up to 30%.
5. If there is still a shortage remaining, the SFPUC will return to *irrigation-only* accounts and make further reductions, proceeding in same order with additional reductions from each sector.

The SFPUC will inform its retail customers of a water shortage by March 31 of every year in which there is a shortage. If mandatory demand reductions are being implemented, the SFPUC will determine water allocations for each retail customer account using the allocation method that is determined to be the most appropriate at the time based on the nature of the water shortage and water use trends. If an allocation method is chosen that requires establishment of baseline water use levels, allocations will be based on water use for the last year prior to the drought declaration. The SFPUC will provide water use allocations to all retail customers by May 1 of the drought year. The water use allocations will become effective July 1. Allocations for residential customers will not go below the per capita water use floor that will be established by the General Manager or designee at the time of declared water shortage emergency.

4.1.5 Appeal Process

On or before May 1, retail customers will be notified of their reduced water allocations. Each retail customer will have the opportunity to appeal the allocation based on increased occupancy, medical exemptions, increased business, or other miscellaneous reasons. The SFPUC will provide retail customers with instructions on how to file appeals at the time the customers are notified of the water use allocations. Customers may be required to submit supplementary information in support of their appeal. The SFPUC will also inform customers of the methodology to be used in modifying allocations if they are granted.

4.2 WATER WASTE PROHIBITIONS

Table 4-1 summarizes potential temporary prohibitions related to water use that the SFPUC may enforce during a drought, as well as permanent restrictions on retail customer water use established in the SFPUC Rules and Regulations Governing Water Service to Customers.[4] Appendix B describes various measures employed during the 1987-92 drought to achieve a 25 percent system-wide reduction in retail demands (as applied to the pre-drought demand). These measures included absolute limitations on water use based on residential customer classification and a proportion of historical use within the non-residential sectors. Appendix C describes various measures employed during the 2012-2016 drought to achieve a primarily voluntary 10 percent system-wide reduction in retail demands.

Note that the SFPUC's implementation of each of the temporary prohibitions is not directly linked to a particular water shortage level under this WSCP. The only water shortage response action that will be implemented specifically in response to a particular shortage level is demand reduction (either voluntary or mandatory).

[4] The SFPUC Rules and Regulations Governing Water Service to Customers may be accessed at: https://www.sfpuc.org/sites/default/files/accounts-and-services/RulesRegs-waterservice_11FEB2020.pdf

Table 4-1. Water Use Restrictions and Prohibitions

Permanent[a]
Water waste, including but not limited to, any flooding or runoff into the street, sidewalk or gutter
Using hoses for any purpose without a positive shut-off valve
Serving water at a restaurant, café, or food counter without waiting for a request by a customer or customers
Potable water is not to be used to clean, fill or maintain levels in decorative fountains.
Use of potable water for consolidation of backfill, dust control or other nonessential construction purposes if groundwater or recycled water is available and approved by the San Francisco Department of Public Health[b]
Use of single-pass cooling systems, fountains, and commercial car washes
Use of potable water to wash sidewalks, driveways, plazas and other outdoor hardscapes for reasons other than health, safety, or to meet City of San Francisco standards for sidewalk cleanliness and in a manner that causes runoff to storm drains and sewer catch basins
Watering outdoor landscapes with potable water during and within 48 hours after a rain event
Not providing guests the option to refuse daily laundering of towels and linens at hotels and motels, and not prominently displaying notice of this option in each guestroom
Irrigation with potable water of ornamental turf on public street medians
Temporary (i.e., imposed during water shortage)
Limit the use of additional water for new or retrofitted landscaping or expansion of existing facilities under all conditions not otherwise subject to San Francisco's Water Efficient Irrigation Ordinance. [c]
Verified water waste as determined by the Water Department would serve as prima facie evidence that the allocation assigned to the water account is excessive; therefore, the allocation was subject to review and possible reduction, including termination of service[c]
Use of supplies other than groundwater and/or recycled water for irrigation of golf courses, median strips, and similar turf areas[c]
Use of potable water on golf courses outside irrigation of putting greens[c]
Use of potable water for street sweepers/washers[c]
The washing of all automobiles, motorcycles, RVS, trucks, transit vehicles, trailers, boats, trains, and airplanes outside of a commercial washing facility; unless required to clean windows on all vehicles and such commercial or safety vehicles for health and safety reasons[c]
The filling of new swimming pools, spas, hot tubs, or the draining and refilling of existing pools, etc.[c]

a Established in SFPUC Rules and Regulations Governing Water Service to Customers, Section E, Rule 12.

b Consistent with the Soil Compaction and Dust Control Ordinance, Ordinance 175-91 (San Francisco Public Works Code, Article 21, Sections 1100-1107).

c Prescribed in the 1987-92 and 2012-16 drought; may be enforced during a future drought.

4.3 DEMAND REDUCTION ACTIONS

The following methods are employed or offered by the SFPUC to help reduce consumption in the retail service area. All of these methods, except for one, are implemented on a continuous basis or as needed, regardless of whether there is a water shortage. Many of these methods are also demand management measures (DMMs) that are currently implemented and described in more detail in the SFPUC's 2020 Urban Water Management Plan (UWMP). Some of these methods may have

an increase in application, participation, or frequency as a result of a shortage (e.g., public outreach, rebates, Water Wise Evaluations), but the increase is not necessarily triggered by a specific level of shortage.

- **Expand Public Information Campaign:** Through its conservation program, the SFPUC develops media campaigns and extensive informational materials, and performs widespread outreach activities to (1) inform the public of a drought, (2) relay information about water use reductions and prohibitions, and (3) promote conservation and use of the SFPUC's conservation services. The SFPUC regularly notifies top residential and commercial water users of their consumption and the SFPUC's conservation services to help reduce demands.

- **Improve Customer Billing and Water Use Information:** In conjunction with the deployment of its Automated Water Meter Program, the SFPUC launched a new bill management system and web portal called My Account in May 2014. This system allows customers to view their daily and hourly water use data provided by the automated water meter reading system. The SFPUC also started to implement fractional billing in January 2017 so customers, instead of being billed on a 1 unit (i.e., 1 CCF) basis, are billed for each 0.01 unit (i.e., 1 cubic foot) consumed which provides customers with more detailed feedback on their water use on their monthly bills. The transition of the billing system from bi-monthly to monthly billing for all customers was completed in July 2013.

    - During the 2012-2016 drought, the SFPUC called for 10 percent voluntary reductions and added information and a graph to My Account so residential customers could visually connect with their water use and identify potential reductions.

- **Offer Water Use Surveys:** The SFPUC provides free Water-Wise Evaluations for homes and businesses through its conservation program. These Water-Wise Evaluations consist of an onsite or phone-based review of indoor fixtures and appliances as well as an onsite review of irrigation systems. Each assessment includes a summary report outlining recommendations to improve efficiency as well as estimated water savings. Interest and participation in this service tends to increase during times of drought.

- **Provide Rebates or Giveaways of Plumbing Fixtures and Devices:** Through its conservation program, the SFPUC provides free conservation fixtures and devices to San Francisco residents. Incentive programs may be accelerated during a water shortage. Free devices include showerheads, faucet aerators, toilet leak detection tablets and standard repair parts, flow-measuring bags, soil moisture meters, pre-rinse spray valves, plumbing repair handbooks, and other items.

- **Provide Rebates for Landscape Irrigation Efficiency or Turf Replacement:** The SFPUC's Large Landscape Grant Program offers grants for large landscape irrigation efficiency improvements. Incentive programs may be accelerated during a water shortage.

- **Increase Water Waste Patrols:** SFPUC field inspectors watch for, report, and respond to potential water waste they may encounter as part of their regular travel throughout the City, and the SFPUC also encourages the general public to report potential water waste through the City's 311 service request system, as described in Section 4.2

4.4 OPERATIONAL CHANGES

The following methods are employed or offered by the SFPUC to help reduce water use in the retail service area. These methods, though not formally enacted in the event of a shortage, are employed at the discretion of the SFPUC's operations.

- **Decrease Line Flushing:** Pipeline and other system flushing may be decreased at the discretion of the SFPUC's operations management. Due to the recent drought, the SFPUC temporarily reduced programmatic flushing of dead

ends within the in-City distribution system pipelines from a scheduled program to an as-needed basis to respond to water quality issues. Regular system maintenance flushing in the Town of Sunol was also temporarily reduced during the drought to an as-needed basis.

- **Reduce System Water Loss:** The SFPUC conducts pressure management, collects main break data, and administers a Linear Asset Management Program to help control distribution system losses. In addition, to address water loss at the customer level, the SFPUC launched a Leak Alert Program in April 2015 to notify single family residential customers about potential plumbing leaks that may be occurring at their homes. The SFPUC expanded this program to include small multi-family homes (2-5 dwelling units) in September 2018, as well as dedicated irrigation customers in March 2019, and commercial customers in April 2020. The Leak Program will be expanded to all remaining customer sectors in 2021. This program also meets State mandates requiring water suppliers to notify customers when they are aware of leaks that are within the customer's control.

4.5 SUPPLY AUGMENTATION ACTIONS

The SFPUC will use voluntary or mandatory demand reduction during a declared water shortage emergency. Depending on the severity and duration of the water shortage emergency, the SFPUC may also seek to develop emergency water supplies. This could include actions such as initiating water transfers.

4.6 SUMMARY OF RETAIL SHORTAGE RESPONSE ACTIONS

The SFPUC expects to meet water shortages primarily with voluntary and mandatory demand reduction, and will utilize the RWSAP described above in Section 4.1 to allocate water shortages amongst its retail customers. The SFPUC will also enforce restrictions and prohibitions of certain water uses (as described in Section 4.2) and provide additional programs to facilitate demand reduction (as described in Section 4.3) in order to support meeting its demand reduction targets. The SFPUC may also implement operational changes to reduce water use (as described in Section 4.4). At this time, no supply augmentation shortage response actions have been identified as a specific response to a shortage, but they would be considered (as described in Section 4.5). As described at the beginning of Section 2, the SFPUC already incorporates supply augmentation with dry-year supplies as a part of normal operations and water management planning to reduce the likelihood of a water shortage condition.

Table 4-2 shows the demand reduction actions and volumes of reduction associated with each shortage level described earlier in Table 3-2. For the purposes of this analysis, system-wide shortages are applied to the baseline available supply of 265 mgd; subsequently, the WSAP allocation process described above is applied to the actual RWS supply that is available to determine the shares of that supply that are available to the SFPUC's retail customers and the Wholesale Customers, respectively. The resulting share of RWS supply available for use by the retail customers, along with the retail groundwater and recycled water supplies that are projected to be available, are compared with the retail customer demands to determine the level of retail shortage that would result.

The demand reduction volumes necessary at a given shortage level will change based on the retail demands at the time of a declared water shortage emergency. The volumes associated with shortage response actions shown in Table 4-2 are intended for illustrative purposes, and are based on the projected 2025 levels of retail demand as presented in the SFPUC's 2020 UWMP. As retail demands increase, the associated necessary demand reductions will increase accordingly.

For Shortage Levels 1-3, the SFPUC expects to have enough supply to meet projected unconstrained retail demands. However, as described in Section 3.1 above, the SFPUC has a contractual obligation to require retail customers to conserve a minimum of 5 percent for any level of required reduction in system-wide water use during shortages. A 5

percent reduction in retail demand can be achieved with a voluntary call for reductions in water use. Retail customers collectively conserved more than they were asked to conserve during a 10 percent voluntary system-wide reduction in 2014-2017 during the previous drought. If a retail demand reduction of greater than 10 percent is needed, mandatory demand reduction will be implemented; in the scenario shown in Table 4-2, that would occur starting at shortage level 4.. Communication actions taken during voluntary and mandatory demand reduction are described in Section 5.1.

At the higher levels of shortage (i.e. those that would require mandatory demand reduction) the SFPUC would identify the appropriate allocation methods for different customer types as described in the RWSAP. Table 4-2 shows that the SFPUC could meet the highest level shortage of 21.2 mgd (i.e. shortage level 6) by requiring reductions of 50 percent to irrigation-only accounts, 30 percent reductions in other non-residential accounts, and using a per capita allocation of 25 GPCD for single-family and multi-family residential accounts.

Table 4-2. Shortage Response Actions (Demand Reduction Actions)

[Standardized UWMP Table 8-2: Demand Reduction Actions]

Shortage Level (percent system-wide supply reduction)	Retail Demand Reduction Actions	Associated Volume (mgd)[a]	Penalty, Charge, or Other Enforcement?
1 (up to 10%)	Voluntary Reduction[b]	3.3	N
2 (up to 20%)	Voluntary Reduction[b]		N
3 (up to 30%)	Voluntary Reduction[b]		N
4 (up to 40%)	Mandatory Reduction	6.3	Y
5 (up to 50%)	Mandatory Reduction	16.2	Y
6 (>50%)[c]	Mandatory Reduction	21.2	Y

a. Associated volume of reduction is based on 2025 projected unconstrained SFPUC Retail customer demands on the Regional Water System of 65.9 mgd. Volumes shown for each level represent the total shortage that must be met with the associated response action at that shortage level.

b. For Shortage Levels 1-3, the SFPUC expects to have enough supply to meet projected unconstrained retail demands. However, SFPUC has a contractual obligation that for any level of required reduction in system-wide water use during shortages, the SFPUC shall require Retail Customers to conserve a minimum of 5 percent. A 5 percent reduction in retail demand can be achieved with a voluntary call for reductions in water use.

c. The Level 6 shortage (assumed to be 55% system-wide supply reduction) has an associated 21.2 mgd shortage gap in 2025. The demand reductions (methodology described further in Section 4.1) are assumed to ultimately be met with a demand reduction approach consisting of a 25 gpcd floor for residential accounts, a 50% demand reduction in irrigation accounts, and 30% demand reduction in other non-residential accounts.

