The City of Hayward
2020 Urban Water Management Plan

FINAL

July 2021

Prepared by:

MADDAUS WATER MANAGEMENT

eki environment & water

TABLE OF CONTENTS PAGE

LIST OF FIGURES 5

LIST OF TABLES 6

LIST OF ABBREVIATIONS AND ACRONYMS 8

1 INTRODUCTION AND OVERVIEW 10
- 1.1 Description 10
- 1.2 Urban Water Management Plan Organization 10
- 1.3 UWMPs in Relation to Other Efforts 11
- 1.4 UWMPs and Grant or Loan Eligibility 11
- 1.5 Demonstration of Consistency with the Delta Plan for Participants in Covered Actions 12
- 1.6 Background and Purpose 12
- 1.7 Urban Water Management Planning and the California Water Code 13

2 PLAN PREPARATION 15
- 2.1 Plan Preparation 15
- 2.2 Basis for Plan Preparation 15
- 2.3 Regional Planning 16
- 2.4 Individual or Regional Planning and Compliance 16
- 2.5 Fiscal or Calendar Year and Units of Measure 17
- 2.6 Coordination and Outreach 18

3 SYSTEM DESCRIPTION 20
- 3.1 General Description 20
- 3.2 Service Area Boundary Maps 20
- 3.3 Service Area Climate 23
- 3.4 Service Area Population, Demographics, and Socioeconomics 25
- 3.5 Land Uses within Service Area 28

4 WATER USE CHARACTERIZATION 29
- 4.1 Non-Potable Versus Potable Water Use 29
- 4.2 Past, Current, and Projected Water Use by Sector 29
- 4.3 Worksheets and Reporting Tables 38
- 4.4 Water Use for Lower Income Households 39
- 4.5 Climate Change Considerations 40

5 SB X7-7 BASELINES AND TARGETS 44
- 5.1 Guidance for Wholesaler Suppliers 44

5.2 Updating Calculations from 2015 UWMP to the 2020 UWMP 45
5.3 General Requirements for Baseline and Targets 45
5.4 Service Area Population 46
5.5 Gross Water Use 47
5.6 Baselines and Target Summary 47
5.7 2020 Compliance Daily Per Capita Water Use (GPCD) 48
5.8 Regional Alliance 48

6 WATER SUPPLY CHARACTERIZATION 49
6.1 Water Supply Analysis Overview 49
6.2 Narrative Sections for UWMP Water Supply Characterization 49
6.3 Special Conditions 70
6.4 Energy Intensity 75

7 WATER SERVICE RELIABILITY AND DROUGHT RISK ASSESSMENT 78
7.1 Water Service Reliability Assessment 78
7.2 Drought Risk Assessment 97

8 WATER SHORTAGE CONTINGENCY PLAN 101
8.1 Overview of the WSCP 101
8.2 Summary of Water Shortage Response Strategy and Required DWR Tables 102

9 DEMAND MANAGEMENT MEASURES 111
9.1 Demand Management Measures for Wholesale Suppliers 111
9.2 Demand Management Measures for Retail Suppliers 111
9.3 Reporting Implementation 115
9.4 Water Use Objectives (Future Requirements) 118

10 PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION 120
10.1 Notice of Public Hearing 120
10.2 Public Hearing and Adoption 122
10.3 Plan Submittal 122
10.4 Public Availability 122
10.5 Notification to Public Utilities Commission 123
10.6 Amending an Adopted UWMP or WSCP 123

11 REFERENCES 124

APPENDICES 127

APPENDIX A – UWMP CHECKLIST 128

APPENDIX B – WATER AUDIT REPORT 139

APPENDIX C – DEMAND & PASSIVE SAVINGS METHODOLOGY 147
C.1 DSS Model Overview 147
C.2 DSS Model Methodology 149
C.3 Present Value Analysis and Perspectives on Benefits and Costs 150
C.4 Measure Cost and Water Savings Assumptions 151
C.5 National Plumbing Code 152
C.6 State Plumbing Code 153
C.7 Key Baseline Potable Demand Inputs, Passive Savings Assumptions, and Resources 154

APPENDIX D – SB X7-7 COMPLIANCE FORM 159
APPENDIX E – STATE WATER RESOURCES CONTROL BOARD 2017 LETTER 166
APPENDIX F – NOTICE OF INTENT TO UPDATE THE 2020 UWMP 169
APPENDIX G – NOTICE OF PUBLIC HEARING 170
APPENDIX H – ADOPTION RESOLUTION 173
APPENDIX I – SFPUC REGIONAL WATER SYSTEM SUPPLY RELIABILITY AND BAWSCA TIER 2 DROUGHT IMPLEMENTATION SCENARIOS 175
APPENDIX J – SFPUC WATER SUPPLY WORKSHOP #3 227
APPENDIX K – 2020 WATER SHORTAGE CONTIGENCY PLAN 251
APPENDIX L – HAYWARD MUNCIPAL CODE – SEC 11-2.47 252
APPENDIX M – HAYWARD MUNICIPAL CODE – BAY FRIENDLY WATER EFFICIENT LANDSCAPE ORDINANCE 253
APPENDIX N – HAYWARD MUNICIPAL CODE – BAY FRIENDLY LANDSCAPING ORDINANCE 254
APPENDIX O – 2020 WATER AND WASTEWATER SERVICE RATES 255

LIST OF FIGURES

Figure 3-1. Potable Water Service Area 21
Figure 3-2. Public Water System 22
Figure 3-3. City of Hayward Climate Characteristics 24
Figure 4-1. City of Hayward Historical Water Demand in Million Gallons per Day 32
Figure 4-2. Bay Area Historical and Projected Mean Maximum Temperatures 41
Figure 6-1. Regional Water System 50
Figure 6-2. Groundwater Basins Underlying the City of Hayward 54
Figure 6-3. Hayward WPCF Unit Process Flow Schematic 60
Figure 6-4. Recycled Water Project Phase 1 Location Map and Distribution System 63
Figure 8-1. Water Shortage Contingency Plan Flow of Information 101
Figure C-1. DSS Model Main Page 147
Figure C-2. Sample Benefit-Cost Analysis Summary 148
Figure C-3. DSS Model Analysis Locations in the U.S. 148
Figure C-4. DSS Model Analysis Flow 149

LIST OF TABLES

Table 2-1. Public Water Systems 16
Table 2-2. Plan Identification Type 17
Table 2-3. Supplier Identification 17
Table 2-4. Water Supplier Information Exchange 18
Table 3-1. Retail Population – Current and Projected 27
Table 4-1. Demands for Potable and Non-Potable Water – Actual 33
Table 4-2. Demands for Potable and Non-Potable Water – Projected 37
Table 4-3. Total Water Use 37
Table 4-4. Water Use Projections for 2021 to 2025 38
Table 4-5. Last Five Years of Water Loss Audit Reporting 39
Table 4-6a. Inclusion in Water Use Projections 40
Table 5-1. Baselines and Targets Summary 47
Table 5-2. 2020 Compliances 48
Table 6-1. Groundwater Volume Pumped 57
Table 6-2. Wastewater Collected Within Service Area in 2020 59
Table 6-3. Wastewater Treatment and Discharge Within Service Area in 2020 61
Table 6-4. Current and Projected Recycled Water Direct Beneficial Uses Within Service Area 65
Table 6-5. 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual 66
Table 6-6. Methods to Expand Future Recycled Water Use 67
Table 6-7. Expected Future Water Supply Projects or Programs 69
Table 6-8. Water Supplies – Actual 69
Table 6-9. Water Supplies – Projected 70
Table 6-10. Recommended Energy Intensity – Total Utility Approach 76
Table 6-11. Recommended Energy Intensity – Wastewater & Recycled Water 77
Table 7-1a. Basis of Water Year Data (Reliability Assessment) 85
Table 7-2. Normal Year Supply and Demand Comparison 88
Table 7-3. Single-Dry Year Supply and Demand Comparison 88
Table 7-4. Multiple-Dry Years Supply and Demand Comparison 89
Table 7-5. Hayward 2020 Base Year Multiple-Dry Year Drought Allocations 98
Table 7-6. Five-Year Drought Risk Assessment Tables to Address Water Code Section 10635(b) 99
Table 8-1. Water Shortage Contingency Plan Levels 103
Table 8-2. Demand Reduction Actions 105
Table 8-3. Supply Augmentation and Other Actions 110

Table 9-1. Programs to Assist in Meeting Water Use Objectives 119
Table 10-1. Notification to Cities and Counties 121
Table C-1. List of Key Assumptions 155
Table C-2. Key Assumptions Resources 156

Hetch Hetchy Reservoir

LIST OF ABBREVIATIONS AND ACRONYMS

2020 UWMP	2020 Urban Water Management Plan
AB	Assembly Bill
ABAG	Association of Bay Area Governments
Act	Urban Water Management Planning Act
ACWD	Alameda County Water District
AF	acre-feet
AFY	acre-feet per year
AMI	Advanced Metering Infrastructure
AWSP	Alternative Water Supply Planning Program
AWWA	American Water Works Association
AWWARF	American Water Works Association Research Foundation
BACWA	Bay Area Clean Water Agencies
BAIRWMP	Bay Area Integrated Regional Water Management Plan
BARR SWAP	Bay Area Regional Reliability Shared Water Access Program
BAWSCA	Bay Area Water Supply and Conservation Agency
BCDC	Bay Conservation and Development Commission
BDPL	Bay Division Pipeline
BMP	Best Management Practice
CalWEP	California Water Efficiency Partnership
CCWD	Contra Costa Water District
CEC	California Energy Commission
CII	Commercial, Industrial, and Institutional
CIMIS	California Irrigation Management Information System
CNRA	California Natural Resources Agency
CPUC	California Public Utilities Commission
CSUEB	California State University East Bay
DDW	State Water Resources Control Board Division of Drinking Water
DMM	Demand Management Measures
DOF	California Department of Finance
DRA	Drought Risk Assessment
DSS Model	Least Cost Planning Decision Support System Model
DWR	California Department of Water Resources
EBDA	East Bay Dischargers Authority
EBMUD	East Bay Municipal Utility District
EPA	Environmental Protection Agency
ET	Evapotranspiration
ETo	Reference Evapotranspiration
GCM	Global Climate Model
GMP	Groundwater Management Plan
GPCD	gallons per capita per day
gpd	gallons per day
gpf	gallons per flush
gpm	gallons per minute
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
HE	high efficiency
HET	High-Efficiency Toilet
HEU	High-Efficiency Urinal
HHLSM	Hetch Hetchy and Local Simulation Model
HTWTP	Harry Tracy Water Treatment Plant
IPCC	Intergovernmental Panel on Climate Change
ISG	Individual Supply Guarantee
JPA	Joint Powers Authority
kWh	kilowatt hour
Legislature	State of California Legislature
LOS	Level of Service
LVRE	Los Vaqueros Reservoir Expansion
MCL	Maximum Contaminant Level
MG	million gallons
MGD	million gallons per day
MID	Modesto Irrigation District
MMWD	Marin Municipal Water District
MOU	Memorandum of Understanding
MWM	Maddaus Water Management
NAICS	North American Industry Classification System
NIWR	Net Irrigation Water Requirement
PDA	Priority Development Area
PAYS	Pay As You Save
PPIC	Public Policy Institute of California
psi	pounds per square inch
PWSID	Public Water System Identification Number
R-GPCD	residential gallons per capita per day

RCP	Representative Concentration Pathways
RCEC	Russell City Energy Center
REUWS	Residential End Uses of Water Study
RHNA	Regional Housing Needs Allocation
RUWMP	Regional Urban Water Management Plan
RWFP	Recycled Water Facility Plan
RWS	Regional Water System
SB	Senate Bill
SB X7-7	Water Conservation Act of 2009
SGMA	Sustainable Groundwater Management Act
SVCW	Silicon Valley Clean Water
SVWTP	Sunol Valley Water Treatment Plant
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
TID	Turlock Irrigation District
TRVA	Tuolumne River Voluntary Agreement
USBR	United States Bureau of Reclamation
USD	Union Sanitary District
UWMP	Urban Water Management Plan
UWMP Act	Urban Water Management Planning Act of 1983
WCR	Water Conservation Requirements
WPCF	Water Pollution Control Facility
WRWC	Western Recycled Water Coalition
WSAP	Water Supply Allocation Plan
WSCP	Water Shortage Contingency Plan
WSIP	Water System Improvement Program
WUE	Water Use Efficiency
WUO	Water Use Objective
WWTP	Wastewater Treatment Plant

1 INTRODUCTION AND OVERVIEW

This 2020 Urban Water Management Plan (2020 UWMP) has been prepared for the City of Hayward (Hayward) Water System. This chapter describes the purpose of the 2020 UWMP, its organization and implementation, its relationship to supplier grant and loan eligibility, and the California Water Code.

1.1 Description

The 2020 UWMP is a water supply planning and management document, which includes water demand projections, water supply reliability, potential supply interruptions, water conservation planning and implementation, and alignment with other local planning documents. The UWMP connects water supply planning and land-use planning, as well as local and statewide issues such as climate change. It provides a means of sharing information about water management practices with customers, the local community, and the state.

The 2020 UWMP also offers information about management actions such as water shortage contingency planning, necessary infrastructure improvements, emergent connections with neighboring suppliers, water supply reliability related to climate change or regulatory conditions, and opportunities to obtain funding for water management projects. Critical to the composition of the UWMP is collecting and evaluating statewide water supply reliability data to help both the suppliers and the state plan for future risk of drought.

1.2 Urban Water Management Plan Organization

This report is organized into the following chapters:

Chapter 1 – UWMP Introduction and Description – provides a discussion on fundamentals of the UWMP and the newly required lay description.

Chapter 2 – Plan Preparation – describes the processes used for developing the UWMP, including coordination and outreach efforts.

Chapter 3 – System Description – details Hayward's water system, including maps of the service area, a description of the service area and climate, details of the public water system, and an overview of Hayward's organizational structure and history.

Chapter 4 – Water Use Characterization – describes and quantifies current and projected water uses within Hayward's service area.

Chapter 5 – SB X7-7 Baseline and Targets – details compliance with the Water Conservation Act of 2009, including the 2020 per capita target value adopted in the 2015 UWMP, and Hayward's compliance status based on actual 2020 customer water use. Also provided are the target and baseline calculations.

Chapter 6 – Water Supply Characterization – describes and quantifies current and projected potable and non-potable water supplies. Also provided is a narrative description of each supply source and quantification of the supply availability for each source.

Chapter 7 – Water Service Reliability and Drought Risk Assessment – describes Hayward's water system reliability through a 20-year planning horizon for a normal year, single-dry year, and five consecutive dry years. This chapter also includes Hayward's Drought Risk Assessment.

Chapter 8 – Water Shortage Contingency Plan – provides Hayward's plan for addressing water shortages, incorporating prescriptive information and standardized action levels, along with implementation actions in the event of a catastrophic supply interruption.

Chapter 9 – Demand Management Measures – presents Hayward's efforts to promote conservation and to reduce demand on its water supply, including a narrative describing efforts to implement several demand management measures.

Chapter 10 – Plan Adoption, Submittal, and Implementation – describes and documents the steps taken to make Hayward's UWMP publicly available, as well as the steps taken to adopt and submit the UWMP in accordance with the Water Code.

Appendices – A number of appendices, as listed in the Table of Contents, are included to supplement information provided in the main chapters.

1.3 UWMPs in Relation to Other Efforts

Effective water supply planning is best achieved when integrated with other urban planning efforts. To that end, Hayward has incorporated relevant data from the following sources into the UWMP:

- Hayward General Plan (2014), which includes:
  - Climate Action Plan
  - Housing Element
- Economic Development Strategic Plan (2014)
- Water Distribution Master Plan (2014)
- Neighborhood Plans (various times)
- Mission Boulevard Corridor Form-Based Code (2010 and 2014)
- Demand Management Programs (various times)
- Hayward Regional Shoreline Adaptation Master Plan (2021)
- Groundwater Sustainability Plan (in progress)

Demand projections were prepared through an "end use" model that uses historical end use data to establish baseline conditions and incorporates forecasted population and job growth, passive and active conservation savings, unique characteristics relevant to Hayward's development and growth, and other pertinent factors into projecting future water use.

Hayward currently purchases 100% of its potable water supply from the San Francisco Public Utilities Commission (SFPUC); thus, Hayward has coordinated closely with the SFPUC regarding available water supplies in normal and dry years and relied on the water supply information provided by SFPUC.

1.4 UWMPs and Grant or Loan Eligibility

In order for a water supplier to be eligible for any water grant or loan administered by the California Department of Water Resources (DWR), the supplier must have a current UWMP on file that has been determined by DWR to address the requirements of the California Water Code. In addition, these requirements must be maintained by the supplier throughout the term of any grant or loan administered by DWR. A UWMP may also be required to be eligible for other state funding, depending on the conditions that are specified in the funding guidelines.

In addition to other benefits, adoption of this UWMP ensures that Hayward remains eligible for funding assistance.

1.5 Demonstration of Consistency with the Delta Plan for Participants in Covered Actions

In December 2018, the State Water Resources Control Board (SWRCB) adopted amendments to the *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan Amendment)[1] to establish water quality objectives with the stated goal of increasing salmonid populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay-Delta. It remains unclear how or if the Bay-Delta Plan Amendment will be implemented. Hayward relies on the SFPUC for 100% of its potable water supplies and has based its water supply reliability analysis on the information received from SFPUC that assumes implementation of the Bay-Delta Plan Amendment.

1.6 Background and Purpose

The UWMP is the legal and technical water management foundation for supplies throughout California. A well-constructed UWMP provides staff, the public, and elected officials with an understanding of past, current, and future water conditions and management. It integrates local and regional land-use planning, regional water supply, infrastructure, and demand management projects, as well as statewide issues of concern like climate change and regulatory revisions. The UWMP provides a water management action plan that can be referred to as conditions change and management decisions arise. It also can demonstrate the reliability of water supplies and how that might affect local growth and the economy.

Additionally, the UWMP provides DWR, SWRCB, and the State of California Legislature (Legislature) with a representation of water reliability so that a full picture of statewide water reliability may be constructed. It also allows Hayward to characterize conditions to improve its water reliability and drought risk assessments.

The UWMP further provides the opportunity to consider additional options for managing water assets to enhance Hayward's long-term water reliability and other management objectives. This water asset reliability information can allow Hayward to make sound management decisions regarding asset management and infrastructure planning to help mitigate long-term water management conditions attributable to climate change, regulatory change, and local water quality conditions.

The UWMP reflects short-term and long-term land-use planning assumptions and goals, accounts for specific plan and infill development projects over the course of the UWMP planning period, addresses the dynamic nature of water supplies and demands through sound water shortage contingency planning, and informs the state and Hayward's customers about its water management practices.

The 2020 UWMP must provide water supply planning for a 20-year planning period in 5-year increments, identify and quantify adequate water supplies for existing and future demands during normal, dry and drought years, and assure efficient use of urban water supplies. This 2020 UWMP addresses all Water Code requirements for such a plan as shown in the completed DWR UWMP checklist provided in Appendix A.

This 2020 UWMP accomplishes the following:

- Assesses changes in natural hydrology, climate, and groundwater conditions
- Anticipates the implications of regional, state, and federal regulations
- Considers supply conditions and water use variability

[1] SWRCB. (2018).*Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary*, p.17, fn. 14, accessed July 2021: https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf)

- Identifies regional constraints on, or opportunities for, shared water resources
- Integrates local land-use changes, development, plans, and population growth
- Prepares for water shortages and unforeseen emergencies
- Anticipates infrastructure improvements
- Recognizes project funding needs and opportunities

Hayward has utilized the following water-planning fundamentals in preparing the UWMP:

- A detailed look at current and future water use, including assessing and error-checking available baseline data, and examining long-term planning documents like Hayward's General Plan and Specific Area Plans
- Analysis of potable and non-potable water supplies, including water rights and contracts, water deliveries, restrictions on water availability under certain regulatory and hydrological conditions, and other opportunities or limitations
- Analysis of water supply reliability by integrating water use analyses with water supply analyses to provide a water service reliability picture under normal conditions, single dry-year conditions, and five consecutive dry years through at least 2040
- A realistic Drought Risk Assessment (DRA) that includes integrated water supplies and projected water use in a hypothetical five-year drought condition
- An effective Water Shortage Contingency Plan that identifies opportunities to reduce demand and augment supplies under numerous, and even unpredictable, water shortage conditions

1.7 Urban Water Management Planning and the California Water Code

In 1983, the California Legislature enacted the Urban Water Management Planning Act (Act). The law required an urban water supplier[2] to adopt a UWMP every five years demonstrating water supply reliability in a normal year, single-dry year, and multiple-dry years. The original Act also required DWR to provide a report to the Legislature on the status of water supply planning in California.

Since the Act was passed, it has undergone significant expansion and revision. Prolonged droughts, groundwater overdraft, regulatory revisions, and changing climatic conditions not only affect a Supplier's water reliability determinations, but also the broad picture of statewide water reliability overseen by DWR, SWRCB, and the Legislature. Accordingly, the Act has grown to address changing conditions as it guides California's water resource management.

There are numerous additional requirements for the 2020 UWMPs passed by the Legislature that update the 2015 UWMP guidance. Significant new requirements include the following:

- **Five Consecutive Dry-Year Water Reliability Assessment** – The Legislature modified the dry-year water reliability planning from a "multiyear" time period to a "drought lasting five consecutive water years" designation. This statutory change requires a Supplier to analyze the reliability of its water supplies to meet its water use over an extended drought period. This requirement is addressed in the water use assessment presented in Chapter 4, the water supply analysis presented in Chapter 6, and the water reliability determinations in Chapter 7.
- **Drought Risk Assessment** – The Legislature created a new UWMP requirement for drought planning in part because of the significant duration of recent California droughts and the predictions about

[2] A "Supplier" is defined as an entity providing water for municipal purposes to more than 3,000 customers or serving more than 3,000 acre-feet annually.

hydrological variability attributable to climate change. The DRA requires a supplier to assess water supply reliability over a five-year period from 2021 to 2025 that examines water supplies, water uses, and the resulting water supply reliability under a reasonable prediction for five consecutive dry years.

- **Seismic Risk** – The Water Code now requires a Supplier to specifically address seismic risk to various water system facilities and to have a mitigation plan (see Chapter 8). An important aspect of this provision is the intersection of water supply infrastructure planning with a county or regional hazard mitigation plan.
- **Water Shortage Contingency Plan** – In 2018, the Legislature modified the UWMP laws to require a Water Shortage Contingency Plan (WSCP) with specific elements. The WSCP is a document that provides a Supplier with an action plan for a drought or catastrophic water supply shortage. Although the new requirements are more prescriptive than previous versions, many of these elements have long been included in WSCPs, other sections of UWMPs, or as part of a Supplier's standard procedures and response actions (see Chapter 8). Many of these actions were implemented by Suppliers during the last drought to successfully meet changing local water supply challenges. The WSCP also will have statewide utility for DWR, SWRCB, and the Legislature in addressing extreme drought conditions or statewide calamities that impact water supply availability.
- **Groundwater Supplies Coordination** – In 2014, the Legislature enacted the Sustainable Groundwater Management Act to address groundwater conditions throughout California. The Water Code now requires 2020 UWMPs to be consistent with Groundwater Sustainability Plans in areas where those plans have been completed by Groundwater Sustainability Agencies.
- **Lay Description** – The Legislature included a new statutory requirement for Suppliers to include a non-technical description for of the fundamental determinations of the UWMP, especially regarding water service reliability, challenges ahead, and strategies for managing reliability risks.

2 PLAN PREPARATION

Description

This chapter describes the basis of the development of the UWMP; the requirements for preparation; the processes used, including notification, coordination, and outreach; the regional planning involved; and the type of year and units of measure used.

2.1 Plan Preparation

Coordination with city and county land use planning agencies provides information on regional planning, demographics, and expected future development for determining future water use, supply, and reliability assessments. Outreach to interested parties and stakeholders allows those entities to provide information on aspects of the 2020 UWMP. As a city, Hayward has authority for land use planning within its boundaries. Planning staff were consulted in the preparation of the UWMP to ensure a complete representation of potential water demand resulting from land use development. A very small portion of Hayward's water service area is outside the city limits in unincorporated Alameda County. The county was notified of the UWMP preparation, but development in this area is not expected to significantly affect water demand. Section 2.6 further describes Hayward's outreach activities.

2.2 Basis for Plan Preparation

California Water Code Section 10617 defines an urban water supplier as "*a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems.*"[3] In accordance with the California Water Code Section 10621, urban water suppliers are required to prepare a UWMP every five years.[4]

By the above definition, Hayward qualifies as an urban water supplier and has prepared this plan in compliance with state law and following the guidelines as outlined in DWR's *Guidelines for Urban Water Suppliers* guidebook, posted as final in April 2021. This 2020 UWMP is the five-year update to the 2015 UWMP and supersedes its contents.

Public water systems are the distribution systems that provide drinking water for human consumption. All public water systems are given a unique Public Water System Identification Number (PWSID). These systems are regulated by the SWRCB Division of Drinking Water (DDW). The California Health and Safety Code 116275 defines a public water system as "*a system for the provision of water for human consumption through pipes or other*

[3] California State Legislature. (1983). Water Code Section 10617, amended 1996. https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=WAT&sectionNum=10617.

[4] Ibid. (1983). Water Code Section 10621. http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=WAT&sectionNum=10621

constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out of the year."[5] Based on this definition, the City of Hayward is a Public Water System, and therefore operates under a water supply permit issued by DDW.

Table 2-1 lists the name and number of connections reported in this 2020 UWMP.

Table 2-1. Public Water Systems

Submittal Table 2-1 Retail Only: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020
110006	City of Hayward	36,300	5,259
	TOTAL	36,300	5,259

NOTES:

1. The volume of water supplied in Fiscal Year 2019/2020 (July 1, 2019 - June 30, 2020) was sourced from SFPUC (5,082 MG) and recycled water (177 MG). The number of connections is the number of active connections, as of June 2020.
2. Beginning with the 2020 UWMP, Hayward will not be including deliveries of secondary treated wastewater to RCEC in its recycled water totals. This decision is further explained in Section 6.2.5

2.3 Regional Planning

Regional planning can deliver mutually beneficial solutions to all agencies involved by assessing water resources at the appropriate geographic scale, allowing for solutions that cross jurisdictional boundaries, and reducing costs for the individual agency. In support of regional UWMPs and regional water conservation targets, the UWMP portion of the Water Code provides mechanisms for participating in area-wide, regional, watershed, or basin-wide urban water management planning.

Hayward recognizes the value in regional water supply planning and, to the extent practicable, has participated in regional efforts to improve and diversify water supplies. Hayward is an active member of the Bay Area Water Supply and Conservation Agency (BAWSCA), which was created in May 2003 to represent the interests of the 26 member agencies in Alameda, Santa Clara and San Mateo counties that purchase water on a wholesale basis from SFPUC. BAWSCA agencies cooperatively implement water conservation programs, communicate with SFPUC regarding maintenance, operation, and improvement of the SFPUC's Regional Water System (RWS), and as appropriate, jointly pursue development of water supplies.

In addition to BAWSCA, Hayward actively participates in other regional planning efforts. As the Groundwater Sustainability Agency for the portion of the East Bay Plain Groundwater Subbasin that underlies the city, Hayward is collaborating with East Bay Municipal Utility District (EBMUD) to prepare a single Groundwater Sustainability Plan (GSP) for the Basin. Hayward also takes part in the Bay Area Integrated Regional Water Management Plan (BAIRWMP), the Western Recycled Water Coalition (WRWC), Bay Area Clean Water Agencies (BACWA), and other multi-agency efforts to increase and diversify water supplies.

2.4 Individual or Regional Planning and Compliance

While Hayward supports and participates in regional water supply planning, it has opted to prepare an individual UWMP for its service area. Individual UWMPs address all requirements of the Water Code including water use

[5] Ibid. (1995). Health and Safety Code Section 116275. https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=HSC&sectionNum=116275.

targets and baselines (for SB X7-7 Water Conservation Act of 2009 reporting). Hayward has notified and coordinated with the appropriate regional agencies and constituents.

Table 2-2 defines the type of plan for this 2020 UWMP.

Table 2-2. Plan Identification Type

Submittal Table 2-2: Plan Identification			
Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance**
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☐	Water Supplier is also a member of a Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**		

2.4.1 Regional UWMP

A group of suppliers agreeing among themselves to plan, comply, and report as a region on the urban water use target requirements of SB X7-7 is referred to as a Regional Alliance. A Regional Alliance allows water suppliers to work toward cooperatively developing programs and meeting regional water conservation targets, but not necessarily submitting a Regional Plan. Since Hayward opted not to join a Regional Alliance, this section does not apply.

2.5 Fiscal or Calendar Year and Units of Measure

Hayward reports on a fiscal year basis rather than calendar year, and therefore has opted to include the water use and planning data on a fiscal year basis – July 1 through June 30. In addition, Hayward utilizes million gallons (MG) throughout this plan as the unit of measure when reporting water volume.

Table 2-3 provides agency identification information, type of year reporting, and units of measure used by Hayward to report water data and assessments.

Table 2-3. Supplier Identification

Submittal Table 2-3: Supplier Identification	
Type of Supplier (select one or both)	
☐	Supplier is a wholesaler
☑	Supplier is a retailer
Fiscal or Calendar Year (select one)	
☐	UWMP Tables are in calendar years
☑	UWMP Tables are in fiscal years
If using fiscal years provide month and date that the fiscal year begins (mm/dd)	
07/01	
Units of measure used in UWMP (select from drop down)	
Unit	MG

2.6 Coordination and Outreach

This section describes the coordination and outreach efforts of Hayward during preparation of the 2020 UWMP.

2.6.1 Wholesale and Retail Coordination

When a water supplier relies upon a wholesale agency for its water supply, both suppliers are required to provide each other with information regarding projected water supply and demand. Retail agencies that receive their water supply from one or more wholesalers are required to provide their wholesaler(s) with the retail agency's projected water demand from that source in 5-year increments for 20 years or as far as possible based on the data available.

During the preparation of the 2020 UWMP, Hayward coordinated information regarding projected water supply and demand with its water supplier, SFPUC, as listed in Table 2-4. Hayward provided SFPUC with information regarding projected water demand for the next 20 years, in 5-year increments, as reported in Chapters 4 and 6 of this UWMP and as documented in Table 2-4. Coordination with SFPUC was facilitated by BAWSCA to maintain consistency among its member agencies in terms of information about SFPUC supplies. More information about coordination and notification efforts can be found in Chapter 10.

Table 2-4. Water Supplier Information Exchange

Submittal Table 2-4 Retail: Water Supplier Information Exchange
The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.
Wholesale Water Supplier Name
San Francisco Public Utilities Commission

2.6.2 Coordination with Other Agencies and the Community

In January 2021, notices of preparation and intent to update the UWMP were sent to the applicable agencies as required through email more than 60 days in advance of the public hearing. A copy of the notice is in Appendix F and was sent to the following entities:

- The 25 other BAWSCA member agencies, which share a common wholesale water source
- East Bay Dischargers Authority (EBDA), a joint powers authority represented by five agencies that dispose treated wastewater through a common outfall to San Francisco Bay. Hayward owns and operates its own wastewater treatment facility and is a member of EBDA.
- EBMUD, which provides water to a small portion of the City of Hayward and shares the East Bay Plain Groundwater Subbasin with Hayward
- The Hayward Area Park and Recreation District, which provides service to Hayward and surrounding communities
- Alameda County, as a small number of county residents outside of the Hayward city limits are served by the Hayward Water System

In addition to providing the notice of intent to update its UWMP to the above entities, Hayward notified applicable surrounding water districts through email more than 60 days prior to the public hearing.

Notification to the general public was published in *The Daily Review*, the local newspaper with the largest circulation in Hayward, for two successive weeks, as per DWR requirements (14 days and 7 days in advance of the public hearing). Copies of the notice can be found in Appendix G of this UWMP. Notification was also posted at City Hall, in Hayward public libraries, on the cable television public access channel, and on the City's website.

On July 20, 2021, Hayward convened the public hearing at its regular meeting to receive comments on the 2020 UWMP. After comments were received, the UWMP and WSCP were adopted and then submitted to the California Department of Water Resources. Prior to the hearing, copies of the draft 2020 UWMP were available for public review and comment at the Hayward City Hall, public libraries, and on the City of Hayward's website.

Prior to and during the preparation of the plan, Hayward encouraged the active involvement of diverse social, cultural, and economic elements of its population within the service area through public noticing.

2.6.3 Notice to Cities and Counties

The California Water Code 10621(b) requires that agencies notify the cities and counties they serve water to that the 2020 UWMP is being updated and reviewed. The California Water Code specifies this must be done at least 60 days prior to the public hearing. The City of Hayward owns, operates, and governs its own municipal water system, so formal notice was not issued to Hayward. As noted in Section 2.6.2, written notice was provided to Alameda County in accordance with requirements.

The full list of cities and counties to which Hayward sent the 60-day notification is reported in Table 10-1 in Chapter 10 of this UWMP.

3 SYSTEM DESCRIPTION

Description

This chapter describes Hayward's water system, service area, climate, projected population, and other factors that might affect water management planning. It also discusses potential uncertainties, such as the potential impacts of climate change.

3.1 General Description

Hayward occupies an area of about 64 square miles, of which 18 square miles are submerged under water. It is located in Southern Alameda County on the east shore of the San Francisco Bay, 25 miles southeast of San Francisco, 14 miles south of Oakland, 26 miles north of San Jose, and 10 miles west of the valley communities surrounding Pleasanton. Hayward is surrounded by the unincorporated communities of San Lorenzo and Castro Valley in the north, Union City in the south, Pleasanton in the east and the San Francisco Bay to the west. Most of Hayward is generally flat, except for the areas east of Mission Boulevard, where the elevation increases from 100 to 1,500 feet above sea level.

Settlement in the Hayward area began around 1851 with the opening of a general store in what is now the downtown area. The City of Hayward was incorporated in 1876 and remained essentially a small agrarian town until the end of World War II. Since then, Hayward has undergone substantial changes. A major increase in population occurred in the 1950s and 1960s as a result of the post-war construction boom. Hayward experienced a surge in industrial development during the 1960s and 1970s, which created employment opportunities and balanced, to some extent, the housing that was developed in earlier decades. During the last four decades, Hayward has seen continued residential and industrial growth, mostly in the form of infill development and annexation of unincorporated "island" areas. Today Hayward enjoys a large and diverse industrial sector, including food and beverage and high-technology manufacturing, along with a growing number of biotechnology firms.

Water service is provided by Hayward for residential, commercial, industrial, governmental, and fire suppression uses. Wells were originally used to supply Hayward with water. During the 1940s and 1950s, the well water was supplemented by water purchased from the SFPUC RWS. In 1962, Hayward entered into an agreement with SFPUC to purchase all Hayward water from SFPUC. Hayward constructed over 20 miles of aqueduct in order to deliver RWS water and ceased providing well water in 1963.

The City of Hayward is governed by a Council-Manager form of government. As a public water system, owned and operated by Hayward, the City Council also directs matters related to the municipal water system. The Hayward City Council is comprised of six elected councilmembers and a directly elected Mayor.

3.2 Service Area Boundary Maps

Figure 3-1 and Figure 3-2 show an overview of Hayward's service area. While there have been no significant changes to the service area since the 2010 UWMP, Hayward and EBMUD completed a service area adjustment in 2016 to accurately reflect the water service providers for several properties. Note that an electronic service area map will be submitted online.

Figure 3-1. Potable Water Service Area

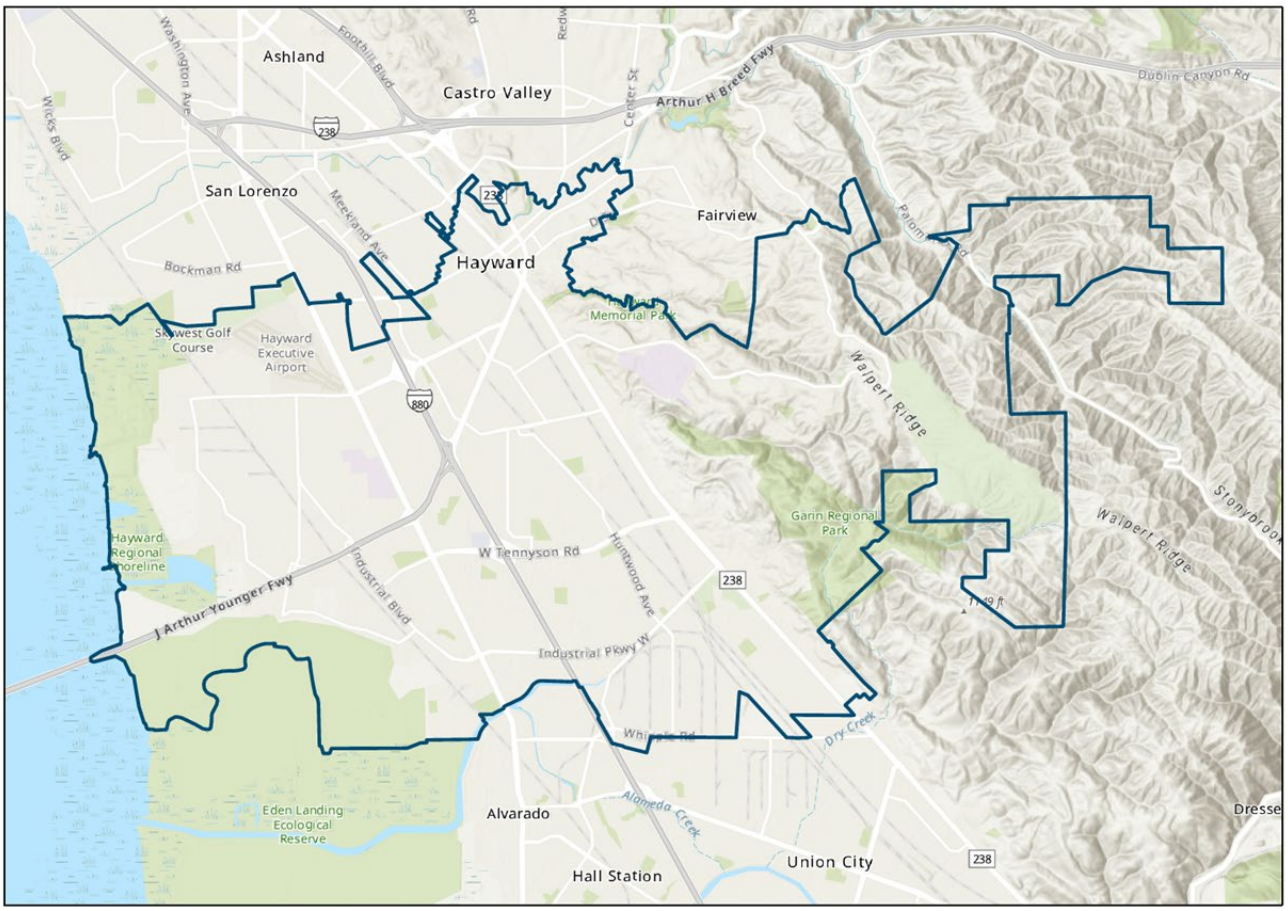
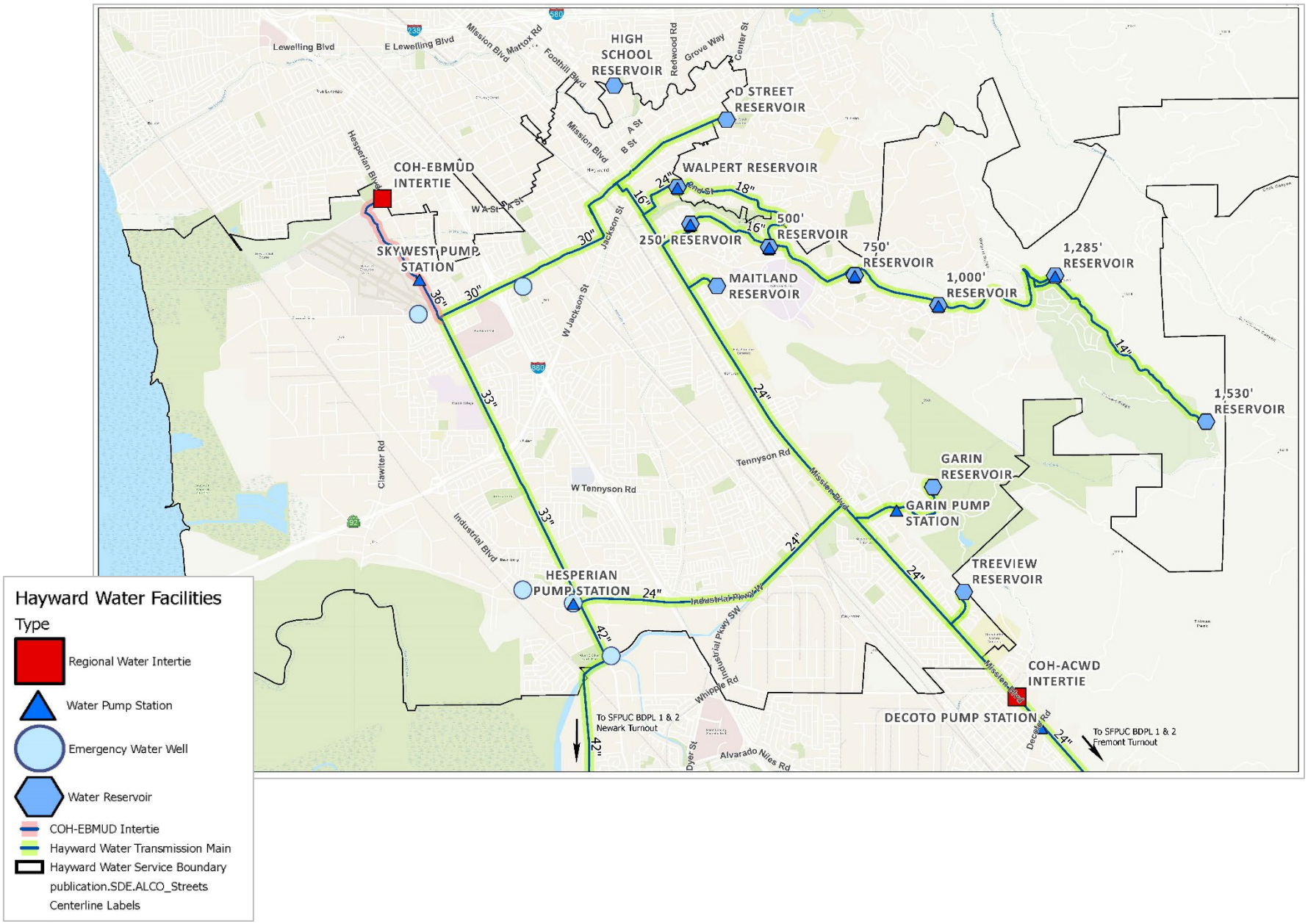


Figure 3-2 provides further details regarding Hayward's water system and infrastructure. Hayward's recycled water system map is included in Chapter 6, Section 6.6.3 – Recycled Water System. Since Hayward does not have a Raw Water Distribution System, the jurisdictional boundary mirrors the service area, and the service area changes since the 2015 UWMP were insignificant, no such figures have been included here.

Figure 3-2. Public Water System



3.3 Service Area Climate

Hayward has a Mediterranean coastal climate with mild, dry summers and cool winters. Most of the precipitation is received during the winter months with only very occasional summer showers. Banks of fog often move inland during summer nights from the Pacific Ocean and evaporate during the day. The total water consumed in Hayward is moderately influenced by precipitation and temperature.

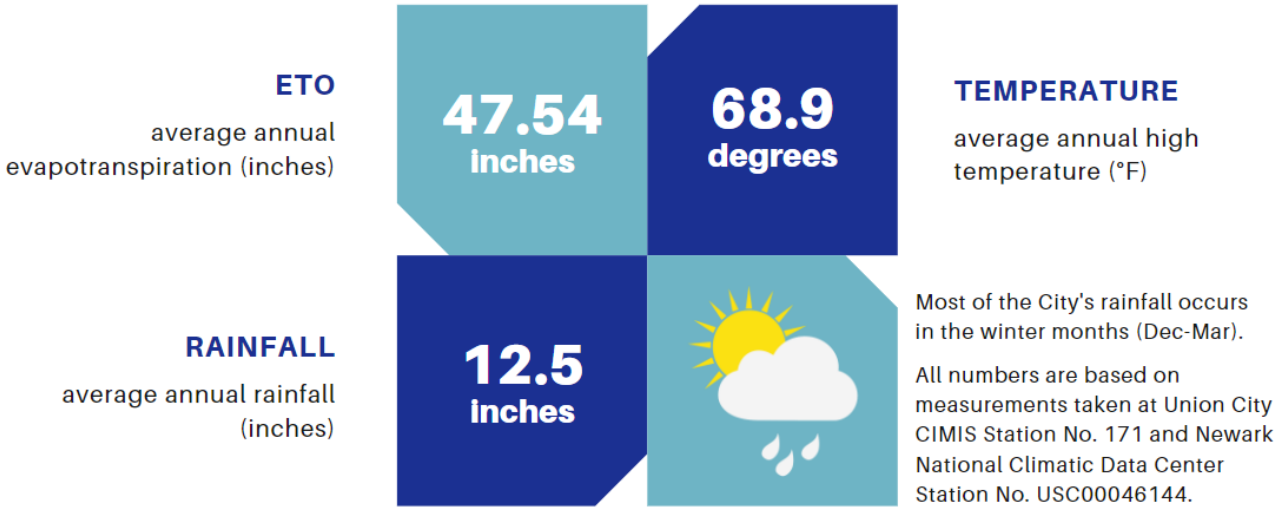
Table 3-0 illustrates average evapotranspiration (ETo), rainfall, and temperature data. ET is the loss of water to the atmosphere by the combined processes of evaporation (from soil and plant surfaces) and transpiration (from plant tissues) and is an indicator of how much water is needed for healthy growth and productivity of crops, gardens, and trees. ETo refers to evapotranspiration as measured from a grass surface. The ETo data is from the Calendar Year 2020. Rainfall and temperature data is based on a 10-year average from 2010 to 2020 in order to illustrate typical conditions.

Table 3-0. Climate Data

Table 3-0: Climate Data				
Month	Standard Monthly Average ETo (inches)[1]	Average Rainfall (inches)[2]	Average Min Temperature (Fahrenheit)[2]	Average Max Temperature (Fahrenheit)[2]
Jan	1.31	2.3	43.0	58.8
Feb	2.69	2.0	45.6	61.8
Mar	2.99	1.7	48.0	64.4
Apr	4.31	1.2	50.6	67.5
May	6.08	0.3	53.8	70.0
Jun	6.88	0.0	56.7	75.5
Jul	6.82	0.0	57.9	76.6
Aug	5.67	0.0	58.5	76.6
Sep	4.01	0.1	57.7	77.5
Oct	3.39	0.5	54.1	74.2
Nov	1.86	1.5	46.8	64.8
Dec	1.53	2.8	43.0	58.7
Annual	**47.54**	**12.5**	**51.3**	**68.9**

[1] Source: California Irrigation Management Information System (CIMIS), State of California Department of Water Resources, CIMIS Data, January 1, 2020 - December 31, 2020, taken at Union City Station #171.
[2] Source: 10-Year Monthly Climate Summary for National Climatic Data Center, station based in Newark, CA, 2010 to 2020. Station number: USC00046144.

Figure 3-3. City of Hayward Climate Characteristics



3.3.1 Climate Change Impacts on Water Demands, Supplies, and Reliability

According to the National Academy of Sciences, climate change refers to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer).[6] Climate change may result from:

- Natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun.
- Natural processes within the climate system (e.g., changes in ocean circulation).
- Human activities that change the atmosphere's composition (e.g., through burning fossil fuels) and the land surface (e.g., deforestation, reforestation, urbanization, desertification, etc.).

Climate change has the potential to directly impact Hayward's surface water supply and indirectly impact groundwater supplies. Hayward is committed to adapting to climate change in a manner that protects the water resources for maximum benefit while continuing to maintain a reliable, affordable, high-quality water supply. Several potential effects of climate change have been identified by the scientific community, including reduced winter snowpack, more variable and extreme weather conditions, shorter winters, and increased evaporative demand. Additionally, climate change could affect water quality through increased flooding and erosion; greater concentration of contaminants, if any, in the water supply; and warmer water, which could lead to increased growth of algae and other aquatic plants. Rising sea level and increased flooding are also potential effects of climate change.

Changes in precipitation, temperature, and atmospheric carbon dioxide affect crop ETo and net irrigation water requirements (NIWRs). Global climate models (GCMs) have been used to project future climate change and impacts on crop water demands. Future conditions of warm-dry, warm-wet, hot-dry, hot-wet, and central tendency were used. Three future periods for these five conditions were selected to project climate change effects and impacts, including the 2020s (2010-2039), 2050s (2040-2069) and 2080s (2070-2099). Changes in precipitation timing and amounts could result in greater or lesser irrigation requirements to meet ETo demands.

Additional Resources for Water Resources Planning for Climate Change

Much work has been done at state and regional levels to evaluate the effects and impacts of climate change and to develop strategies to support effective statewide, regional, and local water management in the future.

[6] https://www.nationalacademies.org/topics/climate

The following resources provide additional information describing water resources planning for climate change:

- Progress on Incorporating Climate Change into Planning and Management of California's Water Resources. California Department of Water Resources Technical Memorandum, July 2006. (DWR, 2006)
- Climate Change and Water. Intergovernmental Panel on Climate Change, June 2008. (IPCC, 2008)
- Managing An Uncertain Future: Climate Change Adaptation Strategies for California's Water. California Department of Water Resources Report, October 2008. (DWR, 2008)
- 2009 California Climate Change Adaptation Strategy. California Natural Resources Agency Report to the Governor, December 2009. (CNRA, 2009)
- Climate Change and Water Resources Management: A Federal Perspective. U.S. Geological Survey, 2009. (USGS, 2009)
- Managing an Uncertain Future. California Water Plan Update 2009. Volume 1, Chapter 5, March 2010. (DWR, 2010a)
- Climate Change Characterization and Analysis in California Water Resources Planning Studies. California Department of Water Resources Final Report, December 2010. (DWR, 2010b)
- Climate Change Handbook for Regional Water Planning. Prepared for U.S. Environmental Protection Agency and California Department of Water Resources by CDM, November 2011. (CDM, 2011)
- Climate Action Plan—Phase 1: Greenhouse Gas Emissions Reduction Plan. California Department of Water Resources, May 2012. (DWR, 2012)
- Climate Change and Integrated Regional Water Management in California: A Preliminary Assessment of Regional Perspectives. Department of Environmental Science, Policy and Management, University of California at Berkeley, June 2012. (UCB, 2012)
- Managing an Uncertain Future. California Water Plan Update 2013, Volume 1, Chapter 5, October 2014. (DWR, 2014)
- West-Wide Climate Risk Assessments: Irrigation Demand and Reservoir Evaporation Projections, Technical Memorandum No. 86-68210-2014-01, U.S. Bureau of Reclamation, 2015. Available at https://www.usbr.gov/watersmart/baseline/docs/irrigationdemand/irrigationdemands.pdf. (USBR, 2015)
- California Climate Adaption Planning Guide. California Natural Resources Agency. Available at https://resources.ca.gov/CNRALegacyFiles/docs/climate/01APG_Planning_for_Adaptive_Communities.pdf. (CNRA, 2012)
- Perspectives and Guidance for Climate Change Analysis. California Department of Water Resources Climate Change Technical Advisory Group. (DWR, 2015)
- *San Francisco Bay Area Summary Report*, California's Fourth Climate Change Assessment. Available at https://www.climateassessment.ca.gov/. (Ackerly et al., 2018)

3.4 Service Area Population, Demographics, and Socioeconomics

Suppliers are required to report their current and projected service area populations. The Water Code does not require a specific methodology for projecting future populations, but it does require that the estimates of future population be based upon data from state, regional, or local service agency population projections.

3.4.1 Service Area Population

The vast majority of the City of Hayward is served water by the Hayward Water System. A very small portion of north Hayward, less than 3% of Hayward's total population, is served by EBMUD. A similarly small portion of unincorporated Alameda County, outside of Hayward city limits, is served by the Hayward Water System.

Based on the California Department of Finance's (DOF) estimate for January 1, 2020, Hayward's residential population stood at just over 160,000. Table 3-1 uses the DOF population figure for 2020. However, Hayward did not find any of the currently available regional projections of future population to be truly representative of Hayward's potential growth and the transformation that is under way. A commonly used source, the Association of Bay Area Governments (ABAG) projections, is updated periodically and tends to vary in the long term with each update due to changes in the economy, housing markets, job growth, and other unpredictable factors.[7] As a result, Hayward determined that a city-centric study would be more appropriate.

Utilities master plan documents by design must account for all potential growth over a lengthy planning horizon to ensure that infrastructure will meet demand. One of the most recent such documents was Hayward's Wastewater Collection System Master Plan, prepared in 2014, which estimated that residential flow would increase by 2.2% per year. While Hayward recognizes that several factors can affect this flow increase, population is one of the main drivers; therefore, Hayward considered this estimate to be a reasonable and appropriate means of forecasting future water demand. The Water Distribution System Master Plan, developed around the same time, was not used because it relied in part on demand projections included in the now very outdated 2010 Urban Water Management Plan.

While the actual population growth may or may not reach the estimates in Table 3-1, they more accurately reflect changes in Hayward, including a higher amount of developable land, recent unprecedented housing and commercial development, and availability and affordability of older housing stock that will be rehabilitated, including installation of some drought tolerant landscaping where no landscaping currently exists. It is critical that water demand projections encompass the total anticipated usage to plan for sufficient supplies and reliable infrastructure.

It is important to note that Hayward's residential per capita water use is one of the lowest among SFPUC's wholesale customers and, in fact, in the state. During the 2014-17 drought, Hayward's assigned required cutback from the state was 8%; however, Hayward achieved a peak reduction of 23%, among the highest differences between assigned and achieved cutbacks in the state. The community's tradition of exemplary water stewardship will continue during years of both normal supplies and drought. Even with increased growth, Hayward expects to maintain per capita use rates that reflect this commitment.

While Hayward's population projections contained in the 2020 UWMP are based on reasonable assumptions given the available options, Hayward recognizes that soon-to-be-available data, including economic impacts from COVID-19 restrictions, updated ABAG projections that include the Regional Housing Needs Allocation (RHNA) for cities, and release of the 2020 United States Census information, could impact water demand projections. For these reasons, Hayward plans to update its water demand study when additional population and job growth information is available. Depending on the outcome of this work, Hayward may amend its 2020 UWMP before the next update is due.

[7] https://abag.ca.gov/our-work/land-use/forecasts-projections

Table 3-1. Retail Population – Current and Projected

Submittal Table 3-1 Retail: Population - Current and Projected					
Population Served	2020	2025	2030	2035	2040
	160,311	181,700	202,600	225,800	251,800

NOTES:

1. Source for 2020 population is the California Department of Finance table E-5 estimate for 2020.
2. 2025 population and forward estimates based on Hayward's Wastewater Collection System Master Plan.
3. Projected population values are rounded to the nearest 100.

3.4.2 Other Social, Economic, and Demographic Factors

Social, economic, and demographic factors in Hayward's service area can affect water management and planning. The water demand projections presented in the UWMP are based, in part, on population and business trends developed by ABAG, combined with Hayward's knowledge of development forecasts and General Plan policies and strategies. A full discussion of specific demographic and development issues affecting water use is contained in Chapter 4, Water Use Characterization. The following paragraphs briefly summarize demographic and economic trends in Hayward.

Hayward's residential population is among the most culturally and economically diverse in the state. Following are some of the key economic and housing factors that may affect water use:

- Median household income is $87,000.
- Per capita income is $34,000.
- Percentage of population at or below the poverty level is 8.4%.
- Unemployment rate (as of May 2021) is 6.1%.[8]
- Median home value is just over $700,000.
- Approximately 50% of housing units are owner-occupied.
- About 70% of housing units were constructed prior to 1980.
- Median rent is $1,825/month.