SECTION 5 COMMUNICATION PROTOCOLS

Communication with the SFPUC's customers and the public is essential during drought, and particularly so when mandatory actions or restrictions are in effect. Demand reduction schedules and requirements must be communicated early and often to all customers. The SFPUC will employ multiple methods and means to inform and educate customers and the public.

Prior to the initiation of any water delivery reductions to its retail customers, whether it be initial implementation of delivery reduction or increasing the severity of water shortage response measures, the SFPUC will outline a drought response plan to address the following: the water supply situation; proposed water use reduction objectives; alternatives to water use reductions; methods to calculate water use allocations and adjustments; minimum per capita allocation (i.e. residential water use floor); compliance methodology and enforcement measures; and budget considerations.

This drought response plan will be presented at a regularly scheduled SFPUC Commission meeting for public input. The meeting will be advertised in accordance with the requirements of Section 6066 of the California Government Code, and the public will be invited to comment on the SFPUC's plan to address reduced supply.

5.1 COMMUNICATIONS ABOUT VOLUNTARY REDUCTIONS

Outreach that may be taken during a call for voluntary reductions include, but are not limited to:

- Milestone press releases and briefings to media
- Social media posts
- Dedicated and regularly updated drought section on sfpuc.org web site
- Articles in the SFPUC's digital and print Currents newsletter to customers
- Bill inserts
- Outdoor billboard, transit station, bus, television, radio and newspaper ads
- Email blasts to stakeholder organizations and groups
- Community presentations
- Direct mail, email, automated call, and mobile text notices
- My Account portal updates to communicate water reduction goals

5.2 COMMUNICATIONS ABOUT MANDATORY DEMAND REDUCTION

Outreach listed in Section 5.1 would likely also occur during mandatory demand reduction. Additional notifications to account holders that the SFPUC will disseminate include:

- Notification letter to all customers prior to activation of mandatory demand reduction that indicates mandatory water demand reduction will be implemented, customers are subject to excess use charges, and that a drought surcharge will be levied.

- Notification letter to all customers affected by mandatory reductions that provides their monthly allocations for the fiscal year, including information about the appeals process, availability of daily and hourly consumption data on My Account, and other resources for conservation assistance.

- Notification letter to customers with adjustments to their reduced flow factors, including information about appeals process and resources for conservation assistance.

- End-of-mandatory reductions letters that inform all customers that water the water shortage emergency has been lifted and the SFPUC is ending mandatory demand reduction.

- Noticing for public hearings conducted at SFPUC Commission meetings that inform the Commissioners and public about the declaration of a water shortage emergency and any subsequent modifications to the water shortage stage.

Account holders receive mailed notifications either through the billing service utilized by Customer Service or the City's Reproduction and Mail Services (ReproMail).

5.3 COMMUNICATIONS RELATED TO WHOLESALE CUSTOMERS

Regardless of the expectation of shortage conditions, as part of normal course of business, the SFPUC provides water supply estimates to its Wholesale Customers on a monthly basis beginning February 1. A Wholesale Customer Annual Meeting is held in the latter part of February, at which the SFPUC makes a presentation on current water supply conditions and forecasts. The last snow survey of the season typically occurs within the first week of April, followed by a runoff forecast to determine total system storage expected as of July 1. By the middle of April, the SFPUC sends a formal letter to the Wholesale Customers summarizing the water supply availability for the coming year and, if applicable, the declaration of need for a voluntary or mandatory response. A flowchart depicting the annual Water Supply and Demand Assessment process, including communication processes, is shown in Figure 2-1.

SECTION 6 ENFORCEMENT AND PENALTIES

6.1 ENFORCEMENT OF WATER USE ALLOCATIONS

The SFPUC's primary methods of enforcing the water shortage response action of mandatory demand reduction include excess use charges, installation of flow restrictors on customers' service lines, and/or shut-off of water. In addition, a new state law passed in 2016 (SB 814, adding Chapter 3.3 to Division 1 of the Water Code) requires public disclosure of customers who are fined for exceeding water use allocations.

During the 1987-92 drought, the SFPUC applied drought excess use charges were applied as outlined below. The fines only applied to the amount of water used over their allotment.

- If a customer consumed up to 10% over its allotment, it was charged 2 times the normal rate;
- If a customer consumed 10.01% to 20% over its allotment, it was charged 8 times the normal rate; and
- If a customer consumed 20.01% or over its allotment, it was charged 10 times the normal rate.

During the 2012-2016 drought, the SFPUC called for a 10 percent voluntary reduction in water use by all customers system-wide. However, mandatory reductions and excess use charges were also applied to a small subset of customers:

- Established a mandatory reduction in water use by dedicated irrigation customers of 25%, subject to excess use charges of 1 times the normal rate.

- Established a mandatory reduction in water use by Interruptible Water Service accounts of 30%, subject to excess use charges of 3 times the normal rate.

Under this WSCP, in the event of mandatory demand reduction, the SFPUC will impose excess use charges at a level deemed appropriate at the time of a declared water shortage emergency. The General Manager, or designee, will inform retail customers of the specific multiplier rates that will be applied for determining excess use charges (as described in Section 5 about Communications). The SFPUC will also offer retail customers an audit at the first run-over of their water use allocation to determine if there are any leaks. In some cases, excess use charges may be reversed if leaks are found and repaired immediately.

In the event that a customer exceeds its water use allocation, the SFPUC may, after issuing one written warning, install a flow restrictor on the customer's service line. The SFPUC may charge the customer a fee for the installation and removal of the flow restrictor, as it did in the 1987-92 drought. The General Manager, or designee, will determine the relevant charge at the time of the drought. If a customer continues to consume water in excess of its allotment, the SFPUC has the authority to discontinue the customer's water service and require that the customer bear the cost for the re-connection of water service.

The Landlord Pass-through Ordinance[5] allows landlords to pass up to 50 percent of excess use charges on to their tenants under certain conditions.

6.2 ENFORCEMENT OF WATER WASTE PROHIBITIONS

The SFPUC has found customer outreach, communication, and responding to water waste reports submitted through the City's 311 service request system to be effective methods for enforcing water use prohibitions and restrictions. The SFPUC reviews reports of potential water waste and violation of prohibitions submitted through the 311 system. If a report contains sufficient information and reflects a restricted water use, the SFPUC issues a written notice to the water account holder, property owner, and occupant. If reports of waste continue, the SFPUC will call or visit the site to try to verify that there is waste. If water waste is verified and continues, the SFPUC will issue additional warning letters to the account holder. Account holders that receive multiple warnings of verified water waste may be subject to additional action. The SFPUC also takes the same actions for incidents of water waste observed by SFPUC conservation field inspectors, and the SFPUC may increase the number of and inspectors patrolling for water waste during drought periods.

The water use restrictions and prohibitions may be enforced using the following means:

- Per the SFPUC Rules and Regulations Governing Water Service to Customers and the SFPUC's water rate schedule, violation of any water use restriction may result in the installation of a flow-restricting device in the service line of the customer, and continued violation could result in termination of service. The customer bears the cost of any enforcement action.

- Per the SFPUC Rules and Regulations Governing Water Service to Customers, violation of water waste prevention for landscaped areas[6] is subject to a written warning, followed by possible termination of service and penalties per Chapter 100 of the San Francisco Administrative Code if the violation is not corrected.

- As part of the SWRCB emergency conservation regulations, the California Water Code was amended to identify violations of water use prohibitions as infractions, and therefore punishable by a fine of up to $500 for each day in which the violation occurs.

[5] San Francisco Administrative Code Section 37.3
[6] SFPUC Rules and Regulations Governing Water Service to Customers, Section F, Rule 16.

SECTION 7 LEGAL AUTHORITIES

The SFPUC shall declare a water shortage emergency in accordance with California Water Code Chapter 3, Section 350 of Division 1 (general provision regarding water shortage emergencies).

The SFPUC shall coordinate with any city of county within which it provides water supply services for the possible proclamation of a local emergency (California Government Code, California Emergency Services Act Article 2, Section 8558). As described in Section 2.5, the SFPUC is in regular communication with its wholesale customers about water supply conditions.

Additional relevant statutory authorities, local ordinances, and resolutions that provide the legal authorities for implementing the WSCP are listed below:

- Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County (described in more detail in Section 3).
- SFPUC Rules and Regulations Governing Water Service to Customers, established by Resolution No. 19.786 passed December 15, 1959.
- Water Efficient Irrigation Ordinance (City and County of San Francisco Ordinance No. 24-16, approved March 4, 2016).
- Chapter 3.3 of Division 1 of the California Water Code (Excessive Residential Water Use During Drought) requires public disclosure of customers who are fined for exceeding water use allocations.

SECTION 8 FINANCIAL CONSEQUENCES OF WSCP

The SFPUC includes a variable component to water rates for most retail customer classes. As a result, as sales decrease, revenues are lost on a per unit basis. Because the marginal cost of water production is relatively small, as production is reduced, the cost of service remains the same. Some new costs may be incurred to implement the water shortage action of mandatory demand reduction, such as the effort required to coordinate implementation of customer-specific allocations in the SFPUC's billing system and the cost of notifying customers (see Section 5.2). For both retail and wholesale customers, a reduction in water purchases – whether voluntary or mandated – would require the SFPUC to raise rates, cut costs, or use existing fund balance reserves to cover its expenses. The financial planning and rate-setting process is complex and iterative. While major impacts of a water shortage on rates are described below, the full process, especially for large water shortages, would incorporate significant stakeholder discussion about tradeoffs and financial impacts.

The SFPUC's current retail water rates have a provision for a "drought surcharge" that automatically increases adopted rates in the event of a declared water shortage. The drought surcharge is calculated so that, accounting for the expected reduction in retail water usage, total revenues are equal to what they would have been without the reduction. The drought surcharge protects the SFPUC's financial stability during water shortages, and provides customers an incentive to meet conservation targets.

For Wholesale Customers, the rate-setting process is governed by the terms of the WSA, which provides that, in the event of a water shortage emergency, the Commission may adjust wholesale rates in an expedited way concurrently with the imposition of drought surcharges on retail customers. Beyond drought rate setting and emergency rate setting, rates are set annually in coordination with the SFPUC annual budget process and are based on the forecasted wholesale share of RWS expenditures and total purchases. If Wholesale Customer usage is expected to decrease – either voluntarily, or due

to shortages – this would be incorporated into the wholesale rate forecast, and rates may increase to make up for the revenue loss caused by reductions in water use.

SECTION 9 MONITORING AND REPORTING

Enforcement of the mandatory demand reduction program is described in more detail above in Section **Error! Reference source not found.**. Actual water savings are tracked through monthly consumption reports that are generated from the customer billing system. These consumption reports are highly accurate as all retail and wholesale customers are metered. Based on a comparison between monthly consumption data, the SFPUC can determine reductions in water use for both retail and wholesale customers. These data will also be used in evaluating the effectiveness of the WSCP (see Section 11). Additional data may be collected on a case-by-case basis. The SFPUC conducts ongoing monitoring of its watersheds, reservoirs, and other components of the RWS for reporting on the status of the water supply for purpose of determining applicability of the water shortage level.

SECTION 10 PREPARATION FOR CATASTROPHIC SUPPLY INTERRUPTION

The SFPUC maintains various planning documents which collectively address its emergency preparedness and planned response in the event of a catastrophic interruption of water supplies due to power outages, earthquakes, or other disasters. These plans are described in sections 10.1 (Emergency Preparedness Plans), 10.2 (Emergency Drinking Water Planning), and 10.3 (Power Outage Preparedness and Response) below. Section 10.4 addresses the seismic risk assessment and mitigation plan required by California Water Code Section 10632.5.(a). Should a catastrophic interruption occur, the SFPUC will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency (California Government Code, California Emergency Services Act Article 2, Section 8558).

10.1 EMERGENCY PREPAREDNESS PLANS

Following the 1989 Loma Prieta Earthquake, the SFPUC created a departmental Emergency Operations Plan (EOP). The SFPUC EOP was originally released in 1992 and has been updated as necessary ever since. Most recently, the SFPUC developed a Water System Emergency Response Plan (Water ERP) to comply with the America's Water Infrastructure Act (AWIA) passed in 2018. The Water ERP acts as a unifying document, integrating and referencing common components of SFPUC plans and programs that have been developed to date. The Water ERP is intended to address water transmission and distribution systems and identify the Enterprises, Divisions, and Bureaus with direct roles and responsibilities. The Water ERP integrates directly into, and functions as an annex to, the SFPUC Emergency Operations Plan (EOP). The SFPUC EOP addresses a broad range of potential emergency situations that may affect the SFPUC and supplements the City's Emergency Response Plan, which was prepared by the Department of Emergency Management and most recently updated in 2017. Specifically, the purpose of the SFPUC EOP is to describe its emergency management organization, roles and responsibilities, and emergency policies and procedures.

In addition, SFPUC divisions and bureaus each have their own Division Emergency Operations Plans (DEOP) (in alignment with the SFPUC EOP), which detail that entity's specific emergency management organization, roles and responsibilities, and emergency policies and procedures. The SFPUC tests its DEOPs on a regular basis by conducting emergency exercises. Through these exercises, the SFPUC learns how well the plans and procedures will or will not work in response to an emergency. DEOP improvements are based on the results of these exercises and real-world event response and evaluation. The SFPUC also has an emergency response training plan that is based on federal, State, and local standards and exercise and incident improvement plans. SFPUC employees have emergency training requirements that are based on their emergency response roles.

The SFPUC EOP functions as a front end for the SFPUC's DEOPs, covering emergency response at the Department level; while each DEOP covers Division-specific information on the Division's emergency organization and response procedures specific to Division responsibilities, assets, technical scope, and operations. The types of events affecting SFPUC that may require emergency plans include but are not limited to:

- Major earthquake
- Loss of power
- Loss of water supply
- Major fire
- Hazardous material release that threatens water supply or environment
- Major pipeline breaks
- Dam break
- Significant outage of SFPUC services
- Man-made or intentional acts of terrorism resulting in damage to the system or interruption in service

In addition to the documents described above, the SFPUC also maintains various plans and procedures that deal with the possibility of alternate supply schemes and options. These include:

- Emergency Disinfection and Recovery Plan (EDRP)
- Emergency Response Action Plan (ERAP)
- Emergency Drinking Water Equipment and Alternatives Report
- Disinfection of SFPUC Water Trailers Procedure
- City Distribution Division Hydrant Manifold Standard Operating Procedure
- Pilot plant trailer (Mobile Pilot Plan O&M Plan)

10.2 EMERGENCY DRINKING WATER PLANNING

In February 2005, the SFPUC published the City Emergency Drinking Water Alternatives report. The purpose of this report was to outline a plan for supplying emergency drinking water in the City after damage and/or contamination of the SFPUC raw and/or treated water systems resulting from a major disaster. Since the publication of this report, the SFPUC has implemented a number of projects to increase its capability to support the provision of emergency drinking water during an emergency. These projects include:

- Completion of many Water System Improvement Program (WSIP) projects and other capital upgrades to improve security, detection, and communication (see Section 10.4);
- Public Information and materials for home and business;
- Construction of a disinfection and fill station at the existing San Francisco Zoo well, and obtaining a permit to utilize this well as a standby emergency drinking water source;

- Constructed six wells as part of the San Francisco Groundwater Supply Project, two of which also serve as emergency drinking water supplies, including a distribution system to fill emergency water tankers;

- Purchase and engineering of emergency-related equipment, including water tanker trucks and water distribution manifolds, to help with distribution post-disaster; and

- Coordination of planning with other City departments, neighboring jurisdictions, and other public and private partners to maximize resources and supplies for emergency response.

The SFPUC has also prepared the RWS Water Quality Notifications and Communications Plan. This plan, which was first prepared in 1996 and was most recently updated in 2017, provides contact information, procedures, and guidelines to be implemented by several SFPUC divisions, wholesale customers, and BAWSCA in the event of water quality impacts. The plan treats water quality issues as potential or actual supply problems, which fall under the emergency response structure of the SFPUC ERP.

10.3 POWER OUTAGE PREPAREDNESS AND RESPONSE

The SFPUC's water transmission system is primarily gravity fed from Hetch Hetchy Reservoir to the City. Within the in-City distribution system, key pump stations have generators on site and all others have connections in place that would allow portable generators to be used.

Although water conveyance throughout the RWS would not be greatly impacted by power outages because it is gravity fed, the SFPUC has prepared for potential regional power outages as follows:

- The Tesla Treatment Facility, the Sunol Valley Water Treatment Plant (SVWTP), and the San Antonio Pump Station have back-up power on site in the form of generators or diesel-powered pumps. Additionally, both the SVWTP and San Antonio Pump Station would not be impacted by a failure of the regional power grid because these facilities are powered by hydropower generated by the Hetch Hetchy Water and Power System.

- Both the Harry Tracy Water Treatment Plant (HTWTP) and the Baden Pump Station (part of the Peninsula System) have back-up generators in place.

- Administrative facilities that will act as emergency operation centers also have back-up power.

- The SFPUC has an emergency water supply connection with the Santa Clara Valley Water District (SCVWD), the SCVWD intertie, which also has back-up generators in place.

- Additionally, as described in the next section, the WSIP includes projects that expand the SFPUC's ability to remain in operation during power outages and other emergency situations.

10.4 SEISMIC RISK ASSESSMENT AND MITIGATION PLAN

As part of the Facilities Reliability Program and the Water System Improvement Program (WSIP), the SFPUC performed an extensive multi-year evaluation of seismic risks to its water system that resulted in major capital improvements to increase seismic reliability. The goals of WSIP include enhancing the ability of the SFPUC water system to meet identified service goals for water quality, seismic reliability, delivery reliability, and water supply. One of the original goals of WSIP was to limit rationing to no more than 20 percent on a system-wide basis; the WSIP was developed to reduce the likelihood of shortages, thereby reducing the likelihood of needing to implement the WSCP.

The WSIP projects include several projects located in San Francisco to improve the seismic reliability of the in-City distribution system, including more wells that can be used as emergency drinking water sources. The WSIP also incorporates many projects related to the RWS to address both seismic reliability and overall system reliability. As of August 2018, the WSIP is over 96 percent complete. Local San Francisco projects are 100 percent complete as of June 2020. The current forecasted date to complete the overall WSIP is December 2021.

WSIP seismic levels of service (LOS) informed development of capital projects and guided program implementation. The LOS established post-earthquake delivery and recovery objectives under the following seismic scenarios:

- Magnitude 7.9 event on the San Andreas fault
- Magnitude 7.3 event on the Hayward fault
- Magnitude 6.9 event on the Calaveras fault

An assessment of seismic risk and resilience is contained in the body of analysis performed to support the WSIP. The risks associated with the seismic scenarios considered are reflected in the delivery objectives established in the LOS, specifically:

- Delivery of winter month demand 24 hours after a major earthquake, and
- Delivery of average day demand 30 days after a major earthquake

In addition to the improvements that have or will come from the WSIP, the City has already constructed system interties for use during catastrophic emergencies, short-term facility maintenance and upgrade activities, and times of water shortages. These are listed below:

- A 35 mgd intertie with the EBMUD allowing EBMUD to serve the City of Hayward's demand and/or supply the SFPUC directly (and vice versa);
- A 40-mgd system intertie between the SFPUC and SCVWD; and,
- One permanent and one temporary intertie to the South Bay Aqueduct, which would enable the SFPUC to receive State Water Project water.

The WSIP also includes projects related to standby power facilities at various locations. These projects provide for standby electrical power at six critical facilities to keep them in operation during power outages and other emergency situations. Permanent engine generators are located at four locations (San Pedro Valve Lot, Millbrae Facility, Alameda West, and HTWTP), while hookups for portable engine generators are at two locations (San Antonio Reservoir and Calaveras Reservoir).The City of San Francisco also has a Hazard Mitigation Plan which was last updated in June 2014 and includes sections describing earthquakes hazards and mitigation for assets within the City's boundary, including state-regulated reservoirs (Sutro, Sunset North and South, and University Mound North and South).

SECTION 11 WSCP REFINEMENT PROCEDURES

The SFPUC considers the WSCP a dynamic tool that will be subject to regular refinement as needed to ensure shortage response actions are effective and produce the desired results. If planned shortage response actions are implemented in the future, the SFPUC will conduct an evaluation of their effectiveness using the monitoring and reporting described in Section 9 and incorporate edits as needed to the WSCP.

SECTION 12 PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY

The SFPUC prepared this 2020 WSCP and presented it to the SFPUC Commission for adoption on June 8, 2021. A copy of the SFPUC resolution adopting this 2020 WSCP is provided in Appendix D.

Within 30 days of SFPUC Commission approval, the adopted 2020 WSCP will be submitted electronically to the DWR via its Water Use Efficiency data online submittal tool (WUEdata). Electronic copies will also be provided on compact disc to the California State Library and via e-mail (within 60 days of WSCP submittal to DWR) to cities and counties within which the SFPUC provides water supplies. In addition, the SFPUC will make this adopted 2020 WSCP available for public review within 30 days of SFPUC Commission approval during normal business hours by placing a copy at the San Francisco Main Public Library and main offices of the SFPUC, as well as by posting an electronic copy on the SFPUC web site at www.sfpuc.org.

Should amendments to the WSCP be required in future years, it is expected that the same adoption, submittal, and availability processes described above would be followed for the updated WSCP.

2020 WATER SHORTAGE CONTINGENCY PLAN

for the City and County of San Francisco

APPENDICES

June 2021

Prepared by:

The San Francisco Public Utilities Commission

San Francisco Water Power Sewer

Services of the San Francisco Public Utilities Commission

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APPENDIX A

Water Shortage Allocation Plan

(Attachment H of Water Supply Agreement Between the City and County of San Francisco and with Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County)

JUNE 2021
WATER SHORTAGE CONTINGENCY PLAN

for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

ATTACHMENT H

WATER SHORTAGE ALLOCATION PLAN

This Interim Water Shortage Allocation Plan ("Plan") describes the method for allocating water between the San Francisco Public Utilities Commission ("SFPUC") and the Wholesale Customers collectively during shortages caused by drought. The Plan implements a method for allocating water among the individual Wholesale Customers which has been adopted by the Wholesale Customers. The Plan includes provisions for transfers, banking, and excess use charges. The Plan applies only when the SFPUC determines that a system-wide water shortage due to drought exists, and all references to "shortages" and "water shortages" are to be so understood. This Plan was adopted pursuant to Section 7.03(a) of the 1984 Settlement Agreement and Master Water Sales Contract and has been updated to correspond to the terminology used in the June 2009 Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County and Santa Clara County ("Agreement").

SECTION 1. SHORTAGE CONDITIONS

1.1. Projected Available SFPUC Water Supply. The SFPUC shall make an annual determination as to whether or not a shortage condition exists. The determination of projected available water supply shall consider, among other things, stored water, projected runoff, water acquired by the SFPUC from non-SFPUC sources, inactive storage, reservoir losses, allowance for carryover storage, and water bank balances, if any, described in Section 3.

1.2 Projected SFPUC Purchases. The SFPUC will utilize purchase data, including volumes of water purchased by the Wholesale Customers and by Retail Customers (as those terms are used in the Agreement) in the year immediately prior to the drought, along with other available relevant information, as a basis for determining projected system-wide water purchases from the SFPUC for the upcoming year.

1.3. Shortage Conditions. The SFPUC will compare the available water supply (Section 1.1) with projected system-wide water purchases (Section 1.2). A shortage condition exists if the SFPUC determines that the projected available water supply is less than projected system-wide water purchases in the upcoming Supply Year (defined as the period from July 1 through June 30). When a shortage condition exists, SFPUC will determine whether voluntary or mandatory actions will be required to reduce purchases of SFPUC water to required levels.

1.3.1 Voluntary Response. If the SFPUC determines that voluntary actions will be sufficient to accomplish the necessary reduction in water use throughout its service area, the SFPUC and the Wholesale Customers will make good faith efforts to reduce their water purchases to stay within their annual shortage allocations and associated monthly water use budgets. The SFPUC will not impose excess use charges during periods of voluntary rationing, but may suspend the prospective accumulation of water bank credits, or impose a ceiling on further accumulation of bank credits, consistent with Section 3.2.1 of this Plan.

1.3.2 Mandatory Response. If the SFPUC determines that mandatory actions will be required to accomplish the necessary reduction in water use in the SFPUC service area, the SFPUC may implement excess use charges as set forth in Section 4 of this Plan.

1.4. Period of Shortage. A shortage period commences when the SFPUC determines that a water shortage exists, as set forth in a declaration of water shortage emergency issued by the SFPUC pursuant to California Water Code Sections 350 et seq. Termination of the water shortage emergency will be declared by resolution of the SFPUC.

SECTION 2. SHORTAGE ALLOCATIONS

2.1. Annual Allocations between the SFPUC and the Wholesale Customers. The annual water supply available during shortages will be allocated between the SFPUC and the collective Wholesale Customers as follows:

Level of System Wide Reduction in Water Use Required	Share of Available Water	
	SFPUC Share	Wholesale Customers Share
5% or less	35.5%	64.5%
6% through 10%	36.0%	64.0%
11% through 15%	37.0%	63.0%
16% through 20%	37.5%	62.5%

The water allocated to the SFPUC shall correspond to the total allocation for all Retail Customers. In the event that the SFPUC share of the available water supply in the above table results in Retail Customers having a positive allocation (i.e., a supply of additional water rather than a required percentage reduction in water use), the SFPUC's percentage share of the available water supply in the table shall be reduced to eliminate any positive allocation to Retail Customers, with a corresponding increase in the percentage share of the available water supply allocated to the Wholesale Customers. For any level of required reduction in system-wide water use during shortages, the SFPUC shall require Retail Customers to conserve a minimum of 5%, with any resulting reallocated supply credited to storage for inclusion in calculation of projected available water SFPUC water supply in a subsequent year (Section 1.1).

The parties agree to reevaluate the percentages of the available water supply allocated to Retail and Wholesale Customers by May 1, 2028.