Over the next 20 years, development of new housing, intensification of existing residential areas, and construction of larger homes will result in increased residential water demand. The majority of residential growth is expected to occur in Priority Development Areas (PDAs) for which specific, form based, or area plans have been adopted. Water use also will be impacted by development of the Route 238 right-of-way properties, a 350-acre noncontiguous area originally purchased by the state to accommodate construction of the Route 238 bypass. With the bypass project no longer planned, Hayward prepared the Route 238 Bypass Land Use Study to identify residential development potential for these properties.

Residential water use also will be impacted by rehabilitation of older homes, which are being purchased and remodeled. This will include installation of water-efficient landscaping where little or no irrigated landscaping currently exists, which will use some water even though the use of native and low-water plants and installation of water-efficient irrigation systems will be encouraged.

Hayward's post-secondary educational institutions are sources of significant non-residential populations, as many of the students commute to the campuses to attend classes while residing in other cities. These student

[8] Bureau of Labor Statistics – Oakland-Fremont-Hayward, May 2021. https://www.bls.gov/eag/eag.ca_oakland_md.htm

populations are not incorporated into Hayward's population projections; however, water use related to increased enrollment and construction of additional facilities is included in the demand projections.

Institutional water use is impacted by three higher education campuses located in Hayward, all of which continue to implement long-range master plans to increase enrollment and develop their academic programs and facilities. California State University East Bay (CSUEB) has long had its main campus in Hayward, has a current student population of 13,600, and intends to add substantially more student and faculty housing facilities. Chabot College, a regional community college with a student population of 13,000, updated its Facilities Master Plan in 2018 and projects that enrollment will increase at a rate of about 0.5% per year to 15,000 students in 2030. Life Chiropractic College West, a smaller college than the two public institutions, is growing and plans to nearly triple its student population.

Regarding industrial and commercial water use, ABAG Projections 2040[9] estimates a nearly 12% increase in the number of jobs in Hayward between 2020 and 2040, with a significant portion of the new employment occurring in the manufacturing/wholesale and health/education fields. Smaller overall increases are expected in the retail and professional services. Hayward is currently home to nearly 10,000 businesses of varying sizes. Hayward's Economic Development policies, specified in the 2014 General Plan and Economic Development Strategic Plan, include a number of policies to diversify the Hayward's economic base and support entrepreneurship and innovation.

3.5 Land Uses within Service Area

There are approximately 64 square miles of land within Hayward city limits, of which about 18 square miles are submerged under water. The primary land uses in the developed portions of Hayward are residential, industrial, and commercial. Hayward also has a significant amount of open space, including parks and baylands.

Because the Hayward Water System is owned and operated by the city, coordination with Hayward's Planning Department is ongoing and proactive. Utilities staff regularly participate in meetings with developers, provide input into water supply and distribution issues and requirements, as well as documents such as the General Plan and specific area plans. Planning staff provided information regarding current and future land use and development and redevelopment potential within the water service area.

Key planning resources used to develop water demand projections included the General Policies Plan (adopted in 2014), which incorporates Hayward's Housing Element and Climate Action Plan; Neighborhood Plans (various years); and the Mission Boulevard Corridor Form-Based Code (2010 and 2014).[10] Other working documents, such as the Development Dashboard, were used to identify current development proposals and non-residential development trends. This information is synthesized in detail in the "Development Factors Affecting Water Demand" discussion in Section 4.2.6. In general, land use designations have not substantially changed since the 2015 UWMP was adopted.

[9] https://abag.ca.gov/our-work/land-use/forecasts-projections

[10] https://www.hayward-ca.gov/your-government/documents/planning-documents

4 WATER USE CHARACTERIZATION

Description

The Water Code requires a description and quantification of water uses within the agencies' service area. This chapter describes and quantifies Hayward's past, current, and future water use projections through the year 2040, to the extent that records are available. Future water use is based on Hayward's past and current water use, combined with considerations of anticipated growth, new regulations, changing climate conditions, and trends in customer water use behaviors. A thorough analysis examined each water use sector for a variety of factors, then aggregated the information into a comprehensive projection of customer water use. Information from this chapter and Chapter 6 have been used to prepare the reliability assessments in Chapter 7. Also presented in this chapter is a summary of the drinking water pressurized distribution system water losses (i.e., leakage from pipes, under-registering meters, etc.).

4.1 Non-Potable Versus Potable Water Use

In 2021, Hayward will complete construction of Phase 1 of its Recycled Water Project that will deliver tertiary treated recycled water for irrigation uses within an approximately two-mile radius of the Hayward Water Pollution Control Facility (WPCF). Hayward expects to deliver about 73 MG per year from this project, to be used for irrigation. Table 4-3 summarizes total water use projections, including recycled water. The remainder of water used in Hayward is potable water purchased from SFPUC.

Hayward also delivers secondary treated wastewater from the WPCF to the Russell City Energy Center (RCEC), located adjacent to the WPCF. The RCEC further treats the wastewater to tertiary standards and uses it as cooling water in its energy production process. Hayward has opted not to include this usage as recycled water in this UWMP.

A full discussion of recycled water and its potential for use in the Hayward service area is included in Chapter 6.

4.2 Past, Current, and Projected Water Use by Sector

The demand model used to prepare the projections is known as the Least Cost Planning Decision Support System Model (DSS Model). The DSS Model was used to project long-term demands through 2040 based on expected service area growth for both population and employment. Demand forecasts were developed for Hayward to account for conservation from passive (i.e., from codes/standards) and active conservation programs. Hayward conservation measures are discussed in Chapter 9, Demand Management Measures (DMMs). BAWSCA also evaluated conservation measures for potential future regional implementation.

For the demand analysis, Hayward provided metering data from 1995 through 2018, water rates, water use sectors, monthly water consumption and water conservation, and additional information for historical and projected use analyses. This data was used to determine past, current, and projected water use for its eight water use sectors, in five-year increments through 2040. As shown in Table 4-1, in fiscal year 2020, water use in Hayward totaled 5,082 million gallons of potable water.

In 2020, Hayward's water consumption was distributed to customer sectors as follows:

- 37.1% to single-family residential
- 17.8% to multi-family residential
- 7.6% to commercial
- 7.4% to institutional
- 13.7% to industrial
- 12.7% to irrigation
- 0.3% to other uses
- 3.4% to losses

4.2.1 Water Use Sectors Listed in Water Code

The following water use sectors are listed in the Water Code. Additional information is included as needed to reflect Hayward's unique conditions.

Single-Family Residential

This is defined as a single-family dwelling unit or a lot with a free-standing building containing one dwelling unit that may include a detached secondary dwelling. Hayward's single-family residential housing category includes any residence with 1-4 dwelling units. It is a mix of single-family detached, condominiums, duplexes up to fourplexes, and townhomes.

Multi-Family

This is defined as multiple dwelling units contained within one building or several buildings within one complex. Hayward's multi-family category includes any building with 5 or more dwelling units. This category also includes mobile homes.

Commercial

This is defined as a water user that provides or distributes a product or service. Commercial businesses in the Hayward service area include a typical mix of office-type services, specialty and big box retail stores, auto dealerships, eating establishments, hotels and motels, and a regional shopping center. Churches and non-profit organizations are also included in this sector.

Industrial

This is defined as a water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System (NAICS) code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development. The following link is to the NAICS website: https://www.census.gov/naics/. Hayward has a diverse industrial sector, including food and beverage manufacturing, high-technology research and manufacturing, biotechnical research and development, and a wide range of other businesses.

Institutional/Governmental

This is defined as a water user dedicated to public service. This type of user includes higher-education institutions, schools, courts, and government facilities. Hayward is home to two regional public post-secondary educational institutions, CSUEB and Chabot Community College, both of which have student populations in the range of 13,000 to 14,000. Hayward is also the site of Life Chiropractic College West, a private educational institution in Hayward's industrial corridor. Life Chiropractic has a current enrollment of about 600 students, and its Strategic Plan for 2019-2025 envisions growing enrollment through 2025.

Landscape

This is defined as water connections supplying water solely for landscape irrigation. Such landscapes may be associated with multi-family, commercial, industrial, or institutional/governmental sites, but are considered a separate water use sector if the connection is solely for landscape irrigation.

Sales to Other Agencies

These are defined as water sales made to other agencies. Hayward does not currently participate in water sales to other agencies; therefore, this section is not applicable.

Groundwater Recharge

This is defined as the managed and intentional replenishment of natural groundwater supplies using man-made conveyances such as infiltration basins or injection wells. Hayward does not currently perform groundwater recharge; therefore, this section is not applicable. However, as part of Groundwater Sustainability Plan development discussed in Section 6.2.2, groundwater options may be evaluated.

Saline Water Intrusion Barrier

This is defined as the injection of water into a freshwater aquifer to prevent the intrusion of saltwater. Hayward does not have a saline water intrusion barrier; therefore, this section is not applicable.

Agricultural

This is defined as water used for commercial agricultural irrigation. Hayward does not have any agricultural irrigation; therefore, this section is not applicable.

Distribution System Water Loss

Distribution system water losses (also known as “real losses”) are the physical water losses from the water distribution system and storage facilities, up to the point of customer consumption. See Section 4.2.4 for further details.

4.2.2 Water Use Sectors in Addition to Those Listed in Water Code

The water use sectors described below are not specifically listed in nor required by the Water Code.

Exchanges

Hayward does not participate in any exchanges; therefore, this section is not applicable.

Surface Water Augmentation

Hayward does not participate in surface water augmentation; therefore, this section is not applicable.

Transfers

Hayward does not participate in any transfers; therefore, this section is not applicable.

Wetlands or Wildlife Habitat

Hayward does not manage a wetlands or wildlife habit program; therefore, this section is not applicable.

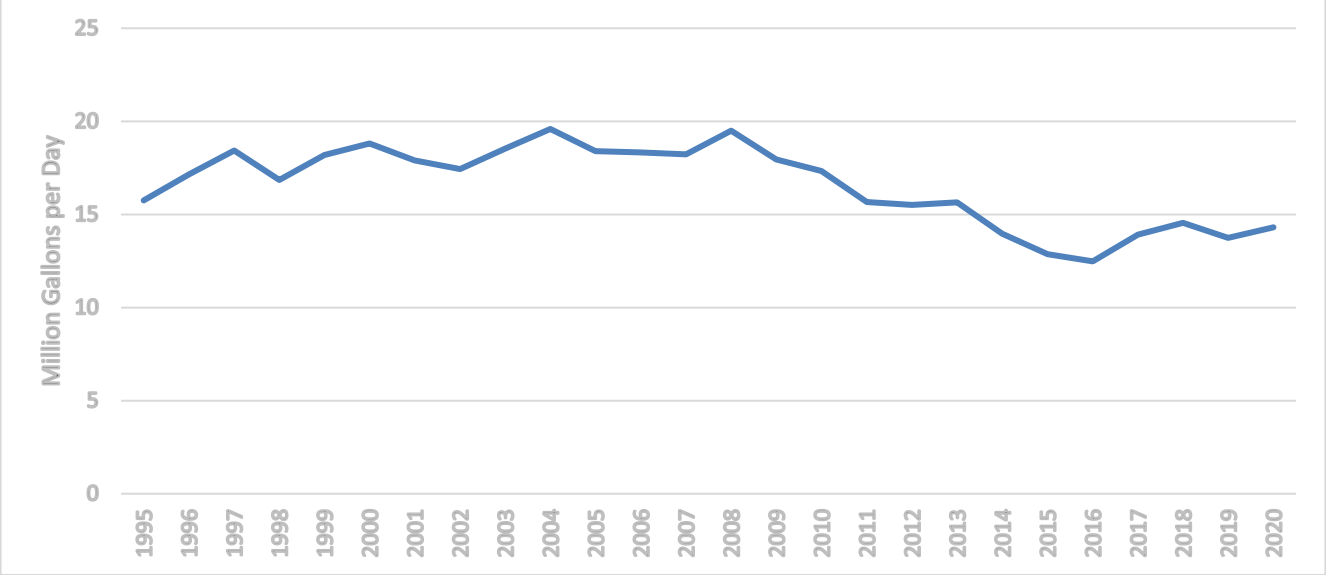
Other

Hayward has no other sectors or subdivisions; therefore, this section is not applicable.

4.2.3 Past Water Use

Hayward's historical water use is part of the data that was used for the DSS Model and for BAWSCA's Demand Study, which identify demand and conservation projections through 2045. For the purpose of the UWMP, demands out to 2040 are used. The DSS Model analyzed historical data from 1995–2018 to assess the impacts of certain factors (e.g., water rates, economic conditions, and weather) on water demands.

Figure 4-1. City of Hayward Historical Water Demand in Million Gallons per Day



4.2.4 Distribution System Water Loss

In the 2020 UWMP, distribution system water loss for each of the five years preceding the plan update must be reported (Water Code Section 10631(d)(3)) in accordance with the rules adopted pursuant to Water Code Section 10608.34. Hayward used the values calculated in the American Water Works Association (AWWA) worksheet and submitted them to DWR for each of the prior five years to complete Table 4-5.

Hayward has a longstanding and active commitment to monitoring and addressing distribution system water losses. Historically, non-revenue water has been a relatively small percentage in relation to total water deliveries, typically between 6% and 9% of total water system input. However, this percentage increased beyond an acceptable level in 2010, prompting Hayward to take action.

In order to better understand the nature of non-revenue water, Hayward completed its first detailed Water Audit and Component Analysis of Real and Apparent Losses in 2011, utilizing the AWWA methodology. This method uses known factors, such as system input volume, authorized consumption, and revenue water, to determine water losses. These losses are further categorized as:

- Apparent losses – Due to meter inaccuracies, data errors and theft. The water is consumed but is not properly measured and accounted for.
- Real losses – Due to system leaks and breaks.
- Non-revenue water – Due to unbilled authorized uses such as fire suppression and hydrant flushing.

This first water audit completed by Hayward in 2011 indicated real losses of about 14% based on 2009 data. Although this was somewhat of an estimate because the information needed for more precise calculations was

not available, the percentage was significant enough to initiate immediate and aggressive action. A comprehensive leak detection and repair effort was implemented to locate leaks through the distribution system, including all service connections. Also, since some of the loss potentially resulted from high system pressure in certain locations, a pressure management program was put in place.

Through these efforts and other measures, real losses have been reduced significantly. The Water Audit for calendar year 2019 indicates total losses, apparent and real, of 89.714 million gallons, with 2.0% of non-revenue water as percent by volume of the total "Water Supplied." Later in this section Table 4-5 (DWR Submittal Table 4-4) lists results of the Water Audit for the most recent five years of water loss data. Screen shots of the results of Water Audit reports from 2016-2019 are included in Appendix B.

4.2.5 Current Water Use

This section presents current water use ascertained by analyzing information such as meter data and billing records, as well as recently submitted eAR monthly reports. Table 4-1 provides data on current gross water use, not including recycled water use. Recycled water use is detailed in Chapter 6 and summarized in Table 4-3 for total water use calculations.

Optional Planning Tool – Current Use

For this 2020 UWMP, rather than using the optional DWR Planning Tool, Hayward used its updated DSS Model as the key reference for current water use since past data and demand projections for Hayward were analyzed in detail during the model's development for the 2019 BAWSCA Regional Water Demand and Conservation Projections Report (Demand Study). See Appendix C for an overview of the DSS Model.

Table 4-1. Demands for Potable and Non-Potable Water – Actual

Submittal Table 4-1 Retail: Demands for Potable and Non-Potable Water - Actual			
Use Type	**2020 Actual**		
	Additional Description	Level of Treatment When Delivered	Volume MG
Single Family	1-4 dwelling units	Drinking Water	1,885
Multi-Family	5+ dwelling units and mobile homes	Drinking Water	904
Commercial		Drinking Water	386
Industrial		Drinking Water	697
Institutional/Governmental		Drinking Water	378
Landscape	Dedicated irrigation meters only	Drinking Water	645
Losses	Apparent and Real Losses	Drinking Water	171
Other	Hydrant Meter and Fireline	Drinking Water	16
		TOTAL	5,082

NOTES:
1. Water consumption by customer class is in Fiscal Year 2020, ending June 30, 2020.
2. 2. Non-revenue water (losses) is calculated as the difference between total customer category use and potable production.

4.2.6 Projected Water Use

This section presents projected water use for each sector, in five-year increments through 2040. Table 4-2 details projected water use. Water use projections were developed using long-term population and employment growth projections, 2018 baseline water use which includes plumbing codes and standards, and short-term drought recovery for 2019-2023. The short-term drought recovery was based on an econometric model, which included Hayward-specific economic conditions, retail water rates, historical population, monthly production data from 1995-2018, and impact of drought restrictions implemented during the 2014-2017 period. The econometric model generated water demand forecast to 2023.

Hayward participated in the Demand Study coordinated by BAWSCA to develop transparent, defensible, and uniform demand and conservation savings projections for each SFPUC wholesale customer, using a common methodology to support both regional and individual agency planning efforts. The Demand Study: 1) quantified the total average-year water demand through 2045; 2) determined passive and active conservation water savings potential through 2045; and 3) identified conservation programs for further consideration for implementation on either a regional or local basis. For the purpose of the 2020 UWMP, demands out to 2040 are included.

The initial step using the DSS Model was to establish the base-year water demand at the end-use level by breaking down total historical water use for each type of water service account (single-family, multi-family, commercial, industrial, etc.) to specific end uses, such as toilets, faucets, showers and irrigation. Forecasting future demand involved determining the growth in the number of water service accounts. Once the rates of change were established, they were entered into the model and applied to those account types and end-use water consumption.

The next step in developing future demand was to evaluate the cost effectiveness and water savings of a variety of potential water conservation measures to determine how much of the projected demand could be reasonably met through demand management. The potential water conservation savings were deducted from the total demand. The model also incorporated the effects of plumbing and appliance codes, or so-called passive savings, on existing and future accounts, as well as anticipated land use changes, densification, and industrial development anticipated in Hayward and supported by General Plan policies and strategies.

Development Factors Affecting Water Demand

As noted, the water demand projections summarized in Tables 4-2 and 4-3 incorporate anticipated development factors within Hayward, affecting both residential and non-residential sectors. In general, Hayward is experiencing a significant amount of development in all sectors. The following paragraphs provide an overview of the factors considered in preparing this 2020 UWMP.

Residential

Hayward's current housing stock, totaling about 50,000 dwelling units, is a mix of single-family detached, condominium, multi-family, and mobile home units. About 65% of the total housing units are single-family detached, condominiums, and duplex to fourplex units, with the remainder being multi-family and mobile home units. Hayward is continuing to add housing units through development of vacant parcels and redevelopment of low-density properties. In 2014, Hayward adopted the current Housing Element to plan for adequate housing to meet future needs and address its obligations under RHNA. Among the stated goals of the Housing Elements are conservation and improvement of existing housing stock, as well as development of a variety of new housing types to meet diverse needs and economic constraints.

According to the most recent ABAG projections (ABAG Projections 2040*)*,[11] about 6,200 households will be added in Hayward through 2040, a 13% increase over 2020. While Hayward anticipates that single-family

[11] https://abag.ca.gov/our-work/land-use/forecasts-projections

detached housing will continue to be constructed, an increasing number of projects are incorporating higher density condominium, townhome, and apartment dwelling units. The Hayward City Council supports the Sustainable Communities Strategy, a regional blueprint for transportation, housing and land use focusing on reduced driving and greenhouse gas emissions which anticipates that the majority of the residential development will be located in five PDAs:

- Cannery Area – 752 units
- Downtown – 3,223 units
- South Hayward BART Corridor – 1,173 units
- South Hayward BART Neighborhood – 2,698 units
- Mission Corridor – 1,839 units

Some of this has been constructed or is under development. For example, the Cannery Area has been substantially built out with a mix of townhome, apartment and detached single-family homes. Significant building activity is also occurring in the South Hayward BART Corridor, Mission Corridor and South Hayward BART Neighborhood. While it is not yet known whether these PDAs will achieve their full sustainable development potential, the dwelling unit counts are still relevant and have been incorporated into Hayward's water demand projections.

Additional potential exists in the former Route 238 right-of-way, which consists of about 350 acres of state-owned vacant or underutilized parcels that were acquired by Caltrans over 45 years ago as right-of-way for the planned Route 238 Bypass. Caltrans no longer plans to construct this project and will be relinquishing the properties to new ownership. In 2009, Hayward adopted a land use study that analyzed the opportunities and constraints for redevelopment of the parcels with a mix of residential and commercial uses, as well as open space. Under the most likely development scenario as indicated in Table 4-54 of the most current Housing Element, adopted in 2014, about 1,350 dwelling units may be constructed. There are about 300 existing dwelling units, 100 of which are inhabitable and boarded up, so the net change could be in the neighborhood of 1,250 new units. There are currently 8 sites in the planning area for which purchase and sale agreements have been executed or are under negotiation. These sites have potential for just under 950 dwelling units. Construction of a charter school is also anticipated within the study area. At this time, actual construction dates are unknown.

Per Table 4-51 of the adopted Housing Element, there is also potential for a small amount of additional housing (less than 100 dwelling units) in the Mt. Eden area, an established neighborhood with underutilized and vacant parcels annexed to the City of Hayward in the mid-2000s. A smaller number of housing units will be constructed through infill development and intensification of underutilized properties.

In addition to the construction of new housing units, the existing housing stock is undergoing significant rehabilitation. Nearly 37% of Hayward's housing stock, about 18,000 units, was constructed prior to 1960. Some of these homes, which are more affordable than new and existing homes in other Bay Area communities, are being renovated and upgraded over time, including installation of water efficient landscaping where currently it is minimal or non-existent. Hayward encourages renovation efforts with funding programs to clean up, upgrade, and landscape common areas within neighborhoods and to assist homeowners in rehabilitating private properties.

All of these factors were accounted for in the residential demand projections, with consideration of new development of both single-family and multi-family units, as well as upgrades of existing properties.

Commercial and Institutional

Commercial businesses include a typical mix of office-type services, specialty and big box retail stores, auto dealerships, eating establishments, and a regional shopping center. Hayward's economic development goals include diversification of the economic base, support of entrepreneurship and innovation, and expansion of employment opportunities. Hayward is implementing strategies to attract and retain restaurants and retail stores that will serve Hayward residents and encourage them to do business locally.

Hayward also is continuing to encourage business activity in the downtown area so that it provides a venue for cultural events and remains a center of social, political, and civic functions. The retail space that was built as part of a 12-screen theater is nearing full capacity with food-related and other complementary uses, and other redevelopment efforts are underway throughout the area.

In addition to downtown, other areas specifically identified for commercial and mixed-use development include:

- South Hayward BART Area
- Mission/Foothill Corridor
- Downtown
- Hesperian Blvd Corridor, including Southland Mall

Hayward's two regional public post-secondary educational institutions, CSUEB and Chabot Community College, each have student populations of about 13,000. CSUEB has a Master Plan that envisions a student population of 18,000 full-time student equivalents and 25,000 students, an increase of about 40%. Additional student housing is expected to increase the number of on-campus beds from the current 1,200 to 5,000 at buildout in 2030. CSUEB's Master Plan projects possible additional water demand of 400,000 gallons per day (gpd), although enhanced water conservation efforts may reduce actual future demand. Chabot College is also implementing its 2018 Facilities Master Plan to guide campus development, including additional teaching space. The Facilities Master Plan estimates that 15,000 students will be enrolled at Chabot by 2032, a 7% increase.

Hayward also is the site of Life Chiropractic College West, a private institution for the training of chiropractors located in Hayward's industrial corridor. Life Chiropractic has a current enrollment of about 600 students, and its Strategic Plan for 2019-2025 envisions continued growth in enrollment.

At the time of UWMP adoption, it was unknown how the COVID-19 pandemic would affect educational institutions – whether in-class learning would resume at the pre-pandemic level or higher education would migrate to a more virtual platform. Hayward will assess changes to related water demands in the 2025 UWMP.

Industrial

Hayward has a large and diverse industrial sector, including food and beverage manufacturing, high-technology research and manufacturing, biotechnical research and development, and a wide range of other businesses. Hayward's central Bay Area location, availability of land zoned for industrial use, and reasonable land and lease costs have attracted a large number and variety of businesses. Hayward has recently attracted significant interest as a location for cannabis cultivation, and several such facilities have been constructed or have applied for permits. There is also significant potential for underutilized properties now occupied by warehouses to be converted to research and development or manufacturing facilities. Job growth in Hayward is expected to be about 11% between 2020 and 2040 (ABAG Projections 2040).[12]

The Economic Development Element of Hayward's General Plan includes strategies to encourage and support economic growth and diversification, including advanced and specialized manufacturing, clean and green technology, and knowledge- and innovation-based technology. Many of the businesses that locate in Hayward have significant process water use. Because it is not possible to anticipate precise future industrial water use, Hayward has included 400,000 gpd over and above normal expected additional industrial water use to accommodate new industries.

Table 4-2 summarizes estimated demand for potable water through 2040 by use type. The BAWSCA Demand Study incorporates projected water savings from the plumbing code, standards, ordinances, and projected demands due to growth in Hayward's service area. Per Water Code Section 10631(h), Hayward provided SFPUC with potable water use projections as shown in Table 4-2. Additionally, in accordance with Water Code Section 10603(d)(2), Hayward reports its projections for each of the water use sectors identified in Section 4.2.1.

[12] Ibid.

Table 4-2. Demands for Potable and Non-Potable Water – Projected

Submittal Table 4-2 Retail: Use for Potable and Non-Potable Water - Projected					
Use Type	Additional Description	Projected Water Use			
		2025	2030	2035	2040
Single Family	1-4 dwelling units	2,149	2,302	2,488	2,710
Multi-Family	5+ dwelling units	1,104	1,172	1,259	1,365
Commercial	Includes Institutional	970	987	1,007	1,006
Industrial		889	910	931	933
Landscape	Dedicated irrigation meters only	662	651	674	684
Losses	Apparent and Real Losses	675	723	765	809
Other	Hydrant Meter and Fireline	39	44	49	54
	TOTAL	6,490	6,789	7,174	7,561
NOTES: Projected water use includes active and passive savings. Commercial category is combination of Commercial and Institutional. Projected water demands were derived from the DSS Model and are in fiscal years.					

20-Year Planning Horizon

In accordance with Water Code Section 10635(a), Hayward is required to report its total projected water use, in five-year increments through 2040. Table 4-3 summarizes potable and recycled water use through 2040.

Table 4-3. Total Water Use

Submittal Table 4-3 Retail: Total Water Use (Potable and Non-Potable)					
	2020	2025	2030	2035	2040
Potable Water, Raw, Other Non-Potable *From Tables 4-1R and 4-2R*	5,082	6,490	6,789	7,174	7,561
Recycled Water Demand* *From Table 6-4*	177	73	73	73	110
TOTAL WATER USE	5,259	6,563	6,862	7,247	7,671
NOTES: Units are in MG.					

Water Year Types

For water supply reliability, Hayward is required to characterize the "normal" water use for estimating normal water supply reliability and reliability in the event of a single dry year. Hayward uses 2018 as the representative year for its normal year. This year was chosen since it was not affected by drought or other unusual

environmental or economic circumstances. Hayward's *normal year* and *single dry year* data are reported in Chapter 7, Tables 7-1, 7-2, and 7-3.

Codes and Other Considerations Used in Projections

Water savings from codes, standards, ordinances, and land use planning, also known as *passive savings*, generally decrease water use for new and future customers compared to existing customers. However, some ordinances and standards may also apply to existing customers, such as plumbing code changes that result in lower water use when existing customers replace fixtures and appliances. In Table 4-6a, Hayward has indicated the extent to which passive savings are considered in its water use projections.

The water demand projections in Table 4-2 are based on analysis of historic metering data and projected growth in population, jobs, and development that are presented in the Hayward's 2020 DSS model. The projections in Table 4-2 include reductions due to "plumbing code" upgrades, reflect on-going change-outs of existing plumbing fixtures for more water efficient devices, and the implementation of conservation measures selected by Hayward.

Optional Planning Tool – Projected Use

In this 2020 UWMP, Hayward is using data from its 2020 DSS Model rather than using the optional DWR Planning Tool because during the DSS Model development Hayward's past data and demand projections were analyzed in detail.

4.2.7 Characteristic Five-Year Water Use

A critical component of the new statutory language in Water Code Section 10635(b) is the requirement to prepare the five-year Drought Risk Assessment (DRA), found in Chapter 7. This five-year DRA can also be used to provide the water service reliability assessment for a drought lasting five years.

As a first step, DWR recommends that the expected gross water use for the next five years without drought conditions (also known as unconstrained demand) be estimated. These numbers can then be adjusted to estimate the five-years' cumulative drought effects.

The water use projections without drought conditions for 2021-2025 is presented in Table 4-4. A linear increase in total water demand is expected between 2021 and 2025. The total water demand in 2025 is expected to be 6,563 MG.

Table 4-4. Water Use Projections for 2021 to 2025

Retail: Total Water Demand					
FY Ending	2021	2022	2023	2024	2025
Total Water Demand (MG)	5,717	5,933	6,153	6,406	6,563
Notes: Demands include potable and recycled water.					

4.3 Worksheets and Reporting Tables

The DWR Submittal Tables relevant to customer water use have been included in the appropriate subsections of this chapter. The tables are similar to those completed by Hayward for its 2015 UWMP. The 2020 tables do contain some modifications to reflect Water Code changes, the 2020 timeframe, and to provide additional details. In addition to including the tables in this 2020 UWMP document, an electronic version of the tables was submitted to DWR.

4.3.1 Optional Planning Tool Use Analysis Worksheet

In this 2020 UWMP, Hayward is using data from its 2020 DSS Model rather than using the optional DWR Planning Tool because during the DSS Model development Hayward's past data and demand projections were analyzed in detail.

4.3.2 DWR 2020 UWMP Submittal Tables

The tables presented in Chapter 4 are part of DWR's electronic reporting system for data input and are used by DWR to evaluate regional and statewide water use information and summarize data for DWR-required Legislative reports. These are the standardized tables for electronic submittal of Hayward's 2020 UWMP.

Earlier in this chapter, Tables 4-1 through 4-3 present Hayward's actual total 2020 water consumption and projected water demands through 2040 by water use sector. Table 4-5 shows Hayward's validated water audit results, indicating that the 2019 water loss was 1.9% of the cost of the operating system, as shown in the screen shots in Appendix B.

Table 4-5. Last Five Years of Water Loss Audit Reporting

Submittal Table 4-4 Retail: Last Five Years of Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss [1,2]
01/2019	90
01/2018	310
01/2017	483
01/2016	343
07/2014	384
[1] Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet. *[2] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*	
NOTES: Water loss in the AWWA Water Loss Workbooks, and listed here, are in calendar year, except for 2015 which is listed in fiscal year (2014/15).	

4.4 Water Use for Lower Income Households

Hayward is required to include the projected water use for lower income households (i.e., those with income below 80% of area median income, adjusted for family size) in its 2020 UWMP. This section documents Hayward's best effort to do so. However, please note that Hayward does not use this estimate for any planning purposes. Projected water use by lower income households is estimated by multiplying the projected housing need for Hayward by the average household size and assumed per capita water use. The most recent source of data for low income housing units for Hayward is the 2014 Housing Element from the current City of Hayward General Plan.

Water usage for lower income housing units is included in the overall water demand projections, shown in Tables 4-2 and 4-3, and verified in Table 4-6a (DWR Submittal Table 4-5).

Table 4-6a. Inclusion in Water Use Projections

Submittal Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections?	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, etc… utilized in demand projections are found.	Appendix C, Table C-1
Are Lower Income Residential Demands Included In Projections?	Yes

NOTES:

1. As indicated in Table 4-6a, estimates of future water savings from passive (plumbing code) and active conservation savings are included in the projections in this UWMP. The 2020 actual water use already reflects significant water savings compared to historical use.
2. According to the December 2014 City of Hayward Housing Element, a part of the Hayward 2040 General Plan identifies Regional Housing Need Allocation (RHNA) goals for the period of 2014-2022 by income level, measured as a percent of Area Median Income. Extremely low, very low, and low income is 34% of Hayward's total RHNA. The low-income is realistically expected to consist of multi-family units. See Table 4-6b for low income residential demand.

Table 4-6b. Projections for Future Low-Income Household Water Use

Projections of Future Low-Income Household Water Use, MG				
Water Use	2025	2030	2035	2040
Estimated Very Low and Low-Income Household Water Use	375	399	428	464

NOTES: The Housing Element of the Hayward's 2040 General Plan, adopted December 2014 identifies Regional Housing Need Allocation (RHNA) goals for the period of 2014-2022 by income level, measured as a percent of Area Median Income. In Hayward, the total number of units allocated for Extremely Low Income (up to 30% of Area Median Income), Very Low Income (up to 50% of Area Median Income) and Low Income (51% to 80% of Area Median Income) is 1,331 units, a total of 34% of Haywards's total RHNA. Realistically, the lower income housing is expected to consist of multi-family units. The timing for construction of these housing units is uncertain. For the purposes of the UWMP, it is assumed that roughly one-fifth of the units, or about 270 dwelling units, will be built during each five-year increment throughout the 20-year planning horizon.

4.5 Climate Change Considerations

Type of climate change impacts that were considered in the water use projections include water demands and temperature increases. The scientific or other information the projections are based on is described in the next section.

4.5.1 Water Demand Impacts and Analysis

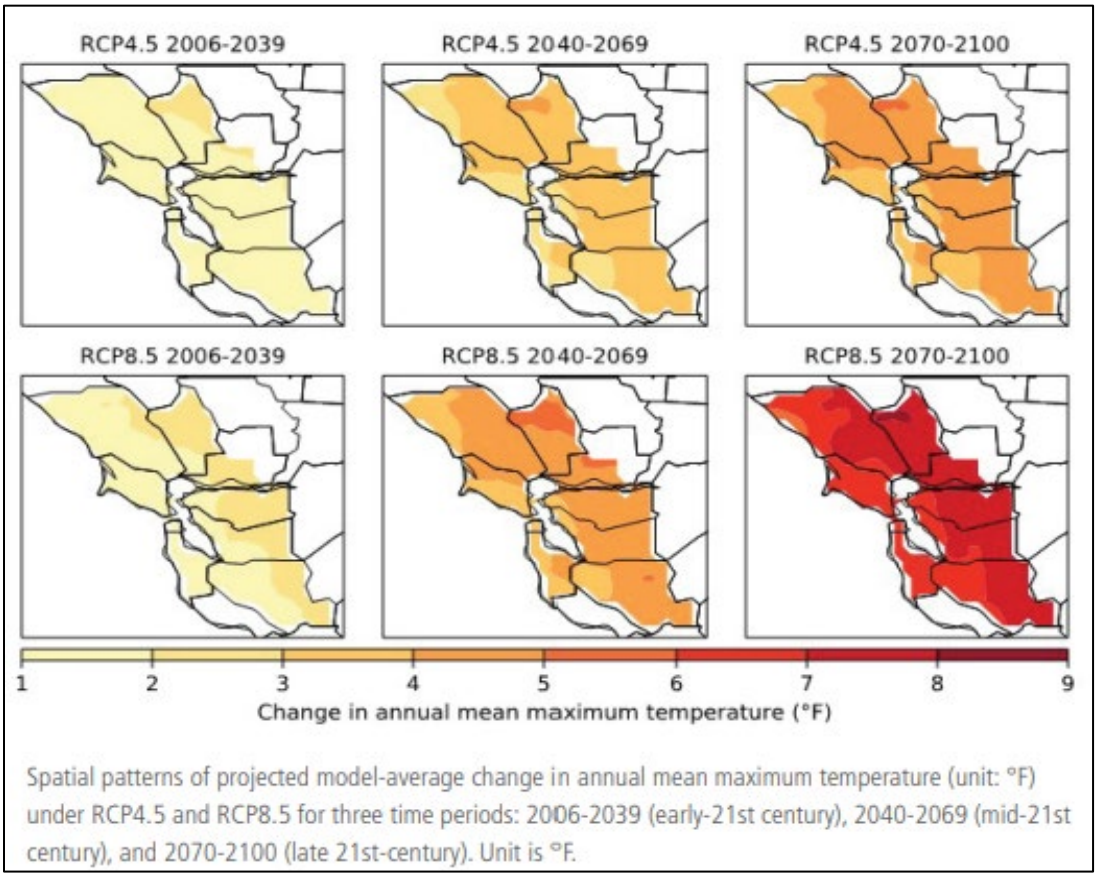
The Public Policy Institute of California (PPIC) has predicted that five climate pressures will impact the future of California's water management: warming temperatures, shrinking snowpack, shorter and more intense wet

seasons, more variable precipitation, and rising seas.[13] As of 2019, some of these pressures are already apparent. The climate impact on water supply is predicted to significantly exceed the impact on water demand.

Precipitation in the Bay Area will continue to have high variability year to year, leading to very wet years sometimes and very dry years at other times. The largest winter storms in the Bay Area will likely become more powerful and potentially more damaging. Due to a predicted future increase in temperature, it is assumed that California and the Bay Area will experience longer and deeper droughts, which could impact the water supply.

The Intergovernmental Panel on Climate Change (IPCC) develops several future climate change scenarios referred to as Representative Concentration Pathways (RCP). RCP 4.5 represents a mitigation scenario where global CO2 emissions peak by the year 2040. RCP 8.5 represents the business-as-usual scenario where CO2 emissions continue to rise throughout the 21st century. The following figure shows the spatial changes in annual mean of maximum daily temperatures across nine Bay Area counties under RCP 4.5 and RCP 8.5.

Figure 4-2. Bay Area Historical and Projected Mean Maximum Temperatures



Spatial patterns of projected model-average change in annual mean maximum temperature (unit: °F) under RCP4.5 and RCP8.5 for three time periods: 2006-2039 (early-21st century), 2040-2069 (mid-21st century), and 2070-2100 (late 21st-century). Unit is °F.

Source: Ackerly, et al. (University of California, Berkeley), 2018.

According to California's Fourth Climate Change Assessment San Francisco Bay Area Summary Report,[14] the Bay Area's historical temperature increased 1.7 degrees Fahrenheit from 1950 to 2005. It is predicted that annual mean maximum temperatures will increase by 1 to 2 degrees Fahrenheit in the early 21st century from the years

[13] Public Policy Institute of California. (2020). *Priorities for California's Water*: https://www.ppic.org/publication/priorities-for-californias-water/

[14] Ackerly, David, Andrew Jones, Mark Stacey, Bruce Riordan (University of California, Berkeley). (2018.) *San Francisco Bay Area Summary Report.* California's Fourth Climate Change Assessment. Publication number: CCCA4-SUM-2018-005. Accessed online December 2019: https://www.energy.ca.gov/sites/default/files/2019-07/Reg%20Report-%20SUM-CCCA4-2018-005%20SanFranciscoBayArea.pdf

2006 to 2039, then will increase by an additional 3.3 degrees Fahrenheit in the mid-21st century from 2040 to 2069. This increment for the mid-21st century rises to 4.4 degrees Fahrenheit if the Bay Area remains under the high emissions scenario of "business-as-usual."

The above IPCC report temperature change is broken over two time periods (early-21st century and mid-21st century). For the BAWSCA Demand Study, the time period of focus was 2019-2045. Therefore, it was necessary to combine the two time periods to get an overall temperature change for the length of the BAWSCA Demand Study.

Following are the considerations and methodology used to calculate the average annual temperature change for each of the IPCC report time periods:

- Early 21st Century (2006-2039) had an estimated temperature increase of 1 to 2 degrees Fahrenheit that was averaged to 1.5 degrees Fahrenheit. For the 33-year time period, this equates to an average annual temperature increase of 0.045 degrees Fahrenheit.
- Mid-Century (2040-2069) was estimated to have a temperature increase of 3.3 degrees Fahrenheit. For the 29-year time period, this equates to an average annual temperature increase of 0.114 degrees Fahrenheit.

Calculating the increase within each time period for the BAWSCA Demand Study required three steps:

- Step 1: Calculate a value for the 20 years from 2019 to 2039, which equates to an estimated temperature change of 0.95 degrees Fahrenheit.
- Step 2: Calculate a value for the five years from 2040 to 2045, which equates to an estimated temperature change of 0.68 degrees Fahrenheit.
- Step 3: Finally, the two values from Step 1 and Step 2 were added together to get a total temperature increase of 1.7 degrees Fahrenheit (rounded) for 2019-2045.

In summary, for the BAWSCA Demand Study, the previously mentioned predicted annual mean temperature increase in the early 21st century of 1.7 degrees Fahrenheit[15] was incorporated into the demand forecast for all scenarios for the time period of 2019 to 2045.

For the purpose of the 2020 UWMP, demands out to 2040 are included; therefore, climate change only applied up to year 2040.

4.5.2 Precipitation

Due to a predicted increase in temperature in the future, California and the Bay Area will likely experience longer and deeper droughts, which could impact the water supply. Per the SFPUC 2020 UWMP:

> Currently, the SFPUC is conducting a Long-term Vulnerability Assessment which assesses the potential effects of climate change on water supply using a wide range of plausible increases in temperature and changes in precipitation to address the wide uncertainty in climate projections over the planning horizon 2020 to 2070. There are many uncertain factors such as climate change, changing regulations, water quality, growth and economic cycles that may create vulnerabilities for the RWS's ability to meet levels of service. The uncertainties associated with the degree to which these factors will occur and how much risk they present to the water system are difficult to predict, but nonetheless they need to be considered in SFPUC planning. To address this planning challenge, the assessment uses a vulnerability-based planning approach to explore a range of future conditions to identify vulnerabilities, and to assess the risks associated with these vulnerabilities, that could lead to developing an adaptation plan that is flexible and robust to a wide range of future outcomes. This study is expected to be completed in the Summer of 2021.

[15] Ibid.

4.5.3 Sea Level Rise

According to the San Francisco Bay Conservation and Development Commission (BCDC), historical records show that sea level in San Francisco Bay has risen 18-20 cm (7 inches) over the past 150 years. Updated in 2018, the *State of California Sea-level Rise Guidance*[16] recommends using three risk projections until 2050 for projects in the San Francisco area with a lifespan to 2050, under a high-emissions scenario (RCP 8.5):

- Low risk aversion projection: 1.1 feet
- Medium-high risk aversion projection: 1.9 feet
- Extreme risk aversion projection: 2.7 feet

For highly vulnerable or critical assets that have a lifespan beyond 2050 and would result in significant consequences if damaged, the extreme risk aversion projection is recommended to be included in planning analyses. The range of low, medium-high, and extreme risk aversion projections should be evaluated across the range of high and low emissions scenarios (RCP 8.5 and RCP 2.6, respectively). For example, for a project with a lifespan to 2100, the recommended range of projections is as follows:

- Low risk aversion projection: 2.4 - 3.4 feet
- Medium-high risk aversion projection: 5.7- 6.9 feet
- Extreme risk aversion projection: 10.2 feet

SFPUC, Hayward's supplier, is developing a Climate Action Plan. The goal of the plan is to identify various climate scenarios that could impact the SFPUC RWS. SFPUC's plan will address climate change adoption measures to ensure a continued supply of high-quality water for its BAWSCA customers. In addition, the SFPUC continues to study the effect of climate change on the RWS. A detailed discussion about the current drought and potential impacts and mitigations to long-term climate change by SFPUC are discussed in Chapter 6.

SFPUC is aware that the effects of climate change require regular assessments and updates to reflect improvements in climate science, atmospheric/ocean modeling, and human response to the threat of greenhouse gas emissions. Both SFPUC and BAWSCA participated in the 2013 update of the Bay Area Integrated Regional Water Management Plan (BAIRWMP), which included an assessment of the potential climate change vulnerabilities of the region's water resources and identified climate change adaptation strategies. Also, the threat to local water system infrastructure due to climate change is being studied under Hayward's overall Risk and Resiliency Assessment currently in development.[17]

A discussion of the potential impacts of climate change on water supply is in Section 6.3.1.

[16] California Natural Resources Agency and California Ocean Protection Council. (2018). *State of California Sea-Level Rise Guidance*, 2018 Update. http://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20180314/Item3_Exhibit-A_OPC_SLR_Guidance-rd3.pdf

[17] U.S. EPA. (2019). Risk and Resilience Assessments and Emergency Response Plans. https://www.epa.gov/sites/production/files/2019-04/documents/awia_factsheet_04-16-2019_v2-508.pdf

5 SB X7-7 BASELINES AND TARGETS

Description

With the adoption of the Water Conservation Act of 2009, also known as SB X7-7, the Legislature required all state water suppliers to reduce urban per capita water use by 20% by the year 2020. California Water Code (Water Code) Section 10608.16(a) states: "The state shall achieve a 20-percent reduction in urban per capita water use in California on or before December 31, 2020." In order to meet this urban water use target requirement, each retail supplier completing a UWMP was required to determine its baseline water use as well as its target water use for the year 2020, in gallons per capita per day, using methods established by DWR. Retail water agencies were given the option to comply individually or regionally. For further information on the technical components of these calculations, DWR's guidelines can be found in its *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use* document (DWR, 2016).[18]

This chapter describes Hayward's calculation of its 2020 urban water use target and baseline water use, and identifies which Target Method was used (see Section 5.2.1). In addition, this chapter demonstrates Hayward's compliance with its target reduction as summarized in Tables 5-1 and 5-2.

GPCD Terminology

When describing water use in a UWMP, two terms are often used interchangeably:

- Daily Per Capita Water Use – This is the amount of water used per person per day. In UWMP calculations, this is total water use within a service area, divided by population, and it is measured in gallons.
- GPCD – This is the "daily per capita water use" measured in gallons. Therefore, the term commonly used when referring to "daily per capita water use" is "gallons per capita per day" or GPCD.

It is important to distinguish GPCD (as used in UWMPs) from the Residential GPCD (R-GPCD) that is used in some reporting to SWRCB.

- GPCD is the total water use from all sectors within a service area (residential, commercial, institutional, and any others) minus allowable exclusions, then divided by the population. This is used in UWMPs.
- R-GPCD is only a part of the GPCD; it is the estimated residential water use in a service area divided by population.

5.1 Guidance for Wholesaler Suppliers

Hayward is a retailer and not a wholesaler; therefore, this section is not applicable.

[18] DWR. (2016). *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use*. https://cadwr.app.box.com/s/5rbv5gjm881dxonycnb7u2253a0l6e8l

5.2 Updating Calculations from 2015 UWMP to the 2020 UWMP

Section 5.2 only applies to suppliers that need to update their 2020 Target and/or Baseline because of changes to their distribution area per *Water Code Section 10608.20 (g)*. Hayward does not need to update its Target or Baseline, as its distribution system and service area boundary did not change.

5.2.1 Update of Target Method

Hayward used Target Method 3 in 2015 and is using the same method for this 2020 UWMP. Since Hayward is not updating its Target Method and is using the same Baseline and Target GPCD that was developed using Method 3 in the 2015 UWMP, this section does not apply.

5.2.2 Updating Baseline and Target GPCDs

For this UWMP, Hayward is not updating its Baseline or Target GPCDs; therefore, this section does not apply.

5.2.3 SB X7-7 Verification Form

Hayward is in compliance with SB X7-7 for the established water use target for the year 2020. Compliance is verified by DWR's review of the SB X7-7 Verification Form, which is summarized in Tables 5-1 and 5-2 of this section.

5.3 General Requirements for Baseline and Targets

The 2020 UWMP requirements are the same as the 2015 UWMP requirements for determining the baseline period, Baseline GPCD, Target Confirmation, and 2020 Target. They are as follows:

- **Baseline Period:** Per *Water Code Section 10608.20*, water use GPCD must be calculated and reported for two baseline periods, the 10- or 15-year baseline (Baseline GPCD) and the 5-year baseline (Target Confirmation).
    - The defined Baseline Period for Hayward for the 10-year baseline was 2000–2009. Hayward used the 10-year period, rather than a 15-year period, because the percentage of recycled water used in 2008 was less than 10%.
    - The same water use from the 5-year baseline period as reported in 2015 UWMPs must be used for this 2020 UWMP. This water use amount is used to confirm that the selected 2020 target meets the minimum water use reduction requirements. The defined Baseline Period for Hayward for the 5-year period baseline was 2004–2008.
- **Baseline GPCD:** To correctly calculate annual GPCD, the population served must be determined for each baseline year in both baseline periods. Hayward used Department of Finance (DOF) data for determining the population served for each baseline period. For each baseline year, a GPCD is calculated by dividing gross water use by the service area population. Baseline GPCD or Target Confirmation GPCD is then an average of all GPCDs for each baseline year in the baseline period. The baseline GPCD for each baseline period for Hayward is 131 for the 10-year period.
- **Target Confirmation:** The 5-year baseline, also called the Target Confirmation, is a shorter-term baseline for confirming the 2020 Target. The same water use from the 5-year baseline period as reported in 2015 UWMPs must be used for the 2020 UWMP. This water use amount will be used to confirm that the selected 2020 target meets the minimum water use reduction requirements. The defined 5-year baseline period for Hayward was 2004–2008. The 5-year baseline GPCD for Hayward was 134.
- **2020 Target:** A water use target for 2020 in GPCD (2020 Target) must be calculated. The target method used in the 2015 UWMP may not be changed in any amendments to the 2015 UWMP or in the 2020 UWMP. Hayward used Target Method 3 for determining the 2020 Target in the 2015 UWMP.

5.4 Service Area Population

Hayward used DOF data for its population numbers in the 2015 UWMP. In the 2020 UWMP, Hayward elected to use DOF data again. Using this data, Hayward has determined that its 2020 service area population was 160,311.

5.4.1 Department of Finance

The UWMP Guidance document provides several alternatives for determining service area population, including California DOF estimates for cities whose service area boundaries correspond by 95% or more with the city boundaries. The use of DOF data is appropriate because Hayward's service area is substantially the same as the City of Hayward boundaries. Therefore, Hayward has used this data for determining the service area population for all SB X7-7 calculations.

5.4.2 U.S. Census Bureau American Community Survey

For the 2020 UWMP, Hayward did not use the U.S. Census Bureau Survey because it opted to use the Department of Finance, as noted in Section 5.4.1.

5.4.3 Persons-per-Connection

For the 2020 UWMP, Hayward did not use Persons-per-Connection because they opted to use the Department of Finance as noted in Section 5.4.1.

5.4.4 DWR Population Tool

For the 2020 UWMP, Hayward did not use the DWR Population Tool because it opted to use Department of Finance as noted in Section 5.4.1.

5.4.5 Other Population Methods

For the 2020 UWMP, Hayward did not use other methods because it opted to use the Department of Finance as noted in Section 5.4.1. Hayward used the population data from DOF for the 10-year and 5-year baseline calculations. As per DWR requirements, Table 5-0a (SB X7-7 Table 2: Method for Population Estimates) and Table 5-0b (SB X7-7 Table 3: Service Area Population) have been completed and are included here.

Table 5-0a. Method for Population Estimates

SB X7-7 Table 2: Method for 2020 Population Estimate	
Method Used to Determine 2020 Population (may check more than one)	
☑	**1. Department of Finance** (DOF) or **American Community Survey** (ACS)
☐	**2. Persons-per-Connection Method**
	3. DWR Population Tool
	4. Other DWR recommends pre-review

Table 5-0b. Service Area Population

SB X7-7 Table 3: 2020 Service Area Population	
2020 Compliance Year Population	
2020	160,311

5.5 Gross Water Use

Gross water use must be reported for each year in the baseline periods as well as for 2020, the compliance year. Hayward's gross water use is the total volume of water, based on metering data, that enters its distribution system over a 12-month period from its supplier, SFPUC, with certain allowable exclusions as follows:

- Recycled water delivered within the service area. Recycled water use has been excluded from all calculation of gross water, as reflected in the SB X7-7 tables. Hayward is not required to report recycled water use nor demonstrate any reduction in recycled water use for purposes of SB X7-7.
- Indirect recycled water – see Methodology 1 from the *Methodologies* document (DWR, 2016)
- Water placed into long-term storage (surface or groundwater)
- Water conveyed to another urban supplier
- Water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24
- Process water

In the 2020 UWMP, Hayward used MG as the unit of measure based on meters purchased from SFPUC. Hayward's metering data includes all the water that enters its distribution system during a fiscal year (July through June). Hayward did not use other sources of water in 2020, such as groundwater, surface water, recycled water,[19] or desalinized water, and does not have other exclusions for industrial water.

Gross water purchases from SFPUC are reported in the SB X7-7 Verification Form tables in Appendix D for each year in the baseline periods as well as in the 2015 Interim Target compliance year and the 2020 Target. There are several tables from the SB X7-7 Verification Form that are related to gross water calculations. Since, as stated above, Hayward does not use other sources of water, this is not applicable and as such not included in Hayward's calculations.

5.6 Baselines and Target Summary

Hayward used Method 3 (water use target is set at 95% of the applicable state hydrologic region target) to develop the 2020 Target and the 2015 Interim Target as the preferred method for determining compliance with SB X7-7. Method 3 requires Hayward's 2020 conservation goal to be 95% of its 5-year baseline, which is 134 GPCD. Hayward's 2020 target is 124 GPCD.

Hayward's Average Baseline GPCD use (as shown in Table 5-1) is the total water used (in gallons) divided by the total service area population that has been averaged over 5 years or 10-15 years. The summary of the SB X7-7 calculations that were previously reported in the 2015 UWMP are unchanged for this 2020 UWMP.

Table 5-1. Baselines and Targets Summary

Submittal Table 5-1 Baselines and Targets Summary From SB X7-7 Verification Form				
Baseline Period	Start Year *	End Year *	Average Baseline GPCD*	Confirmed 2020 Target*
10-15 year	2000	2009	131	124
5 Year	2004	2008	134	
NOTES: Fiscal Years				

[19] While Hayward provides secondary treated wastewater to the Russell City Energy Center (RCEC) facility, this water supply does not offset what would otherwise be a potable demand on the Hayward system.

5.7 2020 Compliance Daily Per Capita Water Use (GPCD)

Per *Water Code Section 10608.12(e),* "Compliance daily per capita water use" means the gross water use during the final year of the reporting period. Per *Water Code Section 10608.20 (e), "An urban retail water supplier shall include in its urban water management plan…compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data*."

This section describes Hayward's compliance to the above water code and adjustments to gross water use.

5.7.1 Meeting the 2020 Target

As can be seen from the data in Table 5-2 based on Hayward's actual metered water consumption for 2020, the GCPD use was 87 GPCD, significantly lower than its 2020 Target of 124 GPCD. Hayward is in compliance with its 2020 Target.

Table 5-2. 2020 Compliances

Submittal Table 5-2: 2020 Compliance From SB X7-7 2020 Compliance Form				
2020 GPCD			2020 Confirmed Target GPCD*	Did Supplier Achieve Targeted Reduction for 2020? Y/N
Actual 2020 GPCD*	2020 TOTAL Adjustments*	Adjusted 2020 GPCD* *(Adjusted if applicable)*		
87	0	87	124	YES

NOTES:
1. Fiscal Year ending June 30, 2020.
2. 2020 Population value (160,311) from Department of Finance.

5.7.2 2020 Adjustments to 2020 Gross Water Use

Hayward has not made any adjustments to its 2020 gross water use; therefore, this section does not apply.

5.8 Regional Alliance

Hayward is complying with SB X7-7 as an individual retailer, not as part of a regional alliance.

6 WATER SUPPLY CHARACTERIZATION

Description

This section characterizes Hayward's system supplies, including (as applicable) purchased or imported water, groundwater, surface water, stormwater, wastewater, recycled water, desalinated water, exchanges or transfers, future water projects, and climate change impacts.

The water supply analysis focuses on characterizing each water asset to assess reliability and risk. The more accurately and detailed this characterization is, the better prepared Hayward will be to manage its water assets, assess supply reliability, perform a Drought Risk Assessment, and prepare and implement the Water Shortage Contingency Plan.

6.1 Water Supply Analysis Overview

San Francisco Public Utilities Commission (SFPUC)

Hayward purchases potable water from the SFPUC, which is delivered through its Regional Water System (RWS). The SFPUC RWS supply is predominantly snowmelt from the Sierra Nevada, delivered through the Hetch Hetchy aqueducts, but it also includes treated water produced by the SFPUC from its local watersheds and facilities in Alameda and San Mateo Counties (see Figure 6-1). Water from the RWS is treated before delivery and supplied to Hayward from two connections: Bay Division Pipelines (BDPL) 1 and 2 and the Crystal Springs Bypass Tunnel.