2.2 Annual Allocations among the Wholesale Customers. The annual water supply allocated to the Wholesale Customers collectively during system wide shortages of 20 percent or less will be apportioned among them based on a methodology adopted by all of the Wholesale Customers, as described in Section 3.11(C) of the Agreement. In any year for which the methodology must be applied, the Bay Area Water Supply and Conservation Agency ("BAWSCA") will calculate each Wholesale Customer's individual percentage share of the amount of water allocated to the Wholesale Customers collectively pursuant to Section 2.1. Following the declaration or reconfirmation of a water shortage emergency by the SFPUC, BAWSCA will deliver to the SFPUC General Manager a list, signed by the President of BAWSCA's Board of Directors and

its General Manager, showing each Wholesale Customer together with its percentage share and stating that the list has been prepared in accordance with the methodology adopted by the Wholesale Customers. The SFPUC shall allocate water to each Wholesale Customer, as specified in the list. The shortage allocations so established may be transferred as provided in Section 2.5 of this Plan. If BAWSCA or all Wholesale Customers do not provide the SFPUC with individual allocations, the SFPUC may make a final allocation decision after first meeting and discussing allocations with BAWSCA and the Wholesale Customers.

The methodology adopted by the Wholesale Customers utilizes the rolling average of each individual Wholesale Customer's purchases from the SFPUC during the three immediately preceding Supply Years. The SFPUC agrees to provide BAWSCA by November 1 of each year a list showing the amount of water purchased by each Wholesale Customer during the immediately preceding Supply Year. The list will be prepared using Customer Service Bureau report MGT440 (or comparable official record in use at the time), adjusted as required for any reporting errors or omissions, and will be transmitted by the SFPUC General Manager or his designee.

2.3. Limited Applicability of Plan to System Wide Shortages Greater Than Twenty Percent. The allocations of water between the SFPUC and the Wholesale Customers collectively, provided for in Section 2.1, apply only to shortages of 20 percent or less. The SFPUC and Wholesale Customers recognize the possibility of a drought occurring which could create system-wide shortages greater than 20 percent despite actions taken by the SFPUC aimed at reducing the probability and severity of water shortages in the SFPUC service area. If the SFPUC determines that a system wide water shortage greater than 20 percent exists, the SFPUC and the Wholesale Customers agree to meet within 10 days and discuss whether a change is required to the allocation set forth in Section 2.1 in order to mitigate undue hardships that might otherwise be experienced by individual Wholesale Customers or Retail Customers. Following these discussions, the Tier 1 water allocations set forth in Section 2.1 of this Plan, or a modified version thereof, may be adopted by mutual written consent of the SFPUC and the Wholesale Customers. If the SFPUC and Wholesale Customers meet and cannot agree on an appropriate Tier 1 allocation within 30 days of the SFPUC's determination of water shortage greater than 20 percent, then (1) the provisions of Section 3.11(C) of the Agreement will apply, unless (2) all of the Wholesale Customers direct in writing that a Tier 2 allocation methodology agreed to by them be used to apportion the water to be made available to the Wholesale Customers collectively, in lieu of the provisions of Section 3.11(C).

The provisions of this Plan relating to transfers (in Section 2.5), banking (in Section 3), and excess use charges (in Section 4) shall continue to apply during system-wide shortages greater than 20 percent.

2.4. Monthly Water Budgets. Within 10 days after adopting a declaration of water shortage emergency, the SFPUC will determine the amount of Tier 1 water allocated to the Wholesale Customers collectively pursuant to Section 2.1. The SFPUC General Manager, using the Tier 2 allocation percentages shown on the list delivered by BAWSCA pursuant to Section 2.2, will calculate each Wholesale Customer's individual annual allocation. The SFPUC General Manager, or his designee, will then provide each Wholesale Customer with a proposed schedule of monthly water budgets based on the pattern of monthly water purchases during the Supply Year immediately preceding the declaration of shortage (the "Default Schedule"). Each

Wholesale Customer may, within two weeks of receiving its Default Schedule, provide the SFPUC with an alternative monthly water budget that reschedules its annual Tier 2 shortage allocation over the course of the succeeding Supply Year. If a Wholesale Customer does not deliver an alternative monthly water budget to the SFPUC within two weeks of its receipt of the Default Schedule, then its monthly budget for the ensuing Supply Year shall be the Default Schedule proposed by the SFPUC.

Monthly Wholesale Customer water budgets will be derived from annual Tier 2 allocations for purposes of accounting for excess use. Monthly Wholesale Customer water budgets shall be adjusted during the year to account for transfers of shortage allocation under Section 2.5 and transfers of banked water under Section 3.4.

2.5. Transfers of Shortage Allocations. Voluntary transfers of shortage allocations between the SFPUC and any Wholesale Customers, and between any Wholesale Customers, will be permitted using the same procedure as that for transfers of banked water set forth in Section 3.4. The SFPUC and BAWSCA shall be notified of each transfer. Transfers of shortage allocations shall be deemed to be an emergency transfer and shall become effective on the third business day after notice of the transfer has been delivered to the SFPUC. Transfers of shortage allocations shall be in compliance with Section 3.05 of the Agreement. The transferring parties will meet with the SFPUC, if requested, to discuss any effect the transfer may have on its operations.

SECTION 3. SHORTAGE WATER BANKING

3.1. Water Bank Accounts. The SFPUC shall create a water bank account for itself and each Wholesale Customer during shortages in conjunction with its resale customer billing process. Bank accounts will account for amounts of water that are either saved or used in excess of the shortage allocation for each agency; the accounts are not used for tracking billings and payments. When a shortage period is in effect (as defined in Section 1.4), the following provisions for bank credits, debits, and transfers shall be in force. A statement of bank balance for each Wholesale Customer will be included with the SFPUC's monthly water bills.

3.2. Bank Account Credits. Each month, monthly purchases will be compared to the monthly budget for that month. Any unused shortage allocation by an agency will be credited to that agency's water bank account. Credits will accumulate during the entire shortage period, subject to potential restrictions imposed pursuant to Section 3.2.1. Credits remaining at the end of the shortage period will be zeroed out; no financial or other credit shall be granted for banked water.

3.2.1. Maximum Balances. The SFPUC may suspend the prospective accumulation of credits in all accounts. Alternatively, the SFPUC may impose a ceiling on further accumulation of credits in water bank balances based on a uniform ratio of the bank balance to the annual water allocation. In making a decision to suspend the prospective accumulation of water bank credits, the SFPUC shall consider the available water supply as set forth in Section 1.1 of this Plan and other reasonable, relevant factors.

3.3. Account Debits. Each month, monthly purchases will be compared to the budget for that month. Purchases in excess of monthly budgets will be debited against an agency's water bank account. Bank debits remaining at the end of the fiscal year will be subject to excess use charges (see Section 4).

3.4. Transfers of Banked Water. In addition to the transfers of shortage allocations provided for in Section 2.5, voluntary transfers of banked water will also be permitted between the SFPUC and any Wholesale Customer, and among the Wholesale Customers. The volume of transferred water will be credited to the transferee's water bank account and debited against the transferor's water bank account. The transferring parties must notify the SFPUC and BAWSCA of each transfer in writing (so that adjustments can be made to bank accounts), and will meet with the SFPUC, if requested, to discuss any affect the transfer may have on SFPUC operations. Transfers of banked water shall be deemed to be an emergency transfer and shall become effective on the third business day after notice of the transfer has been delivered to the SFPUC. If the SFPUC incurs extraordinary costs in implementing transfers, it will give written notice to the transferring parties within ten (10) business days after receipt of notice of the transfer. Extraordinary costs means additional costs directly attributable to accommodating transfers and which are not incurred in non-drought years nor simply as a result of the shortage condition itself. Extraordinary costs shall be calculated in accordance with the procedures in the Agreement and shall be subject to the disclosure and auditing requirements in the Agreement. In the case of transfers between Wholesale Customers, such extraordinary costs shall be considered to be expenses chargeable solely to individual Wholesale Customers and shall be borne equally by the parties to the transfer. In the case of transfers between the SFPUC and a Wholesale Customer, the SFPUC's share of any extraordinary transfer costs shall not be added to the Wholesale Revenue Requirement.

3.4.1. Transfer Limitations. The agency transferring banked water will be allowed to transfer no more than the accumulated balance in its bank. Transfers of estimated prospective banked credits and the "overdrafting" of accounts shall not be permitted. The price of transfer water originally derived from the SFPUC system is to be determined by the transferring parties and is not specified herein. Transfers of banked water shall be in compliance with Section 3.05 of the Agreement.

SECTION 4. WHOLESALE EXCESS USE CHARGES

4.1. Amount of Excess Use Charges. Monthly excess use charges shall be determined by the SFPUC at the time of the declared water shortage consistent with the calendar in Section 6 and in accordance with Section 6.03 of the Agreement. The excess use charges will be in the form of multipliers applied to the rate in effect at the time the excess use occurs. The same excess use charge multipliers shall apply to the Wholesale Customers and all Retail Customers. The excess use charge multipliers apply only to the charges for water delivered at the rate in effect at the time the excess use occurred.

4.2 Monitoring Suburban Water Use. During periods of voluntary rationing, water usage greater than a customer's allocation (as determined in Section 2) will be indicated on each SFPUC monthly water bill. During periods of mandatory rationing, monthly and cumulative water usage greater than a Wholesale Customer's shortage allocation and the associated excess use charges will be indicated on each SFPUC monthly water bill.

4.3. Suburban Excess Use Charge Payments. An annual reconciliation will be made of monthly excess use charges according to the calendar in Section 6. Annual excess use charges will be calculated by comparing total annual purchases for each Wholesale Customer with its

annual shortage allocation (as adjusted for transfers of shortage allocations and banked water, if any). Excess use charge payments by those Wholesale Customers with net excess use will be paid according to the calendar in Section 6. The SFPUC may dedicate excess use charges paid by Wholesale Customers toward the purchase of water from the State Drought Water Bank or other willing sellers in order to provide additional water to the Wholesale Customers. Excess use charges paid by the Wholesale Customers constitute Wholesale Customer revenue and shall be included within the SFPUC's annual Wholesale Revenue Requirement calculation.

SECTION 5. GENERAL PROVISIONS GOVERNING WATER SHORTAGE ALLOCATION PLAN

5.1. Construction of Terms. This Plan is for the sole benefit of the parties and shall not be construed as granting rights to any person other than the parties or imposing obligations on a party to any person other than another party.

5.2. Governing Law. This Plan is made under and shall be governed by the laws of the State of California.

5.3. Effect on Agreement. This Plan describes the method for allocating water between the SFPUC and the collective Wholesale Customers during system-wide water shortages of 20 percent or less. This Plan also provides for the SFPUC to allocate water among the Wholesale Customers in accordance with directions provided by the Wholesale Customers through BAWSCA under Section 2.2, and to implement a program by which such allocations may be voluntarily transferred among the Wholesale Customers. The provisions of this Plan are intended to implement Section 3.11(C) of the Agreement and do not affect, change or modify any other section, term or condition of the Agreement.

5.4. Inapplicability of Plan to Allocation of SFPUC System Water During Non-Shortage Periods. The SFPUC's agreement in this Plan to a respective share of SFPUC system water during years of shortage shall not be construed to provide a basis for the allocation of water between the SFPUC and the Wholesale Customers when no water shortage emergency exists.

5.5. Termination. This Plan shall expire at the end of the Term of the Agreement.. The SFPUC and the Wholesale Customers can mutually agree to revise or terminate this Plan prior to that date due to changes in the water delivery capability of the SFPUC system, the acquisition of new water supplies, and other factors affecting the availability of water from the SFPUC system during times of shortage.

SECTION 6. ALLOCATION CALENDAR

6.1. Annual Schedule. The annual schedule for the shortage allocation process is shown below. This schedule may be changed by the SFPUC to facilitate implementation.

6.1.1

	In All Years	Target Dates
1.	SFPUC delivers list of annual purchases by each Wholesale Customer during the immediately preceding Supply Year	November 1
2.	SFPUC meets with the Wholesale Customers and presents water supply forecast for the following Supply Year	February
3.	SFPUC issues initial estimate of available water supply	February 1
4.	SFPUC announces potential first year of drought (if applicable)	February 1
5.	SFPUC and Wholesale Customers meet upon request to exchange information concerning water availability and projected system-wide purchases	February 1-May 31
6.	SFPUC issues revised estimate of available water supply, and confirms continued potential shortage conditions, if applicable	March 1
7.	SFPUC issues final estimate of available water supply	April 15th or sooner if adequate snow course measurement data is available to form a robust estimate on available water supply for the coming year.
8.	SFPUC determines amount of water available to Wholesale Customers collectively	April 15th or sooner if adequate snow course measurement data is available to form a robust estimate on available water supply for the coming year.
	In Drought Years	**Target Dates**
9.	SFPUC formally declares the existence of water shortage emergency (or end of water shortage emergency, if applicable) under Water Code Sections 350 et. seq.	April 15-30
10.	SFPUC declares the need for a voluntary or mandatory response	April 15-30
11.	BAWSCA submits calculation to SFPUC of individual Wholesale Customers' percentage shares of water allocated to Wholesale Customers collectively	April 15- 30
12.	SFPUC determines individual shortage allocations, based on BAWSCA's submittal of individual agency percentage shares to SFPUC, and monthly water budgets (Default Schedule)	April 25—May 10
13.	Wholesale Customers submit alternative monthly water budgets (optional)	May 8-May 24
14.	Final drought shortage allocations are issued for the Supply Year beginning July 1 through June 30	June 1
15.	Monthly water budgets become effective	July 1
16.	Excess use charges indicated on monthly Suburban bills	August 1 (of the beginning year) through June 30 (of the succeeding year)
17.	Excess use charges paid by Wholesale Customers for prior year	August of the succeeding year

APPENDIX B

Summary of San Francisco's Response to 1987-92 Drought Experience

JUNE 2021
WATER SHORTAGE CONTINGENCY PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

Summary of San Francisco's Response to 1987-92 Drought Experience

Background:

The 1987-92 six year drought provides an example of how the near-term drought management process works in times when the operational capabilities of Hetch Hetchy and other water supplies available to the SFPUC are taxed to a point that forces drastic actions to avoid running out of water. By the sixth year of that drought period, many of the programs and actions identified in San Francisco's current Retail Water Shortage Allocation Plan (adopted in December 2001) had been implemented. The following describes some of the major actions that occurred.