The amount of imported water available to the SFPUC's customers is constrained by climate, hydrology, physical facilities, and the institutional parameters that allocate the Tuolumne River water supply, the key source for SFPUC. Due to these constraints, the SFPUC is very dependent on reservoir and snow-pack storage to manage its water supplies.

6.2 Narrative Sections for UWMP Water Supply Characterization

Hayward's water supply portfolio is described and quantified in the following subsections, including imported supplies, groundwater, and recycled water.

6.2.1 Purchased or Imported Water

Hayward's sole source of potable water since 1963 has been purchased water from the SFPUC RWS. Hayward purchases water from the SFPUC RWS in accordance with the 2009 Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda, San Mateo, and Santa Clara Counties, approved by the Commission on April 28, 2009. Per the 2009 Water Supply Agreement, San Francisco has a perpetual commitment (Supply Assurance) to deliver 184 MGD to the 24 permanent Wholesale Customers (including Hayward) collectively.

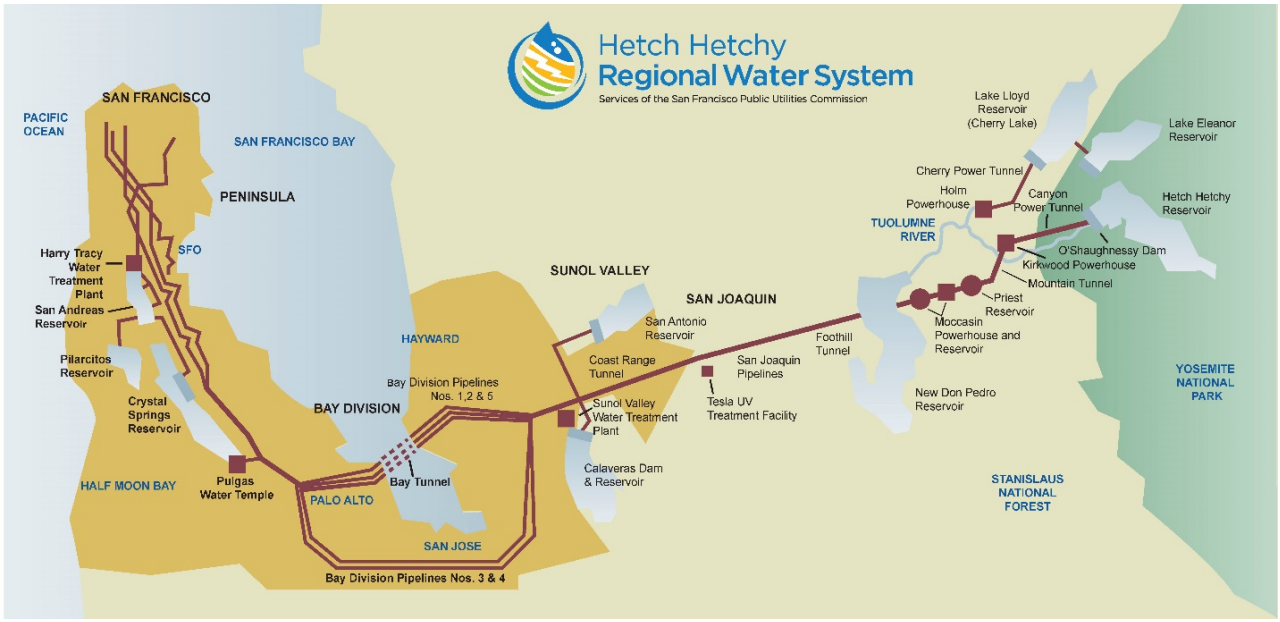
To maintain consistency with the UWMPs prepared by the SFPUC and the other BAWSCA member agencies, much of the language describing the SFPUC wholesale water supply in the following sections is common

language provided by BAWSCA, in coordination with the SFPUC. Common language provided by BAWSCA is shown in indented gray text.

Description of SFPUC RWS

Approximately 85% of the water supply to the SFPUC RWS originates in the Hetch Hetchy watershed, located in Yosemite National Park, and flows down the Tuolumne River into the Hetch Hetchy Reservoir. Water from the Hetch Hetchy watershed is managed through the Hetch Hetchy Water and Power Project. The remaining 15% of the water supply to the SFPUC RWS originates locally in the Alameda and Peninsula watersheds and is stored in six different reservoirs in Alameda and San Mateo Counties. Details of the various components of the SFPUC RWS are provided below and are shown on Figure 6-1. Information regarding the Hetch Hetchy, Alameda, and Peninsula water systems is sourced from the SFPUC's adopted 2020 UWMP (SFPUC, 2021)[20] and is provided verbatim below.

Figure 6-1. Regional Water System



Water Distribution

> The RWS, shown in [Figure 6-1], consists of more than 280 miles of pipelines, 60 miles of tunnels, 11 reservoirs, five pump stations, and two water treatment plants. It includes the Hetch Hetchy Project and the Bay Area water system facilities. The Hetch Hetchy Project is generally composed of the reservoirs, hydroelectric generation and transmission facilities, and water transmission facilities from the Hetch Hetchy Valley west to the Alameda East Portal of the Coast Range Tunnel in Sunol Valley. Water system components of the Hetch Hetchy Project are also referred to as the Hetch Hetchy System. The local Bay Area water system is comprised of two parts—the Alameda System and the Peninsula System—generally consisting of the facilities west of the Alameda East Portal of the Coast Range Tunnel, including the 63,000-acre Alameda and Peninsula watersheds, storage reservoirs, two water treatment plants, and the distribution system that delivers water to both retail

[20] San Francisco Public Utilities Commission (SFPUC). (2021). *Final 2020 UWMP*. https://www.sfpuc.org/sites/default/files/programs/local-water/SFPUC_2020_UWMP2020_%20FINAL.pdf

and wholesale customers. The Hetch Hetchy, Alameda, and Peninsula Systems are described in more detail below.

- Hetch Hetchy System: In the Hetch Hetchy System, water is diverted from Hetch Hetchy Reservoir into a series of tunnels and aqueducts from the Sierra Nevada to the San Joaquin Pipelines that cross the San Joaquin Valley to the Coast Range Tunnel, which connects to the Alameda System at the Alameda East Portal. Hetch Hetchy System water is disinfected at the Tesla Treatment Facility.
- Alameda System: The Alameda System includes two reservoirs, San Antonio Reservoir and Calaveras Reservoir, which collect water from the San Antonio Creek, Upper Alameda Creek, and Arroyo Hondo watersheds in Alameda County. San Antonio Reservoir also receives water from the Hetch Hetchy System. Conveyance facilities in the Alameda System connect the Hetch Hetchy System and Alameda water sources to the Peninsula System. The BDPLs cross the South Bay to the Peninsula System delivering water to customers along the pipeline route. The Sunol Valley Water Treatment Plant (SVWTP) filters and disinfects water supplied from San Antonio Reservoir and Calaveras Reservoir.
- Peninsula System: The Peninsula System includes conveyance facilities connecting the BDPLs to the in-City distribution system and to other customers on the Peninsula. Two reservoirs, Crystal Springs Reservoir and San Andreas Reservoir, collect runoff from the San Mateo Creek watershed. Crystal Springs Reservoir also receives water from the Hetch Hetchy System. A third reservoir, Pilarcitos Reservoir, collects runoff from the Pilarcitos Creek watershed and directly serves one of the Wholesale Customers, the Coastside County Water District (which includes the City of Half Moon Bay), along with delivering water to Crystal Springs and San Andreas Reservoirs. The Harry Tracy Water Treatment Plant (HTWTP) filters and disinfects water supplied from Crystal Springs Reservoir and San Andreas Reservoir before it is delivered to customers on the Peninsula and the in-City distribution system.

Water Treatment

The Hetch Hetchy Reservoir is the largest unfiltered water supply on the West Coast, and one of only a few large unfiltered municipal water supplies in the nation. The water originates from well-protected wilderness areas in Yosemite National Park, which flows down the Tuolumne River to Hetch Hetchy Reservoir. This water meets or exceeds all federal and State criteria for watershed protection. Water from Hetch Hetchy Reservoir is protected in pipes and tunnels as it is conveyed to the Bay Area, and requires pH adjustment to control pipeline corrosion and disinfection for bacteria control. Based on the SFPUC's disinfection treatment practice, extensive bacteriological quality monitoring, and high operational standards, the U.S. Environmental Protection Agency (USEPA) and the SWRCB Division of Drinking Water (DDW) determined that the Hetch Hetchy water source meets federal and State drinking water quality requirements without the need for filtration.

A new USEPA regulation took effect in 2012 requiring secondary disinfection for all unfiltered drinking water systems to control the waterborne parasite cryptosporidium. To comply with this regulation, the SFPUC completed construction of a new ultraviolet (UV) treatment facility in 2011. The Tesla Treatment Facility is a key component of the Water System Improvement Program (WSIP) and enhances the high-quality water from the RWS. The facility has a capacity of 315 mgd, making it the third largest UV drinking water disinfection facility in the U.S.

All water derived from sources other than Hetch Hetchy Reservoir is treated at one of two treatment plants: the SVWTP or the HTWTP. The SVWTP primarily treats water from the Alameda System reservoirs and has both a peak capacity and sustainable capacity of 160 mgd. Treatment processes include coagulation, flocculation, sedimentation, filtration, disinfection, fluoridation, corrosion control treatment, and chloramination. Fluoridation,

chloramination, and corrosion control treatment can also be provided for the combined Hetch Hetchy System and SVWTP water at the Sunol Valley Chloramination Facility. The HTWTP treats water from the Peninsula System reservoirs and has a peak capacity of 180 mgd and a sustainable capacity of 140 mgd. Treatment processes include ozonation, coagulation, flocculation, filtration, disinfection, fluoridation, corrosion control treatment, and chloramination. Major upgrades to the SVWTP were completed in 2013 and to the HTWTP in 2015.

Water Storage

The majority of the water delivered by the SFPUC is supplied by runoff from the upper Tuolumne River watershed on the western slope of the central Sierra Nevada. Three major reservoirs collect runoff: Hetch Hetchy Reservoir, Lake Lloyd (a.k.a., Cherry Lake), and Lake Eleanor. A "water bank" in Don Pedro Reservoir is also integrated into system operations. Don Pedro Reservoir, which is jointly owned and operated by Modesto Irrigation District and Turlock Irrigation District (the Districts), is located on the Tuolumne River downstream of the Hetch Hetchy System.

As a by-product of water delivery and water supply management, hydroelectric power is generated by the Hetch Hetchy Water and Power System. Water stored in Hetch Hetchy Reservoir is used for hydroelectric generation and also satisfies instream flow requirements when released downstream. Normally, only Hetch Hetchy Reservoir water supplies are exported to the Bay Area, while releases from Lake Eleanor and Lake Lloyd are used to satisfy instream flow requirements, satisfy Raker Act entitlements to the Districts downstream, and produce hydroelectric power. The Hetch Hetchy Water and Power System includes three major hydroelectric powerhouses along the Tuolumne River—Holm, Kirkwood, and Moccasin—that have a collective generating capacity of nearly 400 megawatts.

Downstream of the Hetchy System, the SFPUC utilizes local watersheds in the Bay Area. Crystal Springs, San Andreas, and Pilarcitos Reservoirs, located in San Mateo County, capture local runoff in the Peninsula watershed, and Calaveras and San Antonio Reservoirs, located in Alameda Country, capture local runoff in the Alameda watershed. In addition to capturing local runoff, San Andreas, San Antonio, and Crystal Springs Reservoirs also provide storage for water from the Hetch Hetchy System and, along with Calaveras Reservoir, are an important water supply in the event of an interruption to Hetch Hetchy System deliveries.

Calaveras Reservoir had been operating in recent years at one-third of its capacity due to restrictions imposed by the DWR Division of Safety of Dams (DSOD). The Calaveras Dam Replacement Project, which took place from 2011 to 2019, involved the construction of a new dam downstream of the existing dam. The SFPUC began impounding water behind the new dam in the winter of 2018/2019 and continued the initial fill of the reservoir during the 2019/2020 winter season.

Table 6-0. Regional Water System Storage Capacity

Reservoir	Storage	
	Acre-Feet (AF)	Billions of Gallons (BG)
Up-Country[a]		
Hetch Hetchy	360,360	117.4
Lake Lloyd[b]	273,300	89.1
Lake Eleanor	27,100	8.8
Subtotal Up-Country	**660,760**	**215.3**
Local		
Calaveras (East Bay)[c]	96,800	31.5
San Antonio (East Bay)	50,500	16.5
Crystal Springs (Peninsula)[d]	69,300	22.6
San Andreas (Peninsula)	19,000	6.2
Pilarcitos (Peninsula)	3,100	1.0
Subtotal Local	**238,700**	**77.8**
Total Regional Water System[e]	**899,460**	**293.1**

a Three other regulating reservoirs are also part of the RWS: Early Intake, Priest, and Moccasin Reservoirs.

b Storage capacity shown includes flashboards, which are structures placed in a spillway to increase the capacity of a reservoir.

c Calaveras Reservoir was constructed with a storage capacity of 96,800 AF. Since December 2001, in response to safety concerns about the seismic stability of the dam and a directive from the Division of Safety of Dams (DSOD), the SFPUC held the maximum water level at approximately 37,800 AF (roughly 40% of its maximum capacity). The construction of a new replacement dam downstream was completed in 2019 to restore the dam's full storage capacity and the dam was continuing to be filled over the 2019/2020 winter season.

d Crystal Springs Reservoir has a maximum storage capacity of 22.6 BG (at 291.8 feet). Based on permit conditions, the reservoir is currently operated at 287.8 feet (4 feet below capacity).

e This includes 63,700 AF in dead storage (i.e., the volume in a reservoir below the lowest controllable level). In addition, the SFPUC may draw against a credit of up to 570,000 AF in storage in a water bank account in Don Pedro Reservoir, for total storage for planning purposes of 1,469,460 AF.

2028 SFPUC Decisions (formerly 2018 SFPUC Decisions)

Information regarding the 2028 SFPUC Decisions (formerly 2018 SFPUC Decision) was provided by BAWSCA in coordination with SFPUC and is included verbatim below.

> In the 2009 WSA, the SFPUC committed to make three decisions before 2018 that affect water supply development:
>
> Whether or not to make the cities of San Jose and Santa Clara permanent customers,
>
> Whether or not to supply the additional unmet supply needs of the Wholesale Customers beyond 2018, and
>
> Whether or not to increase the wholesale customer Supply Assurance above 184 MGD.
>
> Events since 2009 made it difficult for the SFPUC to conduct the necessary water supply planning and CEQA analysis required to make these three decisions before 2018. Therefore, in the 2018 Amended and Restated WSA, the decisions were deferred for 10 years to 2028.
>
> Additionally, there have been recent changes to instream flow requirements and customer demand projections that have affected water supply planning beyond 2018. As a result, the

SFPUC has established an Alternative Water Supply Planning program to evaluate several regional and local water supply options. Through this program, the SFPUC will conduct feasibility studies and develop an Alternative Water Supply Plan by July 2023 to support the continued development of water supplies to meet future needs.

6.2.2 Groundwater

Local groundwater production wells were originally used to supply Hayward with water. However, in 1962, Hayward entered into an agreement with the SFPUC to purchase potable water supply for Hayward's need from the SFPUC RWS, and ceased supplying groundwater in 1963.[21] Groundwater is now only used as an emergency supply by Hayward. As described in detail in the next section, with the passage of the Sustainable Groundwater Management Act (SGMA) in 2014, and through Hayward's formation of a Groundwater Sustainability Agency (GSA) in 2017,[22] Hayward has assumed renewed active management of the underlying East Bay Plain Subbasin and will be evaluating sustainable use and management of the Basin as part of Groundwater Sustainability Plan (GSP) development.

Basin Description and Status

As shown in Figure 6-2, Hayward overlies portions of two groundwater basins: the southern portion of the East Bay Plain Subbasin and the northern portion of the Niles Cone Subbasin. Hayward currently has three emergency wells located in the East Bay Plain Subbasin and two emergency wells in the Niles Cone Subbasin.

Figure 6-2. Groundwater Basins Underlying the City of Hayward

[21] Luhdorff & Scalmanini Consulting Engineers. (2020). Technical Memorandum 4.1, dated June 2020.

[22] City of Hayward. (2020). City Council Resolution 17-014. https://www.hayward-ca.gov/sites/default/files/GSA%20Formation%20Resolution.pdf

East Bay Plain Subbasin

The East Bay Plain Subbasin of the Santa Clara Valley Groundwater Basin (DWR Basin No. 2-009.04) is not adjudicated and, in its recent evaluation of California groundwater basins, DWR determined that the Basin is not in a condition of critical overdraft.[23]

The East Bay Plain Subbasin covers an area of approximately 71,315 acres. DWR defines the lateral basin boundaries as follows, *"…a northwest trending alluvial plain bounded on the north by San Pablo Bay, on the east by the contact with Franciscan Basement rock, on the south by the Niles Cone Groundwater Basin. The East Bay Plain Basin extends beneath San Francisco Bay to the west*."[24] The basin's extent was revised by DWR as part of the 2016 Basin Boundary Modification process wherein the southern boundary of the Basin was redefined to follow an interpretation of the Alameda County Water District (ACWD) jurisdictional boundary for purposes of groundwater management.[25]

The East Bay Plain Subbasin is designated as a medium priority basin under DWR's 2019 Phase 2 Basin Prioritization.[26] Under this prioritization process, basins are ranked on eight components, and if a basin is assigned more than 14 total points, it is defined as "medium priority." The main factors driving this designation in the East Bay Plain Subbasin included population density (5 out of 5 possible points); population growth (1 out of 5 possible points); total number of wells (5 out of 5 possible points); public supply well density (1 out of 5 possible points); groundwater reliance (1 out of 5 possible points); and documented impacts including sea water intrusion, subsidence and water quality impacts (4 out of 5 possible points).[27] As further discussed below, as a medium priority basin, it is subject to the requirements of SGMA.

A GSP for the East Bay Plain Subbasin is currently under development (as discussed further below). Until this GSP is adopted, the basin is being managed pursuant to the previously adopted Assembly Bill (AB) 3030 Groundwater Management Plan (GMP) that was developed by EBMUD. Additional details on the basin are given in DWR's Groundwater Bulletin 118 (B118), as well as in the key documents described below related to groundwater management of the basin, which are incorporated into this 2020 UWMP by reference:

- EBMUD's Board of Directors adopted the South East Bay Plain Basin Groundwater Management Plan on March 26, 2013. This GMP includes information regarding basin delineation and characterization, the establishment of basin objectives, a description of monitoring activities, and identification of management activities and is available on EBMUD's website:
    - https://www.ebmud.com/about-us/construction-and-maintenance/construction-my-neighborhood/south-east-bay-plain-basin-groundwater-management/

[23] DWR. (2020). *Sustainable Groundwater Management Act 2019 Basin Prioritization*. https://water.ca.gov/programs/groundwater-management/basin-prioritization

[24] DWR. (2004). *California's Groundwater,* Bulletin 118, East Bay Plain Subbasin. https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Files/2003-Basin-Descriptions/2_009_04_East-BayPlainSubbasin.pdf

[25] DWR SGMA Portal – Basin Boundary Modification Request System: https://sgma.water.ca.gov/basinmod/modrequest/preview/54, accessed July 2021. ACWD initiated the request to extend the boundary of the Niles Cone Groundwater Basin to include the jurisdictional boundary extent of ACWD and the areas located within the City of Hayward that were detached from ACWD in 1973, 2000, and 2004 in order for the City of Hayward to provide water service. Hayward disputed the boundary revision request and continues to investigate the nature and location of the appropriate boundary between the East Bay Plain and Niles Cone Subbasins (https://sgma.water.ca.gov/basinmod/modrequest/comments/54, accessed July 2021).

[26] DWR. (2020). *Sustainable Groundwater Management Act 2019 Basin Prioritization.* https://water.ca.gov/programs/groundwater-management/basin-prioritization

[27] https://gis.water.ca.gov/app/bp-dashboard/final/

- It is anticipated that following adoption (anticipated by January 31, 2022), the final GSP for the East Bay Plain Subbasin will be available on the DWR website: https://sgma.water.ca.gov/portal/gsp/all.

Niles Cone Subbasin

The Niles Cone Subbasin of the Santa Clara Valley Groundwater Basin (DWR Basin No. 2-009.01) is not adjudicated and, in its recent evaluation of California groundwater basins, DWR determined that the basin is not in a condition of critical overdraft.[28]

The Niles Cone Subbasin is designated as a medium priority basin under DWR's 2019 Phase 2 Basin Prioritization.[29] The main factors driving this designation included population density (4 out of 5 possible points), population growth (2 out of 5 possible points), total number of wells (2 out of 5 possible points), public supply well density (3 out of 5 possible points), groundwater reliance (2 out of 5 possible points), and documented impacts including sea water intrusion, subsidence and water quality impacts (3 out of 5 possible points) and habitat impacts (2 out of 2 possible).[30] As further discussed below, as a medium priority basin, the Niles Cone Subbasin is subject to the requirements of SGMA.

Additional details on the Niles Cone Subbasin are given in the Alternative GSP that was developed by ACWD and submitted to DWR in 2016 and is incorporated into this UWMP by reference. The Alternative GSP is currently being updated.

- The current Alternative GSP is available on the DWR and ACWD SGMA websites:
  - https://sgma.water.ca.gov/portal/alternative/print/4
  - https://www.acwd.org/566/Sustainable-Groundwater-Management-Act
- It is anticipated that following adoption and submission (anticipated by January 1, 2022), the Updated Alternative GSP for the Niles Cone Subbasin will be available on the DWR and ACWD SGMA websites:
  - https://sgma.water.ca.gov/portal/alternative/all
  - https://www.acwd.org/566/Sustainable-Groundwater-Management-Act

SGMA Groundwater Management

In 2014, the California State Legislature enacted SGMA with subsequent amendments in 2015. The SGMA requires the formation of GSAs and the development and implementation of GSPs for groundwater basins that are designated by DWR as medium or high priority. As medium priority (non-critically overdrafted and non-adjudicated basins), the basins underlying Hayward are subject to the requirements of SGMA, including the requirement to be covered by one or more GSAs and to prepare and submit to DWR one or more GSPs by January 31, 2022.

East Bay Plain Subbasin

Pursuant to these SGMA requirements, two GSAs were formed in the East Bay Plain Subbasin – the EBMUD GSA on August 9, 2016 (EBMUD Board Resolution 34099-16), and the Hayward GSA on February 7, 2017 (City of Hayward Resolution 17-014). The Hayward GSA boundaries are coincident with the portion of Hayward's service area that overlies the basin (see Figure 6-2). The EBMUD GSA covers the remaining portion of the basin. The

[28] DWR. (2020). *Sustainable Groundwater Management Act 2019 Basin Prioritization*. https://water.ca.gov/programs/groundwater-management/basin-prioritization

[29] Ibid.

[30] DWR's 2019 Phase 2 Basin Prioritization used the basin's total possible ranking points assigned to each of the eight components to determine the priority. A basin is defined as Medium Priority if it has more than 14 total ranking points. https://gis.water.ca.gov/app/bp-dashboard/final/

EBMUD GSA and the Hayward GSA are collaboratively working together to develop a single GSP for the East Bay Plain Subbasin. The GSP development process for the basin is ongoing and is anticipated to be complete and submitted to DWR by the statutory deadline of January 31, 2022.

Niles Cone Subbasin

Under SGMA, ACWD was designated as an "exclusive local agency" for purposes of groundwater management.[31] On November 10, 2016, ACWD's Board of Directors adopted Resolution No. 16-069 deciding to become the exclusive GSA for the Niles Cone Subbasin.

On December 8, 2016, ACWD's Board of Directors adopted Resolution No. 16-075 authorizing staff to submit an Alternative to a GSP for Niles Cone Subbasin 2-09.01. ACWD's Alternative submittal includes an explanation of how the Alternative is functionally equivalent to elements of a GSP and achieves the objectives of SGMA. On July 17, 2019, DWR approved ACWD's Alternative for the Niles Cone Groundwater Basin (Niles Cone Subbasin 2-09.01 or Niles Cone). DWR's approval was accompanied by a Statement of Findings Regarding the Approval of the Niles Cone Subbasin Alternative which includes seven recommended actions for ACWD to incorporate in the alternative update, which is due January 1, 2022.

Coordination with Groundwater Sustainability Agencies

As described above, as a GSA in the East Bay Plain Subbasin, Hayward is actively coordinating with the EBMUD GSA on the development of a GSP for the basin. Hayward also is actively involved as a key stakeholder in SGMA implementation in the Niles Cone Subbasin, including reviewing and commenting on SGMA-related efforts in the basin.

Historical Pumping and Supply Sufficiency

Hayward's emergency water supply system includes five emergency groundwater supply wells that collectively have a potential yield of 14 MGD.[32] The emergency groundwater supply wells were installed between the late 1980s and mid-1990s and are intended for use in the event of surface water supply disruptions. The wells have not yet been used for this purpose, but each well is pumped for a few hours each month to maintain equipment in good working order. Prior to 1962, Hayward pumped groundwater to supply some or all of the city's water needs.

Past Five Years

As shown in Table 6-1, groundwater has not been used as a source of supply during the 2016-2020 time period.

Table 6-1. Groundwater Volume Pumped

Submittal Table 6-1 Retail: Groundwater Volume Pumped						
☑	Supplier does not pump groundwater. The supplier will not complete the table below.					
☐	All or part of the groundwater described below is desalinated.					
Groundwater Type	Location or Basin Name	2016	2017	2018	2019	2020
	TOTAL	0	0	0	0	0
NOTES: Groundwater is only permitted for use as an emergency supply source in the event of a catastrophic surface water supply disruption.						

[31] California Water Code 10723 (C)(1).

[32] Luhdorff & Scalmanini Consulting Engineers. (2020). Technical Memorandum 4.1, dated June 2020.

6.2.3 Surface Water

Water that is self-supplied to agencies from streams, lakes and reservoirs is considered a surface water supply. Although a portion of Hayward's supply is derived from surface water, it is categorized as "purchased" water since the water is obtained from the SFPUC RWS. Hayward does not currently, nor does it plan to in the future, use self-supplied surface water as part of its water supply portfolio.

6.2.4 Stormwater

Hayward does not currently, nor does it plan to in the future, use diverted stormwater as part of its water supply portfolio. Small amounts of rainwater may be collected by retail customers for landscape use as a water conservation measure, as discussed in Section 9.2.7. However, large-scale stormwater capture and reuse is not currently planned.

6.2.5 Wastewater and Recycled Water

For the purpose of the UWMP, recycled water is defined as municipal wastewater that has been treated to a specific quality to enable its reuse for a beneficial purpose. In 2007, Hayward prepared a Recycled Water Feasibility Study to assess the technical viability of delivering recycled water, the potential market for recycled water, and consumer acceptance. Based on the results of the Feasibility Study, Hayward developed a Recycled Water Facility Plan (RWFP) in 2009, subsequently updated in 2013, to confirm potential users of recycled water and anticipated quantities, develop a conceptual treatment and distribution system, and estimate project costs. In 2018, Hayward began construction of recycled water facilities, collectively referred to as the Recycled Water Project Phase 1, and will begin delivering recycled water in summer-fall 2021. This section will review Hayward's planning efforts, progress in implementing the RWFP, potential uses of recycled water, and constraints and challenges.

Recycled Water Coordination

Hayward owns and operates a municipal wastewater collection system and treatment plant which, like Hayward's Water Distribution System, are managed in the Department of Public Works & Utilities and allow maximum coordination within the city. Hayward is a founding member of the East Bay Dischargers Authority, a joint powers agency that disposes of treated wastewater through a deepwater outfall to the San Francisco Bay.

Hayward also participates in regional efforts to increase recycled water use, such as the Western Recycled Water Coalition (WRWC), the Bay Area Clean Water Agencies (BACWA), and the Bay Area Integrated Regional Water Management Plan (BAIRWMP). The WRWC is a collaboration of cities, water agencies, and wastewater agencies with a mutual interest in securing funds to pursue locally managed recycled water projects. The BACWA Recycled Water Committee is dedicated to promoting and developing water recycling in order to protect the environment, develop reliable water supply, and sustain our economic viability in the Bay region. The BAIRWMP is a nine-county effort to coordinate and improve water supply reliability.

The following list identifies the entities that collect, treat, and discharge municipal wastewater generated in Hayward:

- City of Hayward Sewer Collection System – collects municipal wastewater and conveys it to the Water Pollution Control Facility
- City of Hayward Water Pollution Control Facility – Treats municipal wastewater and conveys it to the East Bay Dischargers Authority (EBDA) disposal facility
- East Bay Dischargers Authority – Disposes of wastewater produced by member agencies, including Hayward

Wastewater Collection, Treatment, and Disposal

This section addresses the handling of wastewater in Hayward, including collection, treatment, and disposal.

Wastewater Collected Within Service Area

Hayward owns and operates the wastewater collection system that collects wastewater from almost all of the residential, commercial, and industrial users within the incorporated city limits. Hayward also provides wastewater services to a small number of properties in unincorporated areas of Alameda County.

The wastewater collection system is comprised of about 350 miles of sewer mains, nine sewage lift stations, and 2.5 miles of force mains. Hayward maintains a comprehensive maintenance and replacement program to minimize the potential for sanitary sewer overflows and to ensure that sufficient collection capacity is available to meet demand.

Table 6-2 summarizes the collection of wastewater within Hayward.

Table 6-2. Wastewater Collected Within Service Area in 2020

Submittal Table 6-2 Retail: Wastewater Collected Within Service Area in 2020						
☐	There is no wastewater collection system. The supplier will not complete the table below.					
100%	Percentage of 2020 service area covered by wastewater collection system					
100%	Percentage of 2020 service area population covered by wastewater collection system					
Wastewater Collection			**Recipient of Collected Wastewater**			
Name of Wastewater Collection Hayward	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected from UWMP Service Area 2020	Name of Wastewater Treatment Hayward Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party? *(optional)*
City of Hayward	Metered	3,922	City of Hayward	Hayward Water Pollution Control Facility	Yes	No
Total Wastewater Collected from Service Area in 2020:		3,922				
NOTES: Volumes are in units MG.						

Wastewater Treatment and Discharge Within Service Area

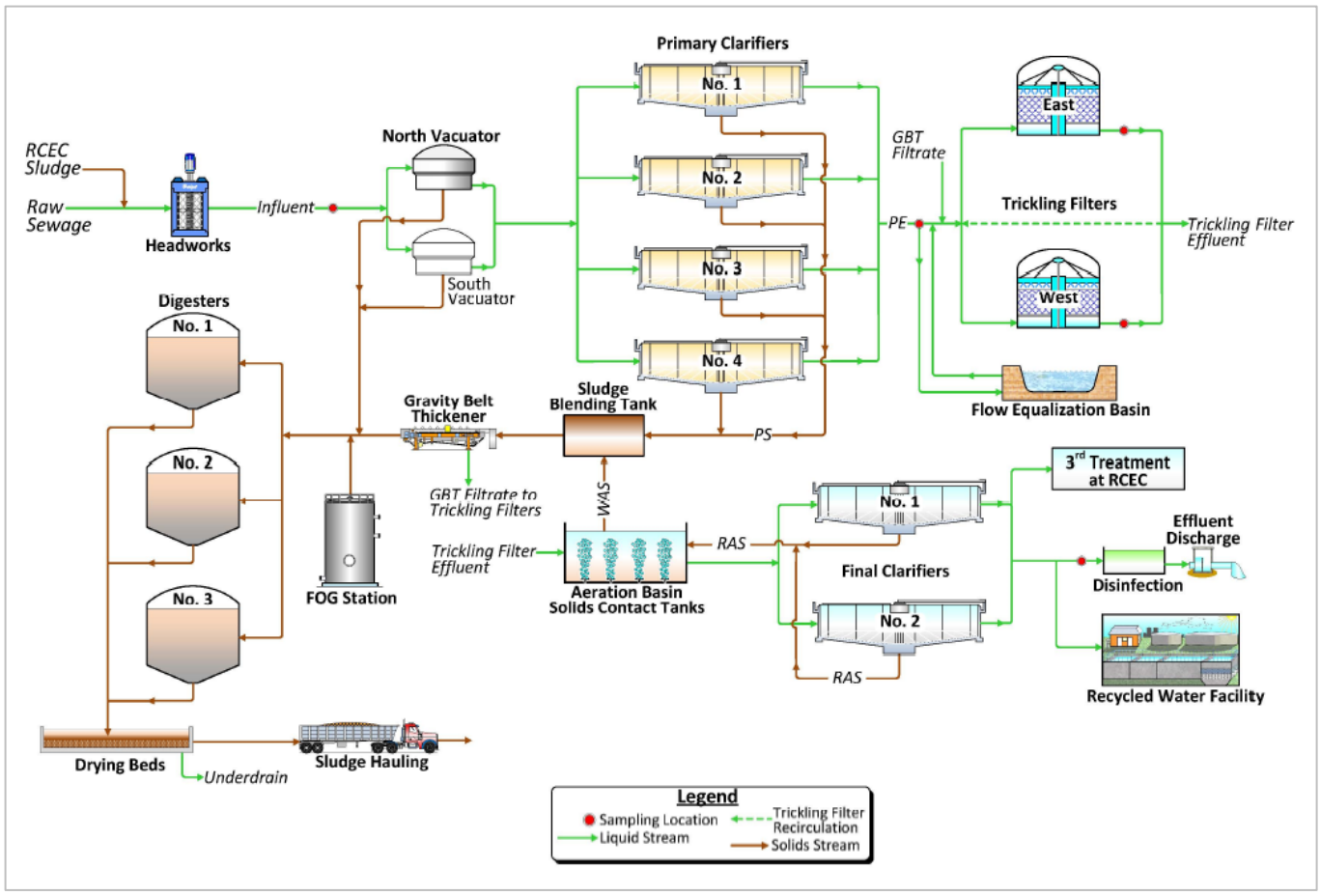
The wastewater collected by Hayward is conveyed to the city-owned WPCF. All wastewater treated at Hayward's WPCF originates within the service area.

The WPCF is permitted to provide primary through advanced secondary treatment for up to 18.5 MGD of wastewater. All wastewater is currently treated to a secondary level utilizing:

- Primary clarification
- High-rate trickling filters
- Solids contact aeration basin
- Secondary clarification

Figure 6-3 graphically depicts the current wastewater treatment process units utilized at Hayward's WPCF.

Figure 6-3. Hayward WPCF Unit Process Flow Schematic



The majority of treated wastewater is disinfected with sodium hypochlorite and conveyed to EBDA for final dechloramination and discharge via EBDA's common outfall to the San Francisco Bay. A portion of the secondary treated effluent is delivered to Calpine Corporation's Russell City Energy Center. The RCEC treats the wastewater to Title 22 disinfected tertiary levels for use as process water for cooling.

Table 6-3 summarizes the treatment of wastewater within the service area.

Table 6-3. Wastewater Treatment and Discharge Within Service Area in 2020

Submittal Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2020											
☐	No wastewater is treated or disposed of within the UWMP service area. The Supplier will not complete the table below.										
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2020 volumes				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	Instream Flow Permit Requirement
Hayward Water Pollution Control Facility	East Bay Dischargers Authority	San Francisco Bay	-	Bay or Estuary Outfall	No	Secondary, Disinfected - 2.2	3,922	3,745	177	0	0
						Total	3,922	3,745	177	0	0

NOTES:

1. Volumes are in units MG.
2. Hayward delivers secondary treated effluent to Calpine Corporation's Russell City Energy Center (RCEC). RCEC further treats to Title 22 recycled water. Beginning with the 2020 UWMP, Hayward will not include this use as recycled water.

Recycled Water System Description

As discussed further in Section 6.2.5, Hayward will begin deliveries of tertiary treated recycled water to 31 irrigation customers in summer-fall 2021 as part of its Phase 1 Recycled Water Project. The project includes the addition of a 0.5 MGD membrane treatment plant at the WPCF, a 1 MG recycled water storage tank, a recycled water pump station, and approximately 8.5 miles of distribution pipelines. A map of the Recycled Water Project Phase 1 distribution system is shown in Figure 6-4.

While Hayward will no longer consider deliveries of secondary treated wastewater to RCEC as recycled water, it is including information regarding this effort for information. The RCEC, located adjacent to Hayward's WPCF, is a 600-megawatt natural gas-fired combined cycle energy generation facility. The RCEC initiated operations in August 2013. The RCEC's permit to operate, issued by the California Energy Commission, requires the facility to use recycled water for cooling. Hayward and RCEC entered into an agreement whereby Hayward delivers secondary-treated wastewater, which is further treated by the RCEC to tertiary level in accordance with Title 22 requirements. RCEC's recycled water use is a direct beneficial use as defined in the California Code of Regulations.

The entities involved are:

- City of Hayward WPCF
- RCEC (owned by Calpine Corporation)

In 2020, Hayward delivered 177 MG to the RCEC, an average of 0.48 MGD. During the peak months (July through December), deliveries averaged about 0.78 MGD. Deliveries to RCEC have been significantly lower than anticipated in the 2015 UWMP because the facility has not been used as a full-time energy provider. The RCEC operates on demand, and demand can be impacted by factors such as weather conditions and how many other plants are operating at the time.

Hayward has opted not to include future deliveries to RCEC in its projected recycled water use totals in the 2020 UWMP and future updates. The secondary treated wastewater must be further treated to Title 22 tertiary standards for use as cooling water in energy production. Additionally, these deliveries do not offset potable water demand, as the California Energy Commission’s approval of the Application for Certification of this facility includes a requirement to use recycled water.

Figure 6-4. Recycled Water Project Phase 1 Location Map and Distribution System

Potential, Current, and Projected Recycled Water Uses

Current and planned beneficial uses of recycled water within Hayward are described below.

Current Uses of Recycled Water by the City of Hayward

Hayward delivers secondary treated wastewater to the RCEC. The wastewater is further treated by RCEC and used as cooling water. As discussed in Section 6.2.5, this use will no longer be included in Hayward's recycled water use although Hayward will continue to make deliveries.

Planned Uses of Recycled Water

Hayward will complete Phase 1 of its Recycled Water Project to deliver tertiary-treated wastewater to 31 other customers within an approximately two-mile radius of the WPCF in summer-fall 2021. As discussed in Section 6.2.5, the Phase 1 Recycled Water Project included construction of a 1 MG storage tank and new pump station (completed in November 2019), approximately 8.5 miles of new distribution pipeline and customer laterals and connections (completed in spring of 2019), and a new 0.5 MGD membrane treatment plant constructed at the WPCF (completed in 2021).

Hayward anticipates delivering an estimated 73 MG of recycled water per year, an annualized average of about 200,000 gallons per day, to 31 customers. All the Phase 1 customers plan to use the recycled water for irrigation. All planned uses of recycled water are direct beneficial uses in accordance with California Water Code §13050(f).

Hayward will be evaluating the feasibility of expanding the use of recycled water to serve additional users within the next few years. While this potential use has not yet been quantified, Hayward is estimating that the next phase may add 100,000 gpd of recycled water use.

Table 6-4 summarizes current and planned direct beneficial uses of recycled water within Hayward's service area.

Table 6-4. Current and Projected Recycled Water Direct Beneficial Uses Within Service Area

Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area									
☐	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.								
Name of Supplier Producing (Treating) the Recycled Water:	City of Hayward								
Name of Supplier Operating the Recycled Water Distribution System:	City of Hayward								
Supplemental Water Added in 2020 (volume) *Include units*	0 MG								
Source of 2020 Supplemental Water									
Beneficial Use Type *Insert additional rows if needed.*	**Potential** Beneficial Uses of Recycled Water (Describe)	Amount of **Potential** Uses of Recycled Water (Quantity) *Include volume units*[1]	General Description of 2020 Uses	Level of Treatment *Drop down list*	2020	2025	2030	2035	2040
Landscape irrigation (exc golf courses)	Landscape irrigation can be served by the Phase 1 Recycled Water Projects	110 MG	N/A	Tertiary	0	73	73	73	110
Industrial use	Power Plant Cooling	0 MG	Power Plant Cooling	Tertiary	177	0	0	0	0
				Total:	177	73	73	73	110
2020 Internal Reuse									

NOTES:

1. Volumes are in units MG.
2. Beginning with the 2020 UWMP, Hayward will no longer consider RCEC Power Plant Cooling uses as recycled water deliveries.

Hayward's 2015 UWMP included projected use of recycled water in 2020 and beyond. Table 6-5 compares the 2020 projected estimates to 2020 actual recycled water use, as reported in Table 6-4.

Table 6-5. 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual

Submittal Table 6-5 Retail: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual		
☐	Recycled water was not used in 2015 nor projected for use in 2020. The supplier will not complete the table below.	
Use Type	**2015 Projection for 2020**	**2020 Actual Use**
Landscape irrigation (excludes golf courses)	70	0
Industrial use (RCEC)	930	177
Total:	1,000	177

NOTES:

1. Volumes are in units MG.
2. Lower 2020 actual use reflects delayed completion of the Phase 1 Recycled Water Project and lower-than-expected use by RCEC.
3. With the 2020 UWMP, Hayward will no longer consider deliveries of secondary treated wastewater to RCEC as recycled water.

In the 2015 UWMP, Hayward projected that recycled water use in 2020 would be comprised of 930 MG to the RCEC, in quantities estimated by the owner of the facility, and 70 MG for landscape irrigation, under the assumption that the Phase 1 Recycled Water Project would be complete by 2017. As discussed above, the Phase 1 Recycled Water Project will be completed in 2021, and the actual deliveries to the RCEC have been less than anticipated due to facility operational issues, seasonal demands, and other factors outside of Hayward's control.

Actions to Encourage and Optimize Future Recycled Water Use

As discussed above, Hayward will complete Phase 1 of its Recycled Water Project to deliver tertiary-treated wastewater to 31 other customers within an approximate two-mile radius of the WPCF in summer-fall 2021. Hayward encourages use of the Phase 1 Recycled Water Project through the following strategies:

- **Public Outreach** – As the use of recycled water becomes more prevalent in Hayward, and throughout the region, there will be more opportunities to reach out to potential customers.
- **Mandatory Use Ordinance** – The Hayward City Council has adopted a Mandatory Use Ordinance that requires that properties which lie within Hayward's recycled water service area be served with recycled water for appropriate purposes if technically feasible.
- **Financial Incentives** – The recycled water rate adopted by Hayward is comprised of a uniform rate schedule for all recycled water customers, which is a minimum 25% reduction compared to non-residential potable water usage rate. This financial benefit, coupled with increased supply reliability, may create additional demand for recycled water.

Issues Constraining Recycled Water Expansion

While Hayward will continue to explore the potential for increasing the use of recycled water, there are technical and feasibility issues that may constrain expansion, including the following:

- **Distribution and Storage** – Since most of the recycled water use in Hayward is expected to be for irrigation, Hayward will need to evaluate storage and distribution needs to ensure that facilities are

properly sized to meet year-round demand, including peak demand that typically would occur in the summer months.

- **Water Quality** – Industrial uses, mainly cooling towers and boiler feed, require that specific water quality standards be met. There is concern among some customers that alkalinity and total dissolved solids in particular may be too high, while irrigation customers may be concerned about the impact of recycled water on plant health. A monitoring program will ensure ongoing and consistent maintenance of water quality standards.
- **Cost –** The capital costs of constructing a distribution system and treatment and storage facilities are significant, and customer retrofits may be costly, which could discourage some customers. Hayward will pursue funding resources for capital costs and may explore the potential for providing financial assistance to customers for retrofits. Finally, recycled water may be priced such that customers are encouraged to utilize it rather than pay for higher-priced potable water.

Assessment of Potential Uses

Hayward anticipates beginning deliveries of 73 MG per year to 31 customers as part of the Recycled Water Project Phase 1, with deliveries starting in summer-fall 2021.

Hayward has not yet determined potential recycled water use beyond the scope of the Recycled Water Project Phase 1 but plans to evaluate future phases of the Recycled Water Project and associated usage within the next few years. Hayward estimates that additional use may be in the range of 100,000 gpd.

Table 6-6. Methods to Expand Future Recycled Water Use

Submittal Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
☐	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
Section 6.2.5	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Complete Recycled Water Project Phase 1	Begin deliveries to 31 irrigation customers	2021	73
Total			73
NOTES: Volumes are in units MG.			

Reasons for Not Considering Recycled Water as a Potential Water Source

Hayward is considering recycled water as a potential water source; therefore, this section is not applicable.

Nearest Known Availability of Recycled Water and Obstacles to Accessing This Resource

This section is not applicable to Hayward.

Feasibility Study

Hayward has prepared a Recycled Water Facility Plan, which includes a feasibility assessment.

6.2.6 Desalinated Water Opportunities

Hayward does not anticipate opportunities for development of desalinated water supplies within the planning horizon of this UWMP, and so this water supply is not being considered. Constraints on developing desalinated water supplies include the high cost of infrastructure and the large amount of energy required to operate a desalination facility.

6.2.7 Water Exchanges and Transfers

Exchanges

Hayward does not currently, nor does it plan to in the future, include water exchanges in its water supply portfolio.

Transfers

Hayward does not currently, nor does it plan to in the future, utilize water transfers as a temporary or long-term water supply to meet normal demand.

Emergency Interties

Hayward has established emergency interties with neighboring agencies to facilitate the short-term transfer of water in the event of an emergency such as an earthquake or other disruption in normal supply. More information about Hayward's emergency interties is contained in Chapter 7.

6.2.8 Future Water Projects

The following sections describe the planned water supply projects to be implemented by both SFPUC (Hayward's wholesaler) and the City of Hayward.

SFPUC Water Supply Projects

Hayward's wholesaler, SFPUC, has been implementing its Water System Improvement Plan (WSIP) since it was adopted in 2008. The WSIP includes several water supply projects to address the Level of Service (LOS) Goals and Objectives established in the WSIP and updated in February 2020. SFPUC has also developed an Alternative Water Supply Planning Program to explore other projects that would increase overall water supply resiliency. These programs and future water supply projects are described in Section 7.1.

City of Hayward Water Projects

Hayward is not planning any water projects that will provide a quantifiable increase to its water supply. As discussed above, Hayward is implementing its Recycled Water Project Phase 1 that will deliver about 73 MG of recycled water to existing customers for irrigation uses. This project will offset potable water use supplies.

Table 6-7. Expected Future Water Supply Projects or Programs

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs					
☑	No expected future water supply projects or programs that provide a quantifiable increase to the Hayward's water supply. Supplier will not complete the table below.				
☐	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.				
Section 6.2.8	Provide page location of narrative in the UWMP				
Name of Future Projects or Programs	Joint Project with other agencies?	Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier
NOTES: This table includes only projects to be implemented by the City of Hayward. Projects to be constructed by SFPUC are documented in the narrative section and in SFPUC's 2020 UWMP.					

6.2.9 Summary of Existing and Planned Sources of Water

Table 6-8 provides a summary of the actual source and volume of water supply in the year 2020. In Table 6-9, a summary of projected water supplies is provided, including volume by source.

Table 6-8. Water Supplies – Actual

Submittal Table 6-8 Retail/Wholesale: Water Supplies — Actual				
Water Supply	Additional Detail on Water Supply	2020		
Drop down list *May use each category multiple times. These are the only water supply categories that will be recognized by the WUE data online submittal tool*		Actual Volume	Water Quality	Total Right or Safe Yield (optional)
Purchased or Imported Water	From SFPUC	5,082	Drinking Water	
Recycled Water		177	Recycled Water	
Total		5,259		0
NOTES: Volumes are in units of MG.				

Table 6-9. Water Supplies – Projected

Submittal Table 6-9 Retail/Wholesale: Water Supplies — Projected					
Water Supply	Additional Detail on Water Supply	Projected Water Supply *Report to the Extent Practicable*			
		2025	2030	2035	2040
		Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Purchased or Imported Water	From SFPUC	6,490	6,789	7,174	7,561
Recycled Water		73	73	73	110
Total		6,563	6,862	7,247	7,671
NOTES: Volumes are in units of MG.					

6.3 Special Conditions

The following sections describe any special conditions relevant to Hayward, including climate change, regulatory conditions, and any other locally applicable conditions.

6.3.1 Climate Change Impacts to SFPUC RWS Supplies

Information regarding the impacts of climate change to the SFPUC RWS supply was provided by BAWSCA in coordination with SFPUC and is provided verbatim below:

> The issue of climate change has become an important factor in water resources planning in the State, and is frequently considered in urban water management planning processes, though the extent and precise effects of climate change remain uncertain. There is convincing evidence that increasing concentrations of greenhouse gasses have caused and will continue to cause a rise in temperatures around the world, which will result in a wide range of changes in climate patterns. Moreover, observational data show that a warming trend occurred during the latter part of the 20th century and virtually all projections indicate this will continue through the 21st century. These changes will have a direct effect on water resources in California, and numerous studies have been conducted to determine the potential impacts to water resources. Based on these studies, climate change could result in the following types of water resource impacts, including impacts on the watersheds in the Bay Area:
>
> - Reductions in the average annual snowpack due to a rise in the snowline and a shallower snowpack in the low and medium elevation zones, such as in the Tuolumne River basin, and a shift in snowmelt runoff to earlier in the year;
> - Changes in the timing, annual average, intensity and variability of precipitation, and an increased amount of precipitation falling as rain rather than snow;
> - Long-term changes in watershed vegetation and increased incidence of wildfires that could affect water quality and quantity;
> - Sea level rise and an increase in saltwater intrusion;
> - Increased water temperatures with accompanying potential adverse effects on some fisheries and water quality;
> - Increases in evaporation and concomitant increased irrigation need; and
> - Changes in urban and agricultural water demand.

Both the SFPUC and BAWSCA participated in the 2020 update of the Bay Area Integrated Regional Water Management Plan (BAIRWMP), which includes an assessment of the potential climate change vulnerabilities of the region's water resources and identifies climate change adaptation strategies. In addition, the SFPUC continues to study the effect of climate change on the Regional Water System (RWS). These works are summarized below.

Bay Area Integrated Regional Water Management Plan

Climate change adaptation continues to be an overarching theme for the 2019 BAIRWMP update. As stated in the BAIRWMP, identification of watershed characteristics that could potentially be vulnerable to future climate change is the first step in assessing vulnerabilities of water resources in the Bay Area Region (Region). Vulnerability is defined as the degree to which a system is exposed to, susceptible to, and able to cope with or adjust to, the adverse effects of climate change. A vulnerability assessment was conducted in accordance with the Department of Water Resources' (DWR's) Climate Change Handbook for Regional Water Planning and using the most current science available for the Region. The vulnerability assessment, summarized in the table below, provides the main water planning categories applicable to the Region and a general overview of the qualitative assessment of each category with respect to anticipated climate change impacts.

Summary of BAIRWMP Climate Change Vulnerability Assessment

Vulnerability Areas	General Overview of Vulnerabilities
Water Demand	**Urban and Agricultural Water Demand** – Changes to hydrology in the Region as a result of climate change could lead to changes in total water demand and use patterns. Increased irrigation (outdoor landscape or agricultural) is anticipated to occur with temperature rise, increased evaporative losses due to warmer temperature, and a longer growing season. Water treatment and distribution systems are most vulnerable to increases in maximum day demand.
Water Supply	**Imported Water** – Imported water derived from the Sierra Nevada sources and Delta diversions provide 66 percent of the water resources available to the Region. Potential impacts on the availability of these sources resulting from climate change directly affect the amount of imported water supply delivered to the Region. **Regional Surface Water** – Although future projections suggest that small changes in total annual precipitation over the Region will not change much, there may be changes to when precipitation occurs with reductions in the spring and more intense rainfall in the winter. **Regional Groundwater** – Changes in local hydrology could affect natural recharge to the local groundwater aquifers and the quantity of groundwater that could be pumped sustainably over the long-term in some areas. Decreased inflow from more flashy or more intense runoff, increased evaporative losses and warmer and shorter winter seasons can alter natural recharge of groundwater. Salinity intrusion into coastal groundwater aquifers due to sea-level rise could interfere with local groundwater uses. Furthermore, additional reductions in imported water supplies would lead to less imported water available for managed recharge of local groundwater basins and potentially more groundwater pumping in lieu of imported water availability.

Vulnerability Areas	General Overview of Vulnerabilities
Water Quality	**Imported Water** – For sources derived from the Delta, sea-level rise could result in increases in chloride and bromide (a disinfection by-product (DBP) precursor that is also a component of sea water), potentially requiring changes in treatment for drinking water. Increased temperature could result in an increase in algal blooms, taste and odor events, and a general increase in DBP formation **Regional Surface Water** – Increased temperature could result in lower dissolved oxygen in streams and prolong thermocline stratification in lakes and reservoirs forming anoxic bottom conditions and algal blooms. Decrease in annual precipitation could result in higher concentrations of contaminants in streams during droughts or in association with flushing rain events. Increased wildfire risk and flashier or more intense storms could increase turbidity loads for water treatment. **Regional Groundwater** – Sea-level rise could result in increases in chlorides and bromide for some coastal groundwater basins in the Region. Water quality changes in imported water used for recharge could also impact groundwater quality.
Sea-Level Rise	Sea-level rise is additive to tidal range, storm surges, stream flows, and wind waves, which together will increase the potential for higher total water levels, overtopping, and erosion. Much of the bay shoreline is comprised of low-lying diked baylands which are already vulnerable to flooding. In addition to rising mean sea level, continued subsidence due to tectonic activity will increase the rate of relative sea-level rise. As sea-level rise increases, both the frequency and consequences of coastal storm events, and the cost of damage to the built and natural environment, will increase. Existing coastal armoring (including levees, breakwaters, and other structures) is likely to be insufficient to protect against projected sea-level rise. Crest elevations of structures will have to be raised or structures relocated to reduce hazards from higher total water levels and larger waves.
Flooding	Climate change projections are not sensitive enough to assess localized flooding, but the general expectation is that more intense storms would occur thereby leading to more frequent, longer and deeper flooding. Changes to precipitation regimes may increase flooding. Elevated Bay elevations due to sea-level rise will increase backwater effects exacerbating the effect of fluvial floods and storm drain backwater flooding.

Vulnerability Areas	General Overview of Vulnerabilities
Ecosystem and Habitat	Changes in the seasonal patterns of temperature, precipitation, and fire due to climate change can dramatically alter ecosystems that provide habitats for California's native species. These impacts can result in species loss, increased invasive species ranges, loss of ecosystem functions, and changes in vegetation growing ranges. Reduced rain and changes in the seasonal distribution of rainfall may alter timing of low flows in streams and rivers, which in turn would have consequences for aquatic ecosystems. Changes in rainfall patterns and air temperature may affect water temperatures, potentially affecting coldwater aquatic species. Bay Area ecosystems and habitat provide important ecosystem services, such as: carbon storage, enhanced water supply and quality, flood protection, food and fiber production. Climate change is expected to substantially change several of these services. The region provides substantial aquatic and habitat-related recreational opportunities, including: fishing, wildlife viewing, and wine industry tourism (a significant asset to the region) that may be at risk due to climate change effects.
Hydropower	Currently, several agencies in the Region produce or rely on hydropower produced outside of the Region for a portion of their power needs. As the hydropower is produced in the Sierra, there may be changes in the future in the timing and amount of energy produced due to changes in the timing and amount of runoff as a result of climate change. Some hydropower is also produced within the region and could also be affected by changes in the timing and amount of runoff.

Source: 2019 Bay Area Integrated Regional Water Management Plan (BAIRWMP), Table 16-3.