Demand Reductions:

The extended drought forced San Francisco to adopt a mandatory rationing program, enforced by stiff excess use charges and the threat of shut-off for continued violations of water use prohibitions. Mandatory rationing was in effect May of 1988 through May of 1989, re-instituted in May of 1990, and continued until March of 1993. A Water Shortage Emergency Resolution was passed by the SFPUC on April 28, 1988 declaring these rationing periods (Resolution No. 88-0155). A copy of this resolution can be found at the end of this appendix.

The SFPUC's water rationing program was one of the toughest in the state and the most stringent imposed by any major urban water supply agency. Although the specifics of the program varied over time, the basic outline of the mandatory rationing program was to achieve a 25 percent reduction to 1987 (pre-drought) consumption (system-wide), with water allocations set on an account-by-account basis.

To provide a strong incentive for customers to use no more water than their allotment, the SFPUC adopted a rate structure that incorporated excess use charges. Any customer that used less water than its allotment was charged the normal rate per unit of water consumption, while any customer who used more than its allotment was charged a multiple of the normal rate for every unit of consumption above its allotment. As of January 1, 1992 (the last year of the rationing program), the rate structure shown in the table below applied to SFPUC customers.

Excess Use Charges	
If Water Consumption Is (Over Allotment)	Excess Use Charge Will Be (Times Normal Rate)
Up to 10%	2
10.01 - 20%	8
20.01% or over	10

In the event that water was used in excess of the customer's specified allotment, the SFPUC could, after one written warning, install a flow restrictor on the customer's service line. The charge to install and remove the restricting device is shown in the table below. If a customer continued to consume water in excess of its allotment, the SFPUC had the authority to discontinue the customer's water service and require the customer to bear the cost for the re-connection of water service.

Fee For Installing Flow Restricting Devices	
Meter Size	Installation/Removal Cost
to 1” 1” to 2” 3” and larger	$95 $149 Actual cost

In addition to pricing disincentives for excess water use, numerous water use restrictions were adopted and enforced. San Francisco retail customers were required to comply with the following water use prohibitions and restrictions:

- Water waste, including but not limited to, any flooding or runoff into the street or gutters, was prohibited.
- Hoses could not be used to clean sidewalks, driveways, patios, plazas, homes, businesses, parking lots, roofs, awnings or other hard surfaces areas.
- Hoses used for any purpose had to have positive shutoff valves.
- Restaurants served water to customers only upon request.
- Potable water was not to be used to clean, fill or maintain levels in decorative fountains.
- Use of additional water was not allowed for new landscaping or expansion of existing facilities unless low water use landscaping designs and irrigation systems were employed.
- Water service connections for new construction were granted only if water saving fixtures or devices were incorporated into the plumbing system.
- Use of potable water for consolidation of backfill, dust control or other non-essential construction purposes was prohibited.
- Irrigation of lawns, play fields, parks, golf courses, cemeteries, and landscaping of any type with potable water would be reduced by at least the amount specified for outside use in the adopted rationing plan.
- Verified water waste as determined by the Water Department would serve as prima facie evidence that the allocation assigned to the water account is excessive; therefore, the allocation was subject to review and possible reduction, including termination of service.
- Water used for all cooling purposes was to be recycled.
- The use of groundwater and/or reclaimed water for irrigation of golf courses, median strips, and similar turf areas was strongly encouraged.
- The use of groundwater and/or reclaimed water for street sweepers/washers was strongly encouraged.

In addition to water use prohibitions and directives specifically responsive to the drought, the SFPUC coincidentally was implementing long-term conservation programs, which also lowered water demands during the drought period (refer to the Demand Management discussion). Following the drought, several of the measures described above were adopted by San Francisco into permanent, on-going programs.

Water Management:

In addition to effecting reductions to water demands, the SFPUC also employed water management activities to control the severity of water shortages to its customers.

During the drought and for the first time in history, the SFPUC utilized a Delta supply within its system. The SFPUC imported water from the Delta through use of State Water Project South Bay Aqueduct facilities. The sources of water transferred included transfers via the California Emergency Water Bank, Placer County and the Modesto Irrigation District. The waters were diverted from the South Bay Aqueduct into the SFPUC's San Antonio Reservoir and then treated and integrated into SFPUC's water distribution system.

The amount of water actually delivered to the SFPUC was constrained due to numerous factors including the lack of willing sellers, allocation procedures, lack of priority in use of the State transmission facilities, storage constraints in San Antonio Reservoir, and water treatment constraints within the SFPUC's system. The total water that was imported into the SFPUC's system amounted to a maximum of approximately 31,000 acre-feet in one year, and in total for the drought period amounted to 59,000 acre-feet.

The importation of additional water into the SFPUC's system allowed the continuation of a 25 percent system-wide rationing program as compared to a potentially higher level of rationing had the transfers not occurred.

System Response and Effects:

The system-wide goal of reducing water use by 25 percent was achieved. However, the reduction was not accomplished without cost or hardship.

To achieve its annual 25 percent system-wide rationing goal, the SFPUC targeted a reduction of indoor consumption by 10 percent and outdoor consumption by 60 percent.

Due to the nature of the allocation formula for water allotments and the level of system-wide reduction goals, instances occurred where individual users or wholesale water customers were burdened with up to twice the system-wide average in delivery reductions.

Some of the costs incurred by individuals, property owners and renters include:

- The cost of installing low-flow toilets, retrofit kits for toilets and showerheads, and special low-water use landscaping and irrigation systems
- The financial losses resulting from loss of lawns, plants and trees due to the 60 percent reduction in water available for irrigation
- The cost of excess use charges ($12,300,000 in excess use charges was billed to retail accounts in fiscal year 1991-92 alone)

The ability of SFPUC's retail customers to achieve a 25 percent reduction in the future is highly unlikely due to the "hardening" of water demands that occurred during and subsequent to the drought. The rationing programs implemented by San Francisco during the 1987-92 drought were measured by comparison to calendar year 1987 water deliveries, i.e., pre-drought conditions.

During the 1987-92 drought San Francisco's retail and wholesale water customers implemented numerous conservation measures that have led to permanent per capita water usage savings. San Francisco's current

water demand is likely hardened as compared to the 1987 level of water demand. This situation leads to a conclusion that comparable rationing goals (e.g., up to 25 percent reduction) would be more difficult to achieve since the drought, and would require measures in excess of those implemented during the 1987-92 drought to achieve a comparable percentage of delivery reduction.

As the level of rationing increases, the economic and societal impacts become more severe. The SFPUC has first hand experience in attempting to employ rationing to levels, which are intolerable to citizens and businesses.

In 1991, water storage had deteriorated and the SFPUC was forced to immediately adopt a 45 percent system-wide rationing plan. It was proposed the reduction would be achieved through a 33 percent reduction to inside water use and a 90 percent reduction to outside water use.

San Francisco's plan for meeting its rationing goal included the following minimum and maximum criteria:

- *Maximum Allocation for Single and Multi-family Residences.* No single-family residence shall receive an allocation of more than 300 gallons per day: no multi-family residence shall receive an allocation of more than 150 gallons per day times the number of living units in the building.

- *Minimum Allocation for All Residential Accounts.* A minimum of 50 gallons per day per documented resident will be allowed. However, a minimum allocation will not be approved to increase an allocation above current usage absent a documented change in circumstances.

- *Irrigation Services.* Accounts classified for irrigation only will be reduced by 90 percent.

- *Commercial/Industrial Allocations.* Commercial and industrial allocations will be reduced by 32 percent. Hospitals and other health care facilities may be subject to lesser restrictions subject to verification that all conservation measures are in place; such approval shall require an on-site conservation inspection.

- *Allocations for New Accounts.* Initial allocations will be established at 50 gallons per day. These allocations will be re-evaluated after customers have installed retrofit kits provided by the San Francisco Water Department. After verification of installation, allocations will be calculated on the basis of the number of documented residents within a household, or, in the case of commercial or industrial customers, on the basis of business data supplied to the Department.

Additional water use restrictions and prohibitions were enforced:

- The washing of all automobiles, motorcycles, RVS, trucks, transit vehicles, trailers, boats, trains and airplanes was prohibited outside of a commercial washing facility.

- Exceptions to the above use restriction were windows on all vehicles and such commercial or safety vehicles requiring cleaning for health and safety reasons.

- Water used for all cooling purposes or for commercial car washes had to be recycled.

- The use of potable water on golf courses was limited to the irrigation of putting greens. The use of groundwater and reclaimed water was permitted when approved by the Department of Health.

- The filling of new swimming pools, spas, hot tubs or the draining and refilling of existing pools, etc., was prohibited; topping off was allowed to the extent that the designated allocation was not exceeded.
- The irrigation of median strips with potable water was prohibited. The use of groundwater and reclaimed water was permitted when approved by the Department of Health.
- The use of potable water for street sweepers/washers was prohibited. The use of groundwater and reclaimed water was permitted when approved by the Department of Health.

Public and commercial response to 45 percent rationing was overwhelmingly negative. During the first weeks after notification of the program, SFPUC received over 2,000 appeal letters per day. In the month before rationing was returned to 25 percent, 19,000 appeals, 12,000 telephone calls, and 1,500 walk-in complaints occurred.

Both the allocation levels and new prohibitions required to meet this level of rationing would have had a devastating effect on commercial enterprises. Some water uses would have simply been prohibited. Simply put, rationing had been taken to a level that was considered intolerable to citizens and had become economically disastrous.

RESOLUTION No. 88-0155

WHEREAS, The San Francisco Water Department obtains water from the reservoirs operated by the Hetch Hetchy Water and Power and from local Bay Area reservoirs; and

WHEREAS, Due to critically low supplies of water within the reservoirs and anticipated low levels of inflow into the reservoirs, such that unless consumption is decreased there may be insufficient water supplies for human consumption, sanitation and fire protection; and

WHEREAS, Decreases in water consumption may be accomplished by reducing allocations to the Water Department's wholesale customers and by imposing water use restrictions on the Water Department's retail customers, as set forth in the Water Rationing Rules and Regulations, issued on April 21, 1988 and attached hereto as Water Rationing Rules and Regulations; and

WHEREAS, This Commission recognizes the need to declare a Water Shortage Emergency (Water Code Sec. 350, et. seq.) due to critically low water supplies now available, and the need for a reduction in water use by the San Francisco Water Department's Suburban Wholesale Customers; and

WHEREAS, This Commission recognizes the need to adopt a Water Conservation Program (Water Code Sec. 375, et. seq.) due to the critically low water supplies now available, and the need for a reduction in water use by the San Francisco Water Department's retail customers; and

WHEREAS, The City of San Jose is, by Resolution 85-0256, a temporary and interruptible wholesale customer of the Water Department, and the Settlement Agreement and Master Water Sales Contract between the City and County of San Francisco and certain Suburban Purchasers in San Mateo County, Santa Clara County and Alameda County (Settlement Agreement) requires action by the Commission to interrupt service to the City of San Jose (Section 8.17); and

WHEREAS, The City of Santa Clara is, by Resolution 85-0257, a temporary and interruptible wholesale customer of the Water Department, and the Settlement Agreement requires action by the Commission to interrupt service to the City of Santa Clara (Section 8.17); and

WHEREAS, Additional funding in the amount of $648,780 for FY 1988/89 has been identified by the Water Department for implementation of a mandatory water rationing program; and

WHEREAS, on April 21, 1988, the Water Department submitted to this Commission a Water Conservation Program; and

WHEREAS, The Conservation Program shall cease to exist in whole or in part at such time as the Commission finds that the supply of water available to the Water Department's service area has been replenished or augmented so that there are sufficient supplies to meet the needs of the Water Department's customers without the continued implementation of these measures; and

00192

I hereby certify that the foregoing resolution was adopted by the Public Utilities Commission at its meeting of APRIL 22 1988

Dorothea A. Baldridge
Secretary, Public Utilities Commission

PUBLIC UTILITIES COMMISSION
CITY AND COUNTY OF SAN FRANCISCO

RESOLUTION No. 88-0155

WHEREAS, The recommended Water Conservation Program has received wide-spread public distribution; and

WHEREAS, Members of the public have been given an opportunity to, and have expressed their views on the recommended Water Conservation Program in a public hearing; now, therefore be it

RESOLVED, That this Commission declares a Water Shortage Emergency; and

BE IT FURTHER RESOLVED, That this Commission adopts a Water Conservation Program; and

BE IT FURTHER RESOLVED, That this Commission approves the Water Conservation Program dated April 21, 1988 as amended April 28, 1988, and directs that it be placed in force on May 1, 1988; and

BE IT FURTHER RESOLVED, That it is not the Commission's intention to interrupt water service to the cities of San Jose and/or Santa Clara; however, pursuant to its obligation under the Settlement Agreement and Master Water Sales Contract this Commission authorizes the General Manager of the Water Department to interrupt water service to the cities of San Jose and/or Santa Clara if necessary to achieve the required water saving, however, prior to actual interruption of service to either the City of San Jose or Santa Clara, the General Manager of the Water Department shall report to the Commission the need for interruption and receive affirmation from the Commission prior to institution of the interruption; and the Commission further directs the General Manager of the Water Department to mitigate the effect of the interruptions to the extent possible and consistent with the needs of San Francisco's permanent customers; and

BE IT FURTHER RESOLVED, That this Commission hereby authorizes the additional budget needs to be added to the Water Department's Conservation Programmatic Budget, thus amending the Water Department's budget request for FY 1988/89; and

BE IT FURTHER RESOLVED, That this Commission hereby designates Tuesday, May 24, 1988 as the date for a public hearing by the Public Utilities Commission for considering proposals for rate increases and additional charges for water service and water supplied by the San Francisco Water Department to retail customers; and

BE IT FURTHER RESOLVED, That this Commission hereby designates Tuesday, May 24, 1988 as the date for a public hearing by the Public Utilities Commission for considering proposals for rate structure adjustments for water service and water supplied by the San Francisco Water Department to wholesale customers; and

BE IT FURTHER RESOLVED, That the revenue requirements and an analysis of the rate increases, rate structure adjustments and additional charges be made available for public inspection and review beginning Monday, May 16, 1988 in Room 287, City Hall, San Francisco.