SFPUC Climate Change Studies

The SFPUC views assessment of the effects of climate change as an ongoing project requiring regular updating to reflect improvements in climate science, atmospheric/ocean modeling, and human response to the threat of greenhouse gas emissions. Climate change research by the SFPUC began in 2009 and continues to be refined. In its 2012 report "Sensitivity of Upper Tuolumne River Flow to Climate Change Scenarios," the SFPUC assessed the sensitivity of runoff into Hetch Hetchy Reservoir to a range of changes in temperature and precipitation due to climate change. Key conclusions from the report include the following:

- With differing increases in temperature alone, the median annual runoff at Hetch Hetchy would decrease by 0.7-2.1% from present-day conditions by 2040 and by 2.6-10.2% from present-day by 2100. Adding differing decreases in precipitation on top of temperature increases, the median annual runoff at Hetch Hetchy would decrease by 7.6-8.6% from present-day conditions by 2040 and by 24.7-29.4% from present-day conditions by 2100.
- In critically dry years, these reductions in annual runoff at Hetch Hetchy would be significantly greater, with runoff decreasing up to 46.5% from present day conditions by 2100 utilizing the same climate change scenarios.

- In addition to the total change in runoff, there will be a shift in the annual distribution of runoff. Winter and early spring runoff would increase and late spring and summer runoff would decrease.
- Under all scenarios, snow accumulation would be reduced and snow would melt earlier in the spring, with significant reductions in maximum peak snow water equivalent under most scenarios.

Currently, the SFPUC is conducting a comprehensive assessment of the potential effects of climate change on water supply using a wide range of plausible increases in temperature and changes in precipitation to address the wide uncertainty in climate projections over the planning horizon 2020 to 2070. There are many uncertain factors such as climate change, changing regulations, water quality, growth and economic cycles that may create vulnerabilities for the Regional Water System's ability to meet levels of service. The uncertainties associated with the degree to which these factors will occur and how much risk they present to the water system is difficult to predict, but nonetheless they need to be considered in SFPUC planning. To address this planning challenge, the project uses a vulnerability-based planning approach to explore a range of future conditions to identify vulnerabilities, assess the risks associated with these vulnerabilities that could lead to developing an adaptation plan that is flexible and robust to a wide range of future outcomes.

6.3.2 Climate Change Impacts to Groundwater Supplies

SGMA requires that GSPs include basin-wide water budget models under various climate change scenarios, including 2070 future conditions which account for the effects of estimated climate change.

It is anticipated that following adoption (anticipated by January 31, 2022), the final GSP for the East Bay Plain Subbasin will be available on the DWR website:

- https://sgma.water.ca.gov/portal/gsp/all

The current Alternative GSP for the Niles Cone Subbasin is available on the DWR and ACWD SGMA websites:

- https://sgma.water.ca.gov/portal/alternative/print/4
- https://www.acwd.org/566/Sustainable-Groundwater-Management-Act

It is anticipated that following adoption and submission (anticipated by January 1, 2022), the Updated Alternative GSP for the Niles Cone Subbasin will be available on the DWR and ACWD SGMA websites:

- https://sgma.water.ca.gov/portal/alternative/all
- https://www.acwd.org/566/Sustainable-Groundwater-Management-Act

6.3.3 Regulatory Conditions and Project Development

Emerging regulatory conditions (e.g., issues surrounding the 2018 amendments to the Water Quality Control Plan for the San Francisco/Sacramento-San Joaquin Delta Estuary [Bay-Delta Plan Amendment]) may affect planned future projects and the characterization of future water supply availability and analysis. The effect of the Bay-Delta Plan Amendment on SFPUC RWS supply reliability is discussed in Section 7.1.

Hayward does not have any current plans to develop additional supply sources. If Hayward does move forward with any plans to develop supply projects, emerging regulatory conditions will be considered, and the associated water supply reliability impacts will be assessed in future UWMP updates.

6.3.4 Other Locally Applicable Criteria

Other locally applicable criteria may affect characterization and availability of an identified water supply (e.g., changes in regional water transfer rules may alter the availability of a water supply that had historically been readily available). Hayward does not have any current plans to develop additional supply sources.

Under SGMA, GSAs have the authority to implement projects and management actions that help basins reach their sustainability goal, including such actions as setting allocations for groundwater pumping, prohibiting development of new groundwater wells, or implementing fees for pumping volumes. As described in Section 6.2.2, the GSP development process for the East Bay Plain Subbasin is still underway. If such actions are implemented, Hayward will consider these actions as part of its future supply planning efforts.

6.4 Energy Intensity

Water energy intensity is the total amount of energy, calculated on a whole-system basis, required for the use of a given amount of water in a specific location (Wilkinson, 2000).[33] The "Total Utility Approach" as defined by DWR in the UWMP Guidebook 2020 is used to report water-related energy consumption data for Hayward. Fiscal Year 2020 is selected as the one-year reporting period, and utility bills for the associated reporting period are used as the source for energy consumption data. Total energy consumed by Hayward during Fiscal Year 2020 based on reported utility bills is 3,819,219 kilowatt hours (kWhs). Table 6-10 shows the energy consumed for each MG of water entering the distribution system. Hayward's water system energy use is almost entirely associated with the pumping and distribution of drinking water. Based on the Total Utility Approach, Hayward's energy intensity is estimated to be 751.5 kWh/MG.

Hayward also has calculated the energy associated with the collection and treatment of wastewater for the Fiscal Year 2020 reporting period (see Table 6-11). Utility bills for Hayward's sewer lift station and pump stations during the associated reporting period are used as the source for energy consumption data for the collection of wastewater. Energy use metered at the WPCF is used as the source for energy consumption data for wastewater treatment. Hayward generates the majority of the energy used for wastewater treatment via a cogeneration facility and solar panels.

[33] Wilkinson. (2020). *Methodology for Analysis of the Energy Intensity of California's Water Systems,* supported by Ernest Orlando Lawrence Berkeley Laboratory and the California Institute for Energy Efficiency, accessed June 2021: http://large.stanford.edu/courses/2012/ph240/spearrin1/docs/wilkinson.pdf

Table 6-10. Recommended Energy Intensity – Total Utility Approach

Urban Water Supplier: *City of Hayward*

Water Delivery Product

Retail Potable Deliveries

Table O-1B: Recommended Energy Intensity - Total Utility Approach				
Enter Start Date for Reporting Period	7/1/2019	**Urban Water Supplier Operational Control**		
End Date	6/30/2020			
☐ Is upstream embedded in the values reported?		**Sum of All Water Management Processes**	**Non-Consequential Hydropower**	
Water Volume Units Used	*MG*	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process (MG)		*5,082*	*0*	5,082
Energy Consumed (kWh)		*3,819,219*	*0*	3,819,219
Energy Intensity (kWh/MG)		*751.5*	*0.0*	751.5

Quantity of Self-Generated Renewable Energy

N/A kWh

Data Quality *(Estimate, Metered Data, Combination of Estimates and Metered Data)*

Metered Data

Data Quality Narrative:

Utility bills for the associated time period are used as the source for energy consumption data.

Narrative:

Total energy consumption represents the energy consumed for pumping and distribution of drinking water.

Table 6-11. Recommended Energy Intensity – Wastewater & Recycled Water

Urban Water Supplier: *City of Hayward*

Table O-2: Recommended Energy Intensity - Wastewater & Recycled Water					
Enter Start Date for Reporting Period	7/1/2019	**Urban Water Supplier Operational Control**			
End Date	6/30/2020	**Water Management Process**			
☐ Is upstream embedded in the values reported?		Collection / Conveyance	Treatment	Discharge / Distribution	Total
Volume of Water Units Used	MG				
Volume of Wastewater Entering Process (MG)		*3,922*	*3,922*	*3,922*	*3,922*
Wastewater Energy Consumed (kWh)		*371,088*	*8,492,632*	*0*	*8,863,720*
Wastewater Energy Intensity (kWh/MG)		*94.6*	*2,165.4*	*0.0*	*2,260.0*
Volume of Recycled Water Entering Process (MG)		*0*	*0*	*177*	*177*
Recycled Water Energy Consumed (kWh)		*0*	*0*	*0*	*0*
Recycled Water Energy Intensity (kWh/MG)		*0.0*	*0.0*	*0.0*	*0.0*

Quantity of Self-Generated Renewable Energy related to recycled water and wastewater operations

8,152,369 kWh

Data Quality *(Estimate, Metered Data, Combination of Estimates and Metered Data)*

Metered Data

Data Quality Narrative:

Meters at the treatment facility and utility bills for the collection system for the associated time period are used as the source for energy consumption data.

Narrative:

Energy consumption represents the energy consumed for pumping and treatment of wastewater. Energy associated with the disposal of wastewater and distribution of recycled water is not metered separately from treatment.

7 WATER SERVICE RELIABILITY AND DROUGHT RISK ASSESSMENT

Description

This chapter assesses the reliability of Hayward's water supplies and identifies potential constraints that could affect the reliability of Hayward's supply during normal year, single dry-year, and multiple dry-year hydrologic conditions. In addition to the long-term reliability assessment, this chapter also presents a Drought Risk Assessment that evaluates Hayward's supply risks under a severe drought period lasting five consecutive years (i.e., through 2025).

Hayward purchases all its potable water supply from SFPUC, which delivers water through its RWS. The reliability of the water supplied by the SFPUC RWS is anticipated to vary greatly in different hydrologic year types. Hayward has relied on the supply reliability estimates provided by SFPUC for RWS supplies and the drought allocation structure provided by SFPUC and BAWSCA to estimate available RWS supplies in dry year types through 2040. Hayward's recycled water supply is expected to be 100% reliable in all year types.

Based on the information provided by SFPUC and BAWSCA, Hayward expects the available supplies to be sufficient to meet projected demands in normal-year conditions; however, significant shortfalls are projected in dry-year conditions. Numerous uncertainties exist in the assumptions that drive the projected dry-year shortage estimates, and Hayward anticipates revising its water service reliability assessment within the next five years as some of these uncertainties are resolved. Hayward has developed a Water Shortage Contingency Plan (Chapter 8) to address potential water shortage conditions. Potential water quality issues are not expected to affect the quality of water supplied to Hayward's customers as water quality is routinely monitored, and Hayward is able to make all appropriate adjustments to its distribution system to ensure that drinking water supplies meet all federal and state standards.

7.1 Water Service Reliability Assessment

The following sections describe Hayward's expected water service reliability for a normal year, single-dry year, and five consecutive dry years in five-year increments between 2025 and 2040.

7.1.1 Service Reliability – Constraints on Water Sources

As discussed in Chapter 6, Hayward purchases all its potable water supply from SFPUC, which delivers water through its RWS. In addition, beginning in summer-fall 2021, Hayward will supply specific non-potable irrigation and industrial uses with recycled water. Hayward has identified potential constraints on future supply availability, water quality, and climate change. These constraints are summarized in the following sections.

Regional Water System Supply Constraints

Detailed information is provided below regarding potential issues and constraints on the water supply availability from the SFPUC RWS. To maintain consistency with the UWMPs prepared by the SFPUC and the other BAWSCA member agencies, much of the language describing the SFPUC RWS supply constraints in the following

sections is common language provided by BAWSCA, in coordination with SFPUC. Common language provided by BAWSCA is shown in gray font.

Level of Service Goals

The SFPUC historically has met demand in its service area in all year types from its watersheds, which consist of:

- Tuolumne River watershed
- Alameda Creek watershed
- San Mateo County watersheds

In general, 85 percent of the supply comes from the Tuolumne River through Hetch Hetchy Reservoir and the remaining 15 percent comes from the local watersheds through the San Antonio, Calaveras, Crystal Springs, Pilarcitos and San Andreas Reservoirs. The adopted Water Supply Improvement Program (WSIP) retains this mix of water supply for all year types.

In 2008, the SFPUC adopted Level of Service (LOS) Goals and Objectives in conjunction with the adoption of WSIP. The SFPUC updated the LOS Goals and Objectives in February 2020. The SFPUC's LOS Goals and Objectives related to water supply are:

Program Goal	System Performance Objective
Water Supply *– meet customer water needs in non-drought and drought periods*	• Meet all state and federal regulations to support the proper operation of the water system and related power facilities. • Meet average annual water demand of 265 mgd from the SFPUC watersheds for retail and Wholesale Customers during non–drought years for system demands consistent with the 2009 Water Supply Agreement. • Meet dry-year delivery needs while limiting rationing to a maximum 20 percent system-wide reduction in water service during extended droughts. • Diversify water supply options during non-drought and drought periods. • Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers.

Bay-Delta Plan Impacts

Based on information provided by SFPUC and BAWSCA, the adoption of the 2018 Bay-Delta Plan Amendment is anticipated to impact the reliability of supplies from the RWS in the future.

In December 2018, the State Water Resources Control Board (SWRCB) adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) to establish water quality objectives to maintain the health of the Bay-Delta ecosystem. The SWRCB is required by law to regularly review this plan. The adopted Bay-Delta Plan Amendment was developed with the stated goal of increasing salmonid populations in three San Joaquin River tributaries (the

Stanislaus, Merced, and Tuolumne Rivers) and the Bay-Delta. The Bay-Delta Plan Amendment requires the release of 30-50% of the "unimpaired flow"[34] on the three tributaries from February through June in every year type. In SFPUC modeling of the new flow standard, it is assumed that the required release is 40% of unimpaired flow.

If the Bay-Delta Plan Amendment is implemented, the SFPUC will be able to meet the projected water demands presented in this Urban Water Management Plan (UWMP) in normal years but would experience supply shortages in single dry years or multiple dry years. Implementation of the Bay-Delta Plan Amendment will require rationing in all single dry years and multiple dry years. The SFPUC has initiated an Alternative Water Supply Planning Program (AWSP) to ensure that San Francisco can meet its Retail and Wholesale Customer water needs, address projected dry years shortages, and limit rationing to a maximum 20 percent system-wide in accordance with adopted SFPUC policies. This program is in early planning stages and is intended to meet future water supply challenges and vulnerabilities such as environmental flow needs and other regulatory changes; earthquakes, disasters, and emergencies; increases in population and employment; and climate change. As the region faces future challenges – both known and unknown – the SFPUC is considering this suite of diverse non-traditional supplies and leveraging regional partnerships to meet Retail and Wholesale Customer needs through 2045.

The SWRCB has stated that it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, assuming all required approvals are obtained by that time. But implementation of the Plan Amendment is uncertain for multiple reasons.

First, since adoption of the Bay-Delta Plan Amendment, over a dozen lawsuits have been filed in both state and federal courts, challenging the SWRCB's adoption of the Bay-Delta Plan Amendment, including a legal challenge filed by the federal government, at the request of the U.S. Department of Interior, Bureau of Reclamation. This litigation is in the early stages and there have been no dispositive court rulings as of this date.

Second, the Bay-Delta Plan Amendment is not self-implementing and does not automatically allocate responsibility for meeting its new flow requirements to the SFPUC or any other water rights holders. Rather, the Bay-Delta Plan Amendment merely provides a regulatory framework for flow allocation, which must be accomplished by other regulatory and/or adjudicatory proceedings, such as a comprehensive water rights adjudication or, in the case of the Tuolumne River, may be implemented through the water quality certification process set forth in section 401 of the Clean Water Act as part of the Federal Energy Regulatory Commission's licensing proceedings for the Don Pedro and La Grange hydroelectric projects. It is currently unclear when the license amendment process is expected to be completed. This process and the other regulatory and/or adjudicatory proceedings would likely face legal challenges and have lengthy timelines, and quite possibly could result in a different assignment of flow responsibility (and therefore a different water supply impact on the SFPUC).

Third, in recognition of the obstacles to implementation of the Bay-Delta Plan Amendment, the SWRCB Resolution No. 2018-0059 adopting the Bay-Delta Plan Amendment directed staff to help complete a "Delta watershed-wide agreement, including potential flow measures for the Tuolumne River" by March 1, 2019, and to incorporate such agreements as an "alternative" for a future amendment to the Bay-Delta Plan to be presented to the SWRCB "as early as possible after December 1, 2019." In accordance with the SWRCB's instruction, on March 1, 2019, SFPUC, in partnership with other key stakeholders, submitted a proposed project description for the Tuolumne River that could be the basis for a voluntary substitute agreement with the SWRCB ("March 1st Proposed Voluntary Agreement"). On March 26, 2019, the Commission adopted Resolution No. 19-0057 to support the SFPUC's

[34] "Unimpaired flow represents the natural water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds." (SWRCB, 2018)

participation in the Voluntary Agreement negotiation process. To date, those negotiations are ongoing under the California Natural Resources Agency and the leadership of the Newsom administration.[35]

Drought Allocation Methodology

Given the constraints described above, SFPUC has provided all of the Wholesale Customers with estimates of the RWS delivery reliability in all year types though 2045, as shown in Appendix I. For the purpose of the 2020 UWMP, Hayward has presented supply and demand comparisons through 2040. The Tier One Plan describes the method for allocating RWS water deliveries between Retail and Wholesale Customers during system-wide shortages of 20% or less. The Tier Two Plan allocates the collective Wholesale Customer share from the Tier One Plan among each of SFPUC's 26 Wholesale Customers.

For the purposes of 2020 UWMP water supply reliability analyses, SFPUC and BAWSCA have provided revised methodologies to allocate RWS supplies during projected future single-dry and multiple-dry years in instances where the projected supply shortfalls are greater than 20%. SFPUC and BAWSCA assumed that Tier One allocations for system-wide shortfalls of 16% to 20% would apply for all shortfalls greater than 20%. BAWSCA provided a revised methodology to allocate RWS supplies to Wholesale Agencies. The inclusion of these revised methodologies, which serve as the preliminary basis for UWMP supply reliability analyses, does not in any way imply an agreement by BAWSCA member agencies as to the allocation methodologies.

The Tier One and Tier Two Plans and the drought allocation methodologies used in the 2020 UWMP for shortfalls of greater than 20% are described further below.

Tier One Drought Allocations

In July 2009, San Francisco and its Wholesale Customers in Alameda County, Santa Clara County, and San Mateo County (Wholesale Customers) adopted the Water Supply Agreement (WSA), which includes a Water Shortage Allocation Plan (WSAP) that describes the method for allocating water from the RWS between Retail and Wholesale Customers during system-wide shortages of 20 percent or less. The WSAP, also known as the Tier One Plan, was amended in the 2018 Amended and Restated WSA.

The SFPUC allocates water under the Tier One Plan when it determines that the projected available water supply is up to 20 percent less than projected system-wide water purchases. The following table shows the SFPUC (i.e, Retail Customers) share and the Wholesale Customers' share of the annual water supply available during shortages depending on the level of system-wide reduction in water use that is required. The Wholesale Customers' share will be apportioned among the individual Wholesale Customers based on a separate methodology adopted by the Wholesale Customers, known as the Tier Two Plan, discussed further below.

[35] California Natural Resources Agency. Voluntary Agreements to Improve Habitat and Flow in the Delta and its Watersheds web page: https://files.resources.ca.gov/voluntary-agreements/.

Level of System-Wide Reduction in Water Use Required	Share of Available Water	
	SFPUC Share	Wholesale Customers Share
5% or less	35.5%	64.5%
6% through 10%	36.0%	64.0%
11% through 15%	37.0%	63.0%
16% through 20%	37.5%	62.5%

The Tier One Plan allows for voluntary transfers of shortage allocations between the SFPUC and any Wholesale Customer as well as between Wholesale Customers themselves. In addition, water "banked" by a Wholesale Customer, through reductions in usage greater than required, may also be transferred.

As amended in 2018, the Tier One Plan requires Retail Customers to conserve a minimum of 5 percent during droughts. If Retail Customer demands are lower than the Retail Customer allocation (resulting in a "positive allocation" to Retail[36]) then the excess percentage would be re-allocated to the Wholesale Customers' share. The additional water conserved by Retail Customers up to the minimum 5 percent level is deemed to remain in storage for allocation in future successive dry years.

The Tier One Plan will expire at the end of the term of the WSA in 2034, unless mutually extended by San Francisco and the Wholesale Customers.

The Tier One Plan applies only when the SFPUC determines that a system-wide water shortage exists and issues a declaration of a water shortage emergency under California Water Code Section 350. Separate from a declaration of a water shortage emergency, the SFPUC may opt to request voluntary cutbacks from its Retail and Wholesale Customers to achieve necessary water use reductions during drought periods.

As discussed above, the Tier One Plan only applies to system-wide shortages of 20% or less, and there is currently no methodology for sharing available water between SFPUC and Wholesale Customers for system-wide shortages of greater than 20%. SFPUC and BAWSCA assumed that Tier One allocations for System-Wide shortfalls of 16% to 20% would apply for all shortfalls greater than 20% for purposes of the UWMP supply reliability analyses. The analyses included herein do not in any way imply an agreement by BAWSCA member agencies with the assumed application of the Tier One allocations by SFPUC and BAWSCA for shortages greater than 20%.

Tier Two Drought Allocations

The Wholesale Customers have negotiated and adopted the Tier Two Plan, referenced above, which allocates the collective Wholesale Customer share from the Tier One Plan among each of the 26 Wholesale Customers. These Tier Two allocations are based on a formula that takes into account multiple factors for each Wholesale Customer including:

- Individual Supply Guarantee;
- Seasonal use of all available water supplies; and
- Residential per capita use.

The water made available to the Wholesale Customers collectively will be allocated among them in proportion to each Wholesale Customer's Allocation Basis, expressed in millions of gallons per day (MGD), which in turn is the weighted average of two components. The first

[36] See Water Supply Agreement, Water Shortage Allocation Plan (Attachment H), Section 2.1.

component is the Wholesale Customer's Individual Supply Guarantee, as stated in the WSA, and is fixed. The second component, the Base/Seasonal Component, is variable and is calculated using the monthly water use for three consecutive years prior to the onset of the drought for each of the Wholesale Customers for all available water supplies. The second component is accorded twice the weight of the first, fixed component in calculating the Allocation Basis. Minor adjustments to the Allocation Basis are then made to ensure a minimum cutback level, a maximum cutback level, and a sufficient supply for certain Wholesale Customers.

The Allocation Basis is used in a fraction, as numerator, over the sum of all Wholesale Customers' Allocation Bases to determine each wholesale customer's Allocation Factor. The final shortage allocation for each Wholesale Customer is determined by multiplying the amount of water available to the Wholesale Customers' collectively under the Tier One Plan, by the Wholesale Customer's Allocation Factor.

The Tier Two Plan requires that the Allocation Factors be calculated by BAWSCA each year in preparation for a potential water shortage emergency. As the Wholesale Customers change their water use characteristics (e.g., increases or decreases in SFPUC purchases and use of other water sources, changes in monthly water use patterns, or changes in residential per capita water use), the Allocation Factor for each Wholesale Customer will also change. However, for long-term planning purposes, each Wholesale Customer shall use as its Allocation Factor, the value identified in the Tier Two Plan when adopted.

Per WSA Section 3.11, the Tier One and Tier Two Plans will be used to allocate water from the Regional Water System between Retail and Wholesale Customers during system-wide shortages of 20% or less. For Regional Water System shortages in excess of 20%, San Francisco shall (a) follow the Tier 1 Shortage Plan allocations up to the 20% reduction, (b) meet and discuss how to implement incremental reductions above 20% with the Wholesale Customers, and (c) make a final determination of allocations above the 20% reduction. After the SFPUC has made the final allocation decision, the Wholesale Customers shall be free to challenge the allocation on any applicable legal or equitable basis. For purposes of the 2020 UWMPs, for San Francisco Regional Water System (RWS) shortages in excess of 20%, the allocations among the Wholesale Customers is assumed to be equivalent among them and to equal the drought cutback to Wholesale Customer by the SFPUC.

The Tier Two Plan, which initially expired in 2018, has been extended by the BAWSCA Board of Directors every year since for one additional calendar year. In November 2020, the BAWSCA Board voted to extend the Tier Two Plan through the end of 2021.

Revised Drought Allocation Plan

As detailed by BAWSCA in multiple memos and workshops (Appendix I), the Tier Two Plan was not designed for RWS shortages greater than 20%.[37] In a memorandum dated February 18, 2021, BAWSCA provided a refined methodology to allocate RWS supplies during projected future single-dry and multiple-dry years in the instance where the supply shortfalls are greater than 20%. The revised methodology developed by BAWSCA allocates the Wholesale Customer RWS supplies as follows:

1. When the average Wholesale Customers' RWS shortages are 10 percent or less, an equal percent reduction will be applied across all agencies. This is consistent with the existing Tier Two requirement of a minimum 10 percent cutback in any Tier Two application scenario.
2. When average Wholesale Customers' shortages are between 10 and 20 percent, the Tier Two Plan will be applied.

[37] Note that the Tier One Drought Allocations were also not designed for shortages greater than 20%. SFPUC and BAWSCA have assumed for UWMP planning purposes that the Wholesale Share will remain 62.5% for all shortfalls greater than 16%.

3. When the average Wholesale Customers' RWS shortages are greater than 20 percent, an equal percent reduction will be applied across all agencies.

The associated allocations based on the updated BAWSCA methodology are included as Appendix I. While this allocation methodology has been used herein, Hayward notes BAWSCA's memorandum dated February 18, 2021:

> "BAWSCA recognizes that this is not an ideal situation or method for allocation of available drought supplies. In the event of actual RWS shortages greater than 20 percent, the Member Agencies would have the opportunity to negotiate and agree upon a more nuanced and equitable approach. Such an approach would likely consider basic health and safety needs, the water needs to support critical institutions such as hospitals, and minimizing economic impacts on individual communities and the region."

This allocation method is intended to serve as the preliminary basis for the 2020 UWMP supply reliability analyses. The analyses provided herein do not in any way imply an agreement by BAWSCA member agencies regarding the exact allocation methodology. BAWSCA member agencies are in discussions about jointly developing an allocation method that would consider additional equity factors in the event SFPUC's RWS is not able to deliver its contractual supply volume and cutbacks to the RWS supply exceed 20%.

Recycled Water Supply Availability

As documented in Chapter 6, Hayward expects to meet specific non-potable irrigation and industrial water uses with recycled water. Hayward considers recycled water to be a reliable and sustainable water supply source that is estimated to be available during all hydrologic years at a volume that meets its projected recycled water demands (see Chapters 4 and 6).

Water Quality

Impaired water quality has the potential to affect water supply reliability. Hayward has met, and will continue to meet, all state and federal water quality regulations. All drinking water standards are set by the U.S. Environmental Protection Agency (USEPA) under the authorization of the Federal Safe Drinking Water Act of 1974. In California, the SWRCB Division of Drinking Water (DDW) can either adopt the USEPA standards or set more stringent standards, which are then codified in Title 22 of the California Code of Regulations. There are two general types of drinking water standards:

- **Primary Maximum Contaminant Levels (MCLs)** are health protective standards and are established using a very conservative risk-based approach for each constituent that takes into account potential health effects, detectability and treatability, and costs of treatment. Public water systems may not serve water that exceeds Primary MCLs for any constituent.
- **Secondary MCLs** are based on the aesthetic qualities of the water such as taste, odor, color, and certain mineral content and are considered limits for constituents that may affect consumer acceptance of the water.

Hayward routinely monitors the water supplied to its customers to ensure it meets these drinking water standards. Testing results are reported to the SWRCB DDW. This information is summarized annually in Water Quality Reports (also known as "Consumer Confidence Reports"), which are provided to customers by mail and made available on Hayward's website: https://www.hayward-ca.gov/services/city-services/water-quality.

As discussed in Chapter 6, Hayward's potable water is supplied by the SFPUC RWS that comes primarily from snowmelt in the Sierra Nevada mountains. Additional RWS water comes from rainfall collecting in East Bay and Peninsula reservoirs. The SFPUC RWS supplies very high-quality water with low total dissolved solid (TDS) concentrations from these protected sources.

SFPUC's Water Quality Division regularly collects and tests water samples from reservoirs and designated sampling points throughout the RWS to ensure SFPUC's water meets or exceeds federal and state drinking water standards. In 2019, the Water Quality Division conducted more than 53,650 drinking water tests in the sources and transmission systems. The SFPUC also has online instruments providing continuous water quality monitoring at numerous locations.

Given Hayward's and SFPUC's proactive monitoring and management, water quality is not expected to impact the reliability of Hayward's available supplies within the 2020 UWMP planning horizon (i.e., through 2040).

Climate Change

Section 6.3.1 provides a summary of the applicable assessments performed by SFPUC regarding the impacts of climate change on the SFPUC RWS supply and those planned for the near term. The anticipated effects of climate change have been factored into Hayward's assessment of its supply reliability.

7.1.2 Service Reliability – Year Type Characterization

Per the UWMP Guidebook 2020, the water service reliability assessment includes three unique year types:

- A normal hydrologic year represents the water supplies available under normal conditions; this could be an averaged range of years or a single representative year
- A single-dry year represents the lowest available water supply
- A five-consecutive year drought represents the driest five-year period in the historical record

Dry year periods consistent with the UWMP Guidebook 2020 methodology are provided in the language and supply projections provided by BAWSCA and SFPUC in Appendix I and as presented in Tables 7-1a and 7-1b. The data and methods used to develop these dry-year supply availabilities are described in the sections below.

Table 7-1a. Basis of Water Year Data (Reliability Assessment)

Submittal Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment)			
Year Type	**Base Year**	**Available Supplies if Year Type Repeats**	
		X	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. **Location: Table 7-1b and Section 7.1.**
			Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available	**% of Average Supply**
Average Year			100%
Single-Dry Year			
Consecutive Dry Years 1st Year			
Consecutive Dry Years 2nd Year			
Consecutive Dry Years 3rd Year			
Consecutive Dry Years 4th Year			
Consecutive Dry Years 5th Year			

SFPUC Supply Modeled RWS Dry-Year Supply Availability

As described in SFPUC's 2020 UWMP, SFPUC used the Hetch Hetchy and Local Simulation Model (HHLSM) to estimate SFPUC RWS supply availability for water service reliability assessment and the DRA (Section 7.2). HHLSM simulates supplies over a historical record of hydrology from 1920 through 2017 with a representation of current and planned SFPUC RWS infrastructure and operations.

Water supply shortfalls presented by SFPUC in Appendix J were estimated using SFPUC's design drought methodology. The SFPUC uses a hypothetical 8.5-year design drought that is more severe than what the RWS has historically experienced as the basis for planning and modeling future scenarios. The design drought consists of the 1987-92 drought, followed by an additional 2.5 years of dry conditions from the hydrologic record that includes the 1976-77 drought. The five-consecutive year dry sequence used for the UWMP represents years 2 through 6 of the design drought. However, the modeling approach assumes water supply rationing each year that is designed to provide sufficient carry-over water in SFPUC reservoirs for continued deliveries, although at reduced levels, during each year of the five-consecutive year drought and the remaining years of the design drought (SFPUC, 2021).

SFPUC provided results for two modeled scenarios, which show significantly different supply reliability projections for the RWS:

1. With full implementation of the Bay-Delta Plan Amendment in 2023
2. Without implementation of the Bay-Delta Plan Amendment

SFPUC decided to present the water reliability analysis with full implementation of the Bay-Delta Plan Amendment in its 2020 UWMP Submittal Tables and provided the following rationale for that decision:

> The adoption of the Bay-Delta Plan Amendment may significantly impact the supply available from the RWS. SFPUC recognizes that the Bay-Delta Plan Amendment has been adopted and that, given that it is now state law, we must plan for a future in which it is fully implemented. SFPUC also acknowledges that the plan is not self-implementing and therefore does not automatically go into effect. SFPUC is currently pursuing a voluntary agreement as well as a lawsuit which would limit implementation of the Plan. With both of these processes occurring on an unknown timeline, SFPUC does not know at this time when the Bay-Delta Plan Amendment is likely to go into effect. As a result, it makes sense to conduct future supply modeling for a scenario that doesn't include implementation of the Bay-Delta Plan Amendment, as that represents a potential supply reliability scenario.
>
> Because of the uncertainty surrounding implementation of the Bay-Delta Plan Amendment, the SFPUC conducted water service reliability assessment that includes: (1) a scenario in which the Bay-Delta Plan Amendment is fully implemented in 2023, and (2) a scenario that considers the SFPUC system's current situation without the Bay-Delta Plan Amendment. The two scenarios provide a bookend for the possible future scenarios regarding RWS supplies. The standardized tables associated with the SFPUC's UWMP contain the future scenario that assumes implementation of the Bay-Delta Plan Amendment starting in 2023.

As shown in Appendix I, SFPUC provided results for each of the modeling scenarios described above assuming demands on the RWS equal to both: 1) the total of projected retail demands and projected Wholesale Customer purchases; and 2) a constant water demand of 265 MGD from the SFPUC watersheds for Retail and Wholesale Customers, consistent with SFPUC's contractual obligation. According to SFPUC, the modeling based on a demand of 265 MGD was used to "facilitate planning that supports meeting this Level of Service goal and their contractual obligations." Supply modeling results presented in the text of the SFPUC's 2020 UWMP reflect an input of projected retail and Wholesale demands on the RWS.

Consistent with SFPUC's approach and the guidance from SFPUC and BAWSCA, Hayward's 2020 UWMP presents results for the water service reliability assessment and the DRA (Section 7.2) based on the modeling scenario that assumes full implementation of the Bay-Delta Plan Amendment in 2023 and uses projected RWS demands.

SFPUC modeling results for this scenario showing the total RWS supply available to Wholesale Customers during the characteristic year types can be found in Tables 3a-3g of the SFPUC letter dated March 30, 2021 (Appendix I). The results show total Wholesale RWS supply shortfalls ranging from 36% to 54% of projected purchases during dry years after 2023.

For comparison purposes, results for the scenario without the Bay-Delta Plan Amendment can be found in Tables 4a-4g of the SFPUC letter. The results indicate that SFPUC would be able to meet 100% of Wholesale projected purchases during all year types through 2040.

Hayward's Year-Type Characterization

Using the SFPUC modeling results presented in the SFPUC letter dated March 30, 2021, BAWSCA provided single- and five-consecutive dry year allocations for each agency based on the methodology described in Section 7.1.1. As discussed therein, for the purposes of the 2020 UWMP supply reliability analyses only, Wholesale Agency drought allocations assume an equal percent reduction to all agencies when the average Wholesale Customers' RWS shortages are greater than 20%. The reductions for the scenario that assumes the implementation of the Bay-Delta Plan Amendment in 2023 are included in Table E of the BAWSCA updated drought allocation memorandum dated April 1, 2021 (Appendix I) and in Table 7-1b below, for base years 2025 through 2040. The percent of available supplies shown in Table 7-1b are applied to Hayward's projected potable demands listed in Table 4-3 for each respective base year to calculate the projected dry-year RWS supplies shown in Table 7-3 and Table 7-4.

Table 7-1b. RWS Wholesale Supply Availability During Normal and Dry Years for Base Years 2025 through 2040 (Responds to DWR Table 7-1)

Base Year	Normal Year	Single Dry Year	Multiple Dry Years				
			Year 1	Year 2	Year 3	Year 4	Year 5
2025	100%	64%	64%	55%	55%	55%	55%
2030	100%	64%	64%	55%	55%	55%	55%
2035	100%	64%	64%	54%	54%	54%	50%
2040	100%	63%	63%	54%	54%	48%	48%

NOTES:
1. Water supply availability is presented in terms of percentage of projected RWS demands for each base year (Table 4-3) consistent with the revised BAWSCA Drought Methodology that assumes equal percent cutbacks to all Wholesale Agencies.
2. Results reflect scenario with Bay-Delta Plan Amendment implemented in 2023 and the projected RWS purchases.

7.1.3 Service Reliability – Supply and Demand Comparison

The following sections compare Hayward's projected water demands (described in Chapter 4) with its projected water supply availability during normal, single-dry, and multiple-dry years to assess the reliability of Hayward's water supplies.

Water Service Reliability - Normal Year

Table 7-2 shows the projected supply and demand totals for a normal year. The supply and demand totals are consistent with those in Table 6-9 and Table 4-3, respectively. Hayward is expected to have adequate water supplies during normal years to meet its projected demands through 2040.

Table 7-2. Normal Year Supply and Demand Comparison

Submittal Table 7-2 Retail: Normal Year Supply and Demand Comparison				
	2025	2030	2035	2040
Supply totals (*autofill from Table 6-9)*	6,563	6,862	7,247	7,671
Demand totals *(autofill from Table 4-3)*	6,563	6,862	7,247	7,671
Difference	0	0	0	0
NOTES: 1. Volumes are in units of MG. 2. Supply and demand include both potable water and recycled water.				

Water Service Reliability – Single-Dry Year

The reliability of deliveries from the RWS are anticipated to vary greatly in different year types. As described above and detailed in Appendix I, Hayward has relied on the supply reliability estimates provided by SFPUC for RWS deliveries and the drought allocation structure provided by SFPUC and BAWSCA to estimate available RWS supplies in dry-year types through 2040.

Table 7-3 shows the projected supply and demand totals for the single-dry year.

Table 7-3. Single-Dry Year Supply and Demand Comparison

Submittal Table 7-3 Retail: Single-Dry Year Supply and Demand Comparison				
	2025	2030	2035	2040
Supply totals	4,220	4,397	4,630	4,909
Demand totals	6,563	6,862	7,247	7,671
Difference	(2,342)	(2,465)	(2,616)	(2,762)
NOTES: 1. Volumes are in units of MG. 2. Totals may not sum due to rounding. 3. Supply and demand include both potable water and recycled water.				

Water Service Reliability – Five-Consecutive Dry Years

Based on the supply reliability estimates and allocation structure provided by SFPUC and BAWSCA, Table 7-4 shows Hayward's projected supply and demand totals for dry year periods extending five years.

Table 7-4. Multiple-Dry Years Supply and Demand Comparison

Submittal Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison					
		2025	2030	2035	2040
First year	Supply totals	4,220	4,397	4,630	4,909
	Demand totals	6,563	6,862	7,247	7,671
	Difference	(2,342)	(2,465)	(2,616)	(2,762)
Second year	Supply totals	3,629	3,782	3,979	4,227
	Demand totals	6,563	6,862	7,247	7,671
	Difference	(2,934)	(3,080)	(3,268)	(3,444)
Third year	Supply totals	3,629	3,782	3,979	4,227
	Demand totals	6,563	6,862	7,247	7,671
	Difference	(2,934)	(3,080)	(3,268)	(3,444)
Fourth year	Supply totals	3,629	3,782	3,979	3,743
	Demand totals	6,563	6,862	7,247	7,671
	Difference	(2,934)	(3,080)	(3,268)	(3,928)
Fifth year	Supply totals	3,629	3,782	3,653	3,743
	Demand totals	6,563	6,862	7,247	7,671
	Difference	(2,934)	(3,080)	(3,594)	(3,928)

NOTES:
1. Volumes are in units of MG.
2. Totals may not sum due to rounding.
3. Supply and demand include both potable water and recycled water.

Uncertainties in Dry-Year Water Supply Projections

As shown in the above tables, significant water supply shortfalls are projected in future single- and multiple-dry years, due to implementation of the Bay-Delta Plan Amendment. These projections likely represent a worst-case scenario in which the Bay-Delta Plan Amendment is implemented without SFPUC and the SWRCB reaching a Voluntary Agreement and does not account for implementation of SFPUC's Alternative Water Supply Program (AWSP) described in more detail below. Under this supply scenario, SFPUC appears to be unable to meet its contractual obligations (i.e., Level of Service goals) and Hayward's forecasted demands during drought years.

As discussed in Section 7.1.2, SFPUC also provided water supply reliability projections without implementation of the Bay-Delta Plan Amendment (see Appendix I). These projections indicate without the Bay-Delta Plan Amendment, SFPUC would be able to supply 100% of projected RWS demands in all year types through 2040. The large disparity in projected water supply reliability between the with and without Bay-Delta Plan Amendment implementation scenarios indicates the current level of uncertainty.

In addition to these two UWMP scenarios, during the March 26, 2021 Special Commission Meeting, SFPUC staff presented HHLSM modeling results for 10 different scenarios, including scenarios with the implementation of the Tuolumne River Voluntary Agreement (TRVA), with the implementation of the Bay-Delta Plan Amendment and the AWSP, and with the use of a modified rationing policy and a modified design drought (Appendix J). Results for the scenarios with the TRVA and with the AWSP (particularly with a modified rationing policy and design drought) showed significantly improved RWS supply availability compared to the Bay-Delta Plan Amendment scenario.

The current sources of uncertainty in the dry-year water supply projections are summarized below:

- *Implementation of the Bay-Delta Plan Amendment is under negotiation.* SFPUC is continuing negotiations with the SWRCB on implementation of the Bay-Delta Plan Amendment for water supply cutbacks, particularly during droughts. SFPUC, in partnership with other key stakeholders, has proposed a voluntary substitute agreement to the Bay-Delta Plan Amendment, the TRVA, that provides a collaborative approach to protect the environment and plan for a reliable and high-quality future potable water supply. This is a dynamic situation and the projected drought cutback allocations may need to be revised before the 2025 UWMP depending on the outcome of ongoing negotiations.
- *Benefits of the AWSP are not accounted for in current supply projections.* As already mentioned, SFPUC is exploring options to increase its supplies through the AWSP. Implementation of feasible projects developed under the AWSP is not reflected in the supply reliability scenarios presented herein and is anticipated to reduce the projected RWS supply shortfalls (Appendix J).
- *Methodology for Tier One and Tier Two Wholesale drought allocations have not been established for wholesale shortages greater than 20%.* As discussed in Section 7.1.1, the current Tier One and Tier Two Plans are not designed for RWS supply shortages greater than 20%. For UWMP planning purposes per BAWSCA guidance, the Tier One Wholesale share for a 16% to 20% supply reduction (62.5%) has been applied for reductions greater than 20%, and an equal percent reduction has been applied to all Wholesale Agencies. BAWSCA member agencies have not formally agreed to adopt this shortage allocation methodology and are in discussions about jointly developing an alternative allocation method that would consider additional equity factors.
- *RWS demands are subject to change.* The RWS supply availability is dependent on system demands. As discussed in Section 7.1.2, the supply scenarios are based on the total projected Wholesale Customer purchases provided by BAWSCA to SFPUC in January 2021. Some BASCWA agencies have refined their projected demands during the UWMP process after their estimates were provided to SFPUC. In addition, the RWS demand projections are subject to change based on future housing needs, increased conservation, and development of additional local supplies.
- *Frequency and duration of cutbacks are also uncertain.* While the projected shortfalls presented in the 2020 UWMP appear severe, the actual frequency and duration of such shortfalls are uncertain. Based on the HHLSM simulations provided by BAWSCA for the Bay-Delta Plan Amendment scenario (Appendix I), rationing is anticipated to be required 20% of years for base years 2025 through 2035, and 23% of all years for base year 2040.

  In addition to evaluating local options to increase supply reliability, Hayward has placed high priority on working with BAWSCA and SFPUC in the upcoming years to better refine the estimates of RWS supply reliability and may amend this 2020 UWMP when new information becomes available.

The above uncertainties notwithstanding, BAWSCA's current drought allocation cutbacks will require Hayward to apply its Water Shortage Contingency Plan Stage 6 for water use restrictions above 50% (see Appendix K) and will affect Hayward's short- and long-term water management decisions. As described in the *Strategies and Actions to Address Dry-Year Supply Shortfalls* section below, Hayward is working independently and with the other BAWSCA agencies to identify regional mitigation measures to improve reliability for regional and local water supplies to meet its customers' water needs.

Hayward recommends users of its 2020 UWMP contact city staff for potential updates about its water supply reliability before using the 2020 UWMP drought cutback projections for their planning projects and referencing the drought.

Strategies and Actions to Address Dry-Year Supply Shortfalls

Although there remains significant uncertainty in future water supply availability, as discussed in the previous section, Hayward, SFPUC, and BAWSCA have developed strategies and actions to address the projected dry-year supply shortfalls. These efforts are discussed in the following sections.

SFPUC's and Other Regional Strategies and Actions

Dry-Water Supply Projects

The WSIP authorized the SFPUC to undertake a number of water supply projects to meet dry-year demands with no greater than 20% system-wide rationing in any one year. Implementation of these projects is also expected to mitigate impacts of the implementation of the Bay-Delta Plan Amendment. Those projects include the following:

- *Calaveras Dam Replacement Project*. Calaveras Dam is located near a seismically active fault zone and was determined to be seismically vulnerable. To address this vulnerability, the SFPUC constructed a new dam of equal height downstream of the existing dam. Construction on the project occurred between 2011 and July 2019. The SFPUC began impounding water behind the new dam in accordance with California Division of Safety of Dams (DSOD) guidance in the winter of 2018/2019.
- *Alameda Creek Recapture Project*. As a part of the regulatory requirements for future operations of Calaveras Reservoir, the SFPUC must implement bypass and instream flow schedules for Alameda Creek. The Alameda Creek Recapture Project will recapture a portion of the water system yield lost due to the instream flow releases at Calaveras Reservoir or bypassed around the Alameda Creek Diversion Dam and return this yield to the RWS through facilities in the Sunol Valley. Water that naturally infiltrates from Alameda Creek will be recaptured into an existing quarry pond known as SMP (Surface Mining Permit)-24 Pond F2. The project will be designed to allow the recaptured water to be pumped to the Sunol Valley Water Treatment Plant or to San Antonio Reservoir. Construction of this project will occur from spring 2021 to fall 2022.
- *Lower Crystal Springs Dam Improvements*. The Lower Crystal Springs Dam (LCSD) Improvements were substantially completed in November 2011. The joint San Mateo County/SFPUC Bridge Replacement Project to replace the bridge across the dam was completed in January 2019. A WSIP follow up project to modify the LCSD Stilling Basin for fish habitat and upgrade the fish water release and other valves started in April 2019. While the main improvements to the dam have been completed, environmental permitting issues for reservoir operation remain significant. While the reservoir elevation was lowered due to DSOD restrictions, the habitat for the Fountain Thistle, an endangered plant, followed the lowered reservoir elevation. Raising the reservoir elevation now requires that new plant populations be restored incrementally before the reservoir elevation is raised. The result is that it may be several years before pre-project water storage volumes can be restored.
- *Regional Groundwater Storage and Recovery Project*. The Groundwater Storage and Recovery Project (GSRP) is a strategic partnership between SFPUC and three San Mateo County agencies – Cal Water, the City of Daly City, and the City of San Bruno – to conjunctively operate the south Westside Groundwater Basin. The project sustainably manages groundwater and surface water resources in a way that provides supplies during times of drought. During years of normal or heavy rainfall, the project would provide additional surface water to the partner agencies in San Mateo County in lieu of groundwater pumping. Over time, reduced pumping creates water storage through natural recharge of up to 20 billion gallons of new water supply available during dry years.

The project's Final Environmental Impact Report was certified in August 2014, and the project also received Commission approval that month. Phase 1 of this project consists of construction of thirteen well sites and is over 99 percent complete. Phase 2 of this project consists of completing construction of the well station at the South San Francisco Main site and some carryover work that has not been completed from Phase 1. Phase 2 design work began in December 2019.

- *2 MGD Dry-year Water Transfer*. In 2012, the dry-year transfer was proposed between the Modesto Irrigation District and the SFPUC. Negotiations were terminated because an agreement could not be reached. Subsequently, the SFPUC had discussions with the Oakdale Irrigation District for a one-year transfer agreement with the SFPUC for 2 MGD (2,240 acre-feet). No progress towards agreement on a transfer was made in 2019, but the irrigation districts recognize SFPUC's continued interest and SFPUC will continue to pursue transfers.

In order to achieve its target of meeting at least 80 percent of its customer demand during droughts with a system demand of 265 MGD, and to mitigate the impacts of the Bay-Delta Plan, the SFPUC must successfully implement the dry-year water supply projects included in the WSIP.

Furthermore, the permitting obligations for the Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements include a combined commitment of 12.8 MGD for instream flows on average. When this is reduced for an assumed Alameda Creek Recapture Project recovery of 9.3 MGD, the net loss of water supply is 3.5 MGD.

Alternative Water Supply Program

As discussed below, BAWSCA has been engaged with SFPUC on development of alternative water supplies:

With the adoption of the Bay-Delta Plan Phase 1 (Bay-Delta Plan) by the State Water Resources Control Board in December of 2018, coupled with the uncertainties associated with litigation and the development of Voluntary Agreements that, if successful, would provide an alternative to the 40% unimpaired flow requirement that is required by the Bay-Delta Plan, BAWSCA redoubled its efforts to ensure that the SFPUC took necessary action to develop alternative water supplies such that they would be in place to fill any potential gap in supply by implementation of the Bay-Delta Plan and that the SFPUC would be able to meet its legal and contractual obligations to its Wholesale Customers.

In 2019, BAWSCA held numerous meetings with the SFPUC encouraging them to develop a division within their organization whose chief mission was to spearhead alternative water supply development. On June 25, 2019, BAWSCA provided a written and oral statement to the Commissioners urging the SFPUC to focus on developing new sources of supply in a manner similar to how it addressed the implementation of the Water System Improvement Program (WSIP). BAWSCA urged that a new water supply program was called for, with clear objectives, persistent focus, a dedicated team, adequate funding, and a plan for successful execution. The SFPUC Commission supported BAWSCA's recommendation and directed staff to undertake such an approach.

In early 2020, the SFPUC began implementation of the Alternative Water Supply Planning Program (AWSP), a program designed to investigate and plan for new water supplies to address future long-term water supply reliability challenges and vulnerabilities on the RWS.

Included in the AWSP is a suite of diverse, non-traditional supply projects that, to a great degree, leverage regional partnerships and are designed to meet the water supply needs of the SFPUC Retail and Wholesale Customers through 2045. As of the most recent Alternative Water Supply Planning Quarterly Update, SFPUC has budgeted $264 million over the next ten years to fund water supply projects. BAWSCA is heavily engaged with the SFPUC on its AWSP efforts.

SFPUC's AWSP is described in more detail below:

> The SFPUC is increasing and accelerating its efforts to acquire additional water supplies and explore other projects that would increase overall water supply resilience through the AWSP. The drivers for the program include: (1) the adoption of the Bay-Delta Plan Amendment and the resulting potential limitations to RWS supply during dry years, (2) the net supply shortfall following the implementation of WSIP, (3) San Francisco's perpetual obligation to supply 184 MGD to the Wholesale Customers, (4) adopted LOS Goals to limit rationing to no more than 20 percent system-wide during droughts, and (5) the potential need to identify water supplies that would be required to offer permanent status to interruptible customers. Developing additional supplies through this program would reduce water supply shortfalls and reduce rationing associated with such shortfalls. The planning priorities guiding the framework of the AWSP are as follows:
>
> 1. Offset instream flow needs and meet regulatory requirements
> 2. Meet existing obligations to existing permanent customers
> 3. Make interruptible customers permanent
> 4. Meet increased demands of existing and interruptible customers
>
> In conjunction with these planning priorities, the SFPUC considers how the program fits within the LOS Goals and Objectives related to water supply and sustainability when considering new water supply opportunities. The key LOS Goals and Objectives relevant to this effort can be summarized as:
>
> - Meet dry-year delivery needs while limiting rationing to a maximum of 20 percent system-wide reduction in water service during extended droughts;
> - Diversify water supply options during non-drought and drought periods;
> - Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers;
> - Meet, at a minimum, all current and anticipated legal requirements for protection of fish and wildlife habitat;
> - Maintain operational flexibility (although this LOS Goal was not intended explicitly for the addition of new supplies, it is applicate here).
>
> Together, the planning priorities and LOS Goals and Objectives provide a lens through which the SFPUC considers water supply options and opportunities to meet all foreseeable water supply needs.
>
> In addition to the Daly City Recycled Water Expansion project[38], which was a potential project identified in the SFPUC's 2015 UWMP and had committed funding at that time, the SFPUC has taken action to fund the study of potential additional water supply projects. Capital projects under consideration to develop additional water supplies include surface water storage expansion, recycled water expansion, water transfers, desalination, and potable reuse. A more detailed list and descriptions of these efforts are provided below.
>
> The capital projects that are under consideration would be costly and are still in the early feasibility or conceptual planning stages. Because these water supply projects would take 10 to 30 years to implement, and because required environmental permitting negotiations may reduce the amount of water that can be developed, the yield from these projects are not currently incorporated into SFPUC's supply projections. State and federal grants and

[38] While this potential project was identified in the 2015 UWMP, it has since been approved by Daly City following environmental review and has a higher likelihood of being implemented.

other financing opportunities would be pursued for eligible projects, to the extent feasible, to offset costs borne by ratepayers.

- *Daly City Recycled Water Expansion (Regional, Normal- and Dry-Year Supply)*. This project can produce up to 3 MGD of tertiary recycled water during the irrigation season (~7 months). On an average annual basis, this is equivalent to 1.25 MGD or 1,400 AFY. The project is envisioned to provide recycled water to 13 cemeteries and other smaller irrigation customers, offsetting existing groundwater pumping from the South Westside Groundwater Basin; this will free up groundwater, enhancing the reliability of the Basin. The project is a regional partnership between the SFPUC and Daly City. The irrigation customers are located largely within California Water Service's (Cal Water's) service area. RWS customers will benefit from the increased reliability of the South Westside Basin for additional drinking water supply during droughts. In this way, this project supports the GSR Project, which is under construction.
- *ACWD-USD Purified Water Partnership (Regional, Normal- and Dry-Year Supply)*. This project could provide a new purified water supply utilizing Union Sanitary District's (USD) treated wastewater. Purified water produced by advanced water treatment at USD could be transmitted to the Quarry Lakes Groundwater Recharge Area to supplement recharge into the Niles Cone Groundwater Basin or put to other uses in Alameda County Water District's (ACWD) service area. With the additional water supply to ACWD, an in-lieu exchange with the SFPUC would result in more water left in the RWS. Additional water supply could also be directly transmitted to the SFPUC through a new intertie between ACWD and the SFPUC.
- *Crystal Springs Purified Water (Regional, Normal- and Dry-Year Supply)*. The Crystal Springs Purified Water (PREP) Project is a purified water project that could provide 6-12 MGD of water supply through reservoir water augmentation at Crystal Springs Reservoir, which is a facility of the RWS. Treated wastewater from Silicon Valley Clean Water (SVCW) and/or the City of San Mateo would go through an advanced water treatment plant to produce purified water that meets state and federal drinking water quality standards. The purified water would then be transmitted 10 to 20 miles (depending on the alignment) to Crystal Springs Reservoir, blended with regional surface water supplies and treated again at Harry Tracy Water Treatment Plant. Project partners include the SFPUC, Bay Area Water Supply and Conservation Agency (BAWSCA), SVCW, CalWater, Redwood City, Foster City, and the City of San Mateo. Partner agencies are contributing financial and staff resources towards the work effort.
- *Los Vaqueros Reservoir Expansion (Regional, Dry Year Supply)*. The Los Vaqueros Reservoir Expansion (LVE) Project is a storage project that will enlarge the existing reservoir located in northeastern Contra Costa County from 160,000 acre-feet to 275,000 acre-feet. While the existing reservoir is owned and operated by the Contra Costa Water District (CCWD), the expansion will have regional benefits and will be managed by a Joint Powers Authority (JPA) that will be set up prior to construction. Meanwhile, CCWD is leading the planning, design and environmental review efforts. CCWD's Board certified the EIS/EIR and approved the LVE Project on May 13, 2020. The additional storage capacity from the LVE Project would provide a dry year water supply benefit to the SFPUC. BAWSCA is working in concert with the SFPUC to support their work effort on the LVE project.
    - Conveyance Alternatives: The SFPUC is considering two main pathways to move water from storage in a prospective LVE Project to the SFPUC's service area, either directly to RWS facilities or indirectly via an exchange with partner agencies. The SFPUC is evaluating potential alignments for conveyance.

- Bay Area Regional Reliability Shared Water Access Program (BARR SWAP): As part of the BARR Partnership, a consortium of 8 Bay Area water utilities (including ACWD, BAWSCA, CCWD, EBMUD, Marin Municipal Water District (MMWD), SFPUC, Valley Water, and Zone 7 Water Agency) are exploring opportunities to move water across the region as efficiently as possible, particularly during times of drought and emergencies. The BARR agencies are proposing two separate pilot projects in 2020-2021 through the Shared Water Access Program (SWAP) to test conveyance pathways and identify potential hurdles to better prepare for sharing water during a future drought or emergency. A strategy report identifying opportunities and considerations will accompany these pilot transfers and will be completed in 2021.

- *Bay Area Brackish Water Desalination (Regional, Normal- and Dry-Year Supply)*. The Bay Area Brackish Water Desalination (Regional Desalination) Project is a partnership between CCWD, the SFPUC, Valley Water, and Zone 7 Water Agency. The East Bay Municipal Utilities District (EBMUD) and ACWD may also participate in the project. The project could provide a new drinking water supply to the region by treating brackish water from CCWD's existing Mallard Slough intake in Contra Costa County. While this project has independent utility as a water supply project, for the current planning effort the SFPUC is considering it as a source of supply for storage in LVE. While the allocations remain to be determined among partners, the SFPUC is considering a water supply benefit of between 5 and 15 MGD during drought conditions when combined with storage at LVE.

- *Calaveras Reservoir Expansion (Regional, Dry Year Supply)*. Calaveras Reservoir would be expanded to create 289,000 acre-feet (AF) additional capacity to store excess Regional Water System supplies or other source water in wet and normal years. In addition to reservoir enlargement, the project would involve infrastructure to pump water to the reservoir, such as pump stations and transmission facilities.

- *Groundwater Banking*. Groundwater banking in the Modesto Irrigation District (MID) and Turlock Irrigation District (TID) service areas could be used to provide some additional water supply to meet instream releases in dry years reducing water supply impacts to the SFPUC service area. For example, additional surface water could be provided to irrigators in wet years, which would offset the use of groundwater, thereby allowing the groundwater to remain in the basin rather than be consumptively used. The groundwater that remains in the basin can then be used in a subsequent dry year for irrigation, freeing up surface water that would have otherwise been delivered to irrigators to meet instream flow requirements.

  A feasibility study of this option is included in the proposed Tuolumne River Voluntary Agreement. Progress on this potential water supply option will depend on the negotiations of the Voluntary Agreement.

- *Inter-Basin Collaborations*. Inter-Basin Collaborations could provide net water supply benefits in dry years by sharing responsibility for in-stream flows in the San Joaquin River and Delta more broadly among several tributary reservoir systems. One mechanism by which this could be accomplished would be to establish a partnership between interests on the Tuolumne River and those on the Stanislaus River, which would allow responsibility for streamflow to be assigned variably based on the annual hydrology.

  As is the case with Groundwater Banking, feasibility of this option is included in the proposed Tuolumne River Voluntary Agreement.

If all the projects identified through the current planning process can be implemented, there would still be a supply shortfall to meet projected needs. Furthermore, each of the supply options being considered has its own inherent challenges and uncertainties that may affect the SFPUC's ability to implement it.

Given the limited availability of water supply alternatives - unless the supply risks are significantly reduced or our needs change significantly - the SFPUC will continue to plan, develop and implement all project opportunities that can help bridge the anticipated water supply gaps during droughts. In 2019, the SFPUC completed a survey among water and wastewater agencies within the service area to identify additional opportunities for purified water. Such opportunities remain limited, but the SFPUC continues to pursue all possibilities.

BAWSCA's Long-Term Reliability Water Supply Strategy

BAWSCA's Long-Term Reliable Water Supply Strategy (Strategy), completed in February 2015, quantified the water supply reliability needs of the BAWSCA member agencies through 2040, identified the water supply management projects and/or programs (projects) that could be developed to meet those needs, and prepared an implementation plan for the Strategy's recommendations.

When the 2015 Demand Study concluded it was determined that while there is no longer a regional normal year supply shortfall, there was a regional drought year supply shortfall of up to 43 MGD. In addition, key findings from the Strategy's project evaluation analysis included:

- Water transfers represent a high priority element of the Strategy.
- Desalination potentially provides substantial yield, but its high effective costs and intensive permitting requirements make it a less attractive drought year supply alternative.
- Other potential regional projects provide tangible, though limited, benefit in reducing dry-year shortfalls given the small average yields in drought years.

Since 2015, BAWSCA has completed a comprehensive update of demand projections and engaged in significant efforts to improve regional reliability and reduce the dry-year water supply shortfall.

- *Water Transfers*. BAWSCA successfully facilitated two transfers of portions of Individual Supply Guarantee (ISG) between BAWSCA agencies in 2017 and 2018. Such transfers benefit all BAWSCA agencies by maximizing use of existing supplies. BAWSCA is currently working on an amendment to the Water Supply Agreement between the SFPUC and BAWSCA agencies to establish a mechanism by which member agencies that have an ISG may participate in expedited transfers of a portion of ISG and a portion of a Minimum Annual Purchase Requirement. In 2019, BAWSCA participated in a pilot water transfer that, while ultimately unsuccessful, surfaced important lessons learned and produced interagency agreements that will serve as a foundation for future transfers. BAWSCA is currently engaged in the Bay Area Regional Reliability Partnership (BARR)[39], a partnership among eight Bay Area water utilities (including the SFPUC, Alameda County Water District, BAWSCA, Contra Costa Water District, Santa Clara Valley Water District) to identify opportunities to move water across the region as efficiently as possible, particularly during times of drought and emergencies.
- *Regional Projects*. Since 2015, BAWSCA has coordinated with local and State agencies on regional projects with potential dry-year water supply benefits for BAWSCA's agencies. These efforts include storage projects, indirect/direct water reuse projects, and studies to evaluate the capacity and potential for various conveyance systems to bring new supplies to the region.

BAWSCA continues to implement the Strategy recommendations in coordination with BAWSCA member agencies. Strategy implementation will be adaptively managed to account

[39] https://www.bayareareliability.com/

for changing conditions and to ensure that the goals of the Strategy are met in an efficient and cost-effective manner. On an annual basis, BAWSCA will reevaluate Strategy recommendations and results in conjunction with development of the BAWSCA's FY 2021-22 Work Plan. In this way, actions can be modified to accommodate changing conditions and new developments.

City of Hayward Strategies and Actions

In addition to the management tools and options discussed below, Hayward has been involved directly and through BAWSCA to advocate for an alternative to the Bay-Delta Plan, including submitting letters and testimony (see Appendix E) that identify, among other things, the significant impact to local water supply reliability. Hayward has concerns regarding SFPUC RWS supply allocations not meeting the Level of Service Goals included in the WSA (see Section 7.1.1) and, therefore, SFPUC is not meeting its contractual obligations to the Wholesale Customers.

In addition, although Hayward is not agreeing to or adopting the revised Tier Two methodology presented herein, Hayward will participate in discussions with BAWSCA and its member agencies on an allocation methodology Hayward can agree to.

Hayward is committed to developing a long-term supply reliability strategy, including evaluation of alternative supply sources and continued commitment to Hayward's comprehensive water conservation program.

7.1.4 Management Tools and Options

At a regional level, Hayward maintains active involvement in the work that SFPUC and BAWSCA are doing with respect to optimizing the use of regional water supplies and pursuing additional supplies. These efforts are detailed above in Section 7.1.3.

In addition to supporting SFPUC and BAWSCA, Hayward has been developing its recycled water supplies and will implement Phase 1 of its Recycled Water Project in 2021. Planning for a Phase 2 expansion of its Recycled Water Project is anticipated to begin within the next few years. If additional recycled water is made available, potable water demands will be less than the current projections, and therefore, the supply shortage will likely be smaller.

Hayward also has been implementing the demand management measures described in Chapter 9. Also, in response to the anticipated future dry-year shortfalls, Hayward has developed a robust WSCP that systematically identifies ways in which Hayward can reduce water demands. The WSCP is summarized in Chapter 8 and included in Appendix K.

As discussed in Section 6.2.2, Hayward formed a Groundwater Sustainability Agency for the East Bay Plain Subbasin in 2017 and is preparing a Groundwater Sustainably Plan to manage and protect the Subbasin in compliance with SGMA.

7.2 Drought Risk Assessment

In addition to the long-term water service reliability assessment presented above, the DRA evaluates Hayward's supply risks under a severe drought period lasting for the next five consecutive years after the assessment is completed (e.g., 2021-2025). The DRA is intended to inform the demand management measures and water supply projects and programs to be included in the UWMP (see Chapters 8 and 9).

7.2.1 Data, Methods, and Basis for Water Shortage Condition

As a first step in developing the DRA, Hayward has estimated unconstrained water demand for the next five years (2021-2025). Unconstrained water demand is the expected water use in the absence of drought water use restrictions. The characteristic five-year water demand is described in Section 4.2.7 and is based on the DSS Model results discussed in Section 4.2.6.

The available potable water supplies assumed in the DRA are based on the same methodology and assumptions used for the long-term water service reliability assessment (Section 7.1) and rely on information provided by SFPUC and BAWSCA (Appendix I). The available RWS water supply estimates are based on the following assumptions: 1) The RWS demands are held constant at 132.1 MGD (i.e., 2020 demand levels); 2) implementation of the Bay-Delta Plan Amendment occurs in 2023; and 3) the 2020 infrastructure conditions are maintained (see Table 1 of the letter from the SFPUC dated January 22, 2021 in Appendix I).

7.2.2 DRA Individual Water Source Reliability

As described in Chapter 6, Hayward purchases imported surface water from the SFPUC RWS to meet its potable water demands and produces recycled water to serve specific non-potable irrigation and industrial uses.

Hayward*'s* available potable water supplies during the five-consecutive-year drought are based on information provided by SFPUC and BAWSCA included in Appendix I. As indicated in Section 7.2.1 specifically, based on the modeling results presented in the March 30, 2021 SFPUC letter, BAWSCA provided percent cutbacks for years 2021 through 2025 in Table F1 of the April 1, 2021 BAWSCA drought allocation tables, which are reproduced in Table 7-6 and serve as the basis for the RWS Reliability in the DRA.

As shown in Table 7-5, prior to the assumed implementation of the Bay-Delta Plan Amendment in 2023, sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests during the first two consecutive dry years (i.e., 2021 and 2022). Shortages are projected to begin in 2023 with the implementation of the Bay-Delta Plan Amendment. In the event of a shortage, the current Tier Two Drought Allocation Plan (Section 7.1.1) specifies that each agencies' Allocation Factor would be calculated at the onset of a shortage based on the previous year's use and remain the same until the shortage condition is over. Therefore, for the purpose of drought allocations for the DRA, the available RWS supply is assumed to remain static in 2023-2025 and the percent cutbacks in 2023-2025 shown in Table 7-5, are presented in terms of the percentage of Hayward's 2022 projected demands.[40]

Table 7-5. Hayward 2020 Base Year Multiple-Dry Year Drought Allocations

	2021	2022	2023	2024	2025
SFPUC RWS Supply Cutbacks	0%	0%	47%	47%	47%

NOTES:

1. With system-wide shortages projected starting in 2023, Wholesale RWS demand is assumed to be static for the remainder of the drought sequence per the Water Supply Agreement. Water supply cutbacks in 2023 to 2025 are presented in terms of a percentage of Hayward's 2022 projected demands.
2. Source: Table F1 from the BAWSCA drought allocation tables dated April 1, 2021.
3. Five consecutive year drought assumed to start in 2021.
4. Scenario reflects implementation of the Bay-Delta Plan Amendment in 2023.
5. Sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests during the first two consecutive dry years, prior to implementation of the Bay-Delta Plan Amendment.

[40] Note that this DRA is based on the percentages shown in Table F1 of the April 1, 2021 BAWSCA letter assuming equal percent cutbacks between agencies instead of the volumes shown in Table F2. This DRA does not rely on the supply volumes shown in Table F2 because they are based on outdated RWS supply projections for Hayward. Specifically, the supply available to Hayward for years 3, 4 and 5 (i.e., 2023-2025 of the DRA) is estimated as 47% of Hayward's projected 2022 demand from the DSS Model that supported the demand projections presented herein.

Hayward considers recycled water to be a reliable and sustainable water supply, and its recycled water supply is estimated to be available during all hydrologic years at a volume that meets its projected recycled water demands (see Chapters 4 and 6).

7.2.3 DRA Total Water Supply and Use Comparison

Table 7-6 provides a comparison of the water supply sources available to Hayward, to the total projected water use for an assumed drought period of 2021 through 2025. Hayward is expected to experience significant shortfalls in years 2023-2025 of the DRA with unconstrained demands because of the assumed implementation of the Bay-Delta Plan Amendment in 2023.

Hayward has developed a WSCP (Chapter 8, Appendix K) to address water shortage conditions resulting from any cause (e.g., droughts, impacted distribution system infrastructure, regulatory-imposed shortage restrictions, etc.). The WSCP identifies a variety of actions that Hayward will implement to reduce demands and further ensure supply reliability at various levels of water shortage. Hayward intends to implement its WSCP to reduce water use and address the supply shortfalls.

Given the current uncertainty discussed in Section 7.1.3, Hayward could revise its DRA prior to the 2025 UWMP update if significant new information becomes available. California Water Code §10635(b) permits urban water suppliers to conduct an interim update or updates to their DRA within the five-year cycle of its UWMP update. Hayward anticipates that by the 2025 UWMP update SFPUC will provide more specific information about the AWSP, with estimated water supply contributions from such projects. Additionally, Hayward expects SFPUC will provide more specific information and a refined estimate of the Bay-Delta Plan Amendment impacts to the SFPUC supply. Hayward will also have more information regarding emergency use of the local groundwater basin and potential expansion of its recycled water system by the 2025 UWMP update. It is also anticipated the Wholesale Customers will negotiate a revised Tier Two allocation formula that could affect each agency's share of available supplies in drought years relative to what has been presented herein.

Hayward recommends that users of its 2020 UWMP contact city staff for potential updates to the DRA presented in the 2020 UWMP for their planning projects.

Table 7-6. Five-Year Drought Risk Assessment Tables to Address Water Code Section 10635(b)

Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)	
2021	**Total**
Total Water Use	5,717
Total Supplies	5,717
Surplus/Shortfall w/o WSCP Action	0
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%

Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)	
2022	**Total**
Total Water Use	5,933
Total Supplies	5,933
Surplus/Shortfall w/o WSCP Action	5,933
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	0
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	0%

2023	Total
Total Water Use	6,165
Total Supplies	3,174
Surplus/Shortfall w/o WSCP Action	(2,991)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	2,991
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	49%

2024	Total
Total Water Use	6,406
Total Supplies	3,174
Surplus/Shortfall w/o WSCP Action	(3,233)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	3,233
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	50%

2025	Total
Total Water Use	6,563
Total Supplies	3,174
Surplus/Shortfall w/o WSCP Action	(3,389)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	0
WSCP - use reduction savings benefit	3,389
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	52%
NOTES: Volumes are in units of MG.	

8 WATER SHORTAGE CONTINGENCY PLAN

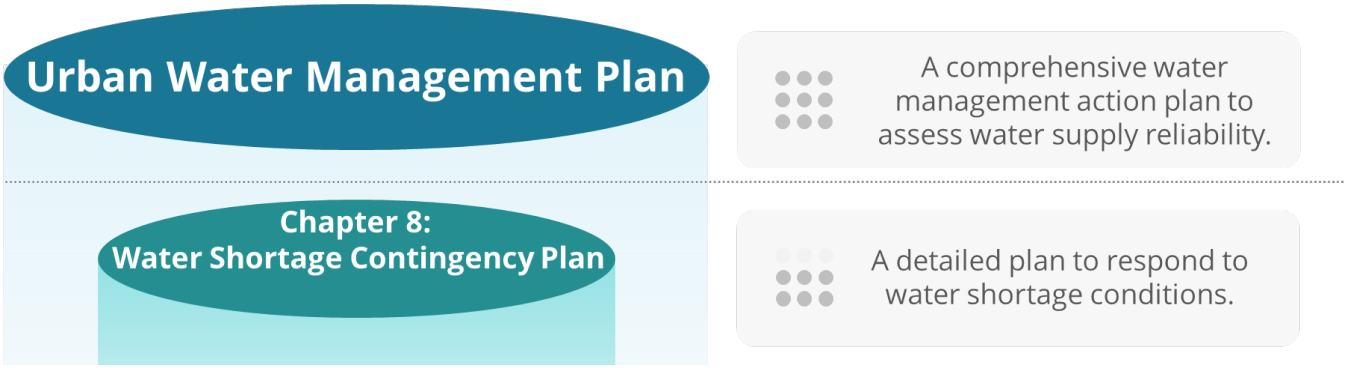
Description

The California Water Code Section 10632 requires every urban water supplier that serves more than 3,000 acre-feet per year or has more than 3,000 connections to prepare and adopt a standalone WSCP as part of its UWMP. Water shortage contingency planning is a strategic planning process in which the City of Hayward engages to prepare for and respond to water shortages, which occur when available water supply is insufficient to meet the normally expected customer water use. A shortage may occur due to a number of reasons, such as water supply quality changes, climate change, drought, and catastrophic events (e.g., earthquake). Hayward's Water Shortage Contingency Plan provides real-time water supply availability assessment and structured steps designed to respond to actual conditions. This level of detailed planning and preparation will help maintain reliable supplies and reduce the impacts of supply interruptions.

8.1 Overview of the WSCP

The WSCP serves as the operating manual that Hayward will use to prevent catastrophic service disruptions through proactive mitigation of water shortages. It contains documented processes and procedures so that Hayward's governing body, staff, and the public can easily identify and efficiently implement pre-determined steps to mitigate a water shortage to the level appropriate for the degree of water shortfall anticipated.

Figure 8-1. Water Shortage Contingency Plan Flow of Information



Hayward's WSCP is provided in Appendix K. It includes the steps to assess if a water shortage is occurring and the level of shortage drought actions to achieve the best response as appropriate to the water shortage conditions. The WSCP has prescriptive elements, including an analysis of water supply reliability, the drought shortage actions for each of the six standard water shortage levels that correspond to water shortage percentages ranging from 10% to greater than 50%, an estimate of potential to close supply gap for each measure, protocols and procedures to communicate identified actions for any current or predicted water shortage conditions, procedures for an annual water supply and demand assessment, monitoring and reporting requirements to determine customer compliance, and reevaluation and improvement procedures for evaluating the WSCP.

8.2 Summary of Water Shortage Response Strategy and Required DWR Tables

This WSCP is organized into three main sections with Section 3 aligned with the California Water Code Section 16032 requirements. In addition to the WSCP, Section 6.2 of this UWMP has further details on Hayward's water supply systems.

Section 1 Introduction and WSCP Overview gives an overview of the WSCP fundamentals.

Section 2 Background Information provides information on Hayward's water service area.

Section 3 Water Shortage Contingency Preparedness and Response Planning

Section 3.1 Water Supply Reliability Analysis provides a summary of the water supply analysis and water reliability findings from the 2020 UWMP.

Section 3.2 Annual Water Supply and Demand Assessment Procedures provides a description of procedures to conduct and approve the Annual Assessment.

Section 3.3 Six Standard Water Shortage Levels explains the WSCP's six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, 50, and more than 50% shortages.

Section 3.4 Shortage Response Actions describes the WSCP's shortage response actions that align with the defined shortage levels.

Section 3.5 Communication Protocols addresses communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments regarding any current or predicted shortages and any resulting shortage response actions.

Section 3.6 Compliance and Enforcement describes customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions.

Section 3.7 Legal Authorities describes the legal authorities that enable Hayward to implement and enforce its shortage response actions.

Section 3.8 Financial Consequences of the WSCP provides a description of the financial consequences of and responses to drought conditions.

Section 3.9 Monitoring and Reporting describes monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements**.**

Section 3.10 WSCP Refinement Procedures addresses re-evaluation and improvement procedures for monitoring and evaluating the functionality of the WSCP.

Section 3.11 Special Water Feature Distinction defines water features that are artificially supplied with water.

Section 3.12 Plan Adoption, Submittal, and Availability provides a record of the process Hayward followed to adopt and submit its WSCP.

The WSCP is based on adequate details of demand reduction and supply augmentation measures that are structured to match varying degrees of shortage so relevant stakeholders may know what to expect during a water shortage situation. Hayward has adopted water shortage levels consistent with the requirements identified in Water Code Section 10632 (a)(3)(A) (Table 8-1).

The supply augmentation actions that align with each shortage level are described in Table 8-3. These augmentations represent short-term management objectives identified in the WSCP and do not overlap with the long-term new water supply development or supply reliability enhancement projects.

The demand reduction measures that align with each shortage level are described in Table 8-2. This table also estimates the extent to which that action will reduce the gap between supplies and demands to demonstrate

that the chosen suite of shortage response actions can be expected to deliver the outcomes necessary to meet the requirements of a given shortage level.

Table 8-1. Water Shortage Contingency Plan Levels

Submittal Table 8-1 Water Shortage Contingency Plan Levels		
Shortage Level	Percent Shortage Range	Water Shortage Condition
0	0% (Normal)	A Level 0 Water Supply Shortage – Condition exists when Hayward notifies its water users that no supply reductions are anticipated in this year. Hayward proceeds with planned water efficiency best practices to support consumer demand reduction in line with state-mandated requirements and local Hayward goals for water supply reliability. Permanent water waste prohibitions are in place as stipulated in the Hayward's Water Shortage Response Ordinance.
1	Up to 10%	A Level 1 Water Supply Shortage – Condition exists when Hayward notifies its water users that, due to drought or other supply reductions, a consumer demand reduction of up to 10% is necessary to make more efficient use of water and respond to existing water conditions. Hayward shall implement the mandatory Level 1 conservation measures identified in this ordinance. The type of event that may prompt Hayward to declare a Level 1 Water Supply Shortage may include, among other factors, finding that its wholesale water provider calls for extraordinary water conservation.
2	11% to 20%	A Level 2 Water Supply Shortage – Condition exists when Hayward notifies its water users that, due to drought or other supply reductions, a consumer demand reduction of up to 20% is necessary to make more efficient use of water and respond to existing water conditions. Upon declaration of a Level 2 Water Supply Shortage condition, Hayward shall implement the mandatory Level 2 conservation measures identified in this ordinance.
3	21% to 30%	A Level 3 Water Supply Shortage – Condition exists when Hayward declares a water shortage emergency condition pursuant to California Water Code section 350 and notifies its residents and businesses that up to 30% consumer demand reduction is required to ensure sufficient supplies for human consumption, sanitation and fire protection. Hayward must declare a Water Supply Shortage Emergency in the manner and on the grounds provided in California Water Code section 350.
4	31% to 40%	A Level 4 Water Supply Shortage – Condition exists when Hayward declares a water shortage emergency condition pursuant to California Water Code section 350 and notifies its residents and businesses that up to 40% consumer demand reduction is required to ensure sufficient supplies for human consumption, sanitation and fire protection. Hayward must declare a Water Supply Shortage Emergency in the manner and on the grounds provided in California Water Code section 350.

Submittal Table 8-1 Water Shortage Contingency Plan Levels		
Shortage Level	Percent Shortage Range	Water Shortage Condition
5	41% to 50%	A Level 5 Water Supply Shortage – Condition exists when Hayward declares a water shortage emergency condition pursuant to California Water Code section 350 and notifies its residents and businesses that up to 50% or more consumer demand reduction is required to ensure sufficient supplies for human consumption, sanitation and fire protection. Hayward must declare a Water Supply Shortage Emergency in the manner and on the grounds provided in California Water Code section 350.
6	>50%	A Level 6 Water Supply Shortage – Condition exists when Hayward declares a water shortage emergency condition pursuant to California Water Code section 350 and notifies its residents and businesses that greater than 50% or more consumer demand reduction is required to ensure sufficient supplies for human consumption, sanitation and fire protection. Hayward must declare a Water Supply Shortage Emergency in the manner and on the grounds provided in California Water Code section 350.
[1] One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.		

Table 8-2. Demand Reduction Actions

Submittal Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
0	Other water feature or swimming pool restriction	Statewide Prohibition is Required	All decorative water features must re-circulate water or users must secure a waiver from Hayward.	Yes
0	Other	Statewide Prohibition is Required	Washing or hosing down vehicles is prohibited except by use of a handheld container, hose with an automatic shut off device, or at a commercial car wash.	Yes
0	Other – Prohibit use of potable water for washing hard surfaces	Statewide Prohibition is Required	Washing hard or paved surfaces is prohibited except to alleviate safety or sanitary hazards using a handheld container, hose with an automatic shut off device, or a low-volume high pressure cleaning machine that recycles used water.	Yes
0	Landscape – Restrict or prohibit runoff from landscape irrigation	Statewide Prohibition is Required	Watering vegetated areas in a manner that causes excessive water flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter, or ditch is prohibited.	Yes
0	Landscape – Other landscape restriction or prohibition	Statewide Prohibition is Required	Irrigating ornamental turf on public street medians is prohibited.	Yes
0	Landscape – Other landscape restriction or prohibition	Statewide Prohibition is Required	No landscape watering shall occur within 48 hours after measurable precipitation.	Yes
0	Landscape – Other landscape restriction or prohibition	On-going Long Term-Conservation Savings Measure. Not applicable to Water Shortage Contingency Plan quantifiable savings.	Any new planting should be performed with drought tolerant plants, as listed in Hayward's established Drought Tolerant Plant List.	Yes

Submittal Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
0	CII – Restaurants may only serve water upon request	On-going Long Term-Conservation Savings Measure. Not applicable to Water Shortage Contingency Plan quantifiable savings.	CII - Restaurants may only serve water upon request.	Yes
0	CII – Lodging establishment must offer opt out of linen service	On-going Long Term-Conservation Savings Measure. Not applicable to Water Shortage Contingency Plan quantifiable savings.	CII - Lodging establishment must offer opt-out of linen service.	Yes
0	CII – Other CII restriction or prohibition	On-going Long Term-Conservation Savings Measure. Not applicable to Water Shortage Contingency Plan quantifiable savings.	No single pass cooling systems may be installed in new or remodeled buildings.	Yes
0	Other – Prohibit vehicle washing except at facilities using recycled or recirculating water	On-going Long Term-Conservation Savings Measure. Not applicable to Water Shortage Contingency Plan quantifiable savings.	All new commercial car wash and laundry facilities must re-circulate the wash water or obtain a waiver from Hayward.	Yes
0	Other – Require automatic shut of hoses	On-going Long Term-Conservation Savings Measure. Not applicable to Water Shortage Contingency Plan quantifiable savings.	Use a shutoff nozzle on hoses.	Yes
0	Other	On-going Long Term Conservation Savings Measure. Not applicable to Water Shortage Contingency Plan quantifiable savings.	Unauthorized use of hydrants is prohibited. Authorization for use must be obtained from Hayward.	Yes

Submittal Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
1	Expand Public Information Campaign	0-1%	Community Outreach and Messaging (Expand Public Information Campaign)	No
1	Expand Public Information Campaign	0-1%	Encourage customers to wash only full loads when washing dishes or clothes.	No
1	Expand Public Information Campaign	0-1%	Encourage customers to use pool covers to minimize evaporation.	No
1	Provide Rebates for Turf Replacement	0-1%	Provide rebates for turf replacement.	No
1	Other – Customers must repair leaks, breaks, and malfunctions in a timely manner	0-1%	Fix leaks or faulty sprinklers promptly/within 5 day(s).	Yes
1	Landscape – Limit landscape irrigation to specific times	0-5%	Watering or irrigation of vegetated areas is prohibited between 9 am and 6 pm except by use of a handheld device, hose equipped with an automatic shutoff device, or for adjusting or repairing an irrigation system for short periods of time.	Yes
1	CII – Other CII restriction or prohibition	0-1%	Commercial, industrial, institutional equipment must be properly maintained and in full working order.	Yes
1	Other	5-10%	Other Prohibited Uses: Hayward may implement other prohibited water uses as determined, after notice to customers.	Yes
2	Landscape – Prohibit certain types of landscape irrigation	0-1%	All non-essential water use for commercial and industrial use should cease.	Yes
2	Provide Rebates on Plumbing Fixtures and Devices	0-1%	Provide rebates on plumbing fixtures and devices.	No
2	Other – Customers must repair leaks, breaks, and malfunctions in a timely manner	0-1%	Fix leaks or faulty sprinklers within 4 day(s).	Yes

Submittal Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
2	Landscape – Limit landscape irrigation to specific days	5-10%	Irrigation shall be limited to 3 days per week turf watering when using potable water. Plant containers, trees, shrubs and vegetable gardens may be watered additional days using only drip irrigation or hand watering.	Yes
2	Water Features – Restrict water use for decorative water features, such as fountains	0-1%	Filling or refilling ornamental lakes and ponds is prohibited. Ornamental lakes and ponds that sustain aquatic life of significant value and were actively managed prior to the storage declaration are exempt.	Yes
2	Decrease Line Flushing	0-1%	Decrease line flushing.	Yes
2	Pools and Spas – Require covers for pools and spas	0-1%	Pools and Spas - Require covers for pools and spas.	Yes
2	Other	5-10%	Other Prohibited Uses: Hayward may implement other prohibited water uses as determined, after notice to customers.	Yes
3	Other – Customers must repair leaks, breaks, and malfunctions in a timely manner	0-1%	Fix leaks or faulty sprinklers within 3 day(s).	Yes
3	Other water feature or swimming pool restriction	0-1%	Decorative water features that use potable water must be drained and kept dry.	Yes
3	Other – Prohibit use of potable water for construction and dust control	0-1%	Require a construction water use plan be submitted to the water supplier that addresses how impacts to existing water users will be mitigated (such as dust control).	Yes

Submittal Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
3	Landscape – Limit landscape irrigation to specific days	5-15%	Irrigation shall be limited to 2 days per week turf watering when using potable water. Plant containers, trees, shrubs and vegetable gardens may be watered additional days using only drip irrigation or hand watering.	Yes
3	Other	5-10%	Other Prohibited Uses: Hayward may implement other prohibited water uses as determined, after notice to customers.	Yes
4	Other water feature or swimming pool restriction	0-1%	Existing pools shall not be emptied and refilled using potable water unless required for public health and safety purposes.	Yes
4	Other water feature or swimming pool restriction	0-1%	No new permits for pools will be issued.	No
4	Landscape – Limit landscape irrigation to specific days	5-15%	Irrigation shall be limited to 1 day per week turf watering when using potable water. Plant containers, trees, shrubs and vegetable gardens may be watered additional days using only drip irrigation or hand watering.	Yes
5	Other	5-10%	Hayward may reduce water allocations in all categories to meet the available water supply.	Yes
5	Landscape – Prohibit certain types of landscape irrigation	0-1%	Watering of parks, school grounds, and recreation fields is prohibited, except for rare plant or animal species	Yes
5	Other	5-10%	Other Prohibited Uses: Hayward may implement other prohibited water uses as determined, after notice to customers.	Yes

Submittal Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
5	Moratorium or Net Zero Demand Increase on New Connections	0-2%	Moratorium or net zero demand on new connections	No
6	Landscape - Prohibit all landscape irrigation	0-5%	Hayward may shut off all non-essential water services. All irrigation is prohibited.	Yes
6	CII – Other CII restriction or prohibition	5-15%	Water for commercial, manufacturing, or processing purposes shall be reduced in volume by up to 50% or exceeded if necessary for public health and safety purposes.	Yes
6	Other	0-15%	Water use for public health and safety purposes only. Customer rationing may be implemented.	Yes

Table 8-3. Supply Augmentation and Other Actions

Table 8-3: Supply Augmentation and Other Actions			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap?	Additional Explanation or Reference
5	Other Purchases	Potential yield will depend on agency's ability to deliver water	Emergency Interties with EBMUD, ACWD, and the Regional Emergency Intertie
5	Other Actions (describe)	Potential yield is 14 MGD	Hayward's emergency water supply system includes 5 emergency groundwater supply wells that collectively have 14 MGD potential yield (see first note in NOTES section below)
NOTES: 1. Volume listed is the theoretical amount that could be obtained through the interties. Actual volumes will depend on the agency's ability to deliver water. 2. Emergency wells permitted for short-term (five consecutive days) use only.			

9 DEMAND MANAGEMENT MEASURES

Description

This chapter provides a description of the water conservation programs that Hayward has implemented, is currently implementing, and plans to implement. Demand management measures (DMMs) are specific actions taken by water suppliers to promote conservation and reduce water supply demand, and are key to maintaining water resources in California. The increase in water demand as populations grow, coupled with potential water supply shifts due to other factors like climate change or the recent 2020 stay-at-home order, can have a significant impact on water supply availability. Having DMMs in place helps water suppliers prepare for these shifts as well as lower overall demands, thereby contributing to water service reliability, as well as state and regional conservation goals. DMM analysis can also help with water demand forecasting and preparation of a WSCP (see Chapter 8 – Water Shortage Contingency Plan).

9.1 Demand Management Measures for Wholesale Suppliers

This section is not applicable to Hayward.

9.2 Demand Management Measures for Retail Suppliers

This section details the efforts made by Hayward to implement DMMs to increase conservation and reduce water demand within the Hayward service area.

9.2.1 Water Waste Prevention Ordinances

The Hayward City Council first adopted a water waste prohibition ordinance in 1993. An updated Ordinance was adopted June 2017 to incorporate prohibitions on additional water wasting activities and is contained in the Hayward Municipal Code Section 11-2.47 (Appendix L). This Ordinance is in place at all times and is not dependent on a water supply shortage. Increasingly restrictive enforcement mechanisms are included in the Ordinance.

In general, the Ordinance prohibits at all times the use of potable water for non-essential purposes, including:

- Defective or broken plumbing
- Flooding or runoff into gutters and streets
- Irrigation that results in excessive water flow, overspray, or runoff onto sidewalks, driveways, etc.
- Washing of buildings, sidewalks, driveways and the like, with a hose unless it is equipped with a positive shut-off nozzle
- Washing of vehicles with a hose unless it is equipped with a positive shut-off nozzle
- Water fountains and other decorative water features unless the water is recirculated

While no changes to the Ordinance are anticipated in the near term, Hayward will consider revisions as the need arises to ensure that the document remains current.

9.2.2 Metering

The City of Hayward Water System is fully metered. Meters are read a minimum of six times annually for billing purposes, and all water sales are based on metered consumption.

In 2018, Hayward implemented an Advanced Metering Infrastructure (AMI) system, including replacement of its approximately 36,000 water meters with new AMI-compatible units. This new technology allows for comprehensive customer engagement, including the ability to monitor daily and hourly water use and receive notices of continuous water usage. The AMI system also provides Hayward with extensive data regarding customer use that will inform water conservation programs and help Hayward target its resources more effectively. Hayward is currently in the process of implementing an AMI Customer Portal to provide customers access to the consumption metrics and other information associated with their accounts.

9.2.3 Conservation Pricing

Conservation pricing provides economic incentives to use water efficiently and to recover the maximum amount of revenue from volumetric rates, in relationship to the direct costs of providing service.

Hayward implemented conservation pricing in the early 1990s, through a structure by which the volumetric rate increases as the quantity of water used increases. The tier rate structure remains in place at all times and is not dependent on a water shortage for implementation. While the tier structure itself has been modified occasionally since it was first conceived, the basic premise has remained constant: Customers pay for water in direct proportion to the cost of delivering that water, and one group of customers does not subsidize the cost of service to another group. Rates are calculated in accordance with accepted principles and based on the actual cost of service for each usage tier. The current rate structure incorporates three tiers for residential customers and two tiers for non-residential accounts.

In addition to tiered usage rates, Hayward encourages water conservation by maintaining a low fixed service fee. This fee is used to recover costs that do not vary with the amount of water used, such as meter reading, billing, customer service and long-term debt service. The California Water Efficiency Partnership considers conservation pricing to be effective if the revenue from fixed fees represents no more than 30% of the water utility's total revenue. In FY 2020, Hayward's total revenue from fixed service fees comprised about 16% of the total Water Fund revenue.

Information regarding penalties, charges, and other enforcement for excessive use during water shortages and impacts of water shortages on revenues and expenditures is located in the WCSP (Appendix K).

Hayward's current water usage rates and service fees are found in Appendix O. Rates are typically adjusted annually after a rigorous examination of service costs and anticipated water deliveries and in accordance with applicable laws that govern water pricing, including provisions of Proposition 218. Hayward implements all required public noticing, and the City Council conducts a public hearing before adopting water rates.

9.2.4 Public Education and Outreach

Hayward conducts an extensive and varied public education and outreach program to inform and encourage customers regarding water use efficiency. Program components include the following:

Marketing Materials

- Materials to promote rebates and no-cost replacement fixtures, such as website announcements and brochures
- Billing inserts created for a variety of topics, including education opportunities and rebate offers

Water Efficient Landscape Classes

- Four to six classes offered in a typical year

- Diverse range of topics, including drip irrigation, lawn replacement, habitat gardening and edible gardening

Water Bill Information

- Gallons per day usage
- Comparison of water use with prior year
- Usage for preceding 12 billing periods in easy-to-read chart format

School Education

- In-class curriculum consisting of lesson plans, teaching aids, student workbooks, student activities, and a water-wise kit for each student (home water use survey, water saving showerhead, faucet aerators, and leak detection aids)
- Assembly program, with programs tailored to specific grade levels

Information Booths

- Participation in city events like summer street fairs, Earth Day events and other relevant activities, which attract a large number of residents and businesses
- Water conservation information available to customers at city sites with high-customer traffic, such as Development Services and Revenue Office

Website and Social Media

- Comprehensive website with up-to-date information about water conservation, tips and tools for reducing water use, rebate incentives and media updates
- Hayward water conservation is an active presence on social media sites, including Facebook and Twitter

Water Waste Reporting

- Hotline and dedicated email address created for reporting water waste incidents
- Timely actions taken to notify property owners and ensure corrective action

9.2.5 Programs to Assess and Manage Distribution System Real Losses

Hayward maintains an aggressive program to assess and address distribution system losses. Section 4.2.4 includes a discussion and quantification of real system losses, current and projected. This section documents Hayward's actions to locate and correct distribution system leaks and prevent future losses. Hayward actively monitors and addresses distribution system water losses.

In 2011, Hayward completed a detailed Water Audit and Component Analysis of Real and Apparent Losses, utilizing the AWWA methodology. Further information about this methodology is located in Section 4.2.4. As a result of this study, a comprehensive leak detection and repair effort was implemented in 2012 to locate leaks through the distribution system, including all service connections. Analysis and repair efforts have continued on an annual basis with corrective actions after each annual water loss report.

Hayward maintains staff dedicated to responding and repairing reported water main and distribution system leaks on an ongoing basis. As necessary, outside resources are brought in to address emergency situations. Hayward also notifies customers when a leak on the customer's side of the meter is suspected. In addition, operations staff track the hotspots of frequent water main leaks and breaks through GIS mapping. The map informs staff to plan for future capital improvement projects.

Since some loss potentially results from high system pressure in certain locations, a pressure management program has been put in place. Operations staff carefully monitor the pressure in key system locations in each elevation zone to reduce the potential for excessive pressure that could result in pipe breakage and leaks.

9.2.6 Water Conservation Program Coordination and Staffing Support

Water conservation in Hayward is a collaborative effort, utilizing both local and regional resources. The Development Review Specialist within the Department of Public Works & Utilities functions as the Water Conservation Coordinator for Hayward. This role is currently assigned to:

Michelle Tran, Development Review Specialist
Email: Michelle.Tran@hayward-ca.gov
Phone: 510-583-4722

The Water Conservation Coordinator is supported by other staff members who manage specific programs under the supervision of the Water Conservation Coordinator. This includes the Water Resources Manager and Sustainability Technician. Hayward's Community and Media Relations Officer also is a key partner in maintaining website information, water conservation messaging, and media outreach.

Hayward actively participates in regional demand management efforts, including development and implementation of the Regional Water Conservation Implementation Plan. Hayward staff participate regularly in meetings and working groups to develop effective regional programs and evaluate each conservation program to assess its benefits to Hayward customers.

Hayward currently participates in the following regional efforts:

- Water efficient landscape classes
- School education programs (in-class and assembly)
- Landscape water budgets
- Rain barrel rebates

Other programs are implemented by Hayward on a local basis, examples of which include the following:

- Lawn replacement rebates
- Residential surveys
- Fixture replacements (showerheads, faucet aerators)
- Leak detection and repair
- Green Hayward Pay As You Save (PAYS) Program (terminated in July 2019)

Public information and outreach efforts are typically a mixture of regional and local messaging. Hayward has participated in regional outreach campaigns, particularly during the drought, but also maintains a robust local presence on Hayward's website, social media, traditional media, and at local events.

Water conservation programs are solely funded by water sales revenue. For FY 2022, a total of nearly $227,000 was budgeted for water demand management. This $227,000 is in addition to staffing costs for water conservation program management, irrigation management for city-owned landscaping, and monies paid to regional entities for program development and oversight.

9.2.7 Other Demand Management Measures

In addition to the demand management measures discussed previously, Hayward is implementing the programs that are described briefly below.

Rebate Programs

Hayward currently offers financial incentives for the following water use efficiency measures:

- Lawn Replacement – A rebate of $0.75 per square foot for replacement of existing front yard lawn with water efficient landscaping and $0.50 for replacement of back yard lawn
- Rain barrels – A rebate of $50 for the purchase of a rain barrel to collect rainwater for irrigation and other non-potable uses

Large Landscape Water Budgets

Hayward has contracted with Waterfluence to develop and distribute water budgets and bimonthly water use reports to selected customers with large landscapes.

Fixture Replacements

Low water Use showerheads and/or faucet aerators are provided to single-family and multi-family residences at no cost to the customer.

Green Hayward PAYS (Pay As You Save)

The PAYS program was implemented in 2015, whereby Hayward fronts the funding to upgrade water fixtures in multi-family housing units. The program was terminated in July 2019 due to low participation. In those four years, only six projects had been completed using the PAYS on-bill repayment program, and only 14% of the total allocated budget was utilized.

Residential Surveys

Working with Rising Sun Energy Services, Hayward offers water use surveys to single-family and multi-family residential customers, including assessment of water use, replacement of high-water-using fixtures, and recommendations for improving water use efficiency. This program operates during the summer, utilizing youth employees who receive job training in water and energy efficiency and customer service.

Water Efficient Landscaping of City-Owned Sites

Hayward's Water Fund supports staffing in the Maintenance Services Department to install and maintain low water usage irrigation and backflow devices in right-of-ways, medians, and city-owned properties. This work includes monitoring and maintaining Cal Sense irrigation and water conservation devices throughout Hayward.

Water Efficient Landscape Ordinances and Guidelines

The Hayward City Council has adopted a variety of ordinances and guidelines for the express purpose of conserving water resources and increasing sustainability. These documents address such issues as landscape irrigation water use and water waste prohibitions. The Ordinances are included in Appendix L, Appendix M, and Appendix N.

9.3 Reporting Implementation

9.3.1 Implementation over the Past Five Years

The following sections document implementation, numerically if feasible, of the water conservation programs listed in the previous sections over the past five years.

Water Waste Prohibition Ordinance

Hayward's Water Waste Prohibition Ordinance was first adopted in 1993 and was most recently updated in 2017. It serves as a cornerstone for actions taken by Hayward to address incidents of wasteful water use. The initial action is a written notice to alert the property owner of wasteful activities. In most cases, corrective action is taken. If not, Hayward follows up with a second notice, door hanger, and personal contact. If the situation is still not corrected, Hayward may issue administrative fines and/or limit water service.

While the Water Waste Prohibition Ordinance is in effect at all times, regardless of water supply, it has been most actively used during the recent drought when over 250 reports of water waste were received and acted upon by Hayward.

Metering

Hayward's water system is fully metered, and all water bills are based on metered water usage.

Conservation Pricing

Hayward's water rates are determined on a cost-of-service basis. Since the early 1990s, water conservation rates have been in place, whereby the volumetric rate increases as the volume of water purchased increases. Further, Hayward has maintained a low fixed service fee, which in FY 2020 generated about 16% of the total Water Fund Revenue.

Public Education and Outreach

Hayward's active and robust public education and outreach program utilizes a variety of media, as described in Section 9.2.4, to get the water conservation message out to customers.

Following are some key five-year statistics to illustrate the breadth of other efforts to educate water customers:

- School education – In the past five years, Hayward has provided the WaterWise in-class curriculum to over 2,500 fifth-grade students. The WaterWise curriculum includes lesson plans, teaching aids, student workbooks, student activities, and a water wise kit for each student (home water use survey, water saving showerhead, faucet aerators, and leak detection aids). The home water use survey and low water using devices provide opportunities for students to engage their families in conservation activities. In addition to the students involved in the classroom study, over 30,000 students have participated in grade-appropriate assembly programs focused on water conservation and sustainability. Both programs are marketed through direct contact with Hayward Unified School District teachers and private schools, and programs are offered on a first-come, first-served basis as long as funding is available.
- Information booths and event participation. Hayward participates in at least six to eight events each year to distribute informational brochures and devices to the general public.
- Water Efficient Landscape Classes – Hayward has hosted 15 classes in the past five years, attended by about 750 people. The class size and hands-on approach serve to provide a meaningful educational experience. The primary methods used to promote the classes are billing inserts and Hayward's website.

Distribution System Losses

Hayward tracks and maintains a comprehensive leak detection survey and repair program. In 2019, city crews uncovered 75 water service leaks and main breaks. It is estimated that repair of these leaks resulted in water savings of about 360,000 gpd or about 400 acre feet per year. With this program, city crews respond promptly to reports of main breaks and water service leaks in order to minimize system losses.

Other Demand Management Measures

- Rebate Programs: During the past five years, Hayward has provided the customer rebates described below. The rebates are marketed through Hayward's websites, newsletters, brochures, and point-of-purchase information.
    - High Efficiency Clothes Washers – Hayward issued about 330 rebates for the purchase of an Energy Star certified model. The program ended in 2016.
    - High Efficiency Toilets – Hayward issued rebates for the replacement of 570 existing toilets with EPA WaterSense-certified high efficiency models.
    - Lawn Replacements – A total of 21 rebates have been issued for the replacement of lawn with water efficient landscaping.
    - Rain Barrels – A total of 10 rebates have been issued for the purchase of rain barrels.
- Large Landscape Water Budgets: Water budgets have been developed for 330 irrigation accounts for customers with a significant amount of landscaping. This program allows participating customers to track their water budgets and usage data in a GIS-based portal to assist them in making informed decisions to conserve water. Hayward selects customers for participation, prioritizing customers who have the largest irrigated landscapes and the highest irrigation water consumption. Participation in the program increased by 65% since the program's inception in 2014.

- Fixture Replacements: About 4,400 residential units have been provided with water efficient showerheads and faucet aerators. On the commercial side, about 20 water efficient pre-rinse spray valves have been distributed to food-related businesses. As with rebates, the program is promoted through the website and brochures. Many customers are also referred from the Revenue Office when they call to ask for assistance in reducing water consumption.
- Green Hayward PAYS: The PAYS program began in 2015 but was terminated in July 2019 due to low participation. During those four years, only six projects were completed using the PAYS on-bill repayment program, and only 14% of the total allocated budget was used.
- Residential Surveys: Working with Rising Sun Energy Services, Hayward has offered about 1,000 residential surveys during the past five years. This program is offered during the summer months only and is promoted through direct contact and outreach at community events.
- Water Efficient City-Owned Landscaping: The Water Fund supports four full-time staff positions, at a cost of $615,000, to install and maintain low water usage irrigation systems. During the drought, city staff reduced water usage by 30%.
- Water Efficient Landscape Ordinances and Guidelines: In addition to the Water Waste Prohibition Ordinance (Appendix L), the Hayward City Council has enacted the Bay Friendly Water Efficient Landscape Ordinance (Appendix M), and the Civic Bay Friendly Landscaping Ordinance (Appendix N). Hayward supports a full-time Landscape Architect staff position to administer the Bay Friendly Water Efficient Landscape standards.

9.3.2 Implementation to Achieve Water Use Targets

Hayward's residential and gross per capita water usage is very low compared to both the statewide average and neighboring communities. Hayward's service area includes a large and growing industrial sector; a state university, community college, and chiropractic college, all of which are mainly "commuter" institutions and anticipate growth; and a major regional hospital. Through a combination of factors, Hayward's demand has "hardened" such that achieving further reductions in per capita use will be challenging.

Hayward has achieved its 2020 water use per capita target. Additional information about Hayward's compliance of SB X7-7 is included in Chapter 5 of the UWMP. Nevertheless, Hayward will continue to implement aggressive demand management strategies. Assuming that they remain cost effective, the following previously described measures are anticipated to remain in place:

- Rain barrel rebates
- Lawn replacement rebates
- Water efficient landscape classes
- Public outreach and education
- School education programs (in-class and assembly)
- Large landscape water budgets
- Residential surveys
- Fixture replacements (showerheads, faucet aerators)
- Leak detection and repair
- Conservation pricing
- Water efficient landscaping of city-owned sites
- Enforcement of city ordinances

In 2018, Hayward completed the replacement of its manual water meters (approximately 36,000) with new AMI meters. This new technology allows for comprehensive customer engagement, including the ability to monitor daily and hourly water use and receive notices of continuous water usage. The AMI system also provides Hayward with extensive data regarding customer use that will inform water conservation programs and help Hayward target its resources more effectively. Hayward is currently in the process of implementing an AMI

Customer Portal to provide customers access to the consumption metrics and other information associated with their accounts.

As water conservation is a constantly evolving field, Hayward will continue to research and evaluate programs and technology. Potential new programs may include:

- Commercial and industrial water use surveys
- AMI customer alerts for potential leak detection and water savings

9.4 Water Use Objectives (Future Requirements)

Beginning in 2023, urban water suppliers are required to calculate and report their annual urban water use objective (WUO), submit validated water audits annually, and implement and report best management practice (BMP) CII performance measures.

Urban Water Use Objective

An Urban Water Supplier's urban WUO is based on efficient water use of the following:

- Aggregate estimated efficient indoor residential water use
- Aggregate estimated efficient outdoor residential water use
- Aggregate estimated efficient outdoor irrigation landscape areas with dedicated irrigation meters or equivalent technology in connection with CII water use
- Aggregate estimated efficient water losses
- Aggregate estimated water use for variances approved by SWRCB
- Allowable potable reuse water bonus incentive adjustments

BAWSCA and Hayward offer a suite of programs, described in detail throughout this chapter, that will help Hayward meet and calculate the WUO (Table 9-1).

Table 9-1. Programs to Assist in Meeting Water Use Objectives

WUO Component	Calculation	Program	Impact
Indoor Residential	Population and GPCD standard	Direct Impact • Plumbing Devices Giveaways Indirect Impact • Water efficiency surveys • Public and School Education • Conservation pricing	Direct Impact: Increase of indoor residential efficiencies and reductions through GPCD use Indirect Impact: Provide information, resources, and education to promote efficiencies in the home
Outdoor Residential	Irrigated/irrigable area measurement and a percent factor of local ETo	Direct Impact • Lawn conversion incentives • Rain barrel rebates • Ordinance requirements for separate irrigation service for certain new accounts • Water efficient landscaping of city-owned properties Indirect Impact • Large landscape water budgets • Public and School Education • Conservation pricing	Direct Impact: Increase outdoor residential efficiencies and reductions of potable gallons per ft2 of irrigated/ irrigable area use Indirect Impact: Provide information, resources, and education to promote efficiencies in the landscape
Water Loss	Following the AWWA M36 Water Audits and Water Loss Control Program, Fourth Edition and AWWA Water Audit Software V	Direct Impact • Water Balance Validation • Customer Meter Accuracy Testing • Distribution System Pressure Surveys • Distribution System Leak Detection • No-Discharge Distribution System Flushing • Water Audit Compilation • Component Analysis	Direct Impact: Identify areas of the distribution system that need repair, replacement, or other action

10 PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

Description

Procedures for adopting and implementing the UWMP in a transparent and stakeholder-accessible manner are designed to provide customers with the opportunity to understand water supply planning and reliability, and to provide input into the process. An adopted UWMP may be used to support water supply capital planning and investment, as well as potential rate adjustments. In this chapter, information is provided on the processes Hayward followed for review and adoption of the 2020 UWMP, including noticing, public review and availability, public hearing, adoption, submission, and implementation.

10.1 Notice of Public Hearing

A public hearing was conducted by the Hayward City Council on July 20, 2021, to discuss and receive comments/input regarding Hayward's 2020 UWMP and WSCP prior to their adoption. The public hearing was advertised in *The Daily Review*, the Hayward newspaper with the largest circulation, 14 days and 7 days prior to the hearing (per DWR requirements). See Appendix G for a copy of the newspaper notice.

10.1.1 Notice to Cities and Counties

In January 2021, notices of preparation and intent to update the UWMP were emailed to the applicable cities, county, and other agencies as required more than 60 days in advance of the public hearing. A copy of the Notice of Intent to Update the 2020 UWMP is included in Appendix F.

In July 2021, notices of the public hearing were emailed to the applicable cities, county, and other agencies as required more than 14 days prior to the hearing. The notices included the location where the 2020 UWMP could be viewed, the UWMP revision schedule, and Hayward's contact information. A copy of the Notice of Public Hearing is included in Appendix G.

Table 10-1 lists the specific entities that were notified for both the above instances.

Table 10-1. Notification to Cities and Counties

Submittal Table 10-1 Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
City of Brisbane	Yes	Yes
City of Burlingame	Yes	Yes
City of Daly City	Yes	Yes
City of East Palo Alto	Yes	Yes
City of Foster City	Yes	Yes
City of Hillsborough	Yes	Yes
City of Menlo Park	Yes	Yes
City of Millbrae	Yes	Yes
City of Milpitas	Yes	Yes
City of Mountain View	Yes	Yes
City of Palo Alto	Yes	Yes
City of Redwood City	Yes	Yes
City of San Bruno	Yes	Yes
City of San Jose	Yes	Yes
City of Santa Clara	Yes	Yes
City of Sunnyvale	Yes	Yes
Alameda County Water District	Yes	Yes
BAWSCA	Yes	Yes
California Water Service	Yes	Yes
Coastside County Water District	Yes	Yes
East Bay Dischargers Authority	Yes	Yes
East Bay Municipal Utility District	Yes	Yes
Hayward Area Recreation and Park District	Yes	Yes
Mid-Peninsula Water District	Yes	Yes
North Coast County Water District	Yes	Yes
Purissima Hills Water District	Yes	Yes
Stanford University	Yes	Yes
Valley Water - Wholesaler	Yes	Yes
Westborough Water District	Yes	Yes
County Name	60 Day Notice	Notice of Public Hearing
Alameda County	Yes	Yes

10.1.2 Notice to the Public

A public hearing notice was placed in *The Daily Review* for two successive weeks, July 2 and July 9, 2021, announcing that Hayward would be reviewing and considering amendments to the UWMP and WSCP. Notification occurred in accordance with Government Code Section 6066 and included the time and place of hearing as well as the location where the UWMP was available for public inspection.[41] This information was also posted on Hayward's website on July 2, 2021.

10.2 Public Hearing and Adoption

10.2.1 Public Hearing

The public hearing, conducted by the Hayward City Council on July 20, 2021, allowed for community input on the 2020 UWMP and WSCP.

10.2.2 Adoption

This 2020 UWMP was adopted on July 20, 2021, thereby superseding the existing plan prepared in 2015. A copy of the resolution adopting the 2020 UWMP is provided in Appendix H.

10.3 Plan Submittal

Within 30 days of adoption, Hayward submitted a copy of the 2020 UWMP and WSCP to DWR, the California State Library Government Publications Section (Sacramento), and to any city or county to which Hayward provides water in accordance with California Water Code Sections 10635(c), 10644(a)(1) and (2), and 10645(a) and (b).

10.3.1 Submitting a UWMP and WSCP to DWR

To satisfy DWR requirements, all UWMPs and WSCPs must be submitted to DWR within 30 days of adoption and prior to July 1, 2021. Hayward submitted the documents within 30 days of the adoption date of July 20, 2021.

10.3.2 Electronic Data Submittal

Hayward submitted its 2020 UWMP and WSCP to DWR electronically.

10.3.3 Submitting a UWMP to the California State Library

Hayward submitted a CD or hard copy of its adopted 2020 UWMP to the California State Library within 30 days of adoption.

10.3.4 Submitting a UWMP to Cities and Counties

Hayward submitted a copy of its adopted 2020 UWMP to Alameda County within 30 days of adoption.

10.4 Public Availability

Within 30 days after filing the 2020 UWMP and WSCP with DWR, the documents were made available for public review during normal business hours at Hayward City Hall (City Clerk's Office and Department of Public Works & Utilities), the public libraries (Main and Weekes Branches), and on Hayward's website at www.hayward-ca.gov.

[41] California State Legislature. (1949). Government Code Section 6066. http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=GOV&sectionNum=6066

10.5 Notification to Public Utilities Commission

Per Water Code Section 10621(c), Suppliers that are regulated by the California Public Utilities Commission (CPUC) must submit their UWMP and WSCP to the CPUC as part of its general rate case filings. Since this is not applicable to Hayward, the plans were not submitted to the CPUC.