0019f

I hereby certify that the foregoing resolution was adopted by the Public Utilities Commission at its meeting of APRIL 28 1988

Romaine A. Boldridge
Secretary, Public Utilities Commission

APPENDIX C

Summary of San Francisco's Response to 2012-2016 Drought Experience

JUNE 2021
WATER SHORTAGE CONTINGENCY PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

Summary of San Francisco's Response to 2012-2016 Drought Experience

Appendix to the 2020 Water Shortage Contingency Plan

Introduction

The purpose of this Drought Summary (Summary) is to provide an overview of the SFPUC's activities in response to the Statewide drought, beginning with State of Emergency declared by Governor Brown in January 2014. This drought is unprecedented, not only for being the driest period in California history, but also for the drastic measures taken by the State to mandate reductions in urban water use. This Summary primarily focuses on the SFPUC's retail service area (e.g., retail sales, excess use charges, customer outreach), but documentation related to the wholesale service area is included to a lesser extent.

This Summary is organized chronologically, with one section for each calendar year (CY): CY 2014, CY 2015, CY 2016, and CY 2017. The Summary covers activities through the end of Fiscal Year (FY) 2016-17 (i.e., through June 2017.

Each section provides an overview of the main drought-related activities that occurred during the year, and includes a timeline of regulatory actions made at the State and local levels and a summary of retail water use by sector compared to the CY 2013 baseline.

Summary of Activities in Calendar Year 2014

The three-year period from October 2011 to September 2014 was the driest in California's hydrologic record and, as a result, reservoir storage, snowpack, and reservoir inflows were significantly lower than normal throughout the State. The unprecedented dry weather conditions prompted Governor Jerry Brown to declare a drought emergency for the State of California in January 2014 (Proclamation 1-17-2014). This action spurred the SFPUC to request that all customers of the Regional Water System (RWS) voluntarily reduce water use by at least 10% (Press Release 3-14), corresponding to Stage 1 of the Retail Water Shortage Allocation Plan.

Soon after, the San Francisco Mayor's Office issued a formal executive directive requiring that all City departments develop individual water conservation plans and take immediate steps to achieve a mandatory 10% reduction in their water consumption (Executive Directive 14-01). Moreover, in July 2014, new emergency regulations issued by the SWRCB (Resolution 2014-0038) prompted the SFPUC to implement outdoor water waste restrictions and require a mandatory 10% reduction in outdoor water use (Resolutions 14-0121 and 14-0140).

At this time, starting in October 2014, mandatory reductions in water use and corresponding excess use charges applied only to dedicated irrigation customers for a few reasons. First, requiring reductions only in irrigation was in line with the State's regulations targeting outdoor water use. The call for a voluntary reduction of 10% still applied to all customers system-wide. Second, the outdoor sector had the most potential for water savings. Third, the SFPUC's Customer Care and Billing System (CC&B) was undergoing an upgrade in summer 2014, so it was not possible to implement any new rationing programs in CC&B until fall 2014. To implement the Mandatory Irrigation Allocation Program, and workaround system was created outside of CC&B. Because the pool of dedicated irrigation customers was relatively small (approximately 1,600 accounts), it was manageable with the workaround system. It would not have been feasible or cost-effective to create a workaround system for any large sectors (e.g., residential).

Per the SFPUC's existing Interruptible Water Service rate (Rate Schedules W-3B and W-34), a subset of dedicated irrigation customers, known as interruptible customers, pay reduced rates, but are subject more stringent reductions during water shortages. Since 2007, this rate was made available only to irrigation customers for public uses within the City and County of San Francisco (i.e., municipal City departments). However, on May 13, 2014, the SFPUC adopted Resolution 14-0070, which expanded Interruptible Water Service to all retail irrigation uses inside and outside the City and County of San Francisco. Coupled with the water use restrictions due to the drought, this resolution prompted SFPUC staff to make changes to and clarify the implementation of the Interruptible Water Service rate effective July 1, 2014. In June 2014, all eligible irrigation account holders, including both municipal and private customers, were notified of the opportunity to opt-in to the Interruptible Water Service program. Most City departments opted to remain in the program, and several private customers also opted to participate in the program. Implementation of the Interruptible Water Service rate was revised again in February 2015 with the adoption of formal rules and regulations for administering Interruptible Water Service; this is described in the chapter for CY 2015.

Summary of San Francisco's Response to 2012-2016 Drought Experience

In June 2014, the SFPUC launched a multilingual "Water Conservation is Smart and Sexy" Citywide public education campaign. The advertisements were designed to capture public attention and present everyday water conservation tips and information about the drought. A combination of television, newspaper, billboard, bus, commuter transit station, and social media advertisements encouraged individuals to adjust their water use practices and pursue water-efficient plumbing fixture upgrades. The campaign also advised individuals to visit SFPUC water conservation web content and learn about the suite of services that are offered. As a result of the campaign, SFPUC water conservation web traffic increased by more than fourfold when comparing June-October of 2013 to June-October of 2014.

The SFPUC also implemented an education and notification program about wasteful outdoor water use activities, such as spraying or washing down outdoor hardscapes unless required for health and safety purposes; watering landscape in a manner that causes runoff to the sidewalk; and operating a hose without the use of an automatic shut-off spray nozzle. One of the key actions included targeted messaging to top water-using residential accounts, individuals demonstrating outdoor water waste, and commercial properties performing maintenance of outdoor hardscapes. The SFPUC also established a public water waste reporting and tracking system through the City of San Francisco's centralized 3-1-1 online and telephone response center.

Retail customers collectively saved 3.3 MGD, or 4.8%, in CY 2014 compared to CY 2013. Wholesale customers collectively saved 13.4 MGD, or 8.9%, of RWS supplies compared to CY 2013. Both sets of customers fell short of the voluntary system-wide goal of 10% that was declared in January 2014. Taking both the retail and wholesale service areas into account, system-wide savings in CY 2014 was 16.7 MGD, or 7.7%, compared to CY 2013 and did not meet the voluntary 10% goal.

Summary of Activities in Calendar Year 2015

In 2015, California was experiencing its fourth year of a severe drought and entering into a fifth year. The drought State of Emergency issued by Governor Brown in January 2014 remained in effect, and the SWRCB enacted additional emergency conservation regulations to promote even more conservation throughout the State (Resolution 2014-0013). These included mandatory restrictions on outdoor water use, as well as prohibitions on water use by businesses, which the SFPUC then adopted locally (Resolution 15-0102). Shortly thereafter, under an Executive Order (EO) issued by the Governor in April 2015 (EO B-29-15), a mandatory Statewide water use reduction of 25%, compared to a 2013 baseline, took effect starting June 2015 (Resolution 2015-0032). When the regulations were initially adopted by the SWRCB, this mandatory reduction was intended to remain in place until February 2016 unless extended or modified if the drought continued.

To help achieve the Statewide conservation goal of 25%, the SWRCB assigned the SFPUC a conservation standard of 8% in recognition of its low residential per capita water use. The 8% standard represents the lowest tier in the SWRCB emergency regulations. In response to the mandatory reduction issued by the State, the SFPUC adopted the 2015-2016 Drought Program (Resolution 15-0119 and 15-0149), which:

- Continued the call for a 10% reduction in water use by all customers system-wide;
- Increased the mandatory reduction in water use by dedicated irrigation customers from 10% to 25%, subject to excess use charges of 100% ("1x");
- Established a mandatory reduction in water use by Interruptible Water Service accounts at 30%, subject to excess use charges of 300% ("3x");
- Adjusted existing reduced wastewater flow factors to reflect a 25% reduction in irrigation usage

The SFPUC decided to maintain its call for a voluntary 10% reduction system-wide for continuity in messaging because (1) retail customers had already achieved about 9% through the first restriction period (i.e., 10% Mandatory Irrigation Allocation Program starting in October 2014), and (2) supply was being successfully managed such that further reductions were not needed. However, a further reduction on irrigation use was imposed in order to provide additional assurance that the 8% reduction mandated by the SWRCB could be met. The SFPUC continued to target dedicated irrigation customers because, similar as for initiation of the 10% Mandatory Irrigation Allocation Program in October 2014, this sector was considered to have the highest potential for savings and could be most feasibility managed through CC&B. Mandatory rationing for other sectors was discussed, but it would have been difficult to set targets equitably and to determine a sensible way to track water use (i.e., volume normalized per dwelling unit, square foot, or occupant). Any additional savings that could have been achieved through rationing would not have been worth the effort to implement rationing given the significant savings already achieved. Ultimately, SFPUC management desired a program that would avoid mandatory rationing while achieving the targeted level of savings.

It should be noted that in February 2015, prior to development of the 2015-2016 Drought Program and unrelated to the drought, the SFPUC adopted rules and regulations for administering Interruptible Water Service (Resolution 15-0040). The rules and regulations allow eligible irrigation customers to opt

into the Interruptible Water Service program and receive water service at a reduced rate (about 9% lower than regular commercial water rates). By opting in, these customers would be subject to service interruption and/or greater mandatory water use reductions, along with greater excess use charges, during water shortages and other emergencies at the discretion of the SFPUC Water Enterprise. The Interruptible Water Service rules had to be amended as part of the 2015-2016 Drought Program because the existing rules did not include a water shortage scenario (or stage) that was set forth by the Drought Program. Specifically, reductions and excess use charges were not defined for interruptible customers during a stage corresponding to a 10% system-wide water reduction with a mandatory reduction on dedicated irrigation. SFPUC staff initially proposed that interruptible customers should be subject to a 25% reduction and excess use charge of 200% ("2x") (Resolution 15-0119). However, the Commission requested that staff evaluate the feasibility and potential impacts of imposing more stringent reductions and excess use charges on interruptible customers. Based on an analysis of hypothetical financial impacts to existing interruptible customers assuming historical water use, with a focus on the largest interruptible customer (the San Francisco Recreation and Parks Department), staff recommended that interruptible customers be subject to a 30% reduction and excess use charge of 300% ("3x"). This proposal was adopted by the Commission and the 2015-2016 Drought Program was amended accordingly (Resolution 15-0149).

With the launch of the 2015-2016 Drought Program in July 2015, the workaround system that was created for the initial 10% Mandatory Irrigation Allocation Program was replaced with full integration of the 25% Mandatory Irrigation Allocation Program in CC&B. However, there was a delay in implementing the rationing program specific to Interruptible Water Service accounts until November 2015 because it took more time than expected to aggregate allocations and usage at the department level.

Although mandatory reductions were not imposed on residential and commercial customers, the SFPUC provided guidance and outreach to those customers on how to track and achieve water savings. In the SFPUC's on-line bill management system My Account, a Drought Water Use Target line was added to daily use charts for each single-family residential, multi-family residential, and non-residential account. The target reflected a 10% reduction from the account's historic 2013 water use. To aid customers in tracking their conservation in the future, the SFPUC started investigating the feasibility of fractional billing which was eventually implemented and launched in January 2017.

In addition to imposing conservation standards on individual urban water suppliers, the emergency regulations adopted by the SWRCB in May 2015 included additional water use prohibitions (Resolution 2015-0032). The SFPUC adopted additional mandatory restrictions to impose the State's prohibitions in the SFPUC retail service area if they had not already been addressed by existing SFPUC water use restrictions. The restrictions adopted by the SFPUC in CY 2015 are listed below:

- Watering outdoor landscapes with potable water during and within forty-eight (48) hours after a rain event (Resolution 15-0102)
- Not providing guests the option to refuse daily laundering of towels and linens at hotels and motels, and not prominently displaying notice of this option in each guestroom (Resolution 15-0102)

- Irrigation with potable water of ornamental turf on public street medians (Resolution 15-0119)

The SFPUC expanded its efforts to educate the public about wasteful water use activities restricted by the State, including runoff from irrigation and hardscape washing. SFPUC field inspectors continued to keep an eye out for water waste during daily rounds, and conservation staff responded to an increasing number of water waste reports submitted through San Francisco's 3-1-1 online and telephone response center.