10.6 Amending an Adopted UWMP or WSCP

Should any changes be made to the 2020 UWMP and/or the WSCP, per Water Code Sections 10621(d) and 10644(a)(1), within 30 days after adoption, Hayward will submit copies of the amendments or changes to DWR, the California State Library, and Alameda County.

10.6.1 Amending a UWMP

If Hayward amends the adopted 2020 UWMP, each of the steps for notification, public hearing, adoption, and submittal of the original 2020 UWMP will be followed.

10.6.2 Amending a WSCP

Specific to Water Code Section 10644(b), if Hayward revises its WSCP after DWR has approved the 2020 UWMP, Hayward will submit to DWR an electronic copy of the revised WSCP within 30 days of adoption.

11 REFERENCES

All links below were accessed in July 2021 unless otherwise indicated.

Ackerly, David, Andrew Jones, Mark Stacey, Bruce Riordan (University of California, Berkeley). (2018.) *San Francisco Bay Area Summary Report.* California's Fourth Climate Change Assessment. Publication number: CCCA4-SUM-2018-005. https://www.energy.ca.gov/sites/default/files/2019-11/Reg_Report-SUM-CCCA4-2018-005_SanFranciscoBayArea_ADA.pdf

Alliance for Water Efficiency. (2016). *The Status of Legislation, Regulation, Codes & Standards on Indoor Plumbing Water Efficiency*. http://www.allianceforwaterefficiency.org/Codes-Standards-White-Paper.aspx

Association of Bay Area Governments (ABAG). Forecasts & Projections web page. https://abag.ca.gov/our-work/land-use/forecasts-projections

Bay Area Regional Reliability (BARR) website. https://www.bayareareliability.com/

Bay Area Water Supply and Conservation Agency (BAWSCA). (2021). BAWSCA Common Language, March 1, 2021, Attachment B, page 8.

Ibid. (2020). *Regional Water Demand and Conservation Projections* Phase III Final Report. http://bawsca.org/uploads/pdf/BAWSCA_Regional_Water_Demand_and_Conservation%20Projections%20Report_Final.pdf

Bureau of Labor Statistics. (April 2021). Oakland-Fremont-Hayward. https://www.bls.gov/eag/eag.ca_oakland_md.htm

California Department of Water Resources. DWR. (2004). *California's Groundwater,* Bulletin 118, East Bay Plain Subbasin. https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Files/2003-Basin-Descriptions/2_009_04_East-BayPlainSubbasin.pdf

Ibid. (2016). *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use*. https://cadwr.app.box.com/s/5rbv5gjm881dxonycnb7u2253a0l6e8l

Ibid. (2006). Progress on Incorporating Climate Change into Planning and Management of California's Water Resources, Technical Memorandum.

Ibid. SGMA Basin Prioritization Dashboard web page. https://gis.water.ca.gov/app/bp-dashboard/final/

Ibid. SGMA Portal – Basin Boundary Modification Request System web page. https://sgma.water.ca.gov/basinmod/modrequest/preview/54

Ibid. (2020). *Sustainable Groundwater Management Act 2019 Basin Prioritization*. https://water.ca.gov/programs/groundwater-management/basin-prioritization

Ibid. (2021). *Urban Water Management Plan Guidebook 2020.* https://water.ca.gov/Programs/Water-Use-And-Efficiency/Urban-Water-Use-Efficiency/Urban-Water-Management-Plans

California Energy Commission. (2013). *Analysis of Standards Proposal for Residential Faucets and Faucet Accessories*, Docket #12-AAER-2C, prepared by Energy Solutions and Natural Resources Defense Council. https://efiling.energy.ca.gov/GetDocument.aspx?tn=71768&DocumentContentId=8103

Ibid. (2015). *Appliance Efficiency Regulations, California Code of Regulations, Title 20, Sections 1601-1609, Toilet, Urinal, Faucet, and Showerhead Regulations*.

Ibid. (2014). *Staff Analysis of Toilets, Urinals and Faucets*, Report # CEC-400-2014-007-SD. http://droughtresilience.com/wp-content/uploads/2018/08/CEC-400-2014-007-SD.pdf

California Green (CALGreen) Building Standards 2019 Code, effective January 1, 2020. https://www.dgs.ca.gov/BSC/CALGreen

California Natural Resources Agency (CNRA). (2012). *California Climate Adaption Planning Guide*. https://resources.ca.gov/CNRALegacyFiles/docs/climate/01APG_Planning_for_Adaptive_Communities.pdf

Ibid. (2009). *California Climate Change Adaptation Strategy, Report to the Governor*.

Ibid. Voluntary Agreements to Improve Habitat and Flow in the Delta and its Watersheds web page. https://files.resources.ca.gov/voluntary-agreements/

California Natural Resources Agency and California Ocean Protection Council. (2018). *State of California Sea-Level Rise Guidance*, 2018 Update. http://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20180314/Item3_Exhibit-A_OPC_SLR_Guidance-rd3.pdf

California State Legislature. Assembly Bill 715 (Laird), October 11, 2007. http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200720080AB715

Ibid. (1949). Government Code Section 6066. http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=GOV&sectionNum=6066

Ibid. (1995). Health and Safety Code Section 116275. https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=HSC&sectionNum=116275.

Ibid. Senate Bill 407 (Padilla), October 11, 2009. https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200920100SB407

Ibid. Senate Bill 837 (Blakeslee), July 1, 2011. http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201120120SB837

Ibid. (1983). Water Code Section 10617, amended 1996. https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=WAT&sectionNum=10617.

Ibid. (1983). Water Code Section 10621. http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=WAT&sectionNum=10621

Ibid. (2014). Water Section 10723 (C)(1). https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=10723.&lawCode=WAT

City of Hayward. (2015). City Council Resolution 17-014. https://www.hayward-ca.gov/sites/default/files/GSA%20Formation%20Resolution.pdf

Consortium for Efficient Energy website. www.cee1.org

DeOreo, W.B. (2016). *Residential End Uses of Water, Version 2 - 4309.* Denver, Colorado: AWWA Research Foundation. https://www.waterrf.org/research/projects/residential-end-uses-water-version-2

DeOreo, W.B., P.W. Mayer, Leslie Martien, Matthew Hayden, Andrew Funk, Michael Kramer-Duffield, Renee Davis, James Henderson, Bob Raucher, Peter Gleick, and Matt Heberger. (2011). *California Single Family Water Use Efficiency Study*. Sacramento, California: Department of Water Resources. http://water.cityofdavis.org/Media/PublicWorks/Documents/PDF/PW/Water/Documents/California-Single-Family-Home-Water-Use-Efficiency-Study-20110420.pdf

Dziegielewski, B., J. C. Kiefer, W. DeOreo, P. Mayer, E. M. Opitz, G. A. Porter, G. L. Lantz, and J. O. Nelson. (2000). *Commercial and Institutional End Uses of Water*. Denver, Colorado: AWWA, Research Foundation and American Water Works Association with Cooperation of the U.S. Bureau of Reclamation. Catalog No.90806. 264 pp. ISBN 1-58321-035-0. http://ufdc.ufl.edu/WC13511002/00001

GMP Research, Inc. (2019). 2019 U.S. WaterSense Market Penetration Industry Report, commissioned by Plumbing Manufacturers International. https://www.safeplumbing.org/files/safeplumbing.org/documents/misc/7-1-19-WaterSense-2019-Report.pdf

Intergovernmental Panel on Climate Change (IPCC). (2008). *Climate Change and Water*. https://www.ipcc.ch/publication/climate-change-and-water-2/

Luhdorff & Scalmanini Consulting Engineers. (2020). Technical Memorandum 4.1, dated June 2020.

National Academy of Sciences. Climate Resources at the National Academies web page. https://www.nationalacademies.org/topics/climate

North American Industry Classification System (NAICS) website. https://www.census.gov/naics/

Oak Ridge National Laboratory, Energy Division. (1998). "Bern Clothes Washer Study, Final Report," prepared for U.S. Department of Energy. https://digital.library.unt.edu/ark:/67531/metadc691712/

Plumbing Efficiency Research Coalition. (2012). *The Drainline Transport of Solid Waste in Buildings, PERC Phase 1 Report*, Table 2-A: Water Consumption by Water-Using Plumbing Products and Appliances – 1980-2012. http://www.map-testing.com/assets/files/PERC%20Report_Final_Phase%20One_Nov%202011_v1.1.pdf

Public Policy Institute of California (PPIC). (2020). *Priorities for California's Water*. https://www.ppic.org/publication/priorities-for-californias-water/

San Francisco Public Utilities Commission (SFPUC). (2021). *Final 2020 UWMP*. https://www.sfpuc.org/sites/default/files/programs/local-water/SFPUC_2020_UWMP2020_%20FINAL.pdf

State Water Resources Control Board. (2018). *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary*, p.17, fn. 14: https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf)

U.S. Congress. Energy Policy Act of 1992; amended in 2005. https://www.congress.gov/bill/102nd-congress/house-bill/776/text/enr; https://www.epa.gov/laws-regulations/summary-energy-policy-act; https://www.gpo.gov/fdsys/pkg/BILLS-109hr6enr/pdf/BILLS-109hr6enr.pdf

U.S. EPA. (2019). Risk and Resilience Assessments and Emergency Response Plans. https://www.epa.gov/sites/production/files/2019-04/documents/awia_factsheet_04-16-2019_v2-508.pdf

Wilkinson. (2020). *Methodology for Analysis of the Energy Intensity of California's Water Systems,* supported by Ernest Orlando Lawrence Berkeley Laboratory and the California Institute for Energy Efficiency. http://large.stanford.edu/courses/2012/ph240/spearrin1/docs/wilkinson.pdf

APPENDICES

A. UWMP Checklist

B. Water Audit Report

C. Demand & Passive Savings Methodology

D. SB X7-7 Compliance Form

E. State Water Resources Control Board 2017 Letter

F. Notice of Intent to Update the 2020 UWMP

G. Notice of Public Hearing

H. Adoption Resolution

I. SFPUC Regional Water System Supply Reliability and BAWSCA Tier 2 Drought Implementation Scenarios

J. SFPUC Water Supply Workshop #3

K. 2020 Water Shortage Contingency Plan

L. Hayward Municipal Code – Sec 11-2.47

M. Hayward Municipal Code – Bay Friendly Water Efficient Landscape Ordinance

N. Hayward Municipal Code – Bay Friendly Landscaping Ordinance

O. 2020 Water and Wastewater Service Rates

APPENDIX A – UWMP CHECKLIST

2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
Chapter 1	10615	A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation, and demand management activities.	Introduction and Overview	Section 1.2
Chapter 1	10630.5	Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a supplier may also choose to include a simple description at the beginning of each chapter.	Summary	Start of Each Chapter
Section 2.2	10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Chapter 1 and Section 2.2
Section 2.6	10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Sections 2.1, 2.3, 2.6.2, and 10.1
Section 2.6.2	10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan.	Plan Preparation	Section 2.6.2
Section 2.6, Section 6.1	10631(h)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source.	System Supplies	Sections 2.6.1 and 4.2.6
Section 2.6	10631(h)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	N/A (Wholesale Only)

2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
Section 3.1	10631(a)	Describe the water supplier service area.	System Description	Sections 3.1 and 3.2
Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3
Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Section 3.4.1
Section 3.4.2	10631(a)	Describe other social, economic, and demographic factors affecting the supplier's water management planning.	System Description	Section 3.4.2
Sections 3.4 and 5.4	10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Section 3.4.1
Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	Section 3.5 and 4.2.6
Section 4.2	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Sections 4.2.3, 4.2.5, and 4.2.6
Section 4.2.4	10631(d)(3)(C)	Retail suppliers shall provide data to show the distribution loss standards were met.	System Water Use	Section 4.2.4
Section 4.2.6	10631(d)(4)(A)	In projected water use, include estimates of water savings from adopted codes, plans, and other policies or laws.	System Water Use	Section 4.2.6 and Appendix C
Section 4.2.6	10631(d)(4)(B)	Provide citations of codes, standards, ordinances, or plans used to make water use projections.	System Water Use	Section 4.2.6 and Appendix C
Section 4.3.2.4	10631(d)(3)(A)	Report the distribution system water loss for each of the 5 years preceding the plan update.	System Water Use	Section 4.3.2
Section 4.4	10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.4
Section 4.5	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System Water Use	Sections 4.5 and 7.2.1, Appendix I

2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
Chapter 5	10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Sections 5.3 and 5.6
Chapter 5	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 5.7.1
Section 5.1	10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	N/A (Wholesale Only)
Section 5.2	10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Section 5.7.2
Section 5.5	10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5-year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.6
Section 5.5 and Appendix E	10608.4	Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SB X7-7 2020 Compliance Form.	Baselines and Targets	Section 5.7.2
Sections 6.1 and 6.2	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought.	System Supplies	Sections 7.1.2, 7.1.3 and 7.2
Sections 6.1	10631(b)(1)	Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, including changes in supply due to climate change.	System Supplies	Sections 6.2.8, 6.3.1, 7.1.1, 7.1.2, 7.1.3 and 7.2

2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
Section 6.1	10631(b)(2)	When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies.	System Supplies	Sections 6.2.1, 6.2.2, and 6.2.5
Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Sections 6.2.5 and 6.2.8
Section 6.2.8	10631(b)	Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045.	System Supplies	Sections 6.2.9
Section 6.2	10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2.2
Section 6.2.2	10631(b)(4)(A)	Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.2.2
Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	Section 6.2.2
Section 6.2.2	10631(b)(4)(B)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.2
Section 6.2.2.1	10631(b)(4)(B)	For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions.	System Supplies	Section 6.2.2
Section 6.2.2.4	10631(b)(4)(C)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Section 6.2.2
Section 6.2.2	10631(b)(4)(D)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Sections 6.2.2

2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
Section 6.2.7	10631(c)	Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis.	System Supplies	Section 6.2.8
Section 6.2.5	10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (RecycledWater)	Section 6.2.5
Section 6.2.5	10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Sections 6.2.5
Section 6.2.5	10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (RecycledWater)	Sections 6.2.5
Section 6.2.5	10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (RecycledWater)	Section 6.2.5
Section 6.2.5	10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (RecycledWater)	Section 6.2.5
Section 6.2.5	10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.2.5
Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.2.6
Section 6.2.5	10633(a)	Describe the wastewater collection and treatment systems in the supplier’s service area with quantified amount of collection and treatment and the disposal methods.	System Supplies (RecycledWater)	Section 6.2.5
Section 6.2.8, Section 6.3.7	10631(f)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years.	System Supplies	Section 6.2.8

2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
Section 6.4 and Appendix O	10631.2(a)	The UWMP must include energy information, as stated in the code, that a supplier can readily obtain.	System Suppliers,Energy Intensity	Section 6.4
Section 7.2	10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Section 7.1.1
Section 7.2.4	10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.1.4
Section 7.3	10635(a)	Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.1.3
Section 7.3	10635(b)	Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects.	Water Supply Reliability Assessment	Section 7.2
Section 7.3	10635(b)(1)	Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years.	Water Supply Reliability Assessment	Section 7.2.1
Section 7.3	10635(b)(2)	Include a determination of the reliability of each source of supply under a variety of water shortage conditions.	Water Supply Reliability Assessment	Sections 7.2.2
Section 7.3	10635(b)(3)	Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.	Water Supply Reliability Assessment	Section 7.2.3
Section 7.3	10635(b)(4)	Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.	Water Supply Reliability Assessment	Sections 7.1.1

2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	2020 UWMP Appendix K 2020 WSCP
Chapter 8	10632(a)(1)	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP	Water Shortage Contingency Planning	2020 WSCP Section 3.1
Section 8.10	10632(a)(10)	Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented.	Water Shortage Contingency Planning	2020 WSCP Section 3.10
Section 8.2	10632(a)(2)(A)	Provide the written decision- making process and other methods that the supplier will use each year to determine its water reliability.	Water Shortage Contingency Planning	2020 WSCP Section 3.2
Section 8.2	10632(a)(2)(B)	Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code.	Water Shortage Contingency Planning	2020 WSCP Section 3.2
Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50% shortage and greater than 50% shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply.	Water Shortage Contingency Planning	2020 WSCP Section 3.3
Section 8.3	10632(a)(3)(B)	Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories.	Water Shortage Contingency Planning	N/A – using six standard categories
Section 8.4	10632(a)(4)(A)	Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions.	Water Shortage Contingency Planning	2020 WSCP Section 3.4
Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	2020 WSCP Section 3.4

2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	2020 WSCP Section 3.4
Section 8.4	10632(a)(4)(D)	Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions.	Water Shortage Contingency Planning	2020 WSCP Section 3.4
Section 8.4	10632(a)(4)(E)	Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action.	Water Shortage Contingency Planning	2020 WSCP Section 3.4
Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	2020 WSCP Section 3.4
Section 8.5	10632(a)(5)(A)	Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages.	Water Shortage Contingency Planning	2020 WSCP Section 3.5 and WSCP Appendix B
Section 8.5 and 8.6	10632(a)(5)(B) 10632(a)(5)(C)	Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications.	Water Shortage Contingency Planning	2020 WSCP Section 3.5 and WSCP Appendix B
Section 8.6	10632(a)(6)	Retail supplier must describe how it will ensure compliance with and enforce provisions of the WSCP.	Water Shortage Contingency Planning	2020 WSCP Section 3.6 and WSCP Appendix A
Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	2020 WSCP Section 3.7
Section 8.7	10632(a)(7)(B)	Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3.	Water Shortage Contingency Planning	2020 WSCP Section 3.7
Section 8.7	10632(a)(7)(C)	Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency.	Water Shortage Contingency Planning	2020 WSCP Section 3.7
Section 8.8	10632(a)(8)(A)	Describe the potential revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	2020 WSCP Section 3.8

2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
Section 8.8	10632(a)(8)(B)	Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions.	Water Shortage Contingency Planning	2020 WSCP Section 3.8
Section 8.8	10632(a)(8)(C)	Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought	Water Shortage Contingency Planning	2020 WSCP Section 3.8
Section 8.9	10632(a)(9)	Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance.	Water Shortage Contingency Planning	2020 WSCP Section 3.9
Section 8.11	10632(b)	Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas.	Water Shortage Contingency Planning	2020 WSCP Section 3.11
Sections 8.12 and 10.4	10635(c)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Section 10.3.4 2020 WSCP Section 3.12
Section 8.14	10632(c)	Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan.	Water Shortage Contingency Planning	Sections 10.3.4 and 10.4 2020 WSCP Section 3.12
Sections 9.1 and 9.3	10631(e)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	N/A (Wholesale Only)
Sections 9.2 and 9.3	10631(e)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Sections 9.2 and 9.3

2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
Chapter 10	10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance).	Plan Adoption, Submittal, and Implementation	Section 10.2.1
Section 10.2.1	10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1.	Plan Adoption, Submittal, and Implementation	Sections 10.1.1
Section 10.4	10621(f)	Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.	Plan Adoption, Submittal, and Implementation	Section 10.3.1
Sections 10.2.2, 10.3, and 10.5	10642	Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan.	Plan Adoption, Submittal, and Implementation	Section 10.1.2 and Appendix G
Section 10.2.2	10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Section 10.1.2 and Appendix G
Section 10.3.2	10642	Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Appendix H of the UWMP and Appendix D of the WSCP
Section 10.4	10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.3.3
Section 10.4	10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Sections 10.3.4
Sections 10.4.1 and 10.4.2	10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Section 10.3.2

2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
Section 10.5	10645(a)	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.4
Section 10.5	10645(b)	Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.4
Section 10.6	10621(c)	If supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings.	Plan Adoption, Submittal, and Implementation	N/A – The City of Hayward is not regulated by the Public Utilities Commission
Section 10.7.2	10644(b)	If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption.	Plan Adoption, Submittal, and Implementation	Section 10.6

APPENDIX B – WATER AUDIT REPORT

Water Loss Reports included for the most recent four years, Calender Years 2016-2019:

Level 1 Validation Certificate

WSO

This document verifies that the Level 1 Validation process was completed. The session details and audit review outcomes are included here.

This certificate is required for submission – alongside the Level 1 validated water audit software file – to the California Department of Water Resources.

Call Date: 9/8/2020

Water Supplier

Supplier Name:	City of Hayward
Supplier Participants:	Michelle Tran, Cheryl Munoz, Darly Lockhart, Bert Weiss

Validator

Validator:	Kevin Burgers, Water Systems Optimization
Validator Qualifications:	Water Audit Validator Certificate from the AWWA California Nevada Section

Key Audit Metrics

Data Validity Score:	73	
ILI:	0.14	
Real Loss:	2.85	gal / conn / day
Apparent Loss:	3.58	gal / conn / day
Non-Revenue Water as Percent of Cost of Operating System:	1.9%	

Certification Statement by Validator

This water loss audit report has been Level 1 validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

All recommendations on volume derivation and Data Validity Grades were incorporated into the water audit. ☒

Level 1 Validation – Water Supplier Confirmation

This document confirms participation in and endorsement of the Level 1 Validation as completed.

This acknowledgement is required for submission – alongside your Level 1 validated water audit software file – to the California Department of Water Resources.

Water Supplier Name:	City of Hayward
Water Supplier Public Water System ID:	11006
Water Audit Period:	Calendar Year 2019

Water Audit & Water Loss Improvement Steps

Steps taken in the audit period timeframe to increase data source accuracy, reduce real losses, and/or reduce apparent losses, as informed by the water audit.

The City of Hayward implemented a Advanced Metering Infrastructure (AMI) program throughout the City to improve monitoring and reporting of water consumption. The AMI program allows the City to be more proactive in reducing unbilled water usage and provide more accurate usage data.

Certification Statement by Water Supplier Executive:

This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, *Water Audits and Loss Control Programs, Manual M36, Fourth Edition* and in the Free Water Audit Software version 5.

Executive Name (print):	Alex Ameri
Executive Position:	Director of Public Works
Signature:	
Date	9/21/20

Level 1 Validation Certificate

WSO

This document verifies that the Level 1 Validation process was completed. The session details and audit review outcomes are included here.

This certificate is required for submission – alongside the Level 1 validated water audit software file – to the California Department of Water Resources.

Call Date: 9/6/2019

Water Supplier

Supplier Name:	City of Hayward
Supplier Participants:	Michelle Tran, Jan Lee, Daryl Lockhart, Bert Weiss

Validator

Validator:	Kim Manago, Water Systems Optimization
Validator Qualifications:	Water Audit Validator Certificate from the AWWA California Nevada Section

Key Audit Metrics

Data Validity Score:	72	
ILI:	0.96	
Real Loss:	18.9	gal / conn / day
Apparent Loss:	3.8	gal / conn / day
Non-Revenue Water as Percent of Cost of Operating System:	4.3%	

Certification Statement by Validator

This water loss audit report has been Level 1 validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

All recommendations on volume derivation and Data Validity Grades were incorporated into the water audit. ☒

Level 1 Validation – Water Supplier Confirmation

This document confirms participation in and endorsement of the Level 1 Validation as completed.

This acknowledgement is required for submission – alongside your Level 1 validated water audit software file – to the California Department of Water Resources.

Water Supplier Name:	City of Hayward
Water Supplier Public Water System ID:	110006
Water Audit Period:	Calendar Year 2018

Water Audit & Water Loss Improvement Steps

Steps taken in the audit period timeframe to increase data source accuracy, reduce real losses, and/or reduce apparent losses, as informed by the water audit.

Click or tap here to enter text.

Certification Statement by Water Supplier Executive:

This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, *Water Audits and Loss Control Programs, Manual M36, Fourth Edition* and in the Free Water Audit Software version 5.

Executive Name (print):	Alex Ameri
Executive Position:	Director of Public Works
Signature:	
Date	9/23/2019

Level 1 Validation Certificate

WSO

This document verifies that the Level 1 Validation process was completed. The session details and audit review outcomes are included here.

This certificate is required for submission – alongside the Level 1 validated water audit software file – to the California Department of Water Resources.

Call Date: 9/14/2018

Water Supplier

Supplier Name:	City of Hayward
Supplier Participants:	Michelle Tran, Jan Lee, Darrel Lockhart

Validator

Validator:	Kate Gasner, Water Systems Optimization
Validator Qualifications:	Water Audit Validator Certificate from the AWWA California Nevada Section

Key Audit Metrics

Data Validity Score:	65	
ILI:	1.5	
Real Loss:	29.4	gal / conn / day
Apparent Loss:	7.1	gal / conn / day
Non-Revenue Water as Percent of Cost of Operating System:	7.2%	

Certification Statement by Validator

This water loss audit report has been Level 1 validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

All recommendations on volume derivation and Data Validity Grades were incorporated into the water audit. ☒

Level 1 Validation – Water Supplier Confirmation

This document confirms participation in and endorsement of the Level 1 Validation as completed.

This acknowledgement is required for submission – alongside your Level 1 validated water audit software file – to the California Department of Water Resources.

Water Supplier Name:	City of Hayward
Water Supplier Public Water System ID:	110006
Water Audit Period:	Calendar Year 2017

Water Audit & Water Loss Improvement Steps

Steps taken in the audit period timeframe to increase data source accuracy, reduce real losses, and/or reduce apparent losses, as informed by the water audit.

- Implementation of a system-wide AMI project. Approximately 50% of existing meter inventory was replaced with new AMI meters during Calendar Year 2017.

Certification Statement by Water Supplier Executive:

This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, *Water Audits and Loss Control Programs, Manual M36, Fourth Edition* and in the Free Water Audit Software version 5.

Executive Name (print):	Alex Ameri
Executive Position:	Director of Utilities & Environmental Services
Signature:	
Date	09/28/18

American Water Works Association
California-Nevada Section

CA-NV AWWA Water Loss Technical Assistance Program

Wave 4 Water Audit Level 1 Validation Document

Utility Provided

Water System Name: City of Hayward Water System ID Number: 0110006 Water Audit Period: Calendar 2016

Water Audit & Water Loss Improvement Steps:

Steps taken in preceding year to increase data validity, reduce real loss and apparent loss as informed by the annual validated water audit:

- Participation in the TAP and water audit validation process
- Implementation of a system-wide AMI project, including meter replacement for all meters greater than four years old

Certification Statement by Utility Executive:

This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, ***Water Audits and Loss Control Programs, Manual M36, Fourth Edition*** and in the Free Water Audit Software version 5.

Alex Ameri	Director of Utilities & Environmental Services	D. Ameri	Sept. 29, 2017
Executive Name (Print)	Executive Position	Signature	Date

WSO | CAVANAUGH Stewardship Through Innovation

American Water Works Association
California-Nevada Section

CA-NV AWWA Water Loss Technical Assistance Program

Wave 4 Water Audit Level 1 Validation Document

Validator Provided

Audit Information:

Utility: Hayward PWS ID: 0110006

System Type: Potable Audit Period: Calendar 2016

Utility Representation: Alicia Sargiotto, Corrine Ferreyra

Validation Date: 9/28/2017 Call Time: 8:30am Sufficient Supporting Documents Provided: Yes

Validation Findings & Confirmation Statement:

Key Audit Metrics:

Data Validity Score: 63 Data Validity Band (Level): Band III (51-70)

ILI: 0.69 Real Loss: 13.29 (gal/conn/day) Apparent Loss: 13.14 (gal/conn/day)

Non-revenue water as percent of cost of operating system: 6.6%

Certification Statement by Validator:

This water loss audit report has been Level 1 validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

All recommendations on volume derivation and Data Validity Grades were incorporated into the water audit. ☒

Validator Information:

Water Audit Validator: Drew Blackwell Validator Qualifications: Contractor for CA-NV AWWA Water Loss TAP

WSO | CAVANAUGH
Stewardship Through Innovation

APPENDIX C – DEMAND & PASSIVE SAVINGS METHODOLOGY

C.1 DSS Model Overview

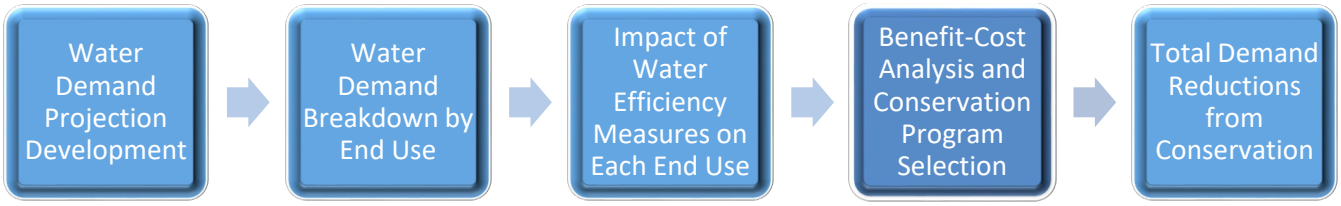


Figure C-1. DSS Model Main Page

DSS Model Overview: The Least Cost Planning Decision Support System Model (DSS Model) is used to prepare long-range, detailed demand projections. The purpose of the extra detail is to enable a more accurate assessment of the impact of water efficiency programs on demand and to provide a rigorous and defensible modeling approach necessary for projects subject to regulatory or environmental review.

Originally developed in 1999 and continuously updated, the DSS Model is an "end-use" model that breaks down total water production (water demand in the service area) to specific water end uses, such as plumbing fixtures and appliances. The model uses a bottom-up approach that allows for multiple criteria to be considered when estimating future demands, such as the effects of natural fixture replacement, plumbing codes, and conservation efforts. The DSS Model may also use a top-down approach with a utility-prepared water demand forecast.

Demand Forecast Development and Model Calibration: To forecast urban water demands using the DSS Model, customer demand data is obtained from the water agency being modeled. Demand data is reconciled with available demographic data to characterize water usage for each customer category in terms of number of users per account and per capita water use. Data is further analyzed to approximate the split of indoor and outdoor water usage in each customer category. The indoor/outdoor water usage is further divided into typical end uses for each customer category. Published data on average per capita indoor water use and average per capita end use is combined with the number of water users to calibrate the volume of water allocated to specific end uses in each customer category. In other words, the DSS Model checks that social norms from end studies on water use behavior (e.g., flushes per person per day) are not exceeded or drop below reasonable use limits.

Passive Water Savings Calculations: The DSS Model is used to forecast service area water fixture use. Specific end-use type, average water use, and lifetime are compiled for each fixture. Additionally, state and national plumbing codes and appliance standards are modeled by customer category. These fixtures and plumbing codes can be added to, edited, or deleted by the user. This process yields two demand forecasts, one with plumbing codes and one without plumbing codes.

Active Conservation Measure Analysis Using Benefit-Cost Analysis: The DSS Model evaluates active conservation measures using benefit-cost analysis with the present value of the cost of water saved ($/Million Gallons or $/Acre-Feet). Benefits are based on savings in water and wastewater facility operations and maintenance (O&M) and any deferred capital expenditures. The figures on the previous page illustrate the processes for forecasting conservation water savings, including the impacts of fixture replacement due to existing plumbing codes and standards.

Figure C-2. Sample Benefit-Cost Analysis Summary

Conservation Measures

Benefit Cost Analysis

Previo | Conser | AMI | RES | WC | IRR | CIIR | NO | MU | LDS | PRV | LEA | UHE | UHE | TOI | HO | RAI | RAI | SPR | Lan | SCH | GEN | DIP | B/C | Next

Review Data

Benefit Cost Analysis

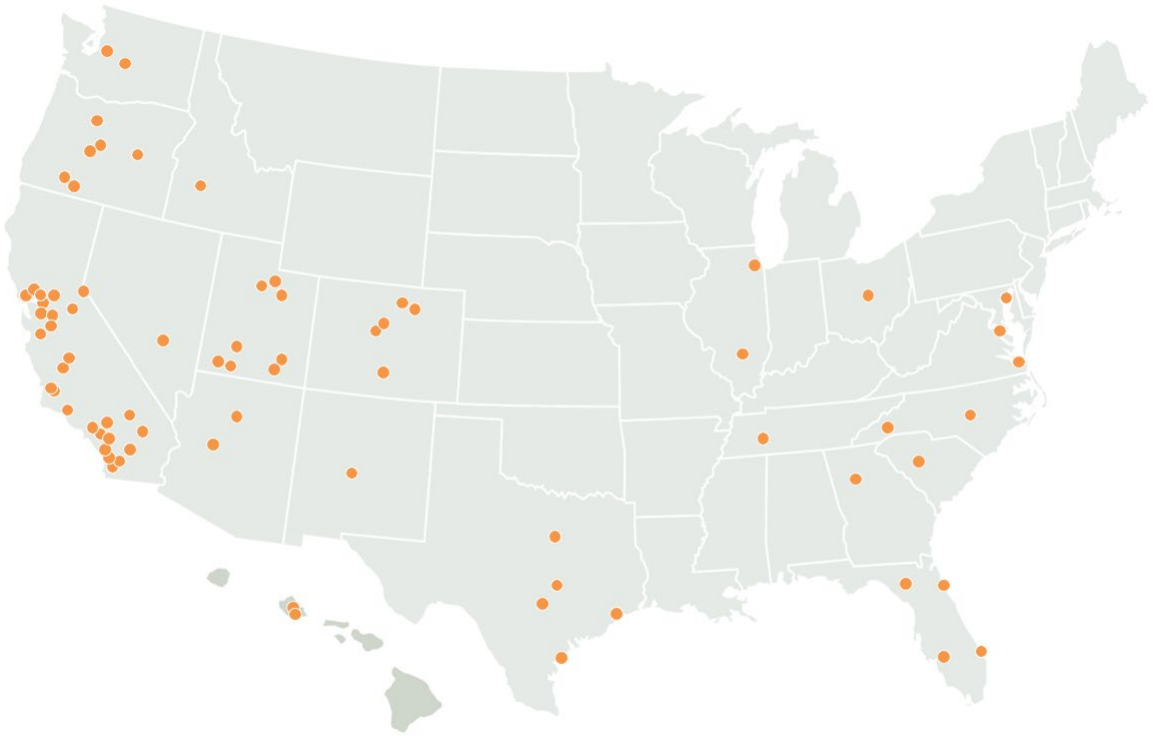
Util Cost Five Year Start Year: 2020 | Water Savings Year: 2030 | Units: AF

Benefit Cost Analysis

	Measure	Present Value of Water Utility Benefits	Present Value of Community Benefits	Present Value of Water Utility Costs	Present Value of Community Costs	Water Utility Benefit to Cost Ratio	Community Benefit to Cost Ratio	Five Years of Water Utility Costs 2020-2025	Water Savings in 2030 (afy)	Cost of Savings per Unit Volume ($/af)
AMI	Full AMI Implementation	$3,976,434	$16,635,194	$1,566,069	$5,893,340	2.54	2.82	$320,000	133.764878	$324
RESH	Residential Rebates for HECW	$139,312	$365,447	$95,879	$200,665	1.45	1.82	$50,325	5.124572	$824
WC	Water Checkup	$7,648,165	$30,288,419	$6,005,949	$7,665,564	1.27	3.95	$1,382,995	239.652915	$877
IRREV	Irrigation Evaluations	$1,589,488	$1,589,488	$1,918,184	$4,332,779	0.83	0.37	$443,824	98.051821	$646
CIIRe	CII Water Survey Level 2 and Customized Rebate	$910,720	$3,313,109	$915,904	$2,581,185	0.99	1.28	$193,725	18.753753	$1,055
NOZZ	Free Sprinkler Nozzle Program	$277,886	$277,886	$329,386	$455,933	0.84	0.61	$103,145	23.005687	$680
MULC	Mulch Program	$80,739	$80,739	$287,676	$287,676	0.28	0.28	$66,932	4.554625	$2,000
LDS	Water Conserving Landscape and Irrigation Codes	$1,055,819	$1,055,819	$350,316	$7,979,608	3.01	0.13	$78,568	46.098525	$161
PRV	Pressure Reduction Valve Rebate	$102,170	$193,972	$49,161	$132,223	2.08	1.47	$37,818	8.503521	$425
LEAK	Leak Detection Device Rebate	$174,130	$847,416	$306,843	$1,288,743	0.57	0.66	$80,053	6.065394	$1,895
UHET	Ultra-High Efficiency Toilet Rebate	$538,624	$538,624	$405,529	$761,556	1.33	0.71	$362,736	16.287780	$921

Model Use and Validation: The DSS Model has been used for over 20 years for practical applications of conservation planning in over 300 service areas representing 60 million people, including extensive efforts nationally and internationally in Australia, New Zealand, and Canada.

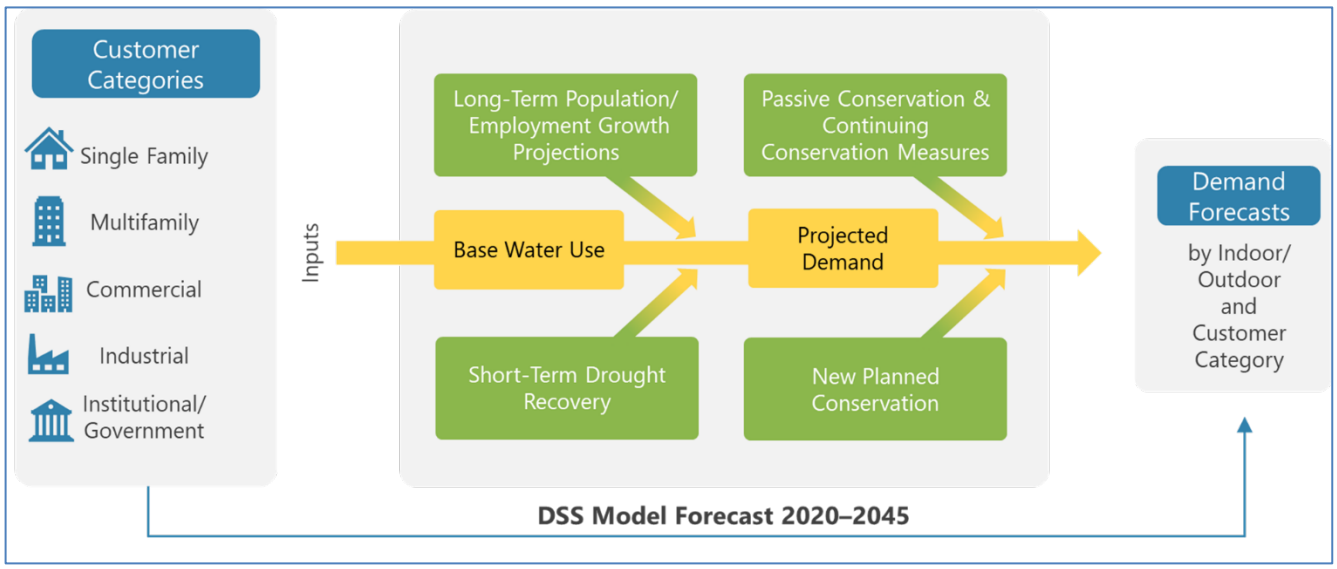
Figure C-3. DSS Model Analysis Locations in the U.S.



The California Water Efficiency Partnership, or CalWEP (formerly the CUWCC), has peer reviewed and endorsed the model since 2006. It is offered to all CalWEP members for use to estimate water demand, plumbing code, and conservation program savings.

The DSS Model can use one of the following: 1) a statistical approach to forecast demands (e.g., an econometric model); 2) a forecasted increase in population and employment; 3) predicted future demands; or 4) a demand projection entered into the model from an outside source. The following figure presents the flow of information in the DSS Model Analysis.

Figure C-4. DSS Model Analysis Flow



C.2 DSS Model Methodology

Each conservation measure targets a particular water use, such as indoor single family water use. Targeted water uses are categorized by water user group and by end use. Targeted water user groups include single family residential; multi-family residential; commercial, industrial, and institutional; and so forth. Measures may apply to more than one water user group. Targeted end uses include indoor and outdoor use. The targeted water use is important to identify because the water savings are generated from reductions in water use for the targeted end use. For example, a residential retrofit conservation measure targets single family and multi-family residential indoor use, and in some cases specifically shower use. When considering the water savings potential generated by a residential retrofit, one considers the water saved by installing low-flow showerheads in single family and multi-family homes.

The market penetration goal for a measure is the extent to which the product or service related to the conservation measure occupies the potential market. Essentially, the market penetration goal identifies how many fixtures, rebates, surveys, and so forth that the wholesale customer would have to offer or conduct over time to reach its water savings goal for that conservation measure. This is often expressed in terms of the number of fixtures, rebates, or surveys offered or conducted per year.

The potential for error in market penetration goal estimates for each measure can be significant because the estimates are based on previous experience, chosen implementation methods, projected utility effort, and funds allocated to implement the measure. The potential error can be corrected through reevaluation of the measure as the implementation of the measure progresses. For example, if the market penetration required to achieve specific water savings turns out to be different than predicted, adjustments to the implementation efforts can be made. Larger rebates or additional promotions are often used to increase the market penetration. The

process is iterative to reflect actual conditions and helps to ensure that market penetration and needed savings are achieved regardless of future variances between estimates and actual conditions.

In contrast, market penetration for mandatory ordinances can be more predictable with the greatest potential for error occurring in implementing the ordinance change. For example, requiring dedicated irrigation meters for new accounts through an ordinance can assure an almost 100% market penetration for affected properties.

Hayward is constantly examining when a measure might reach saturation. Baseline surveys are the best approach to having the most accurate information on market saturation. This was considered when analyzing individual conservation measures where best estimates were made. MWM was not provided with any baseline surveys for this analysis, but discussions were held with Hayward regarding what the saturation best estimates were within its service area.

C.3 Present Value Analysis and Perspectives on Benefits and Costs

The determination of the economic feasibility of water conservation programs involves comparing the costs of the programs to the benefits provided using the DSS Model, which calculates the cost effectiveness of conservation measure savings at the end-use level. For example, the model determines the amount of water a toilet rebate program saves in daily toilet use for each single family account.

Present value analysis using present day dollars and a real discount rate of 3% is used to discount costs and benefits to the base year. From this analysis, benefit-cost ratios of each measure are computed. When measures are put together in programs, the model is set up to avoid double counting savings from multiple measures that act on the same end use of water. For example, multiple measures in a program may target toilet replacements. The model includes assumptions to apportion water savings between the multiple measures.

Economic analysis can be performed from several different perspectives, based on which party is affected. For planning water use efficiency programs for utilities, perspectives most commonly used for benefit-cost analyses are the “utility” perspective and the “community” perspective. The “utility” benefit-cost analysis is based on the benefits and costs to the water provider. The “community” benefit-cost analysis includes the utility benefit and costs together with account owner/customer benefits and costs. These include customer energy and other capital or operating cost benefits plus costs of implementing the measure beyond what the utility pays.

The utility perspective offers two advantages. First, it considers only the program costs that will be directly borne by the utility. This enables the utility to fairly compare potential investments for saving versus supplying increased quantities of water. Second, revenue shifts are treated as transfer payments, which means program participants will have lower water bills and non-participants will have slightly higher water bills so that the utility’s revenue needs continue to be met. Therefore, the analysis is not complicated with uncertainties associated with long-term rate projections and retail rate design assumptions. It should be noted that there is a significant difference between the utility’s savings from the avoided cost of procurement and delivery of water and the reduction in retail revenue that results from reduced water sales due to water use efficiency. This budget impact occurs slowly and can be accounted for in water rate planning. Because it is the water provider’s role in developing a water use efficiency plan that is vital in this study, the utility perspective was primarily used to evaluate elements of this report.

The community perspective is defined to include the utility and the customer costs and benefits. Costs incurred by customers striving to save water while participating in water use efficiency programs are considered, as well as benefits received in terms of reduced energy bills (from water heating costs) and wastewater savings, among others. Water bill savings are not a customer benefit in aggregate for reasons described previously. Other factors external to the utility, such as environmental effects, are often difficult to quantify or are not necessarily under the control of the utility. They are therefore frequently excluded from economic analyses, including this one.

The time value of money is explicitly considered. Typically, the costs to save water occur early in the planning period whereas the benefits usually extend to the end of the planning period. A long planning period of over 30

years is often used because costs and benefits that occur beyond these 20 years (beyond the year 2040 in this Plan) have very little influence on the total present value of the costs and benefits. The value of all future costs and benefits is discounted to the first year in the DSS Model (the base year) at the real interest rate of 3.01%. The DSS Model calculates this real interest rate, adjusting the current nominal interest rate (assumed to be approximately 6.1%) by the assumed rate of inflation (3.0%).

The formula to calculate the real interest rate is:

(nominal interest rate – assumed rate of inflation) / (1 + assumed rate of inflation)

Cash flows discounted in this manner are herein referred to as "Present Value" sums.

C.4 Measure Cost and Water Savings Assumptions

In City of Hayward's DSS Model, to evaluate each water conservation measure, assumptions regarding the following variables were made for each measure:

- **Targeted Water User Group End Use** – Water user group (e.g., single family residential) and end use (e.g., indoor or outdoor water use).
- **Utility Unit Cost** – Cost of rebates, incentives, and contractors hired to implement measures. The assumed dollar values for the measure unit costs were closely reviewed by staff and are found to be adequate for each individual measure. The values in most cases are in the range of what is currently offered by other water utilities in the region.
- **Retail Customer Unit Cost** – Cost for implementing measures that is paid by retail customers (i.e., the remainder of a measure's cost that is not covered by a utility rebate or incentive).
- **Utility Administration and Marketing Cost** – The cost to the utility for administering the measure, including consultant contract administration, marketing, and participant tracking. The mark-up is sufficient (in total) to cover conservation staff time, general expenses, and overhead.

Costs are determined for each of the measures based on industry knowledge, past experience, and data provided by Hayward. Costs may include incentive costs, usually determined on a per-participant basis; fixed costs, such as marketing; variable costs, such as the cost to staff the measures and to obtain and maintain equipment; and a one-time set-up cost. The set-up cost is for measure design by staff or consultants, any required pilot testing, and preparation of materials that are used in marketing the measure. Measure costs are estimated each year through 2040. Costs are spread over the time period depending on the length of the implementation period for the measure and estimated voluntary customer participation levels.

Lost revenue due to reduced water sales is not included as a cost because the water use conservation measures evaluated herein generally take effect over a long span of time. This span is sufficient to enable timely rate adjustments, if necessary, to meet fixed cost obligations and savings on variable costs such as energy and chemicals.

The unit costs vary according to the type of customer account and implementation method being addressed. For example, a measure might cost a different amount for a residential single family account than for a residential multi-family account, and for a rebate versus an ordinance requirement or a direct installation implementation method. Typically, water utilities have found there are increased costs associated with achieving higher market saturation, such as more surveys per year. The DSS Model calculates the annual costs based on the number of participants each year. The general formula for calculating annual utility costs is:

- Annual Utility Cost = Annual market penetration rate x total accounts in category x unit cost per account x (1+administration and marketing markup percentage)
- Annual Customer Cost = Annual number of participants x unit customer cost
- Annual Community Cost = Annual utility cost + annual customer cost

Data necessary to forecast water savings of measures include specifics on water use, demographics, market penetration, and unit water savings. Savings normally develop at a measured and predetermined pace, reaching full maturity after full market penetration is achieved. This may occur 3 to 10 years after the start of implementation, depending upon the implementation schedule.

For every water use efficiency activity or replacement with more efficient devices, there is a useful life. The useful life is called the "Measure Life" and is defined to be how long water use conservation measures stay in place and continue to save water. It is assumed that measures implemented because of codes, standards, or ordinances (e.g., toilets) would be "permanent" and not revert to an old inefficient level of water use if the device needed to be replaced. However, some measures that are primarily behavior-based, such as residential surveys, are assumed to need to be repeated on an ongoing basis to retain the water savings (e.g., homeowners move away, and the new homeowners may have less efficient water using practices). Surveys typically have a measure life on the order of five years.

C.5 National Plumbing Code

The Federal Energy Policy Act of 1992, as amended in 2005, mandates that only fixtures (as listed below) meeting the following standards can be installed in new buildings:

- Toilet – 1.6 gal/flush maximum
- Urinals – 1.0 gal/flush maximum
- Showerhead – 2.5 gal/min at 80 pounds per square inch (psi)
- Residential faucets – 2.2 gal/min at 60 psi
- Public restroom faucets – 0.5 gal/min at 60 psi
- Dishwashing pre-rinse spray valves – 1.6 gal/min at 60 psi

Replacement of fixtures in existing buildings is also governed by the Federal Energy Policy Act, which mandates that only devices with the specified level of efficiency (as shown above) can be sold as of 2006. The net result of the plumbing code is that new buildings will have more efficient fixtures and old inefficient fixtures will slowly be replaced with new, more efficient models. The national plumbing code is an important piece of legislation and must be carefully taken into consideration when analyzing the overall water efficiency of a service area.

In addition to the plumbing code, the U.S. Department of Energy regulates appliances, such as residential clothes washers, further reducing indoor water demands. Regulations to make these appliances more energy efficient have driven manufactures to dramatically reduce the amount of water these machines use. Generally, front-loading washing machines use 30-50% less water than conventional (top-loading) models, which are still available but are becoming more water efficient.

In this analysis, the DSS Model forecasts a gradual transition to high efficiency clothes washers (using 12 gallons or less) so that by the year 2025 that will be the only type of machine available for purchase. In addition to the industry becoming more efficient, rebate programs for washers have been successful in encouraging customers to buy more water-efficient models. Given that machines last about 10 years, eventually all machines on the market will be the more water-efficient models. Energy Star washing machines have a water factor of 6.0 or less – the equivalent of using 3.1 cubic feet (or 23.2 gallons) of water per load. The maximum water factor for residential clothes washers under current federal standards is 6.5 (equates to approximately 19 gallons per load based on an average 2.9 cubic ft. tub). The water factor equals the number of gallons used per cycle per cubic foot of capacity.

Water Factor (WF) = gallons per load/tub volume

OR

washer capacity (cubic ft.)/average tub volume

Prior to the year 2000, the water factor for a typical new residential clothes washer was around 12 (equates to approximately 35 gallons per load based on an average 2.9 cubic ft. tub). In March 2015, the federal standard reduced the maximum water factor for top- and front-loading machines to 8.4 and 4.7, respectively. In 2018, the maximum water factor for top-loading machines was further reduced to 6.5. For commercial washers, the maximum water factors were reduced in 2010 to 8.5 and 5.5 for top- and front-loading machines, respectively. Beginning in 2015, the maximum water factor for Energy Star certified washers was 3.7 for front-loading and 4.3 for top-loading machines. In 2011, the U.S. Environmental Protection Agency estimated that Energy Star washers comprised more that 60% of the residential market and 30% of the commercial market (Energy Star, 2011). A new Energy Star compliant washer uses about two-thirds less water per cycle than washers manufactured in the 1990s.

C.6 State Plumbing Code

This section describes California state codes applicable to Hayward's water use.

C.6.1 California State Law – AB 715

Plumbing codes for toilets, urinals, showerheads, and faucets were initially adopted by California in 1991, mandating the sale and use of ultra-low flush toilets (ULFTs) using 1.6 gpf, urinals using 1 gpf, and low-flow showerheads and faucets. AB 715 led to an update to California Code of Regulations Title 20 (see Section C.5.3) mandating that all toilets and urinals sold and installed in California as of January 1, 2014 must be high efficiency versions having flush ratings that do not exceed 1.28 gpf (toilets) and 0.5 gpf (urinals).

C.6.2 California State Laws – SB 407 and SB 837

SB 407 addresses plumbing fixture retrofits on resale or remodel. The DSS Model carefully considers the overlap with SB 407, the plumbing code (natural replacement), CALGreen, AB 715 and rebate programs (such as toilet rebates). SB 407 (enacted in 2009) requires that properties built prior to 1994 be fully retrofitted with water conserving fixtures by the year 2017 for single family residential houses and 2019 for multi-family and commercial properties. SB 407 program length is variable and continues until all the older high flush toilets have been replaced in the service area. The number of accounts with high flow fixtures is tracked to make sure that the situation of replacing more high flow fixtures than actually exist does not occur. Additionally, SB 407 conditions issuance of building permits for major improvements and renovations upon retrofit of non-compliant plumbing fixtures. SB 837 (enacted in 2011) requires that sellers of real estate property disclose on their Real Estate Transfer Disclosure Statement whether their property complies with these requirements. Both laws are intended to accelerate the replacement of older, low efficiency plumbing fixtures, and ensure that only high efficiency fixtures are installed in new residential and commercial buildings.

C.6.3 2019 CALGreen and 2015 CA Code of Regulations Title 20 Appliance Efficiency Regulations

Fixture characteristics in the DSS Model are tracked in new accounts, which are subject to the requirements of the 2019 California Green Building Code and 2015 California Code of Regulations Title 20 Appliance Efficiency Regulations adopted by the California Energy Commission (CEC) on September 1, 2015. The CEC 2015 appliance efficiency standards apply to the following new appliances, if they are sold in California: showerheads, lavatory faucets, kitchen faucets, metering faucets, replacement aerators, wash fountains, tub spout diverters, public lavatory faucets, commercial pre-rinse spray valves, urinals, and toilets. The DSS Model accounts for plumbing code savings due to the effects these standards have on showerheads, faucet aerators, urinals, toilets, and clothes washers.

- Showerheads – July 2016: 2.0 gallons per minute (gpm); July 2018: 1.8 gpm
- Wall Mounted Urinals – January 2016: 0.125 gpf (pint)
- Lavatory Faucets and Aerator – July 2016: 1.2 gpm at 60 psi
- Kitchen Faucets and Aerator – July 2016: 1.8 gpm with optional temporary flow of 2.2 gpm at 60 psi
- Public Lavatory Faucets – July 2016: 0.5 gpm at 60 psi

In summary, the controlling law for **toilets** is AB 715, requiring high efficiency toilets of 1.28 gpf sold in California beginning in 2014. The controlling law for wall-mounted urinals is the 2015 CEC efficiency regulations requiring that ultra-high efficiency pint **urinals** (0.125 gpf) be exclusively sold in California beginning January 1, 2016. This is an efficiency progression for urinals from AB 715's requirement of high efficiency (0.5 gpf) urinals starting in 2014.

Standards for **residential clothes washers** fall under the regulations of the U.S. Department of Energy. In 2018, the maximum water factor for standard top-loading machines was reduced to 6.5.

Showerhead flow rates are regulated under the 2015 California Code of Regulations Title 20 Appliance Efficiency Regulations adopted by the CEC, which requires the exclusive sale in California of 2.0 gpm showerheads at 80 psi as of July 1, 2016 and 1.8 gpm showerheads at 80 psi as of July 1, 2018. The WaterSense specification applies to showerheads that have a maximum flow rate of 2.0 gpm or less. This represents a 20% reduction in showerhead flow rate over the current federal standard of 2.5 gpm, as specified by the Energy Policy Act of 1992.

Faucet flow rates likewise have been regulated by the 2015 CEC Title 20 regulations. This standard requires that the residential faucets and aerators manufactured on or after July 1, 2016 be exclusively sold in California at 1.2 gpm at 60 psi; and public lavatory and kitchen faucets/aerators sold or offered for sale on or after July 1, 2016 be 0.5 gpm at 60 psi and 1.8 gpm at 60 psi (with optional temporary flow of 2.2 gpm), respectively. Previously, all faucets had been regulated by the 2010 California Green Building Code at 2.2 gpm at 60 psi.

C.7 Key Baseline Potable Demand Inputs, Passive Savings Assumptions, and Resources

The following tables present the key assumptions and references that are used in the DSS Model in determining projected demands with plumbing code savings. The assumptions having the most dramatic effect on future demands are the natural replacement rate of fixtures, how residential or commercial future use is projected, and the percent of estimated real water losses.

Table C-1. List of Key Assumptions

Parameter	Model Input Value, Assumptions, and Key References
Model Start Year for Analysis	2020
Water Demand Factor Year (Base Year)	2016–2019
Population Projection Source	2.2% annual growth rate per Hayward 2014 Wastewater Collection System Master Plan
Employment Projection Source	Hayward Economic Development Department Monthly Labor Market – Employment Annual Average
Avoided Cost of Water	$10,360/MG

Potable Water System Base Year Water Use Profile					
Customer Categories	**Start Year Accounts**	**Total Water Use Distribution**	**Demand Factors (gpd/account)**	**Indoor Use %**	**2020 Residential Indoor Water Use (GPCD)**
Single Family	29,175	35.9%	166.07	91%	46
Multi-family	1,436	19.1%	1,793.95	95%	41
Commercial/ Institutional	2,002	16.7%	1,127.46	75%	N/A
Industrial	1,781	15.2%	1,154.85	87%	N/A
Other	93	0.6%	868.87	0%	N/A
Irrigation	1,464	11.8%	1,092.53	0%	N/A
Renovated SF	295	0.7%	304.41	80%	75
Total/Avg	**36,246**	**100%**	**N/A**	**N/A**	**N/A**

Table C-2. Key Assumptions Resources

Parameter	Resource
Residential End Uses	Key Reference: CA DWR Report "California Single Family Water Use Efficiency Study," (DeOreo, 2011 – Page 28, Figure 3: Comparison of household end-uses) and AWWA Research Foundation (AWWARF) Report "Residential End Uses of Water, Version 2 - 4309" (DeOreo, 2016). Table 2-A. Water Consumption by Water-Using Plumbing Products and Appliances - 1980-2012. PERC Phase 1 Report. Plumbing Efficiency Research Coalition. 2013. http://www.map-testing.com/assets/files/PERC%20Report_Final_Phase%20One_Nov%202011_v1.1.pdf Model Input Values are found in the "End Uses" section of the DSS Model on the "Breakdown" worksheet.
Non-Residential End Uses, percent	Key Reference: AWWARF Report "Commercial and Institutional End Uses of Water" (Dziegielewski, 2000 – Appendix D: Details of Commercial and Industrial Assumptions, by End Use). Santa Clara Valley Water District Water Use Efficiency Unit. "SCVWD CII Water Use and Baseline Study." February 2008. Model Input Values are found in the "End Uses" section of the DSS Model on the "Breakdown" worksheet.
Efficiency Residential Fixture Current Installation Rates	U.S. Census, housing age by type of dwelling plus natural replacement plus rebate program (if any). Key Reference: GMP Research, Inc. (2019). 2019 U.S. WaterSense Market Penetration Industry Report. Key Reference: Consortium for Efficient Energy (www.cee1.org). Model Input Values are found in the "Codes and Standards" green section of the DSS Model by customer category fixtures.
Water Savings for Fixtures, gal/capita/day	Key Reference: AWWARF Report "Residential End Uses of Water, Version 2 - 4309" (DeOreo, 2016). Key Reference: CA DWR Report "California Single Family Water Use Efficiency Study" (DeOreo, 2011 – Page 28, Figure 3: Comparison of household end-uses). Key Reference: California Energy Commission, Staff Analysis of Toilets, Urinals and Faucets, Report # CEC-400-2014-007-SD, 2014. Model Input Values are found in the "Codes and Standards" green section on the "Fixtures" worksheet of the DSS Model.
Non-Residential Fixture Efficiency Current Installation Rates	Key Reference: 2010 U.S. Census, Housing age by type of dwelling plus natural replacement plus rebate program (if any). Assume commercial establishments built at same rate as housing, plus natural replacement. California Energy Commission, Staff Analysis of Toilets, Urinals and Faucets, Report # CEC-400-2014-007-SD, 2014. Santa Clara Valley Water District Water Use Efficiency Unit. "SCVWD CII Water Use and Baseline Study." February 2008. Model Input Values are found in the "Codes and Standards" green section of the DSS Model by customer category fixtures.

Parameter	Resource
Residential Frequency of Use Data, Toilets, Showers, Faucets, Washers, Uses/user/day	Key Reference: AWWARF Report "Residential End Uses of Water, Version 2 - 4309" (DeOreo, 2016). Summary values can be found in the full report: https://www.waterrf.org/research/projects/residential-end-uses-water-version-2 Key Reference: California Energy Commission, Staff Analysis of Toilets, Urinals and Faucets, Report # CEC-400-2014-007-SD, 2014. Key Reference: Alliance for Water Efficiency, The Status of Legislation, Regulation, Codes & Standards on Indoor Plumbing Water Efficiency, January 2016. Model Input Values are found in the "Codes and Standards" green section on the "Fixtures" worksheet of the DSS Model and confirmed in each "Service Area Calibration End Use" worksheet by customer category.
Non-Residential Frequency of Use Data, Toilets, Urinals, and Faucets, Uses/user/day	Key References: Estimated based on AWWARF Report "Commercial and Institutional End Uses of Water" (Dziegielewski, 2000 – Appendix D: Details of Commercial and Industrial Assumptions, by End Use). Key Reference: California Energy Commission, Staff Analysis of Toilets, Urinals and Faucets, Report # CEC-400-2014-007-SD, 2014. Fixture uses over a 5-day work week are prorated to 7 days. Non-residential 0.5gpm faucet standards per Table 2-A. Water Consumption by Water-Using Plumbing Products and Appliances - 1980-2012. PERC Phase 1 Report. Plumbing Efficiency Research Coalition, 2012. http://www.map-testing.com/assets/files/PERC%20Report_Final_Phase%20One_Nov%202011_v1.1.pdf Model Input Values are found in the "Codes and Standards" green section on the "Fixtures" worksheet of the DSS Model and confirmed in each "Service Area Calibration End Use" worksheet by customer category.
Natural Replacement Rate of Fixtures (percent per year)	Residential Toilets 2%-4%
	Non-Residential Toilets 2%-3%
	Residential Showers 4% (corresponds to 25-year life of a new fixture)
	Residential Clothes Washers 10% (based on 10-year washer life). Key References: "Residential End Uses of Water" (DeOreo, 2016) and "Bern Clothes Washer Study, Final Report" (Oak Ridge National Laboratory, 1998).
	Residential Faucets 10% and Non-Residential Faucets 6.7% (every 15 years). CEC uses an average life of 10 years for faucet accessories (aerators). A similar assumption can be made for public lavatories, though no hard data exists and since CII fixtures are typically replaced less frequently than residential, 15 years is assumed. CEC, Analysis of Standards Proposal for Residential Faucets and Faucet Accessories, a report prepared under CEC's Codes and Standards Enhancement Initiative, Docket #12-AAER-2C, August 2013.
	Model Input Value is found in the "Codes and Standards" green section on the "Fixtures" worksheet of the DSS Model.
Residential Future Water Use	Increases Based on Population Growth and Demographic Forecast
Non-Residential Future Water Use	Increases Based on Employment Growth and Demographic Forecast

C.7.1 Fixture Estimates

Determining the current level of efficient fixtures in a service area while evaluating the passive savings in the DSS Model is part of the standard process and is called "initial fixture proportions." MWM reconciled water-efficient fixtures and devices installed within Hayward's service area and estimated the number of outstanding inefficient fixtures.

MWM used the DSS Model to perform a saturation analysis for toilets, urinals, showerheads, faucets, and clothes washers. The process included a review of age of buildings from census data, number of rebates per device, and assumed natural replacement rates. MWM presumed the fixtures that were nearing saturation and worth analysis would include residential toilets and residential clothes washers, as both have been included in recommended water use efficiency practices for over two decades.

In 2014, the Water Research Foundation updated its 1999 Residential End Uses of Water Study (REUWS). Water utilities, industry regulators, and government planning agencies consider it the industry benchmark for single family home indoor water use. This incorporates recent study results that reflect the change to the water use profile in residential homes including adoption of more water-efficient fixtures over the 15 years that transpired from 1999 to 2014. REUWS results were combined with Hayward's historical rebate and billing data to enhance and verify assumptions made for all customer accounts, including saturation levels on the above-mentioned plumbing fixtures.

The DSS Model presents the estimated current and projected proportions of these fixtures by efficiency level within Hayward's service area. These proportions were calculated by:

- Using standards in place at the time of building construction,
- Taking the initial proportions of homes by age (corresponding to fixture efficiency levels),
- Adding the net change due to natural replacement, and
- Adding the change due to rebate measure minus the "free rider effect."

Further adjustments were made to initial proportions to account for the reduction in fixture use due to lower occupancy and based on field observations. The projected fixture proportions do **not** include any future active water use efficiency measures implemented by Hayward. More information about the development of initial and projected fixture proportions can be found in the DSS Model "Codes and Standards" section.

The DSS Model is capable of modeling multiple types of fixtures, including fixtures with different designs. For example, currently toilets can be purchased that flush at a rate of 0.8 gpf, 1.0 gpf or 1.28 gpf. The 1.6 gpf and higher toilets still exist but can no longer be purchased in California. Therefore, they cannot be used for replacement or new installation of a toilet. So, the DSS Model utilizes fixture replacement rates to determine what type of fixture should be used for a new construction installation or replacement. The replacement of the fixtures is listed as a percentage within the DSS Model. A value of 100% would indicate that all the toilets installed would be of one particular flush volume. A value of 75% means that three out of every four toilets installed would be of that particular flush volume. All the Fixture Model information and assumptions were carefully reviewed and accepted by City of Hayward staff.

The DSS Model provides inputs and analysis of the number, type, and replacement rates of fixtures for each customer category (e.g., single family toilets, commercial toilets, residential clothes washing machines.). For example, the DSS Model incorporates the effects of the 1992 Federal Energy Policy Act and AB 715 on toilet fixtures. A DSS Model feature determines the "saturation" of 1.6 gpf toilets as the 1992 Federal Energy Policy Act was in effect from 1992-2014 for 1.6 gpf toilet replacements. AB 715 now applies for the replacement of toilets at 1.28 gpf. Further consideration and adjustments were made to replacement rates to account for the reduction in fixture use and wear, due to lower occupancy and based on field observations.

APPENDIX D – SB X7-7 COMPLIANCE FORM

SB X7-7 Table 0: Units of Measure Used in 2020 UWMP* *(select one from the drop down list)*
Million Gallons
**The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.*
NOTES:

SB X7-7 Table 2: Method for 2020 Population Estimate	
Method Used to Determine 2020 Population (may check more than one)	
☑	**1. Department of Finance** (DOF) or **American Community Survey** (ACS)
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☐	**4. Other** DWR recommends pre-review
NOTES:	

SB X7-7 Table 3: 2020 Service Area Population	
2020 Compliance Year Population	
2020	160,311
NOTES:	

SB X7-7 Table 4: 2020 Gross Water Use							
Compliance Year 2020	2020 Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.*	2020 Deductions					2020 Gross Water Use
		Exported Water *	Change in Dist. System Storage* (+/-)	Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.*	Water Delivered for Agricultural Use*	Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.*	
	5,082	-	-	-	-	-	**5,082**

* **Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.

NOTES:

SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment

Complete one table for each source.

Name of Source	San Francisco Public Utilities Commission
This water source is *(check one)* **:**	
☐	The supplier's own water source
☑	A purchased or imported source

Compliance Year 2020	Volume Entering Distribution System [1]	Meter Error Adjustment [2] *Optional (+/-)*	Corrected Volume Entering Distribution System
	5,082	-	5,082

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

[2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES: Volume entering distribution system is in Fiscal Years.

SB X7-7 Table 4-B: 2020 Indirect Recycled Water Use Deduction *(For use only by agencies that are deducting indirect recycled water)*									
2020 Compliance Year	**2020 Surface Reservoir Augmentation**					**2020 Groundwater Recharge**			**Total Deductible Volume of Indirect Recycled Water Entering the Distribution System**
	Volume Discharged from Reservoir for Distribution System Delivery[1]	Percent Recycled Water	Recycled Water Delivered to Treatment Plant	Transmission/ Treatment Loss[1]	Recycled Volume Entering Distribution System from Surface Reservoir Augmentation	Recycled Water Pumped by Utility[1,2]	Transmission/ Treatment Losses[1]	Recycled Volume Entering Distribution System from Groundwater Recharge	
	-	0%	-	-	-	-	-	-	-

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

[2] *Suppliers will provide supplemental sheets to document the calculation for their input into "Recycled Water Pumped by Utility". The volume reported in this cell must be less than total groundwater pumped - See Methodology 1, Step 8, section 2.c.*

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

SB X7-7 Table 4-C: 2020 Process Water Deduction Eligibility (For use only by agencies that are deducting process water) Choose Only One	
☐	**Criteria 1**- Industrial water use is equal to or greater than 12% of gross water use. Complete SB X7-7 Table 4-C.1
☐	**Criteria 2** - Industrial water use is equal to or greater than 15 GPCD. Complete SB X7-7 Table 4-C.2
☐	**Criteria 3** - Non-industrial use is equal to or less than 120 GPCD. Complete SB X7-7 Table 4-C.3
☐	**Criteria 4** - Disadvantaged Community. Complete SB x7-7 Table 4-C.4
NOTES: Not applicable for City of Hayward	

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

SB X7-7 Table 4-C.1: 2020 Process Water Deduction Eligibility
(For use only by agencies that are deducting process water using Criteria 1)

Criteria 1
Industrial water use is equal to or greater than 12% of gross water use

2020 Compliance Year	2020 Gross Water Use Without Process Water Deduction	2020 Industrial Water Use	Percent Industrial Water	Eligible for Exclusion Y/N
	5,082		0%	NO

NOTES: Not applicable for City of Hayward/not planning on deducting Industrial use

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

SB X7-7 Table 4-C.2: 2020 Process Water Deduction Eligibility
(For use only by agencies that are deducting process water using Criteria 2)

Criteria 2
Industrial water use is equal to or greater than 15 GPCD

2020 Compliance Year	2020 Industrial Water Use	2020 Population	2020 Industrial GPCD	Eligible for Exclusion Y/N
		160,311	-	NO

NOTES: Not applicable for City of Hayward/Not planning on deducting Industrial use

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

SB X7-7 Table 4-C.3: 2020 Process Water Deduction Eligibility
(For use only by agencies that are deducting process water using Criteria 3)

Criteria 3
Non-industrial use is equal to or less than 120 GPCD

2020 Compliance Year	2020 Gross Water Use Without Process Water Deduction *Fm SB X7-7 Table 4*	2020 Industrial Water Use	2020 Non-industrial Water Use	2020 Population *Fm SB X7-7 Table 3*	Non-Industrial GPCD	**Eligible for Exclusion Y/N**
	5,082		5,082	160,311	87	YES

NOTES: Not applicable for City of Hayward/Not planning on deducting Industrial use

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

SB X7-7 Table 4-C.4: 2020 Process Water Deduction Eligibility *(For use only by agencies that are deducting process water using Criteria 4)*

Criteria 4

Disadvantaged Community. A "Disadvantaged Community" (DAC) is a community with a median household income less than 80 percent of the statewide average.

SELECT ONE

"Disadvantaged Community" status was determined using one of the methods listed below:

1. IRWM DAC Mapping tool https://gis.water.ca.gov/app/dacs/

☐	If using the IRWM DAC Mapping Tool, include a screen shot from the tool showing that the service area is considered a DAC.

2. 2020 Median Income

	California Median Household Income*		Service Area Median Household Income	Percentage of Statewide Average	**Eligible for Exclusion? Y/N**
☐	**2020**	**$75,235**		0%	YES

*California median household income 2015-2019 as reported in US Census Bureau QuickFacts.

NOTES: Not applicable for City of Hayward/Not planning on deducting DAC process water

Data from these tables will not be entered into WUEdata.
Instead, the entire tables will be uploaded to WUEdata as a separate upload in Excel format.

This table(s) is only for Suppliers that deduct process water from their 2020 gross water use.

SB X7-7 Table 4-D: 2020 Process Water Deduction - Volume

Complete a separate table for each industrial customer with a process water exclusion

Name of Industrial Customer	*Enter Name of Industrial Customer 1*				
Compliance Year 2020	Industrial Customer's Total Water Use *	Total Volume Provided by Supplier*	% of Water Provided by Supplier	Customer's Total Process Water Use*	Volume of Process Water Eligible for Exclusion for this Customer
					-

*** Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.

NOTES: Not applicable for City of Hayward/Not planning on deducting process water

SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD)

2020 Gross Water *Fm SB X7-7 Table 4*	**2020 Population** *Fm SB X7-7 Table 3*	**2020 GPCD**
5,082	160,311	**87**

NOTES:

SB X7-7 Table 9: 2020 Compliance

Actual 2020 GPCD[1]	Optional Adjustments to 2020 GPCD (Enter "0" if Adjustment Not Used)			TOTAL Adjustments[1]	Adjusted 2020 GPCD [1] *(Adjusted if applicable)*	2020 Confirmed Target GPCD [1, 2]	**Did Supplier Achieve Targeted Reduction for 2020?**
	Extraordinary Events[1]	Weather Normalization[1]	Economic Adjustment[1]				
87	-	-	-	-	87	124	**YES**

[1] *All values are reported in GPCD*

[2] ***2020 Confirmed Target GPCD*** *is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.*

NOTES:

APPENDIX E – STATE WATER RESOURCES CONTROL BOARD 2017 LETTER

HAYWARD

February 27, 2017

Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
Cal/EPA Headquarters
1001 "I" Street, 24th Floor
Sacramento, CA 95814-0100
commentletters@waterboards.ca.gov

Subject: City of Hayward Comments on the Recirculated Draft Substitute Environmental Document for the Bay-Delta Water Quality Control Plan Amendment

Dear Ms. Townsend:

The City of Hayward appreciates the opportunity to review and provide comments on the *Recirculated Draft Substitute Environmental Document in Support of Potential Changes to the Water Quality Control Plan for the San Francisco Bay-Sacramento/San Joaquin Delta Estuary: San Joaquin River Flows and Southern Delta Water Quality* (SED). The City is supportive of the State Water Resources Control Board's (SWRCB) efforts to update the Bay-Delta Plan for the protection of fish and wildlife and recognizes the difficult challenge of trying to balance the beneficial uses of water in the Bay-Delta. However, the City has serious concerns with the SWRCB's current proposal to substantially change the flow objectives for the Tuolumne River and the adequacy of the Draft SED to fully consider and analyze the potentially significant and unavoidable impacts the SWRCB's proposal would have on San Francisco Public Utility Commission's (SFPUC) wholesale water customers.

The City of Hayward is currently the second largest purchaser of wholesale water from SFPUC. The City provides drinking water to approximately 150,000 residents and over 8,700 businesses and other non-residential customers in Alameda County. California State University – East Bay, Chabot Community College, and Life Chiropractic College West are among the higher education institutions served by City water. The City purchases potable water supply from SFPUC under the terms of a 1962 individual water sales contract with SFPUC. Similar to all SFPUC wholesale water customers, the quantity of water available to the City is subject to reduction in dry years or other periods of water supply shortage.

Under the Draft SED, the SWRCB is proposing substantial changes to flow objectives for the Tuolumne River. These changes are anticipated to significantly reduce the quantity of surface water available for diversion by SFPUC. Based on SFPUC's water supply impact analysis of the SWRCB's proposed instream flow schedule for the Tuolumne River,

Utilities & Environmental Services Department 777 B Street, Hayward, CA 94541
T 510.583.4700 TTD 510.247.3340 F 510.583.3610 www.hayward-ca.gov

rationing levels for the SFPUC Regional Water System could exceed 50% under drought conditions at normal or contract level demands and the number of dry year shortages could double or triple. Of equal concern to the City of Hayward, is the severity of the rationing that SFPUC is projecting would be required in the first year of a drought to be able to manage through multi-year droughts. Even at current levels of demand, SFPUC is projecting an increase in the severity of rationing that would be required if the SWRCB implements the Draft SED proposal.

The City of Hayward is currently one of the lowest water users per capita in the State of California. The City's residential per capita water use has decreased over the last eight years from 68 gallons per capita per day (gpcd) in 2008 to 46 gpcd in 2016. During the recent drought, the SWRCB recognized the City's low water use by placing the City in the lowest assigned tier for urban water supplier conservation standards, with an 8% reduction requirement. In response, the City of Hayward achieved a water use reduction of 23% in 2016 as compared to 2013, with substantial water use reductions occurring in every customer classification. Hayward customers have historically been excellent stewards of water resources and they continued to do their part during the recent drought.

Since Hayward purchases 100% of its potable water supply from SFPUC, the City does not have the needed flexibility to achieve further substantial reductions in water use without causing severe and unavoidable impacts to the residents and businesses located in Hayward. Therefore, the City requests that the SWRCB consider the following information for the City of Hayward in its analysis of the Draft SED's potential impacts:

- The City's residential per capita use in 2016 was 46 gpcd, which was below the minimum quantity of 50 gpcd used by the State to calculate minimum health and safety needs (*Cal. Code Regs., tit. 23, § 878.1, subds. (a)-(b) [operative March 30, 2015 and repealed Dec. 29, 2015]*). Given that SFPUC's water supply impact analysis of the Draft SED proposal shows required water supply cutbacks to its wholesale customers could approach 50% or greater, which would far exceed the water supply reductions that were achieved during the recent drought, the City would be forced to limit all noncritical uses of water so that water is available for human consumption, sanitation, and fire protection. Even with implementing all the water supply shortage actions identified in the City's 2015 Urban Water Management Plan, the City of Hayward is likely to experience severe and unavoidable impacts due to extreme water supply shortages. In addition, the City's ongoing commitment to demand management and efforts to lock-in a portion of the water conservation savings realized by its customers during the recent drought will make it even more difficult to achieve greater water supply reductions in the future. The Draft SED should fully consider and adequately analyze impacts to the City of Hayward's ability to provide sufficient water supply for the public health and safety needs of its residents.

- The City of Hayward supplies over 25% of the water it purchases from SFPUC to commercial, institutional, and industrial businesses. Hayward is also home to two

regional post-secondary educational institutions, California State University - East Bay and Chabot Community College, and Life Chiropractic College West. The potential consequences of the SED proposal on businesses include major job losses, slower economic growth and delayed community development in the City of Hayward's service area. The environmental and economic impacts of shortages on the SFPUC Regional Water System, and the associated lost jobs and delayed development, should be fully and adequately analyzed as part of the SWRCB's proposed flow alternatives.

- The proposed severity and frequency of water supply shortages that SFPUC anticipates would occur under the SWRCB's proposal would force the City of Hayward to develop supplemental water supply sources to address the risk of severe impacts to the residents and businesses within the City of Hayward. If the SWRCB's proposed instream requirements for the Tuolumne River were to be adopted, the City would need to look at development and long-term use of other reliable, high quality water supply options to provide additional water in drought years. The Draft SED must fully consider and adequately analyze the potential environmental impacts of the City of Hayward, SFPUC, and other SFPUC wholesale customers developing and implementing supplemental water supply projects to mitigate the potential for severe water supply shortages due to the SWRCB's proposal.

Lastly, the Draft SED encourages stakeholders to work together to reach voluntary agreements that could implement the Bay-Delta objectives for fish and wildlife beneficial uses. The City of Hayward supports the continued efforts of SFPUC and the Bay Area Water Supply and Conservation Agency (BAWSCA) to work closely with the diverse interests and stakeholders to develop a shared solution for the Tuolumne River and Bay-Delta. The City of Hayward requests that the SWRCB provide adequate time for voluntary agreements to be reached amongst the stakeholders and for other elements of the Bay-Delta Plan to be developed, prior to any action on the SED.

If you have any questions, please contact me at (510) 583-4720 or via email at Alex.Ameri@hayward-ca.gov.

Sincerely,

Alex Ameri
Director of Utilities & Environmental Services

cc: Al Mendall, Hayward City Council Member and BAWSCA Chair
Kelly McAdoo, Hayward City Manager
Nicole Sandkulla, BAWSCA
Ellen Levin, SFPUC

APPENDIX F – NOTICE OF INTENT TO UPDATE THE 2020 UWMP

From: Marilyn Mosher <Marilyn.Mosher@hayward-ca.gov>
Sent: Tuesday, January 26, 2021 3:44 PM
To: *<email list removed due to space and privacy issues>*
Subject: Preparation of City of Hayward 2020 Urban Water Management Plan

The City of Hayward is currently preparing its 2020 Urban Water Management Plan (UWMP) and its associated Water Shortage Contingency Plan (WSCP). The Urban Water Management Planning Act (California Water Code §10608–10656) requires that certain municipal water suppliers, including Hayward, update and adopt an UWMP and WSCP every five years. The UWMP integrates land use, water needs and supply, and demand management to document Hayward's ability to provide a reliable supply of water to its customers. The associated WSCP considers dry-year water supply planning, including strategies to address six levels of water supply shortage conditions, and a drought risk assessment.
Hayward coordinates with its wholesale water supplier, nearby water agencies, relevant public entities, and other interested parties in preparing the UWMP and WSCP. A draft of the 2020 UWMP and WSCP will be available for public review, and a public hearing will be scheduled in Spring 2021. In the meantime, if you would like more information regarding the City's 2020 UWMP and WSCP, and the schedule for updating these documents, please contact Cheryl Munoz, Water Resources Manager, at:
City of Hayward
Department of Public Works & Utilities
777 B Street, Hayward, CA 94541
Phone: 510-583-4701
Email: Cheryl.Munoz@Hayward-ca.gov

APPENDIX G – NOTICE OF PUBLIC HEARING

From: Marilyn Mosher <Marilyn.Mosher@hayward-ca.gov>
Sent: Friday, July 2, 2021 3:44 PM
To: <*email list removed due to space and privacy issues*>
Subject: City of Hayward – Notice of Public Hearing for the 2020 Urban Water Management Plan and Water Shortage Contingency Plan

The Hayward City Council will hold a public hearing at its regular meeting on July 20, 2021 to consider adoption of the 2020 Urban Water Management Plan (UWMP) and the associated Water Shortage Contingency Plan (WSCP). The meeting begins at 7 pm. These documents are updated every five years in accordance with the Urban Water Management Planning Act, and describe Hayward's anticipated water demand, water conservation strategies, water supply reliability, and response to water supply shortages, including actions that may be implemented in the event of a supply deficiency or interruption. The 2020 UWMP also assesses the City's compliance with its 2020 water use target as required by Senate Bill X7-7.

The meeting will be conducted as a Zoom webinar and login details will be provided on the agenda, which is available on Friday before the meeting. The report to City Council will also be available at that time.

Copies of the draft documents are available for public review at

Draft 2020 Urban Water Management Plan: https://www.hayward-ca.gov/sites/default/files/Hayward_2020%20UWMP_Public%20Release_2021%20July%202.pdf
Draft 2020 Water Shortage Contingency Plan: https://www.hayward-ca.gov/sites/default/files/Hayward%202020%20Water%20Shortage%20Contingency%20Plan_2021%20July%202.pdf

If you have questions or wish to provide comments, please direct them to:

Cheryl Muñoz, Water Resources Manager
Cheryl.munoz@hayward-ca.gov

Regards,

Marilyn Mosher
Senior Management Analyst
City of Hayward|Department of Public Works & Utilities
Email: Marilyn.Mosher@hayward-ca.gov
Ph: 510-909-9182

Daily Review
c/o Bay Area News Group-East Bay
800-595-9595

3774608

CITY OF HAYWARD
ATTN: UTILITIES AND ENVIRONMENTAL SVS.
777 B ST., 2ND FL.
HAYWARD, CA 94541

PROOF OF PUBLICATION

FILE NO. 7/20/2021 Hearing - Urban Water Mgmt Plan

In the matter of

Daily Review

The Daily Review

I am a citizen of the United States; I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the Legal Advertising Clerk of the printer and publisher of The Daily Review, a newspaper published in the English language in the City of Hayward, County of Alameda, State of California.

I declare that the Daily Review is a newspaper of general circulation as defined by the laws of the State of California as determined by this court's decree, dated March 2, 1950, in the action entitled In the Matter of the Ascertainment and Establishment of the Standing of The Daily Review as a Newspaper of General Circulation, case number 221938. Said decree states that "'The Daily Review' has been established, printed, and published daily in the City of Hayward, County of Alameda, State of California, for one year or more next preceding the date of the filing of said petition; that it is a newspaper published for the dissemination of local and telegraphic news and intelligence of a general character and has a bona fide subscription list of paying subscribers; ... [ ] [and] THEREFORE, ... 'The Daily Review' is hereby determined and declared to be a newspaper of general circulation [within the meaning of Government Code §§ 6000 et seq.]" Said decree has not been revoked, vacated or set aside.

I declare that the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

07/02/2021, 07/09/2021

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated: July 12, 2021

Public Notice Advertising Clerk

Legal No. **0006588905**

NOTICE OF PUBLIC HEARING
HAYWARD CITY COUNCIL

DATE: July 20, 2021
TIME: 7:00 P.M.
PLACE: Zoom Webinar. Login details will be provided on agenda. For more information on how to watch and comment, please view the Guide to Virtual Meeting Participation at https://bit.ly/3jmaUxa

On the above date, at approximately the hour noted, the Hayward City Council will hold a public hearing to obtain citizen input on the following matter:

2020 URBAN WATER MANAGEMENT PLAN

The Urban Water Management Plan is updated every five years. The Urban Water Management Plan assesses Hayward's water supply reliability, describes the City's anticipated water demand and water conservation strategies. The 2020 Plan also assesses the City's compliance with its 2020 water use target as required by Senate Bill X7-7.

The Draft Urban Water Management Plan is available for review by contacting the City Clerk's office at 510-583-4400, and at the Main and Weekes Branch libraries. The Plan can also be accessed at on the City's website at www.hayward-ca.gov.

A copy of the staff report may be reviewed at https://hayward.legistar.com/Calendar.aspx. Staff reports are available the Friday before the hearing.

The community is encouraged to participate in the review process by attending the meeting to speak or by offering written comments.

Written comments may be directed to:
Alex Ameri, Director of Public Works
City of Hayward
777 B Street, Hayward, CA 94541
Phone number: (510) 583-4720
E-Mail: alex.ameri@hayward-ca.gov

ASSISTANCE will be provided to those requiring accommodations for disabilities in compliance with the Americans with Disabilities Act of 1990. Persons needing accommodation should contact the Planning Division 48 hours in advance of the meeting at (510) 583-4200, or by using the TDD line for those with speech and hearing disabilities at (510) 247-3340.

PLEASE TAKE NOTICE that if you file a lawsuit challenging any final decision on the subject of this notice, the issues in the lawsuit may be limited to the issues which were raised at the City's public hearing or presented in writing to the City Clerk at or before the public hearing. By Resolution the City Council has imposed the 90-day time deadline set forth in C.C.P. Section 1094.6 for filing of any lawsuit challenging final action on an item which is subject to C.C.P. Section 1094.5.

Dated: July 2 and July 9, 2021
Miriam Lens, City Clerk
City of Hayward

DR #6588905; July 2, 9, 2021

r.BP316-07/17/17

1

HAYWARD

DISCOVER RESIDENTS BUSINESS SERVICES YOUR GOVERNMENT YOUR ENVIRONMENT

URBAN WATER MANAGEMENT PLAN

Water planning is an essential function of water suppliers, particularly during extended periods of drought and diminished supplies. Since the early 1980s, the State of California has required water purveyors that provide 3,000 or more acre feet of water per year, or have 3,000 or more service connections, to prepare an Urban Water Management Plan (UWMP) every five years, in years ending in five and zero.

UWMPs provide a framework for long term water resource planning at the local level to ensure adequate water supplies to meet current and future demands.

More specifically, the UWMP:

- Quantifies current and future water demands over a 25-year planning horizon
- Assesses the reliability of water supplies in normal and dry years
- Describes water shortage contingency plans
- Describes current and planned demand management efforts
- Documents the progress towards meeting target water use reductions as required in the Water Conservation Bill of 2009

The UWMP also includes a Water Shortage Contingency Plan, which will guide the City's response to water supply shortage conditions, including strategies to address six levels of water supply shortage conditions.

REVIEW THE DRAFT 2020 URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN:

The UWMP and WSCP will be considered for adoption after a public hearing conducted by the Hayward City Council at its regular meeting on **July 20, 2021, 7 p.m.** via Zoom webinar.

Login details will be provided on the agenda at https://hayward.legistar.com/Calendar.aspx. The community is encouraged to participate in the review process by attending the meeting to speak or by offering written comments by **July 20, 2021 at 5 p.m.**

Written comments may be directed to:
Alex Ameri, Director of Public Works
City of Hayward
777 B Street, Hayward, CA 94541
Phone number: (510) 583-4720
E-Mail: alex.ameri@hayward-ca.gov

DRAFT 2020 URBAN WATER MANAGEMENT PLAN

DRAFT 2020 WATER SHORTAGE CONTINGENCY PLAN

https://www.hayward-ca.gov/documents/urban-water-management-plan

APPENDIX H – ADOPTION RESOLUTION

HAYWARD CITY COUNCIL

RESOLUTION NO. 21-166

Introduced by Council Member Wahab

RESOLUTION ADOPTING THE 2020 URBAN WATER MANAGEMENT PLAN FOR THE CITY OF HAYWARD

WHEREAS, the 1983 Urban Water Management Planning Act (Act), amended through 2020, requires all California urban water agencies that supply more than 3,000-acre feet of water annually or have more than 3,000 connections to review and update its Urban Water Management Plan every five years; and

WHEREAS, the City of Hayward Water System supplied more than 16,000-acre feet of water in 2020 and has 36,000 service connections, and is therefore subject to the provisions of the Act; and

WHEREAS, the City of Hayward has prepared the 2020 Urban Water Management Plan in accordance with provisions of the Act in cooperation with the City's wholesale water supplier and other public entities to the extent practicable; and

WHEREAS, the City of Hayward has comprehensively and methodically reviewed and assessed current and historical water usage data, projected water demand, projected water supplies, water supply reliability, and water conservation; and

WHEREAS, a draft of the 2020 Urban Water Management Plan in its entirety was made available for public review on July 2, 2021; and

WHEREAS, the Director of Public Works has submitted to the City Council for review a copy of the draft 2020 Urban Water Management Plan and staff report dated July 20, 2021; and

WHEREAS, a public hearing was held on July 20, 2021, in the manner prescribed by law.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Hayward that the plan entitled "2020 Urban Water Management Plan," a copy of which is on file in the office of the Department of Public Works & Utilities and Office of the City Clerk, is hereby adopted as the urban water management plan for the City of Hayward.

BE IT FURTHER RESOLVED by the City Council of the City of Hayward that, under the California Water Code Section 10652, adoption of the Urban Water Management Plan does not constitute a project under the California Environmental Quality Act (CEQA) and this action is exempt from CEQA.

IN COUNCIL, HAYWARD, CALIFORNIA July 20, 2021.

ADOPTED BY THE FOLLOWING VOTE:

AYES: COUNCIL MEMBERS: Andrews, Lamnin, Márquez, Salinas Wahab, Zermeño
MAYOR: Halliday

NOES: COUNCIL MEMBERS: None

ABSTAIN: COUNCIL MEMBERS: None

ABSENT: COUNCIL MEMBERS: None

ATTEST: _____
City Clerk of the City of Hayward

APPROVED AS TO FORM:
_____
City Attorney of the City of Hayward

APPENDIX I – SFPUC REGIONAL WATER SYSTEM SUPPLY RELIABILITY AND BAWSCA TIER 2 DROUGHT IMPLEMENTATION SCENARIOS

APPENDIX J
SFPUC REGIONAL WATER SYSTEM SUPPLY RELIABILITY AND BAWSCA TIER 2 DROUGHT IMPLEMENTATION SCENARIOS

- BAWSCA Memorandum on Updated Drought Cutbacks, dated 18 February 2021 with Attachment B, dated 8 April 2021
- SFPUC Letter to BAWSCA dated 30 March 2021 regarding UWMP 2020 Additional Modeling,
- BAWSCA Updated Drought Allocations, dated 1 April 2021

BAWSCA
Bay Area Water Supply & Conservation Agency

February 18, 2021

TO: BAWSCA Member Agencies

FROM: Danielle McPherson, Senior Water Resources Specialist
Tom Francis, Water Resources Manager

SUBJECT: San Francisco Regional Water System Supply Reliability for 2020 Urban Water Management Plans

The purpose of this memorandum is to provide updated drought allocations among the Member Agencies under the various scenarios provided in the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS) Supply Reliability Letter dated January 22, 2021 and transmitted to the Member Agencies via email on January 25th ("Supply Reliability Letter", Attachment A). As presented and discussed at the February 12th BAWSCA Urban Water Management Plan (UWMP) Workshop, the Tier 2 Drought Allocation Plan was not designed for RWS shortages greater than 20 percent. As a result, the Tier 2 allocation tables shared with the Supply Reliability Letter showed unexpected and wide-ranging results between Member Agencies that should not be used for UWMP purposes.

As provided for in the 2018 Amended and Restated Water Supply Agreement (WSA), the SFPUC will honor new Tier 2 allocations agreed upon by all Member Agencies if an RWS shortage greater than 20 percent is declared. However, at this time, there is no method for allocating supplies under such significant cutbacks. Additionally, the time it would take to negotiate a modified Tier 2 plan to address those significant cutbacks would be extensive and greater than the timeline required for BAWSCA to provide your agency with numbers for input into your 2020 UWMP submittals.

For these reasons, BAWSCA is recommending that for the purpose of the 2020 UWMP updates, allocation of wholesale RWS supplies should be as follows:

1. When the average Wholesale Customers' RWS shortages are 10 percent or less, an equal percent reduction will be applied across all agencies. This is consistent with the existing Tier 2 requirement of a minimum 10 percent cutback in any Tier 2 application scenario.
2. When average Wholesale Customers' shortages are between 10 and 20 percent, the Tier 2 Drought Allocation Plan will be applied.
3. When the average Wholesale Customers' RWS shortages are greater than 20 percent, an equal percent reduction will be applied across all agencies.

Attachment B "Updated 2020 UWMP Drought Cutbacks" provides further detail, including recommended wholesale RWS allocation tables, for use in your agency's 2020 UWMP.

BAWSCA recognizes that this is not an ideal situation or method for allocation of available drought supplies. In the event of actual RWS shortages greater than 20 percent, the Member Agencies would have the opportunity to negotiate and agree upon a more nuanced and equitable approach. Such an approach would likely consider basic health and safety needs, the

155 Bovet Road, Suite 650, • San Mateo, CA 94402 • *ph* 650 349 3000 • *fx* 650349 8395 • www.bawsca.org

water needs to support critical institutions such as hospitals, and minimizing economic impacts on individual communities and the region.

Enclosed: Attachment A: Supply Reliability Letter
Attachment B: Updated 2020 UWMP Drought Cutbacks

cc: Nicole Sandkulla
Allison Schutte

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

525 Golden Gate Avenue, 13th Floor
San Francisco, CA 94102
T 415.554.3155
F 415.554.3161
TTY 415.554.3488

January 22, 2021

Danielle McPherson
Senior Water Resources Specialist
Bay Area Water Supply and Conservation Agency
155 Bovet Road, Suite 650
San Mateo, CA 94402

Dear Ms. McPherson,

Attached please find the information you requested on the Regional Water System's supply reliability for use in the Wholesale Customer's 2020 Urban Water Management Plan (UWMP) updates. The SFPUC has assessed the water supply reliability under the following planning scenarios:

- Projected supply reliability for year 2020 through 2045
- Projected single dry year and multiple dry year reliability for base year 2020, both with and without implementation of the Bay-Delta Plan Amendment
- Projected single dry year and multiple dry year reliability for base year 2025, both with and without implementation of the Bay-Delta Plan Amendment

The tables presented below assume full implementation of the Bay-Delta Plan Amendment will begin in 2023. All tables assume that the wholesale customers will purchase 184 mgd from the RWS through 2045. Assumptions about the status of the dry-year water supply projects included in the Water Supply Improvement Program (WSIP) are provided below in the table 'WSIP Project Assumptions'. The tables reflect instream flow requirements at San Mateo and Alameda Creeks, as described in the common language provided to BAWSCA separately.

Concerning allocation of supply during dry years, the Water Shortage Allocation Plan (WSAP) was utilized to allocate shortages between the SFPUC and the Wholesale Customers collectively. The WSAP implements a method for allocating water between the SFPUC retail customers and wholesale customers collectively which has been adopted by the Wholesale Customers per the July 2009 Water Supply Agreement between the City and County of

San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County. The WSAP, also known as the Tier One Plan, was amended in the 2018 Amended and Restated Water Supply Agreement. The wholesale customers have adopted the Tier Two Plan, the second component of the WSAP, which allocates the collective wholesale customer share among each of the 26 wholesale customers.

Compared to the reliability projections that were provided previously for the 2015 UWMP update, the biggest difference in projected future deliveries is caused by the implementation of the Bay-Delta Plan Amendment. Given the uncertainty about the implementation of the Amendment (described further in the common language provided to BAWSCA), tables are included to show future projected supplies both with and without the Bay-Delta Plan Amendment.

It is our understanding that you will pass this information on to the Wholesale Customers. If you have any questions or need additional information, please do not hesitate to contact Sarah Triolo, at striolo@sfwater.org or (628) 230 0802.

Sincerely,

Paula Kehoe

Paula Kehoe
Director of Water Resources

Table 1: **WSIP Project Assumptions**

	2020	2025 and Beyond
Calaveras Dam Replacement Project	Calaveras Reservoir partially refilled at spring 2020 level of 63,900 AF	Calaveras Reservoir fully refilled
Lower Crystal Springs Dam Improvements	Crystal Springs storage not restored	
Regional Groundwater Storage and Recovery (GSR) Project	GSR account partially filled at spring 2020 level of 23,500 AF; GSR recovery rate of 6.2 mgd	GSR account fully filled; GSR recovery rate of 6.2 mgd
Alameda Creek Recapture Project	Project not built	Project built
Dry-year Transfers	Not in effect	

Table 2: Projected Wholesale Supply from Regional Water System [For Table 6-9]:

Year	2020	2025	2030	2035	2040	2045
RWS Supply (mgd)	265	265	265	265	265	265
Wholesale Supply (mgd)	184	184	184	184	184	184

Table 3: Basis of Water Supply Data [For Table 7-1], 2020 Infrastructure Conditions With Bay Delta Plan

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2020	265	100%	184	
Single dry year		238.5	90%	157.5	• At 10% shortage, wholesale allocation is 64%, or 152.6 mgd • Retail allocation is 36%, or 85.9 mgd • Retail allocations above 81 mgd are re-allocated to Wholesale Customers, per the 2018 WSA • 4.9 mgd added to wholesale allocation, bringing it to 157.5 mgd
Consecutive 1st Dry year		238.5	90%	157.5	• Same as above
Consecutive 2nd Dry year		212	80%	132.5	• At a 20% shortage, wholesale allocation is 62.5%, or 132.5 mgd • Retail allocation is 37.5%, or 79.5 mgd
Consecutive 3rd Dry year[1]		119.25	45%	74.5	• WSA does not define percentage split above a 20% shortage level • Assume same split as for a 20% shortage level, i.e. Wholesale Customers receive 62.5%
Consecutive 4th Dry year		119.25	45%	74.5	• Same as above
Consecutive 5th Dry year		119.25	45%	74.5	• Same as above

[1] Assuming this year represents 2023, when Bay Delta Plan Amendment would come into effect.

Table 4: Basis of Water Supply Data [For Table 7-1], 2020 Infrastructure Conditions Without Bay Delta Plan

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2020	265	100%	184	
Single dry year		238.5	90%	157.5	• At 10% shortage, wholesale allocation is 64%, or 152.6 mgd • Retail allocation is 36%, or 85.9 mgd • Retail allocations above 81 mgd are re-allocated to Wholesale Customers, per the 2018 WSA • 4.9 mgd added to wholesale allocation, bringing it to 157.5 mgd
Consecutive 1st Dry year		238.5	90%	157.5	• Same as above
Consecutive 2nd Dry year		212	80%	132.5	• At a 20% shortage, wholesale allocation is 62.5%, or 132.5 mgd • Retail allocation is 37.5%, or 79.5 mgd
Consecutive 3rd Dry year		212	80%	132.5	• Same as above
Consecutive 4th Dry year		212	80%	132.5	• Same as above
Consecutive 5th Dry year		212	80%	132.5	• Same as above

Table 5: Basis of Water Supply Data [For Table 7-1], 2025 Infrastructure With Bay Delta Plan

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2025	265	100%	184	
Single dry year		132.5	50%	82.8	• WSA does not define percentage split above a 20% shortage level • Assume same split as for a 20% shortage level, i.e. Wholesale Customers receive 62.5%
Consecutive 1st Dry year		132.5	50%	82.8	• Same as above
Consecutive 2nd Dry year		119.25	45%	74.5	• Same as above
Consecutive 3rd Dry year		119.25	45%	74.5	• Same as above
Consecutive 4th Dry year		119.25	45%	74.5	• Same as above
Consecutive 5th Dry year		119.25	45%	74.5	• Same as above

Table 6: Basis of Water Supply Data [For Table 7-1], 2025 Infrastructure Without Bay Delta Plan

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2025	265	100%	184	
Single dry year		238.5	90%	157.5	• At 10% shortage, wholesale allocation is 64% • Retail allocation is 36%, or 85.9 mgd; retail allocations above 81 mgd are re-allocated to Wholesaler Customers, per the 2018 WSA • 4.9 mgd added to wholesale allocation, bringing it to 157.5 mgd
Consecutive 1st Dry year		238.5	90%	157.5	• Same as above
Consecutive 2nd Dry year		238.5	90%	157.5	• Same as above
Consecutive 3rd Dry year		238.5	90%	157.5	• Same as above
Consecutive 4th Dry year		212	80%	132.5	• At a 20% shortage, wholesale allocation is 62.5%, or 132.5 mgd • Retail allocation is 37.5%, or 79.5 mgd
Consecutive 5th Dry year		212	80%	132.5	• Same as above

Table 7: Projected Multiple Dry Years Wholesale Supply from RWS [For Table 7-4], With Bay Delta Plan

	2025	2030	2035	2040	2045
First year	82.8	82.8	82.8	82.8	82.8
Second year	74.5	74.5	74.5	74.5	74.5
Third year	74.5	74.5	74.5	74.5	74.5
Fourth year	74.5	74.5	74.5	74.5	74.5
Fifth year	74.5	74.5	74.5	74.5	74.5

Table 8: Projected Multiple Dry Years Wholesale Supply from RWS [For Table 7-4], Without Bay Delta Plan

	2025	2030	2035	2040	2045
First year	157.5	157.5	157.5	157.5	157.5
Second year	157.5	157.5	157.5	157.5	157.5
Third year	157.5	157.5	157.5	157.5	157.5
Fourth year	132.5	132.5	132.5	132.5	132.5
Fifth year	132.5	132.5	132.5	132.5	132.5

Table 9: Projected Regional Water System Supply for 5-Year Drought Risk Assessment [For Table 7-5], With Bay Delta Plan. This table assumes Bay Delta Plan comes into effect in 2023.

Year	2021	2022	2023	2024	2025
RWS Supply (mgd)	238.5	212	119.25	119.25	119.25
Wholesale Supply (mgd)	157.5	132.5	74.5	74.5	74.5

Table 10: Projected Regional Water System Supply for 5-Year Drought Risk Assessment [For Table 7-5], Without Bay Delta Plan

Year	2021	2022	2023	2024	2025
RWS Supply (mgd)	238.5	212	212	212	212
Wholesale Supply (mgd)	157.5	132.5	132.5	132.5	132.5

Attachment B: Updated 2020 UWMP Drought Cutbacks

The January 22, 2021, SFPUC Regional Water System (RWS) Supply Reliability Letter (Supply Reliability Letter) provides RWS supplies available to the Wholesale Customers under two scenarios: (1) With Bay-Delta Plan, and (2) Without Bay-Delta Plan. Your agency must choose which scenario to use for your agency's 2020 UWMP submittal tables. However, you may discuss both scenarios in the body of your agency's UWMP. The purpose of this attachment is to provide further detail about your agency's allocation of total RWS supplies available to the Wholesale Customers under both scenarios.

Data Sources for Projected RWS Purchases

Supply allocations are based on projected RWS purchases provided to BAWSCA by the Member Agencies. Following the completion of the Demand Study in June 2020, BAWSCA used the results to develop a table for each Member Agency listing possible supplies and total demand for 2025, 2030, 2035, 2040, and 2045. BAWSCA populated the tables with total demand after passive conservation and entered active conservation, as calculated in the agencies' DSS Model, as a source of supply. Multi-source agencies were asked to complete the table with supply projections, including from the RWS, to meet total demand. Single-source agencies were offered the opportunity to review the tables upon request. Because active conservation was treated as a source of supply, projected RWS purchases are after passive and active conservation.[1]

Water Management Representatives (WMRs) received a draft copy of all projected wholesale RWS purchase requests as part of the January 7, 2021 WMR meeting agenda packet and meeting slides. Agencies were asked to notify BAWSCA if changes were necessary regarding their purchase requests prior to BAWSCA sending those purchase requests to the SFPUC. Purchase requests were transmitted to the SFPUC via a letter dated January 15, 2021 for use in their 2020 UWMP efforts.

Note that the projected RWS purchases used by BAWSCA for fiscal years 2020-21 and for 2021-22 were provided to Christina Tang, BAWSCA's Finance Manager, by each Member Agency in January 2021. This annual reporting is part of the SFPUC's wholesale rate setting process. Member Agencies have provided BAWSCA with these projected purchases annually for the past 10 years.

UWMP Tables 7-1 and 7-5

UWMP Table 7-1 requests supply reliability for a normal year, a single dry year, and multiple (five) dry years. Tables 3, 4, 5, and 6 provided in the Supply Reliability Letter will help your agency complete UWMP Table 7-1. The Drought Risk Assessment (DRA) in UWMP Table 7-5 also requests a five-year drought sequence but specifies years 2021 through 2025. Supply Reliability Letter Tables 9 and 10 will help your agency complete UWMP Table 7-5.

The Supply Reliability Letter provides four scenarios to select from for completing UWMP Table 7-1. The Supply Reliability Letter Tables 3 (with Bay-Delta Plan) and 4 (without Bay-Delta Plan) use 2020 as the base year. Depending on which scenario you choose, these will be the basis for your agency's five-year DRA (UWMP Table 7-5). The Supply Reliability Letter Tables 5 (with Bay-Delta Plan) and 6 (without Bay-Delta Plan) use 2025 as the base year. Depending on which scenario you choose, these will be the basis for UWMP Tables 7-2 through 7-4.

[1] Projected RWS purchases are after conservation, except for Mountain View.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Total RWS supplies available to the Wholesale Customers in the first through fifth consecutive dry years in Supply Reliability Letter Table 3 align with those in Table 9 of the same letter. Similarly, Supply Reliability Letter Table 4 aligns with Table 10 of the same letter.

Table A below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Tables 7-1and 7-5.

Table A: Wholesale Customer Drought Cutbacks Based on a Single Dry Year and Multiple Dry Years (Base Year 2020)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
(1)	Projected SF RWS Wholesale Purchases	132.2 MGD	138.6 MGD	140.8 MGD	142.5 MGD	144.3 MGD	146.0 MGD
(2)	Supply Available to the Wholesale Customers	Percent Cutback on Wholesale RWS Purchases					
		2020	**2021**	**2022**	**2023**	**2024**	**2025**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
(4)	132.5 MGD	0.0%	-4.4%	-5.9%	-7.0%	-8.2%	-9.3%
(5)	82.8 MGD	-37.4%	-40.3%	-41.2%	-41.9%	-42.6%	-43.3%
(6)	74.5 MGD	-43.7%	-46.3%	-47.1%	-47.7%	-48.4%	-49.0%

Table A, column (a), rows 3 through 6 lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative actual wholesale RWS purchases for 2020 and projected purchases for 2021 through 2025. Projected RWS purchases for years 2021 and 2022 were provided to Christina Tang, BAWSCA's Finance Manager, by the Member Agencies in January. Projected RWS purchases for 2025 were provided to BAWSCA by the Member Agencies as described previously in this memo. Projected wholesale RWS purchases for 2023 and 2024 were derived assuming a linear change between 2022 and 2025.

Table B below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Table 7-1.

Table B: Wholesale Customer Drought Cutbacks Based on a Single Dry Year and Multiple Dry Years (Base Year 2025)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
(1)	Projected SF RWS Wholesale Purchases	146.0 MGD	146.4 MGD	146.8 MGD	147.1 MGD	147.5 MGD	147.9 MGD
(2)	Supply Available to the Wholesale Customers	Percent Cutback on Wholesale RWS Purchases					
		2025	**2026**	**2027**	**2028**	**2029**	**2030**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
(4)	132.5 MGD	-9.2%	-9.5%	-9.7%	-9.9%	-10.2%	-10.4%
(5)	82.8 MGD	-43.3%	-43.4%	-43.6%	-43.7%	-43.9%	-44.0%
(6)	74.5 MGD	-49.0%	-49.1%	-49.3%	-49.4%	-49.5%	-49.6%

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table B, column (a), rows 3 through 6 lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative projected wholesale RWS purchases for 2025 through 2030. Projected wholesale RWS purchases for years 2025 and 2030 were provided to BAWSCA by the Member Agencies as described previously in this memo. Projected wholesale RWS purchases for 2026 through 2029 were derived assuming a linear change between 2025 and 2030.

To complete UWMP Tables 7-1 and 7-5, reference tables in the Supply Reliability Letter to identify total RWS supplies available to the Wholesale Customers and apply the percent cutback in the corresponding year of the drought sequence using Tables A and B. For example, in Supply Reliability Letter Table 3, in the 5th consecutive year of a drought, the volume available to the Wholesale Customers is 74.5 MGD. To calculate RWS supplies available to your agency in 2025 using table A, locate the row with 74.5 MGD on the table – row 6 – and the column for 2025 – column (g). Then apply the percent cutback to your agency's RWS demand in 2025.

A list of purchase projections by agency are provided in Tables C, D, E, and F. The table also indicates the percent cutback that should be applied based on total RWS supplies available to the Wholesale Customers. Tables C and E use Scenario 1: With Bay-Delta Plan. Tables D and F use Scenario 2: Without Bay-Delta Plan. Tables C and D use 2020 as the base year and Tables E and F use 2025 as the base year.