The SFPUC continued to inform customers on the drought, water efficient practices, and new regulations through a variety of means in addition to those described above. The drought outreach campaign from the previous summer was updated and re-launched. In June 2015, irrigation customers were sent letters describing the Mandatory Irrigation Allocation Program and providing monthly account allocations through February 2016. The letters also provided an opportunity for the account holder to participate in or opt out of the Interruptible Service Program. The SFPUC also sent letters to account holders with reduced flow factors to notify them of adjustments to their reduced flow factor, or lack thereof in the case of adjustments that were too small to implement.

As the 2015-2016 Drought Program was being developed, SFPUC management and staff contemplated temporarily suspending high bill appeals, flow factor appeals, and interruptible rates during the drought as these processes could be considered counterproductive to conservation. However, the City Attorney's Office advised against suspending these processes, and instead, the SFPUC proceeded with the adjustment to reduced flow factors.

In December 2015, SFPUC management and staff met to discuss the effectiveness of the 2015-2016 Drought Program to date in anticipation of an extension to the State mandates in the beginning of 2016 as directed by the Governor (EO B-36-15). In brief, the Drought Program was effective at reducing water use across all customer sectors (except industrial, which is a small sector), and was on track to meet its objectives. Challenges in implementing program criteria and modifications to the billing system (CC&B) were also discussed at this meeting as well as at a follow-up meeting specifically regarding CC&B held in May 2016.

The April 2015 EO B-29-15 directed the California Department of Water Resources (DWR) to update the State's Model Water Efficient Landscape Ordinance (MWELO) to increase water efficiency standards for new and existing landscapes. In July 2015, the California Water Commission approved a revised MWELO. Accordingly, the SFPUC adopted amendments to San Francisco's Water Efficient Irrigation Ordinances and the related SFPUC rules (Section F of the Rules and Regulations Governing Water Service to Customers) to comply with the State's revisions (Resolution 15-0221).

The next few pages provide a timeline of the State and local regulatory actions described above, retail water use by sector compared to the CY 2013 baseline, and monthly production data submitted to the SWRCB per the emergency regulations adopted in July 2014. The monthly reports to the SWRCB include residential per capita estimates as well as implementation and enforcement metrics. For metrics related to excess use charges, see the summary provided in the introduction of this report.

Summary of San Francisco's Response to 2012-2016 Drought Experience

Retail customers collectively saved 7.9 MGD, or 11.7%, in CY 2015 compared to CY 2013, thus exceeding the voluntary system-wide goal of 10%. Looking specifically at retail irrigation use, dedicated irrigation customers collectively saved 0.7 MGD, or 27.9%, over the course of the 10% Mandatory Irrigation Allocation Program (October 2014 through June 2015), far exceeding program's goal. Wholesale customers also exceeded the voluntary system-wide goal of 10% by collectively saving 33.7 MGD, or 22.4%, of RWS supplies compared to CY 2013. Taking both the retail and wholesale service areas into account, system-wide savings in CY 2015 was 41.6 MGD, or 19.1%, compared to CY 2013 and exceeded the voluntary 10% goal.

Summary of Activities in Calendar Year 2016

Although hydrologic conditions improved during the winter of 2015/2016, the Statewide drought continued into its fifth consecutive year. In anticipation of a dry winter, the Governor issued EO B-36-15 in November 2015 directing the SWRCB to extend the emergency regulations adopted in May 2015 beyond their initial expiration date in February 2016. In response, the SWRCB updated and extended the emergency regulations through October 2016 (Resolution 2016-0007). The most significant update to the emergency regulations was the addition of credits and adjustments to urban water suppliers' conservation standards that consider the differences in climate, growth, and investments in creating new, local, drought-resilient sources of potable water supply.

To comply with the SWRCB's extended emergency regulations, the SFPUC maintained its 2015-2016 Drought Program. The SFPUC did not apply for an adjustment to its existing 8% conservation standard because its customers were doing well to conserve well beyond that system-wide. Letters were sent to irrigation customers notifying them of the extension of the 25% Mandatory Irrigation Allocation Program, and included a new batch of monthly allocations from March through October 2016.

Despite improved conditions during the past winter, Governor Brown issued EO B-37-16 in May 2016 aiming to make water conservation a California way of life. Among other directives, the EO directed the SWRCB to extend its emergency regulations, which had previously been extended through October 2016, through January 2017[1]. Additionally, the EO called for the emergency regulations to be adjusted in recognition of differing water supply conditions throughout the State. In response, the SWRCB required that all urban water suppliers self-certify their water supply reliability and corresponding conservation standard by June 2016 (Resolution 2016-0029). The self-certification process, also referred to as a "stress test," assumed three additional dry years. The self-certified conservation standard replaces the existing State-developed conservation standard (i.e., 8% for SFPUC), and will remain in effect through January 2017[2]. SFPUC staff analyzed the regulations and described proposed actions for its Commissioners in a memo dated May 18, 2016.

To comply with the revised emergency regulations, the SFPUC conducted the self-certification procedures and determined that potable water supplies would be sufficient to meet both retail and wholesale demands over the next three years. Thus, the revised conservation standard for the SFPUC retail system was established to be 0%, rather than the existing 8% conservation standard. Despite its self-certified conservation standard of 0%, the SFPUC continued to promote and encourage conservation in line with the State mandates. Specifically, the SFPUC maintained its call for a voluntary 10% system-wide reduction in water use over the 2013 baseline in light of the proposed SWRCB emergency regulations and the fact that the Hetch Hetchy Regional Water System was still recovering from the drought. System storage was not anticipated to fill in 2016, and the next year's hydrology remained uncertain.

[1] The regulation was set to expire in February 28, 2017 per the Office of Administrative Law.
[2] Same as previous footnote.

However, in recognition of improved hydrologic conditions and the reduced conservation standard, the SFPUC adopted changes to the 2015-2016 Drought Program in June 2016 to ease mandatory reductions on outdoor irrigation with potable water (Resolution 16-0130). These changes included:

- Ceasing the 25% mandatory reduction in water use by dedicated irrigation customers and corresponding excess use charges;
- Reducing the mandatory reduction in water use by interruptible customers from 30% to 10%, subject to excess use charges; and
- Reverting reduced wastewater flow factors that had been adjusted to reflect a 25% reduction in irrigation usage back to their pre-adjusted reduced values.

In July 2016, the SFPUC sent letters to irrigation customers and customers with adjusted flow factors regarding the lifted restrictions. The letters to irrigation customers offered account holders the opportunity to participate in the Interruptible Water Service program for FY 2016-17 effective August 2016.

EO B-37-16 also directed the SWRCB to permanently prohibit practices that waste potable water. While the SWRCB has yet to take action to make the prohibitions permanent, the SFPUC updated its water waste restrictions and made temporary restrictions permanent in line with the Executive Order (Resolution 16-0127).

In June 2016, the SFPUC surveyed San Francisco residents to learn what they did at home to achieve water savings during the drought, how long water-savings from these actions might last, and how people got information about the drought and ways to conserve. Overall, the poll showed that most respondents are informed about the drought, cut back their water use, feel they and others could conserve even more but need direction on what more they should do. The SFPUC will use the results to help shape continued outreach about all the ways people can save water whether they own or rent, and live in an apartment or single family home.

In addition to addressing the current drought through temporary regulations, EO B-37-16 also builds on the conservation accomplished during the current drought and seeks to establish longer-term water conservation and efficiency measures through the following directives:

- Use Water More Wisely – Develop new urban water use targets that generate more water conservation than existing SBX7-7 requirements.
- Eliminate Water Waste – Reduce water loss.
- Strengthen Local Drought Resilience – Improve urban Water Shortage Contingency Plans and reporting requirements.

The EO calls for DWR, SWRCB, and the California Department of Food and Agricultural (CDFA), in coordination with the California Public Utilities Commission (CPUC) and California Energy Commission (CEC) (collectively referred to as the "EO State Agencies") to seek input from stakeholders on implementation of EO B-37-16. The Urban Advisory Group (UAG) was formed by the EO State Agencies

to provide input and advice on recommendations and approaches regarding EO directives applicable to urban water use.

Although the SFPUC is not a member of the UAG, SFPUC staff closely monitored the development of the recommendations and framework report that was finalized by the EO Agencies in April 2017. SFPUC staff continue to track the development of the resulting legislation. Because this long-term water use efficiency framework was not intended to influence the current drought, ***this Drought Summary does not cover activities related to the long-term directives of EO B-37-16***.

Separate from SWRCB emergency regulations and Governor EOs, State legislation was signed by the Governor on August 29, 2016 requiring urban retail water suppliers to set rules for identifying and discouraging excessive residential water consumption during a prescribed statewide or local drought. The provisions of this legislation, known as Senate Bill (SB) 814, took effect January 1, 2017 and are described further in the next chapter as the SFPUC took action in January 2017 to implement the provisions.

Retail customers collectively saved 8.8 MGD, or 13.0%, in CY 2016 compared to CY 2013, thus exceeding the voluntary system-wide goal of 10%. Looking specifically at retail irrigation use, dedicated irrigation customers collectively saved 1.2 MGD, or 38.5%, over the course of the 25% Mandatory Irrigation Allocation Program (July 2015 through June 2016), far exceeding program's goal. Wholesale customers also exceeded the voluntary system-wide goal of 10% by collectively saving 31.7 MGD, or 21.1%, of RWS supplies compared to CY 2013. Taking both the retail and wholesale service areas into account, system-wide savings in CY 2016 was 40.5 MGD, or 18.6%, compared to CY 2013 and exceeded the voluntary 10% goal.

Summary of Activities in Calendar Year 2017 (through June 2017)

The winter of 2016/2017 was one of California's wettest winters on record and marked the end of the five-year drought in most of the State. Despite much improved hydrologic conditions, portions of state remained dry and groundwater basins remained depleted. Thus, in February 2017, the SWRCB readopted its emergency regulations (i.e., the stress test approach) and extended them through October 2017 with the intent to reconsider repealing the regulations in May should Statewide water supply conditions improve (Resolution 2017-0004). However, on April 7, 2017, Governor Brown issued EO B-40-17 to lift the drought emergency throughout the State except for four counties that continue to suffer from water supply shortages (Fresno, Kings, Tulare, and Tuolumne). In response to this EO, on April 26, 2017, the SWRCB rescinded the stress test and conservation standard portions of its emergency regulations for all of California except for the four counties identified in the EO (Resolution 2017-0024). Monthly water use reporting and water waste prohibitions remain in place until the emergency regulations expire in November 2017, though the SWRCB is working to make these requirements permanent as directed by EO B-37-16.

While EO B-40-17 ended the Statewide emergency drought proclamation put in place by the Governor in January 2014 (Proclamation 1-17-2014), it also marks a transition to the long-term water use efficiency framework to make water conservation a California way of life under EO B-37-16.

Prior to the Governor issuing EO B-40-17, SFPUC staff reviewed RWS conditions and determined that precipitation and snowpack were well above normal. It was anticipated that the system would fill over the course of the year. Because of these favorable supply conditions and because the SFPUC was subject to a 0% self-certified conservation standard per the SWRCB emergency regulations at the time, the SFPUC lifted its call for a voluntary 10% reduction in water use system-wide on April 11, 2017 (Resolution 17-0075). The SFPUC also notified its wholesale customers that it would no longer be requesting voluntary reductions.

As noted in the chapter for CY 2016, the Governor signed into law SB 814, which required urban retail water suppliers to set rules for identifying and discouraging excessive residential water consumption during a prescribed statewide or local drought. To implement this legislation locally, in January 2017, the SFPUC adopted rules and regulations to establish a 500-gallon-per-day threshold for single-family households and individually-metered multi-family units (Resolution 17-0010). The threshold would be effective during designated drought periods in which mandatory reduction on residential customers are imposed, and result in a $150 excess use fine for each 30-day period a customer's average daily water use exceeds the threshold.

During the 12-month period of July 2016 to June 2017, retail customers collectively saved slightly less water in FY 2016-17 (with only the voluntary 10% system-wide reduction in place) compared to FY 2015-16 (when 25% Mandatory Irrigation Allocation Program was in place): 8.6 MGD (12.7%) compared to 9.1 MGD (13.4%) savings. For the same periods of time, dedicated irrigation customers also saved slightly less water: 1.1 MGD (35.2%) compared to 1.2 MGD (38.5%) savings. However, both retail and wholesale customers still exceeded the voluntary 10% goal.

APPENDIX D

San Francisco Public Utilities Commission Resolution Adopting 2020 Water Shortage Contingency Plan

JUNE 2021
WATER SHORTAGE CONTINGENCY PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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PUBLIC UTILITIES COMMISSION

City and County of San Francisco

RESOLUTION NO. **21-0100**

WHEREAS, The Urban Water Management Planning Act of 1983, as amended through 2020 (the Act), requires that an urban water supplier serving 3,000 customers or 3,000 acre-feet per year must prepare an Urban Water Management Plan (Plan or UWMP) update every five years; and

WHEREAS, On June 14, 2016, by Resolution No. 16-0118, the San Francisco Public Utilities Commission (SFPUC) adopted the 2015 Urban Water Management Plan; and

WHEREAS, The SFPUC, in compliance with the Act, has prepared a 2020 update to its Plan, including the 2020 Water Shortage Contingency Plan; and

WHEREAS, The preparation of the Plan update has been coordinated with the City's wholesale water customers and other public agencies to the extent practicable, and staff has encouraged the active involvement of diverse social, cultural and economic elements of the population within the SFPUC's retail water service area during preparation of the Plan; and

WHEREAS, At this Commission's regular public meeting on April 13, 2021, a Draft Plan was presented to the Commission and a Public Hearing was held during the Commission meeting in order to receive public comment on the Draft Plan; and

WHEREAS, Minor revisions to the Draft Plan have been made based on public comments received at the Public Hearing and during the public comment period of April 5, 2021 through May 5, 2021; and

WHEREAS, The San Francisco Planning Department issued a statutory exemption determination on May 25, 2021 under California Environmental Quality Act Guidelines section 15282(v), under Planning Department Case Number 2021-005261ENV; and

WHEREAS, This action constitutes the Approval Action for the project for the purposes of CEQA, pursuant to Section 31.04(h) of the San Francisco Administrative Code; and

WHEREAS, A Final 2020 Urban Water Management Plan was presented to the Commission at its public meeting on June 8, 2021 for consideration and adoption in advance of the July 1, 2021 deadline for submittal to the State and copy of the Final Plan is on file with the Commission Secretary; now, therefore, be it

RESOLVED, That this Commission hereby adopts the 2020 Urban Water Management Plan for the City and County of San Francisco, including the 2020 Water Shortage Contingency Plan, and directs the General Manager to submit it to the California Department of Water Resources by July 1, 2021.

I hereby certify that the foregoing resolution was adopted by the Public Utilities Commission at its meeting of June 11, 2021.

Secretary, Public Utilities Commission

2020
WATER SHORTAGE CONTINGENCY PLAN
for the City and County of San Francisco

PUBLIC REVIEW DRAFT

April 2021

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

APPENDIX L

Resolution to Adopt the 2020 Urban Water Management Plan

JUNE 2021
2020 URBAN WATER MANAGEMENT PLAN
for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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PUBLIC UTILITIES COMMISSION

City and County of San Francisco

RESOLUTION NO. **21-0100**

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Secretary, Public Utilities Commission

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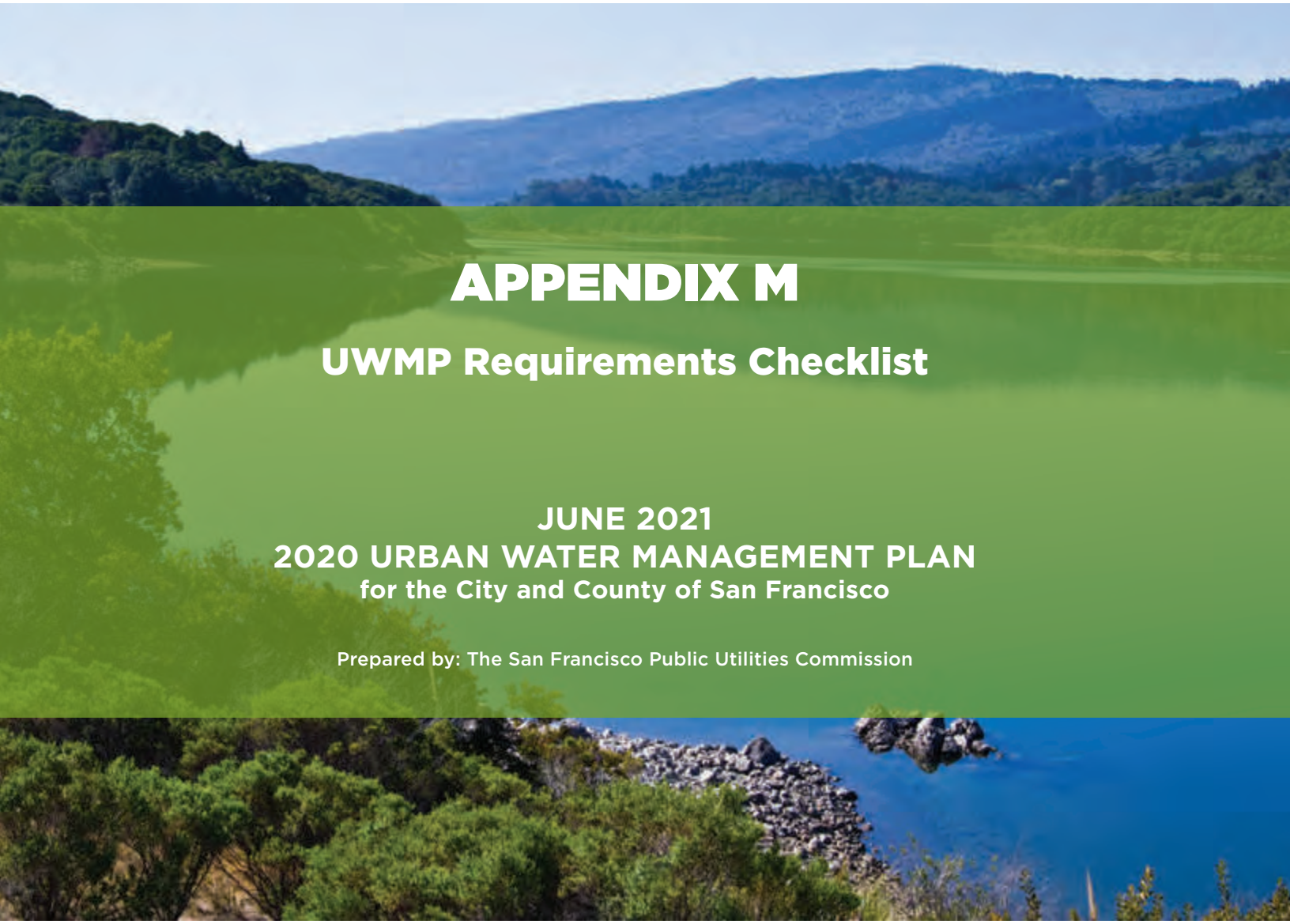

APPENDIX M

UWMP Requirements Checklist

JUNE 2021

2020 URBAN WATER MANAGEMENT PLAN

for the City and County of San Francisco

Prepared by: The San Francisco Public Utilities Commission

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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Water Code Section	Summary as Applies to UWMP	2020 UWMP Location	
		Retail	Wholesale
Summary			
10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information.	Section 1	Section 1
Plan Preparation			
10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Section 10.1	Section 10.1
10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Section 2.3.1 and Appendix C	Section 2.3.1 and Appendix C
10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Appendix C	Appendix C
System Description			
10631(a)	Describe the water supplier service area.	Section 3.2	Section 3.3
10631(a)	Describe the climate of the service area of the supplier.	Section 3.2.1	section 3.3.1
10631(a)	Indicate the current population of the service area.	Table 3-3 & Table 5-1	Table 3-4
10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	Table 3-3	Table 3-4
10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	Section 3.2.2	Section 3.3.2
10631(a)	Describe the land uses within the service area.	Section 3.2.2	Section 3.3.2
System Water Use			
10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	Section 4.1	Section 4.2
10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	Section 4.1.3	N.A.
10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	Section 4.1.3	N.A.
10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	Section 4.1.5	N.A.
System Description and Baselines and Targets			

10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Section 5.1 & Appendix D	N.A.
10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Section 5.2	N.A.
10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Section 5.3	N.A.
10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	N.A.	N.A.
10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	N.A	Section 5.4 & Section 10.3
10608.4	Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form.	Appendix D	N.A.
10631(a)	Indicate the current population of the service area.	Table 3-3 & Table 5-1	N.A.
System Supplies			
10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	Table 6-3 & Table 6-5	Table 6-3
10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	Section 6.2.1.1	N.A
10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	Section 8.2	Section 8.2
10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	Section 6.2.5	N.A
10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	Section 6.2.2 & Section 7.4	N.A
10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater	Section 6.2.1.1	N.A

	management. Include a copy of the plan or authorization.		
10631(b)(4)(B)	Describe the groundwater basin.	Section 6.2.1.1	N.A
10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	Section 6.2.1.1	N.A
10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	Section 6.2.1.1	N.A
10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	Section 6.2.1.1 & Table 6-2	N.A
10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	Section 6.2.1.1 & Table 6-5	N.A
10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	Section 7.4.2 & Section 7.5	Section 7.4.2 & Section 7.5
10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	Section 7.4	Section 7.4
10631(g)	Describe desalinated water project opportunities for long-term supply.	Section 7.4.2	Section 7.4.2
10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	N.A	N.A
10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	N.A	Appendix C
System Supplies (Recycled Water)			
10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	Table 6-4	N.A
10633(c)	Describe the recycled water currently being used in the supplier's service area.	Section 6.2.1.3	N.A

10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	Section 6.2.2 & Table 6-5	N.A
10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	Table 6-5 & Table 6-3	N.A
10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	Section 6.2.2.3	N.A
10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	Section 6.2.2.3	N.A
Water Supply Reliability Assessment			
10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Section 6.2.2, Section 7.4	Section 7.2, Section 7.4 & Section 7.5
10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Section 6.1.2 & Section 6.2.3	Section 6.1.2
10635(a)	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Section 8.3 & Section 8.4	Section 8.3 & Section 8.4
10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Section 8.5	N.A
10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Section 8.5.1, Section 8.5.2, Section 8.2	N.A
10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Section 8.5.2, Section 8.5.3	N.A
10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Section 8.5.4	N.A

10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change condition, anticipated regulatory changes, and other locally applicable criteria.	Section 8.2.2 & Section 8.5.4	N.A
Water Shortage Contingency Planning			
10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Appendix K	Appendix K
10632(a)(2)(A)	Provide the written decision-making process and other methods that the supplier will use each year to determine its water reliability.	Appendix K Section 2.5 & Figure 2-1	Appendix K Section 2.5 & Figure 2-1
10632(a)(2)(B)	Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Appendix K Section 2	Appendix K Section 2
10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Appendix K, Section 3, Table 3-1, Table 3-2	Appendix K, Section 3.1, Table 3-1
10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Not Applicable; supplier uses 6 standard categories	Not Applicable; supplier uses 6 standard categories
10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Not Applicable; supplier will meet shortage with demand reduction actions as described in Appendix K, Section 4	Not Applicable; supplier will meet shortage with Water Shortage Allocation Plan as described in Appendix K, Section 3
10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Appendix K Section 4, Table 4-2	Supplier will meet shortage with Water Shortage Allocation Plan as described in Appendix K, Section 3
10632(a)(4)(C)	Specify locally appropriate operational changes.	Appendix M Section 4.4	Supplier will meet shortage with Water Shortage Allocation Plan as described in Appendix K, Section 3
10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated	Appendix K Section 4.2, Table 4-1, Table 4-2	Supplier will meet shortage with Water Shortage Allocation

	prohibitions are appropriate to local conditions.		Plan as described in Appendix K, Section 3
10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Appendix K Table 4-2	Supplier will meet shortage with Water Shortage Allocation Plan as described in Appendix K, Section 3
10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Appendix K Section 2.5, Figure 2-1, Section 5	Appendix K Section 2.5, Figure 2-1, Section 5
10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Appendix K Section 2.5, Figure 2-1, Section 5	Appendix K Section 2.5, Figure 2-1, Section 5
10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Appendix K Section 7	Appendix K Section 7
10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Appendix K Section 7	Appendix K Section 7
10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Appendix K Section 7	Appendix K Section 7
10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Appendix K Section 8	Appendix K Section 8
10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Appendix K Section 8	Appendix K Section 8
10632(a)(8)(C)	Describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought.	Appendix K Section 8	Appendix K Section 8
10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Appendix K Section 9	N.A
10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Appendix K Section 11	Appendix K Section 11
10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Appendix K Section 4	N.A

Demand Management Measures			
10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years.	Section 10.1	N.A
10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	N.A	Section 10.2
Plan Adoption, Submittal and Implementation			
10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets.	Section 11.1 and Appendix L	N.A
10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.	Section 11.1 and Appendix C	Section 11.1 and Appendix C
10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Section 11.1 and Appendix C	Section 11.1 and Appendix C
10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 60 days after the submission of the plan to DWR.	Section 11.1, Appendix C, Appendix K Section 12	Section 11.1 and Appendix C, Appendix K Section 12
10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing.	Section 11.1 and Appendix C	Section 11.1 and Appendix C
10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Section 11.1 and Appendix C	Section 11.1 and Appendix C
10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Section 11.1 and Appendix C	Section 11.1 and Appendix C
10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Section 11.1 and Appendix C	Section 11.1 and Appendix C
10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Section 11.1 and Appendix C	Section 11.1 and Appendix C
10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Section 11.1 and Appendix C	Section 11.1 and Appendix C

10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Section 11.1 and Appendix C	Section 11.1 and Appendix C
10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Section 11.1 and Appendix C	Section 11.1 and Appendix C
Energy Intensity			
10631.2(a)	The UWMP must include energy intensity information as stated in the code.	Appendix I	Appendix I

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June 2021

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