BAWSCA understands that agencies are updating projected demands for their 2020 UWMPs and that projected RWS purchases may change from what was previously provided. Additionally, BAWSCA recognizes that not all Member Agencies will choose the same scenario for their UWMP supply reliability tables. For both reasons, projected RWS purchases in each Member Agency's 2020 UWMP may not add up to total Wholesale demands in the SFPUC's 2020 UWMP. This is consistent with direction given by the Department of Water Resources, which encourages suppliers use the UWMP tables to represent what they believe to be the most likely supply reliability scenario and to characterize the five-consecutive year drought in a manner that is best suited for understanding and managing their water service reliability and individual agency level of risk tolerance.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table C: Scenario 1: With Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2020)

	2020 (184 MGD)		2021 (157.5 MGD)		2022 (132.5 MGD)		2023 (74.5 MGD)		2024 (74.5 MGD)		2025 (74.5 MGD)	
Agency	Actual Purchases	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.87	0.0%	9.44	0.0%	9.46	-5.9%	8.87	-47.7%	8.27	-48.4%	7.68	-49.0%
Brisbane/GVMID	0.64	0.0%	0.62	0.0%	0.65	-5.9%	0.73	-47.7%	0.81	-48.4%	0.89	-49.0%
Burlingame	3.48	0.0%	3.34	0.0%	3.35	-5.9%	3.67	-47.7%	4.00	-48.4%	4.33	-49.0%
Coastside	1.02	0.0%	1.54	0.0%	1.23	-5.9%	1.29	-47.7%	1.34	-48.4%	1.40	-49.0%
CalWater Total	29.00	0.0%	29.66	0.0%	29.81	-5.9%	29.87	-47.7%	29.93	-48.4%	29.99	-49.0%
Daly City	3.97	0.0%	4.00	0.0%	4.01	-5.9%	3.86	-47.7%	3.72	-48.4%	3.57	-49.0%
East Palo Alto	1.57	0.0%	1.63	0.0%	1.69	-5.9%	1.75	-47.7%	1.81	-48.4%	1.88	-49.0%
Estero	4.34	0.0%	4.48	0.0%	4.51	-5.9%	4.36	-47.7%	4.22	-48.4%	4.07	-49.0%
Hayward	13.92	0.0%	14.47	0.0%	15.12	-5.9%	16.03	-47.7%	16.94	-48.4%	17.86	-49.0%
Hillsborough	2.62	0.0%	2.95	0.0%	3.05	-5.9%	3.12	-47.7%	3.19	-48.4%	3.26	-49.0%
Menlo Park	2.96	0.0%	2.92	0.0%	2.93	-5.9%	3.14	-47.7%	3.35	-48.4%	3.55	-49.0%
Mid-Peninsula	2.66	0.0%	2.65	0.0%	2.80	-5.9%	2.82	-47.7%	2.84	-48.4%	2.86	-49.0%
Millbrae	1.90	0.0%	1.95	0.0%	2.15	-5.9%	2.19	-47.7%	2.24	-48.4%	2.29	-49.0%
Milpitas	5.92	0.0%	5.88	0.0%	5.34	-5.9%	5.76	-47.7%	6.17	-48.4%	6.59	-49.0%
Mountain View	7.67	0.0%	7.80	0.0%	8.05	-5.9%	8.23	-47.7%	8.42	-48.4%	8.60	-49.0%
North Coast	2.37	0.0%	2.58	0.0%	2.66	-5.9%	2.56	-47.7%	2.45	-48.4%	2.34	-49.0%
Palo Alto	9.75	0.0%	9.44	0.0%	9.66	-5.9%	9.79	-47.7%	9.93	-48.4%	10.06	-49.0%
Purissima Hills	1.75	0.0%	1.97	0.0%	2.02	-5.9%	2.04	-47.7%	2.06	-48.4%	2.09	-49.0%
Redwood City	8.76	0.0%	8.72	0.0%	9.07	-5.9%	8.86	-47.7%	8.66	-48.4%	8.46	-49.0%
San Bruno	0.95	0.0%	3.39	0.0%	3.40	-5.9%	3.35	-47.7%	3.29	-48.4%	3.24	-49.0%
San José	4.26	0.0%	4.31	0.0%	4.51	-5.9%	4.51	-47.7%	4.50	-48.4%	4.50	-49.0%
Santa Clara	3.27	0.0%	3.29	0.0%	3.50	-5.9%	3.83	-47.7%	4.17	-48.4%	4.50	-49.0%
Stanford	1.43	0.0%	1.40	0.0%	1.54	-5.9%	1.70	-47.7%	1.85	-48.4%	2.01	-49.0%
Sunnyvale	9.33	0.0%	9.35	0.0%	9.45	-5.9%	9.35	-47.7%	9.26	-48.4%	9.16	-49.0%
Westborough	0.82	0.0%	0.84	0.0%	0.81	-5.9%	0.83	-47.7%	0.84	-48.4%	0.86	-49.0%
Wholesale Total	**132.2**	**132.2†**	**138.6**	**138.6†**	**140.8**	**132.5†**	**142.5**	**74.5†**	**144.3**	**74.5†**	**146.0**	**74.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table D: Scenario 2: Without Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2020)

	2020 (184 MGD)		**2021** (157.5 MGD)		**2022** (132.5 MGD)		**2023** (132.5 MGD)		**2024** (132.5 MGD)		**2025** (132.5 MGD)	
Agency	Actual Purchases	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.87	0.0%	9.44	0.0%	9.46	-5.9%	8.87	-7.0%	8.27	-8.2%	7.68	-9.2%
Brisbane/GVMID	0.64	0.0%	0.62	0.0%	0.65	-5.9%	0.73	-7.0%	0.81	-8.2%	0.89	-9.2%
Burlingame	3.48	0.0%	3.34	0.0%	3.35	-5.9%	3.67	-7.0%	4.00	-8.2%	4.33	-9.2%
Coastside	1.02	0.0%	1.54	0.0%	1.23	-5.9%	1.29	-7.0%	1.34	-8.2%	1.40	-9.2%
CalWater Total	29.00	0.0%	29.66	0.0%	29.81	-5.9%	29.87	-7.0%	29.93	-8.2%	29.99	-9.2%
Daly City	3.97	0.0%	4.00	0.0%	4.01	-5.9%	3.86	-7.0%	3.72	-8.2%	3.57	-9.2%
East Palo Alto	1.57	0.0%	1.63	0.0%	1.69	-5.9%	1.75	-7.0%	1.81	-8.2%	1.88	-9.2%
Estero	4.34	0.0%	4.48	0.0%	4.51	-5.9%	4.36	-7.0%	4.22	-8.2%	4.07	-9.2%
Hayward	13.92	0.0%	14.47	0.0%	15.12	-5.9%	16.03	-7.0%	16.94	-8.2%	17.86	-9.2%
Hillsborough	2.62	0.0%	2.95	0.0%	3.05	-5.9%	3.12	-7.0%	3.19	-8.2%	3.26	-9.2%
Menlo Park	2.96	0.0%	2.92	0.0%	2.93	-5.9%	3.14	-7.0%	3.35	-8.2%	3.55	-9.2%
Mid-Peninsula	2.66	0.0%	2.65	0.0%	2.80	-5.9%	2.82	-7.0%	2.84	-8.2%	2.86	-9.2%
Millbrae	1.90	0.0%	1.95	0.0%	2.15	-5.9%	2.19	-7.0%	2.24	-8.2%	2.29	-9.2%
Milpitas	5.92	0.0%	5.88	0.0%	5.34	-5.9%	5.76	-7.0%	6.17	-8.2%	6.59	-9.2%
Mountain View	7.67	0.0%	7.80	0.0%	8.05	-5.9%	8.23	-7.0%	8.42	-8.2%	8.60	-9.2%
North Coast	2.37	0.0%	2.58	0.0%	2.66	-5.9%	2.56	-7.0%	2.45	-8.2%	2.34	-9.2%
Palo Alto	9.75	0.0%	9.44	0.0%	9.66	-5.9%	9.79	-7.0%	9.93	-8.2%	10.06	-9.2%
Purissima Hills	1.75	0.0%	1.97	0.0%	2.02	-5.9%	2.04	-7.0%	2.06	-8.2%	2.09	-9.2%
Redwood City	8.76	0.0%	8.72	0.0%	9.07	-5.9%	8.86	-7.0%	8.66	-8.2%	8.46	-9.2%
San Bruno	0.95	0.0%	3.39	0.0%	3.40	-5.9%	3.35	-7.0%	3.29	-8.2%	3.24	-9.2%
San José	4.26	0.0%	4.31	0.0%	4.51	-5.9%	4.51	-7.0%	4.50	-8.2%	4.50	-9.2%
Santa Clara	3.27	0.0%	3.29	0.0%	3.50	-5.9%	3.83	-7.0%	4.17	-8.2%	4.50	-9.2%
Stanford	1.43	0.0%	1.40	0.0%	1.54	-5.9%	1.70	-7.0%	1.85	-8.2%	2.01	-9.2%
Sunnyvale	9.33	0.0%	9.35	0.0%	9.45	-5.9%	9.35	-7.0%	9.26	-8.2%	9.16	-9.2%
Westborough	0.82	0.0%	0.84	0.0%	0.81	-5.9%	0.83	-7.0%	0.84	-8.2%	0.86	-9.2%
Wholesale Total	**132.2**	**132.2†**	**138.6**	**138.6†**	**140.8**	**132.5†**	**142.5**	**132.5†**	**144.3**	**132.5†**	**146.0**	**132.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table E: Scenario 1: With Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2025)

	2025 (184 MGD)		2026 (82.8 MGD)		2027 (74.5 MGD)		2028 (74.5 MGD)		2029 (74.5 MGD)		2030 (74.5 MGD)	
Agency	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.68	0%	7.68	-43.4%	7.68	-49.3%	7.68	-49.4%	7.68	-49.5%	7.68	-49.6%
Brisbane/GVMID	0.89	0%	0.89	-43.4%	0.89	-49.3%	0.89	-49.4%	0.89	-49.5%	0.89	-49.6%
Burlingame	4.33	0%	4.34	-43.4%	4.35	-49.3%	4.37	-49.4%	4.38	-49.5%	4.40	-49.6%
Coastside	1.40	0%	1.40	-43.4%	1.39	-49.3%	1.39	-49.4%	1.38	-49.5%	1.38	-49.6%
CalWater Total	29.99	0%	29.94	-43.4%	29.89	-49.3%	29.84	-49.4%	29.79	-49.5%	29.74	-49.6%
Daly City	3.57	0%	3.56	-43.4%	3.55	-49.3%	3.54	-49.4%	3.53	-49.5%	3.52	-49.6%
East Palo Alto	1.88	0%	1.89	-43.4%	1.91	-49.3%	1.92	-49.4%	1.93	-49.5%	1.95	-49.6%
Estero	4.07	0%	4.08	-43.4%	4.08	-49.3%	4.09	-49.4%	4.10	-49.5%	4.11	-49.6%
Hayward	17.86	0%	18.02	-43.4%	18.19	-49.3%	18.35	-49.4%	18.52	-49.5%	18.68	-49.6%
Hillsborough	3.26	0%	3.26	-43.4%	3.26	-49.3%	3.26	-49.4%	3.26	-49.5%	3.25	-49.6%
Menlo Park	3.55	0%	3.58	-43.4%	3.60	-49.3%	3.63	-49.4%	3.66	-49.5%	3.68	-49.6%
Mid-Peninsula	2.86	0%	2.85	-43.4%	2.85	-49.3%	2.85	-49.4%	2.84	-49.5%	2.84	-49.6%
Millbrae	2.29	0%	2.33	-43.4%	2.37	-49.3%	2.41	-49.4%	2.46	-49.5%	2.50	-49.6%
Milpitas	6.59	0%	6.62	-43.4%	6.65	-49.3%	6.68	-49.4%	6.72	-49.5%	6.75	-49.6%
Mountain View	8.60	0%	8.66	-43.4%	8.72	-49.3%	8.78	-49.4%	8.84	-49.5%	8.90	-49.6%
North Coast	2.34	0%	2.34	-43.4%	2.33	-49.3%	2.33	-49.4%	2.33	-49.5%	2.33	-49.6%
Palo Alto	10.06	0%	10.08	-43.4%	10.10	-49.3%	10.12	-49.4%	10.13	-49.5%	10.15	-49.6%
Purissima Hills	2.09	0%	2.09	-43.4%	2.09	-49.3%	2.09	-49.4%	2.09	-49.5%	2.09	-49.6%
Redwood City	8.46	0%	8.46	-43.4%	8.47	-49.3%	8.48	-49.4%	8.49	-49.5%	8.49	-49.6%
San Bruno	3.24	0%	3.23	-43.4%	3.23	-49.3%	3.22	-49.4%	3.22	-49.5%	3.22	-49.6%
San José	4.50	0%	4.50	-43.4%	4.50	-49.3%	4.50	-49.4%	4.50	-49.5%	4.50	-49.6%
Santa Clara	4.50	0%	4.50	-43.4%	4.50	-49.3%	4.50	-49.4%	4.50	-49.5%	4.50	-49.6%
Stanford	2.01	0%	2.04	-43.4%	2.08	-49.3%	2.11	-49.4%	2.15	-49.5%	2.18	-49.6%
Sunnyvale	9.16	0%	9.19	-43.4%	9.22	-49.3%	9.24	-49.4%	9.27	-49.5%	9.30	-49.6%
Westborough	0.86	0%	0.86	-43.4%	0.86	-49.3%	0.86	-49.4%	0.85	-49.5%	0.85	-49.6%
Wholesale Total	**146.0**	**146.0†**	**146.4**	**82.8†**	**146.8**	**74.5†**	**147.1**	**74.5†**	**147.5**	**74.5†**	**147.9**	**74.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table F: Scenario 2: Without Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2025)

	2025 (184 MGD)		2026 (157.5 MGD)		2027 (157.5 MGD)		2028 (157.5 MGD)		2029 (132.5 MGD)		2030 (132.5 MGD)	
Agency	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.68	0.0%	7.68	0.0%	7.68	0.0%	7.68	0.0%	7.68	-10.2%	7.68	-10.4%
Brisbane/GVMID	0.89	0.0%	0.89	0.0%	0.89	0.0%	0.89	0.0%	0.89	-10.2%	0.89	-10.4%
Burlingame	4.33	0.0%	4.34	0.0%	4.35	0.0%	4.37	0.0%	4.38	-10.2%	4.40	-10.4%
Coastside	1.40	0.0%	1.40	0.0%	1.39	0.0%	1.39	0.0%	1.38	-10.2%	1.38	-10.4%
CalWater Total	29.99	0.0%	29.94	0.0%	29.89	0.0%	29.84	0.0%	29.79	-10.2%	29.74	-10.4%
Daly City	3.57	0.0%	3.56	0.0%	3.55	0.0%	3.54	0.0%	3.53	-10.2%	3.52	-10.4%
East Palo Alto	1.88	0.0%	1.89	0.0%	1.91	0.0%	1.92	0.0%	1.93	-10.2%	1.95	-10.4%
Estero	4.07	0.0%	4.08	0.0%	4.08	0.0%	4.09	0.0%	4.10	-10.2%	4.11	-10.4%
Hayward	17.86	0.0%	18.02	0.0%	18.19	0.0%	18.35	0.0%	18.52	-10.2%	18.68	-10.4%
Hillsborough	3.26	0.0%	3.26	0.0%	3.26	0.0%	3.26	0.0%	3.26	-10.2%	3.25	-10.4%
Menlo Park	3.55	0.0%	3.58	0.0%	3.60	0.0%	3.63	0.0%	3.66	-10.2%	3.68	-10.4%
Mid-Peninsula	2.86	0.0%	2.85	0.0%	2.85	0.0%	2.85	0.0%	2.84	-10.2%	2.84	-10.4%
Millbrae	2.29	0.0%	2.33	0.0%	2.37	0.0%	2.41	0.0%	2.46	-10.2%	2.50	-10.4%
Milpitas	6.59	0.0%	6.62	0.0%	6.65	0.0%	6.68	0.0%	6.72	-10.2%	6.75	-10.4%
Mountain View	8.60	0.0%	8.66	0.0%	8.72	0.0%	8.78	0.0%	8.84	-10.2%	8.90	-10.4%
North Coast	2.34	0.0%	2.34	0.0%	2.33	0.0%	2.33	0.0%	2.33	-10.2%	2.33	-10.4%
Palo Alto	10.06	0.0%	10.08	0.0%	10.10	0.0%	10.12	0.0%	10.13	-10.2%	10.15	-10.4%
Purissima Hills	2.09	0.0%	2.09	0.0%	2.09	0.0%	2.09	0.0%	2.09	-10.2%	2.09	-10.4%
Redwood City	8.46	0.0%	8.46	0.0%	8.47	0.0%	8.48	0.0%	8.49	-10.2%	8.49	-10.4%
San Bruno	3.24	0.0%	3.23	0.0%	3.23	0.0%	3.22	0.0%	3.22	-10.2%	3.22	-10.4%
San José	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	-10.2%	4.50	-10.4%
Santa Clara	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	-10.2%	4.50	-10.4%
Stanford	2.01	0.0%	2.04	0.0%	2.08	0.0%	2.11	0.0%	2.15	-10.2%	2.18	-10.4%
Sunnyvale	9.16	0.0%	9.19	0.0%	9.22	0.0%	9.24	0.0%	9.27	-10.2%	9.30	-10.4%
Westborough	0.86	0.0%	0.86	0.0%	0.86	0.0%	0.86	0.0%	0.85	-10.2%	0.85	-10.4%
Wholesale Total	**146.0**	**146.0†**	**146.4**	**146.4†**	**146.8**	**146.8†**	**147.1**	**147.1†**	**147.5**	**132.5†**	**147.9**	**132.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

UWMP Table 7-4

Supply Reliability Letter Tables 7 and 8 will help your agency complete UWMP Table 7-4. Table G below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Table 7-4. The table assumes (1) the Tier 2 Plan will be used to allocate supplies available to the Wholesale Customers when average Wholesale Customers' RWS shortages are greater than 10 and up to 20 percent, and (2) an equal percent reduction will be shared across all Wholesale Customers when average Wholesale Customers' RWS shortages are 10 percent or less or greater than 20 percent.

Table G: Drought Cutbacks Based on Projected Demands Under All Water Supply Availability Conditions

	(a)	(b)	(c)	(d)	(e)	(f)
(1)	Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
(2)	Supply Available to the Wholesale Customers	% Cutback on Wholesale RWS Purchases				
		2025	**2030**	**2035**	**2040**	**2045**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	-3.2%
(4)	132.5 MGD	-9.3%	-10.4%	Tier 2 Avg. -14%*	Tier 2 Avg. -16%*	Tier 2 Avg. -19%*
(5)	82.8 MGD	-43.3%	-44.0%	-45.5%	-47.0%	-49.1%
(6)	74.5 MGD	-49.0%	-49.6%	-51.0%	-52.3%	-54.2%

* Calculated average. Individual agency cutbacks are calculated in Table H.

Table G, column (a) lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative projected wholesale RWS purchases for 2025, 2030, 2035, 2040, and 2045.

Tables H, I, J and K provide additional detail by agency for each of the four supply availability conditions listed in Table G. To complete UWMP Table 7-4, reference Table 7 or 8 (depending on which Bay-Delta Plan scenario you choose) in the Supply Reliability Letter to identify total RWS supplies available to the Wholesale Customers and apply the percent cutback in the corresponding year using Table G or input the volumetric drought allocation using Tables H, I, J and K below.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table H: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 157.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2030**	**2040**	**2045**
ACWD	7.68	7.68	7.68	7.68	8.82
Burlingame	0.89	0.89	0.88	0.89	0.87
Burlingame	4.33	4.40	4.47	4.58	4.54
Coastside	1.40	1.38	1.36	1.33	1.28
CalWater Total	29.99	29.74	29.81	30.27	29.71
Daly City	3.57	3.52	3.49	3.46	3.32
East Palo Alto	1.88	1.95	2.10	2.49	2.80
Estero	4.07	4.11	4.18	4.23	4.24
Hayward	17.86	18.68	19.75	20.82	21.43
Hillsborough	3.26	3.25	3.26	3.26	3.15
Menlo Park	3.55	3.68	3.87	4.06	4.15
Mid-Peninsula	2.86	2.84	2.88	2.89	2.83
Millbrae	2.29	2.50	2.45	2.82	3.10
Milpitas	6.59	6.75	7.03	7.27	7.29
Mountain View	8.60	8.90	9.20	9.51	9.61
North Coast	2.34	2.33	2.34	2.34	2.27
Palo Alto	10.06	10.15	10.28	10.51	10.44
Purissima Hills	2.09	2.09	2.12	2.13	2.08
Redwood City	8.46	8.49	8.64	8.74	8.62
San Bruno	3.24	3.22	3.20	3.20	3.11
San José	4.50	4.50	4.50	4.50	4.35
Santa Clara	4.50	4.50	4.50	4.50	4.35
Stanford	2.01	2.18	2.35	2.53	2.61
Sunnyvale	9.16	9.30	10.70	11.44	11.71
Westborough	0.86	0.85	0.85	0.84	0.82
Wholesale Total	**146.0**	**147.9**	**151.9**	**156.3**	**157.5**

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table I: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 132.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2030**	**2040**	**2045**
ACWD	6.97	6.88	6.91	6.91	8.20
Burlingame	0.81	0.79	0.73	0.73	0.72
Burlingame	3.93	3.94	3.96	3.89	3.80
Coastside	1.27	1.24	1.22	1.20	1.19
CalWater Total	27.21	26.65	26.46	25.69	24.69
Daly City	3.24	3.15	3.04	3.01	2.98
East Palo Alto	1.70	1.75	1.97	2.30	2.62
Estero	3.69	3.68	3.76	3.87	3.77
Hayward	16.20	16.74	17.32	17.69	18.07
Hillsborough	2.96	2.92	2.90	2.75	2.56
Menlo Park	3.22	3.30	3.37	3.33	3.26
Mid-Peninsula	2.59	2.54	2.59	2.62	2.54
Millbrae	2.07	2.24	2.16	2.32	2.45
Milpitas	5.98	6.05	6.25	6.31	6.35
Mountain View	7.80	7.97	8.28	8.49	8.34
North Coast	2.12	2.09	2.11	2.11	2.11
Palo Alto	9.13	9.09	9.26	9.46	9.71
Purissima Hills	1.89	1.87	1.42	1.38	1.32
Redwood City	7.67	7.61	7.89	7.70	7.49
San Bruno	2.94	2.88	2.56	2.51	2.45
San José	4.08	4.03	3.03	2.91	2.76
Santa Clara	4.08	4.03	3.03	2.91	2.76
Stanford	1.82	1.95	2.06	2.13	2.16
Sunnyvale	8.31	8.33	9.46	9.51	9.43
Westborough	0.78	0.76	0.76	0.76	0.76
Wholesale Total	**132.5**	**132.5**	**132.5**	**132.5**	**132.5**

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table J: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 82.8 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2030**	**2040**	**2045**
ACWD	4.36	4.30	4.19	4.07	4.64
Burlingame	0.51	0.50	0.48	0.47	0.45
Burlingame	2.45	2.46	2.44	2.43	2.39
Coastside	0.79	0.77	0.74	0.71	0.68
CalWater Total	17.00	16.65	16.25	16.03	15.62
Daly City	2.02	1.97	1.90	1.83	1.75
East Palo Alto	1.06	1.09	1.14	1.32	1.47
Estero	2.31	2.30	2.28	2.24	2.23
Hayward	10.13	10.46	10.77	11.03	11.26
Hillsborough	1.85	1.82	1.78	1.73	1.66
Menlo Park	2.01	2.06	2.11	2.15	2.18
Mid-Peninsula	1.62	1.59	1.57	1.53	1.49
Millbrae	1.30	1.40	1.34	1.49	1.63
Milpitas	3.74	3.78	3.83	3.85	3.83
Mountain View	4.88	4.98	5.01	5.04	5.05
North Coast	1.33	1.30	1.28	1.24	1.19
Palo Alto	5.71	5.68	5.61	5.57	5.49
Purissima Hills	1.18	1.17	1.15	1.13	1.10
Redwood City	4.80	4.76	4.71	4.63	4.53
San Bruno	1.83	1.80	1.75	1.70	1.63
San José	2.55	2.52	2.45	2.38	2.29
Santa Clara	2.55	2.52	2.45	2.38	2.29
Stanford	1.14	1.22	1.28	1.34	1.37
Sunnyvale	5.19	5.21	5.83	6.06	6.16
Westborough	0.49	0.48	0.46	0.45	0.43
Wholesale Total	**82.8**	**82.8**	**82.8**	**82.8**	**82.8**

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table K: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 74.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2030**	**2040**	**2045**
ACWD	3.92	3.87	3.77	3.66	4.17
Burlingame	0.46	0.45	0.43	0.42	0.41
Burlingame	2.21	2.21	2.19	2.18	2.15
Coastside	0.71	0.70	0.67	0.64	0.61
CalWater Total	15.30	14.98	14.62	14.43	14.05
Daly City	1.82	1.77	1.71	1.65	1.57
East Palo Alto	0.96	0.98	1.03	1.19	1.32
Estero	2.08	2.07	2.05	2.02	2.00
Hayward	9.11	9.41	9.69	9.92	10.14
Hillsborough	1.66	1.64	1.60	1.55	1.49
Menlo Park	1.81	1.86	1.90	1.94	1.96
Mid-Peninsula	1.46	1.43	1.41	1.38	1.34
Millbrae	1.17	1.26	1.20	1.34	1.47
Milpitas	3.36	3.40	3.45	3.47	3.45
Mountain View	4.39	4.48	4.51	4.53	4.54
North Coast	1.19	1.17	1.15	1.12	1.07
Palo Alto	5.14	5.11	5.04	5.01	4.94
Purissima Hills	1.06	1.05	1.04	1.02	0.99
Redwood City	4.31	4.28	4.24	4.17	4.08
San Bruno	1.65	1.62	1.57	1.53	1.47
San José	2.30	2.27	2.21	2.14	2.06
Santa Clara	2.30	2.27	2.21	2.14	2.06
Stanford	1.03	1.10	1.15	1.21	1.24
Sunnyvale	4.67	4.69	5.25	5.45	5.54
Westborough	0.44	0.43	0.41	0.40	0.39
Wholesale Total	**74.5**	**74.5**	**74.5**	**74.5**	**74.5**

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

525 Golden Gate Avenue, 13th Floor
San Francisco, CA 94102
T 415.554.3155
F 415.554.3161
TTY 415.554.3488

March 30, 2021

Danielle McPherson
Senior Water Resources Specialist
Bay Area Water Supply and Conservation Agency
155 Bovet Road, Suite 650
San Mateo, CA 94402

Dear Ms. McPherson,

Attached please find additional supply reliability modeling results conducted by the SFPUC. The SFPUC has conducted additional supply reliability modeling under the following planning scenarios:

- Projected supply reliability for years 2020 through 2045, assuming that demand is equivalent to the sum of the projected retail demands on the Regional Water System (RWS) and Wholesale Customer purchase request projections provided to SFPUC by BAWSCA on January 21st (see Table 1 below).
- Under the above demand conditions, projected supply reliability for scenarios both with and without implementation of the Bay-Delta Plan Amendment starting in 2023.

The SFPUC will be using this supply modeling in the text of its draft UWMP and moving the original modeling results into an appendix.

Table 1: Retail and Wholesale RWS Demand Assumptions Used for Additional Supply Reliability Modeling (mgd)

	2020	2025	2030	2035	2040	2045
Retail	66.5	67.2	67.5	68.6	70.5	73.7
Wholesale[1, 2]	132.1	146.0	147.9	151.9	156.3	162.8
Total	**198.6**	**213.2**	**215.4**	**220.5**	**226.8**	**236.5**

[1] Wholesale purchase request projections provided to the SFPUC by BAWSCA on January 21st, 2021

[2] Includes demands for Cities of San Jose and Santa Clara

Please note the following about the information presented in the attached tables:

OUR MISSION: To provide our customers with high-quality, efficient and reliable water, power and sewer services in a manner that values environmental and community interests and sustains the resources entrusted to our care.

- Assumptions about infrastructure conditions remain the same as what was provided in our January 22nd letter.
- The Tier 1 allocations were applied to the RWS supplies to determine the wholesale supply, as was also described in the January 22nd letter; for any system-wide shortage above 20%, the Tier 1 split for a 20% shortage was applied.
- The SFPUC water supply planning methodology, including simulation of an 8.5-year design drought, is used to develop these estimates of water supply available from the RWS for five dry years. In each demand scenario for 2020 through 2045, the RWS deliveries are estimated using the standard SFPUC procedure, which includes adding increased levels of rationing as needed to balance the demands on the RWS system with available water supply. Some simulations may have increased levels of rationing in the final years of the design drought sequence, which can influence the comparison of results in the first five years of the sequence.
- Tables 7 and 8 in the attached document provide RWS and wholesale supply availability for the five-year drought risk assessment from 2021 to 2025. SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. Therefore, the supply projections for 2021 to 2025 are based on meeting 2020 levels of demand. However, in years when the Bay-Delta Plan Amendment is not in effect, sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests assuming that they are between the 2020 and 2025 projected levels. This is not reflected in Tables 7 and 8 because SFPUC did not want to make assumptions about the growth of purchase requests between 2020 and 2025.

In our draft UWMP, we acknowledge that we have a Level of Service objective of meeting average annual water demand of 265 mgd from the SFPUC watersheds for retail and Wholesale Customers during non-drought years, as well as a contractual obligation to supply 184 mgd to the Wholesale Customers. Therefore, we will still include the results of our modeling based on a demand of 265 mgd in order to facilitate planning that supports meeting this Level of Service objective and our contractual obligations. The results of this modeling will be in an appendix to the draft UWMP. As will be shown in this appendix, in a normal year the SFPUC can provide up to 265 mgd of supply from the RWS. The RWS supply projections shown in the attached tables are more accurately characterized as supplies that will be used to meet projected retail and Wholesale Customer demands.

It is our understanding that you will pass this information on to the Wholesale Customers. If you have any questions or need additional information, please do not hesitate to contact Sarah Triolo, at striolo@sfwater.org or (628) 230 0802.

Sincerely,

Paula Kehoe

Paula Kehoe
Director of Water Resources

Table 2: Projected Total RWS Supply Utilized and Portion of RWS Supply Utilized by Wholesale Customers in Normal Years [For Table 6-9]:

Year	2020	2025	2030	2035	2040	2045
RWS Supply Utilized (mgd)	198.6	213.2	215.4	220.5	226.8	236.5
RWS Supply Utilized by Wholesale Customers[a] (mgd)	132.1	146.0	147.9	151.9	156.3	162.8

[a] RWS supply utilized by Wholesale Customers is equivalent to purchase request projections provided to SFPUC by BAWSCA on January 21, 2021, and includes Cities of San Jose and Santa Clara.

Basis of Water Supply Data: With Bay-Delta Plan Amendment

Table 3a: Basis of Water Supply Data [For Table 7-1], Base Year 2020, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2020	198.6	100%	132.1	
Single dry year		198.6	100%	132.1	
Consecutive 1st Dry year		198.6	100%	132.1	
Consecutive 2nd Dry year		198.6	100%	132.1	
Consecutive 3rd Dry year[1]		119.2	60%	74.5	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 4th Dry year		119.2	60%	74.5	• Same as above
Consecutive 5th Dry year		119.2	60%	74.5	• Same as above

[1] Assuming this year represents 2023, when Bay Delta Plan Amendment would come into effect.

Table 3b: Basis of Water Supply Data [For Table 7-1], Base Year 2025, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2025	213.2	100%	146.0	
Single dry year		149.2	70%	93.3	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		149.2	70%	93.3	• Same as above
Consecutive 2nd Dry year		127.9	60%	80.0	• Same as above
Consecutive 3rd Dry year		127.9	60%	80.0	• Same as above
Consecutive 4th Dry year		127.9	60%	80.0	• Same as above
Consecutive 5th Dry year		127.9	60%	80.0	• Same as above

Table 3c: Basis of Water Supply Data [For Table 7-1], Base Year 2030, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2030	215.4	100%	147.9	
Single dry year		150.8	70%	94.2	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		150.8	70%	94.2	• Same as above
Consecutive 2nd Dry year		129.2	60%	80.8	• Same as above
Consecutive 3rd Dry year		129.2	60%	80.8	• Same as above
Consecutive 4th Dry year		129.2	60%	80.8	• Same as above
Consecutive 5th Dry year		129.2	60%	80.8	• Same as above

Table 3d: Basis of Water Supply Data [For Table 7-1], Base Year 2035, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2035	220.5	100%	151.9	
Single dry year		154.4	70%	96.5	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		154.4	70%	96.5	• Same as above
Consecutive 2nd Dry year		132.3	60%	82.7	• Same as above
Consecutive 3rd Dry year		132.3	60%	82.7	• Same as above
Consecutive 4th Dry year		132.3	60%	82.7	• Same as above
Consecutive 5th Dry year		121.3	55%	75.8	• Same as above

Table 3e: Basis of Water Supply Data [For Table 7-1], Base Year 2040, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2040	226.8	100%	156.3	
Single dry year		158.8	70%	99.2	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		158.8	70%	99.2	• Same as above
Consecutive 2nd Dry year		136.1	60%	85.1	• Same as above
Consecutive 3rd Dry year		136.1	60%	85.1	• Same as above
Consecutive 4th Dry year		120.2	53%	75.1	• Same as above
Consecutive 5th Dry year		120.2	53%	75.1	• Same as above

Table 3f: Basis of Water Supply Data [For Table 7-1], Base Year 2045, With Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2045	236.5	100%	162.8	
Single dry year		141.9	60%	88.7	• At shortages 20% or greater, wholesale allocation is assumed to be 62.5%
Consecutive 1st Dry year		141.9	60%	88.7	• Same as above
Consecutive 2nd Dry year		141.9	60%	88.7	• Same as above
Consecutive 3rd Dry year		141.9	60%	88.7	• Same as above
Consecutive 4th Dry year		120.6	51%	75.4	• Same as above
Consecutive 5th Dry year		120.6	51%	75.4	• Same as above

Table 3g: Projected RWS Supply Availability [Alternative to Table 7-1], Years 2020-2045, With Bay-Delta Plan Amendment

Year	2020	2025	2030	2035	2040	2045
Average year	100%	100%	100%	100%	100%	100%
Single dry year	100%	70%	70%	70%	70%	60%
Consecutive 1st Dry year	100%	70%	70%	70%	70%	60%
Consecutive 2nd Dry year	100%	60%	60%	60%	60%	60%
Consecutive 3rd Dry year[1]	60%	60%	60%	60%	60%	60%
Consecutive 4th Dry year	60%	60%	60%	60%	53%	51%
Consecutive 5th Dry year	60%	60%	60%	55%	53%	51%

[1] Assuming that at base year 2020, this year represents 2023, when Bay Delta Plan Amendment would come into effect.

Basis of Water Supply Data: Without Bay-Delta Plan Amendment

Table 4a: Basis of Water Supply Data [For Table 7-1], Base Year 2020, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2020	198.6	100%	132.1	
Single dry year		198.6	100%	132.1	
Consecutive 1st Dry year		198.6	100%	132.1	
Consecutive 2nd Dry year		198.6	100%	132.1	
Consecutive 3rd Dry year		198.6	100%	132.1	
Consecutive 4th Dry year		198.6	100%	132.1	
Consecutive 5th Dry year		198.6	100%	132.1	

Table 4b: Basis of Water Supply Data [For Table 7-1], Base Year 2025, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2025	213.2	100%	146.0	
Single dry year		213.2	100%	146.0	
Consecutive 1st Dry year		213.2	100%	146.0	
Consecutive 2nd Dry year		213.2	100%	146.0	
Consecutive 3rd Dry year		213.2	100%	146.0	
Consecutive 4th Dry year		213.2	100%	146.0	
Consecutive 5th Dry year		213.2	100%	146.0	

Table 4c: Basis of Water Supply Data [For Table 7-1], Base Year 2030, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2030	215.4	100%	147.9	
Single dry year		215.4	100%	147.9	
Consecutive 1st Dry year		215.4	100%	147.9	
Consecutive 2nd Dry year		215.4	100%	147.9	
Consecutive 3rd Dry year		215.4	100%	147.9	
Consecutive 4th Dry year		215.4	100%	147.9	
Consecutive 5th Dry year		215.4	100%	147.9	

Table 4d: Basis of Water Supply Data [For Table 7-1], Base Year 2035, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2035	220.5	100%	151.9	
Single dry year		220.5	100%	151.9	
Consecutive 1st Dry year		220.5	100%	151.9	
Consecutive 2nd Dry year		220.5	100%	151.9	
Consecutive 3rd Dry year		220.5	100%	151.9	
Consecutive 4th Dry year		220.5	100%	151.9	
Consecutive 5th Dry year		220.5	100%	151.9	

Table 4e: Basis of Water Supply Data [For Table 7-1], Base Year 2040, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2040	226.8	100%	156.3	
Single dry year		226.8	100%	156.3	
Consecutive 1st Dry year		226.8	100%	156.3	
Consecutive 2nd Dry year		226.8	100%	156.3	
Consecutive 3rd Dry year		226.8	100%	156.3	
Consecutive 4th Dry year		226.8	100%	156.3	
Consecutive 5th Dry year		226.8	100%	156.3	

Table 4f: Basis of Water Supply Data [For Table 7-1], Base Year 2045, Without Bay-Delta Plan Amendment

Year Type	Base Year	RWS Volume Available (mgd)	% of Average Supply	Wholesale Volume Available (mgd)	Notes on Calculation of Wholesale Supply
Average year	2045	236.5	100%	162.8	
Single dry year		236.5	100%	162.8	
Consecutive 1st Dry year		236.5	100%	162.8	
Consecutive 2nd Dry year		236.5	100%	162.8	
Consecutive 3rd Dry year		236.5	100%	162.8	
Consecutive 4th Dry year		212.8	90%	139.1	• At a 10% shortage level, the wholesale allocation is 64% of available supply • The retail allocation is 36% of supply, which resulted in a positive allocation to retail of 2.9 mgd, which was re-allocated to the Wholesale Customers
Consecutive 5th Dry year		212.8	90%	139.1	• Same as above

Table 4g: Projected RWS Supply [Alternative to Table 7-1], Years 2020-2045, Without Bay-Delta Plan Amendment

Year	2020	2025	2030	2035	2040	2045
Average year	100%	100%	100%	100%	100%	100%
Single dry year	100%	100%	100%	100%	100%	100%
Consecutive 1st Dry year	100%	100%	100%	100%	100%	100%
Consecutive 2nd Dry year	100%	100%	100%	100%	100%	100%
Consecutive 3rd Dry year	100%	100%	100%	100%	100%	100%
Consecutive 4th Dry year	100%	100%	100%	100%	100%	90%
Consecutive 5th Dry year	100%	100%	100%	100%	100%	90%

Supply Projections for Consecutive Five Dry Year Sequences

Table 5: Projected Multiple Dry Years Wholesale Supply from RWS [For Table 7-4], With Bay-Delta Plan Amendment

	2025	2030	2035	2040	2045
First year	93.3	94.2	96.5	99.2	88.7
Second year	80.0	80.8	82.7	85.1	88.7
Third year	80.0	80.8	82.7	85.1	88.7
Fourth year	80.0	80.8	82.7	75.1	75.4
Fifth year	80.0	80.8	75.8	75.1	75.4

Table 6: Projected Multiple Dry Years Wholesale Supply from RWS [For Table 7-4], Without Bay-Delta Plan Amendment

	2025	2030	2035	2040	2045
First year	146.0	147.9	151.9	156.3	162.8
Second year	146.0	147.9	151.9	156.3	162.8
Third year	146.0	147.9	151.9	156.3	162.8
Fourth year	146.0	147.9	151.9	156.3	139.1
Fifth year	146.0	147.9	151.9	156.3	139.1

Table 7: Projected Regional Water System Supply for 5-Year Drought Risk Assessment [For Table 7-5], With Bay-Delta Plan Amendment. This table assumes Bay Delta Plan comes into effect in 2023.

Year	2021	2022	2023	2024	2025
RWS Supply (mgd)	198.6	198.6	119.2	119.2	119.2
Wholesale Supply (mgd)	132.1	132.1	74.5	74.5	74.5

Table 8: Projected Regional Water System Supply for 5-Year Drought Risk Assessment [For Table 7-5], Without Bay Delta Plan

Year	2021	2022	2023	2024	2025
RWS Supply (mgd)	198.6	198.6	198.6	198.6	198.6
Wholesale Supply (mgd)	132.1	132.1	132.1	132.1	132.1

Section 1: Basis for Calculations. Projected Wholesale RWS Purchases Through 2045

Table A: Wholesale RWS Actual Purchases in 2020 and Projected Purchases for 2025, 2030, 2035, 2040, and 2045 (mgd)[a]

Agency	2020 Actual	Projected Wholesale RWS Purchases 2025	2030	2035	2040	2045
ACWD	7.87	7.68	7.68	7.68	7.68	9.11
Brisbane/GVMID	0.64	0.89	0.89	0.88	0.89	0.89
Burlingame	3.48	4.33	4.40	4.47	4.58	4.69
Coastside	1.02	1.40	1.38	1.36	1.33	1.33
CalWater Total	29.00	29.99	29.74	29.81	30.27	30.70
Daly City	3.97	3.57	3.52	3.49	3.46	3.43
East Palo Alto	1.57	1.88	1.95	2.10	2.49	2.89
Estero	4.34	4.07	4.11	4.18	4.23	4.38
Hayward	13.92	17.86	18.68	19.75	20.82	22.14
Hillsborough	2.62	3.26	3.25	3.26	3.26	3.26
Menlo Park	2.96	3.55	3.68	3.87	4.06	4.29
Mid-Peninsula	2.66	2.86	2.84	2.88	2.89	2.93
Millbrae	1.90	2.29	2.50	2.45	2.82	3.20
Milpitas	5.92	6.59	6.75	7.03	7.27	7.53
Mountain View	7.67	8.60	8.90	9.20	9.51	9.93
North Coast	2.37	2.34	2.33	2.34	2.34	2.34
Palo Alto	9.75	10.06	10.15	10.28	10.51	10.79
Purissima Hills	1.75	2.09	2.09	2.12	2.13	2.15
Redwood City	8.76	8.46	8.49	8.64	8.74	8.90
San Bruno	0.95	3.24	3.22	3.20	3.20	3.21
San Jose	4.26	4.50	4.50	4.50	4.50	4.50
Santa Clara	3.27	4.50	4.50	4.50	4.50	4.50
Stanford	1.43	2.01	2.18	2.35	2.53	2.70
Sunnyvale	9.33	9.16	9.30	10.70	11.44	12.10
Westborough	0.82	0.86	0.85	0.85	0.84	0.84
Total	**132.22**	**146.01**	**147.87**	**151.90**	**156.31**	**162.76**

[a] Wholesale RWS purchase projections for 2025, 2030, 2035, 2040, and 2045 were provided to BAWSCA between July 2020 and January 2021 by the Member Agencies following the completion of the June 2020 Demand Study.

Table B: Basis for the 5-Year Drought Risk Assessment Wholesale RWS Actual Purchases in 2020 and 2021-2025 Projected Purchases (mgd)

Agency	2020 Actual	Projected and Estimated Wholesale RWS Purchases 2021[b]	2022[b]	2023[c]	2024[c]	2025[c]
ACWD	7.87	9.44	9.46	9.46	9.46	9.46
Brisbane/GVMID	0.64	0.62	0.65	0.65	0.65	0.65
Burlingame	3.48	3.34	3.35	3.35	3.35	3.35
Coastside	1.02	1.54	1.23	1.23	1.23	1.23
CalWater Total	29.00	29.66	29.81	29.81	29.81	29.81
Daly City	3.97	4.00	4.01	4.01	4.01	4.01
East Palo Alto	1.57	1.63	1.69	1.69	1.69	1.69
Estero	4.34	4.48	4.51	4.51	4.51	4.51
Hayward	13.92	14.47	15.12	15.12	15.12	15.12
Hillsborough	2.62	2.95	3.05	3.05	3.05	3.05
Menlo Park	2.96	2.92	2.93	2.93	2.93	2.93
Mid-Peninsula	2.66	2.65	2.80	2.80	2.80	2.80
Millbrae	1.90	1.95	2.15	2.15	2.15	2.15
Milpitas	5.92	5.88	5.34	5.34	5.34	5.34
Mountain View	7.67	7.80	8.05	8.05	8.05	8.05
North Coast	2.37	2.58	2.66	2.66	2.66	2.66
Palo Alto	9.75	9.44	9.66	9.66	9.66	9.66
Purissima Hills	1.75	1.97	2.02	2.02	2.02	2.02
Redwood City	8.76	8.72	9.07	9.07	9.07	9.07
San Bruno	0.95	3.39	3.40	3.40	3.40	3.40
San Jose	4.26	4.31	4.51	4.51	4.51	4.51
Santa Clara	3.27	3.29	3.50	3.50	3.50	3.50
Stanford	1.43	1.40	1.54	1.54	1.54	1.54
Sunnyvale	9.33	9.35	9.45	9.45	9.45	9.45
Westborough	0.82	0.84	0.81	0.81	0.81	0.81
Total	**132.22**	**138.61**	**140.77**	**140.77**	**140.77**	**140.77**

[b] Wholesale RWS purchase projections for 2021 and 2022 were provided to Christina Tang, BAWSCA's Finance Manager, by the Member Agencies in January 2021.

[c] The SFPUC's supply reliability tables assume the Bay-Delta Plan takes effect in 2023. In the event of a shortage, the Tier 2 Plan specifies that each agencies' Allocation Factor would be calculated once at the onset of a shortage based on the previous year's use and remains the same until the shortage condition is over. Therefore, for the purpose of drought allocations for the 5-year Drought Risk Assessment, wholesale RWS demand is assumed to remain static from 2022 through the drought sequence.

Section 2: Drought Allocations *With* Bay-Delta Plan

Table C: RWS Supply Available to the Wholesale Customers (Combined Tables 3a-3f from the SFPUC's March 30th letter) *With* Bay-Delta Plan (mgd)

	2020[e]	2025	2030	2035	2040	2045
Projected Purchases[d]	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 1st Dry Year	138.6	93.3	94.2	96.5	99.2	88.7
Consecutive 2nd Dry Year	140.8	80.0	80.8	82.7	85.1	88.7
Consecutive 3rd Dry Year	74.5	80.0	80.8	82.7	85.1	88.7
Consecutive 4th Dry Year	74.5	80.0	80.8	82.7	75.1	75.4
Consecutive 5th Dry Year	74.5	80.0	80.8	75.8	75.1	75.4

[d] Values for 2020 are actual purchases. This row aligns with what is labeled as an "Average Year" in Tables 3a-3f in the SFPUC's March 30th letter. However, these values do not represent an average year and instead are actual purchases for 2020 or projected purchases for 2025 through 2045.

[e] In years when the Bay-Delta Plan is not in effect, sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests assuming that they are between the 2020 and 2025 projected levels. As such, RWS supply available to the Wholesale Customers in the 1st and 2nd consecutive dry years under base year 2020 is equal to the cumulative projected wholesale RWS purchases for 2021 and 2022, respectively.

Table D: Wholesale RWS Demand (Combined Totals from Tables A and B) (mgd)[f]

	2020	2025	2030	2035	2040	2045
Projected Purchases[d]	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 1st Dry Year	138.6	146.0	147.9	151.9	156.3	162.8
Consecutive 2nd Dry Year	140.8	146.0	147.9	151.9	156.3	162.8
Consecutive 3rd Dry Year	140.8	146.0	147.9	151.9	156.3	162.8
Consecutive 4th Dry Year	140.8	146.0	147.9	151.9	156.3	162.8
Consecutive 5th Dry Year	140.8	146.0	147.9	151.9	156.3	162.8

[f] The SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. Additionally, the Tier 2 Plan calculates each agencies' Allocation Factor once at the onset of a drought and it remains the same until the shortage condition is over. When system-wide shortages are projected, wholesale RWS demand is assumed to be static for the remainder of the drought sequence.

Table E: Percent Cutback to the Wholesale Customers *With* Bay-Delta Plan[g]

	2020	2025	2030	2035	2040	2045
Projected Purchases[d]	0%	0%	0%	0%	0%	0%
Consecutive 1st Dry Year	0%	36%	36%	36%	37%	46%
Consecutive 2nd Dry Year	0%	45%	45%	46%	46%	46%
Consecutive 3rd Dry Year	47%	45%	45%	46%	46%	46%
Consecutive 4th Dry Year	47%	45%	45%	46%	52%	54%
Consecutive 5th Dry Year	47%	45%	45%	50%	52%	54%

[g] Agencies that wish to use new or different projected RWS purchases may use the percent cutbacks listed in this table to determine their drought allocation.

Table F1: Basis of Water Supply Data [For Tables 7-1 and 7-5], Base Year 2020, *With* Bay-Delta Plan (mgd)

Year Consecutive Dry Year	2020 Actual	2021 1st	2022 2nd	2023 3rd	2024 4th	2025 5th
Wholesale RWS Demand	132.2	138.6	140.8	140.8	140.8	140.8
Wholesale RWS Supply Available	132.2	138.6	140.8	74.5	74.5	74.5
Percent Cutback	0%	0%	0%	47%	47%	47%

Table F2: Individual Agency Drought Allocations [For Tables 7-1 and 7-5], Base Year 2020, *With* Bay-Delta Plan (mgd)

	2020	Wholesale RWS Drought Allocations				
Agency	Actual	2021	2022	2023	2024	2025
ACWD	7.87	9.44	9.46	5.01	5.01	5.01
Brisbane/GVMID	0.64	0.62	0.65	0.34	0.34	0.34
Burlingame	3.48	3.34	3.35	1.77	1.77	1.77
Coastside	1.02	1.54	1.23	0.65	0.65	0.65
CalWater Total	29.00	29.66	29.81	15.78	15.78	15.78
Daly City	3.97	4.00	4.01	2.12	2.12	2.12
East Palo Alto	1.57	1.63	1.69	0.89	0.89	0.89
Estero	4.34	4.48	4.51	2.39	2.39	2.39
Hayward	13.92	14.47	15.12	8.00	8.00	8.00
Hillsborough	2.62	2.95	3.05	1.61	1.61	1.61
Menlo Park	2.96	2.92	2.93	1.55	1.55	1.55
Mid-Peninsula	2.66	2.65	2.80	1.48	1.48	1.48
Millbrae	1.90	1.95	2.15	1.14	1.14	1.14
Milpitas	5.92	5.88	5.34	2.83	2.83	2.83
Mountain View	7.67	7.80	8.05	4.26	4.26	4.26
North Coast	2.37	2.58	2.66	1.41	1.41	1.41
Palo Alto	9.75	9.44	9.66	5.11	5.11	5.11
Purissima Hills	1.75	1.97	2.02	1.07	1.07	1.07
Redwood City	8.76	8.72	9.07	4.80	4.80	4.80
San Bruno	0.95	3.39	3.40	1.80	1.80	1.80
San Jose	4.26	4.31	4.51	2.39	2.39	2.39
Santa Clara	3.27	3.29	3.50	1.85	1.85	1.85
Stanford	1.43	1.40	1.54	0.82	0.82	0.82
Sunnyvale	9.33	9.35	9.45	5.00	5.00	5.00
Westborough	0.82	0.84	0.81	0.43	0.43	0.43
Total	**132.2**	**138.6**	**140.8**	**74.5**	**74.5**	**74.5**

Table G1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2025, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	146.0	146.0	146.0	146.0	146.0
Wholesale RWS Supply Available	93.3	80.0	80.0	80.0	80.0
Percent Cutback	36%	45%	45%	45%	45%

Table G2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2025, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.91	4.21	4.21	4.21	4.21
Brisbane/GVMID	0.57	0.49	0.49	0.49	0.49
Burlingame	2.76	2.37	2.37	2.37	2.37
Coastside	0.89	0.77	0.77	0.77	0.77
CalWater Total	19.16	16.43	16.43	16.43	16.43
Daly City	2.28	1.96	1.96	1.96	1.96
East Palo Alto	1.20	1.03	1.03	1.03	1.03
Estero	2.60	2.23	2.23	2.23	2.23
Hayward	11.41	9.78	9.78	9.78	9.78
Hillsborough	2.08	1.79	1.79	1.79	1.79
Menlo Park	2.27	1.95	1.95	1.95	1.95
Mid-Peninsula	1.83	1.57	1.57	1.57	1.57
Millbrae	1.46	1.25	1.25	1.25	1.25
Milpitas	4.21	3.61	3.61	3.61	3.61
Mountain View	5.49	4.71	4.71	4.71	4.71
North Coast	1.49	1.28	1.28	1.28	1.28
Palo Alto	6.43	5.51	5.51	5.51	5.51
Purissima Hills	1.33	1.14	1.14	1.14	1.14
Redwood City	5.40	4.63	4.63	4.63	4.63
San Bruno	2.07	1.77	1.77	1.77	1.77
San Jose	2.88	2.47	2.47	2.47	2.47
Santa Clara	2.88	2.47	2.47	2.47	2.47
Stanford	1.28	1.10	1.10	1.10	1.10
Sunnyvale	5.85	5.02	5.02	5.02	5.02
Westborough	0.55	0.47	0.47	0.47	0.47
Total	**93.3**	**80.0**	**80.0**	**80.0**	**80.0**

Table H1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2030, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	147.9	147.9	147.9	147.9	147.9
Wholesale RWS Supply Available	94.2	80.8	80.8	80.8	80.8
Percent Cutback	36%	45%	45%	45%	45%

Table H2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2030, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.89	4.20	4.20	4.20	4.20
Brisbane/GVMID	0.56	0.48	0.48	0.48	0.48
Burlingame	2.80	2.40	2.40	2.40	2.40
Coastside	0.88	0.75	0.75	0.75	0.75
CalWater Total	18.94	16.25	16.25	16.25	16.25
Daly City	2.24	1.92	1.92	1.92	1.92
East Palo Alto	1.24	1.07	1.07	1.07	1.07
Estero	2.62	2.24	2.24	2.24	2.24
Hayward	11.90	10.21	10.21	10.21	10.21
Hillsborough	2.07	1.78	1.78	1.78	1.78
Menlo Park	2.35	2.01	2.01	2.01	2.01
Mid-Peninsula	1.81	1.55	1.55	1.55	1.55
Millbrae	1.59	1.37	1.37	1.37	1.37
Milpitas	4.30	3.69	3.69	3.69	3.69
Mountain View	5.67	4.86	4.86	4.86	4.86
North Coast	1.48	1.27	1.27	1.27	1.27
Palo Alto	6.47	5.55	5.55	5.55	5.55
Purissima Hills	1.33	1.14	1.14	1.14	1.14
Redwood City	5.41	4.64	4.64	4.64	4.64
San Bruno	2.05	1.76	1.76	1.76	1.76
San Jose	2.87	2.46	2.46	2.46	2.46
Santa Clara	2.87	2.46	2.46	2.46	2.46
Stanford	1.39	1.19	1.19	1.19	1.19
Sunnyvale	5.92	5.08	5.08	5.08	5.08
Westborough	0.54	0.47	0.47	0.47	0.47
Total	**94.2**	**80.8**	**80.8**	**80.8**	**80.8**

Table I1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2035, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	151.9	151.9	151.9	151.9	151.9
Wholesale RWS Supply Available	96.5	82.7	82.7	82.7	75.8
Percent Cutback	36%	46%	46%	46%	50%

Table I2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2035, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.88	4.18	4.18	4.18	3.83
Brisbane/GVMID	0.56	0.48	0.48	0.48	0.44
Burlingame	2.84	2.44	2.44	2.44	2.23
Coastside	0.86	0.74	0.74	0.74	0.68
CalWater Total	18.94	16.23	16.23	16.23	14.88
Daly City	2.22	1.90	1.90	1.90	1.74
East Palo Alto	1.33	1.14	1.14	1.14	1.05
Estero	2.66	2.28	2.28	2.28	2.09
Hayward	12.55	10.75	10.75	10.75	9.86
Hillsborough	2.07	1.78	1.78	1.78	1.63
Menlo Park	2.46	2.10	2.10	2.10	1.93
Mid-Peninsula	1.83	1.57	1.57	1.57	1.44
Millbrae	1.56	1.34	1.34	1.34	1.22
Milpitas	4.47	3.83	3.83	3.83	3.51
Mountain View	5.84	5.01	5.01	5.01	4.59
North Coast	1.49	1.27	1.27	1.27	1.17
Palo Alto	6.53	5.60	5.60	5.60	5.13
Purissima Hills	1.34	1.15	1.15	1.15	1.06
Redwood City	5.49	4.70	4.70	4.70	4.31
San Bruno	2.03	1.74	1.74	1.74	1.60
San Jose	2.86	2.45	2.45	2.45	2.25
Santa Clara	2.86	2.45	2.45	2.45	2.25
Stanford	1.49	1.28	1.28	1.28	1.17
Sunnyvale	6.80	5.83	5.83	5.83	5.34
Westborough	0.54	0.46	0.46	0.46	0.42
Total	**96.5**	**82.7**	**82.7**	**82.7**	**75.8**

Table J1: Basis of Water Supply Data [For Table 7-1 and 7-4], Base Year 2040, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	156.3	156.3	156.3	156.3	156.3
Wholesale RWS Supply Available	99.2	85.1	85.1	75.1	75.1
Percent Cutback	37%	46%	46%	52%	52%

Table J2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2040, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.87	4.18	4.18	3.69	3.69
Brisbane/GVMID	0.56	0.48	0.48	0.43	0.43
Burlingame	2.91	2.49	2.49	2.20	2.20
Coastside	0.85	0.73	0.73	0.64	0.64
CalWater Total	19.21	16.48	16.48	14.54	14.54
Daly City	2.20	1.88	1.88	1.66	1.66
East Palo Alto	1.58	1.36	1.36	1.20	1.20
Estero	2.69	2.30	2.30	2.03	2.03
Hayward	13.21	11.34	11.34	10.00	10.00
Hillsborough	2.07	1.78	1.78	1.57	1.57
Menlo Park	2.58	2.21	2.21	1.95	1.95
Mid-Peninsula	1.84	1.58	1.58	1.39	1.39
Millbrae	1.79	1.53	1.53	1.35	1.35
Milpitas	4.62	3.96	3.96	3.49	3.49
Mountain View	6.03	5.18	5.18	4.57	4.57
North Coast	1.49	1.27	1.27	1.12	1.12
Palo Alto	6.67	5.72	5.72	5.05	5.05
Purissima Hills	1.35	1.16	1.16	1.03	1.03
Redwood City	5.55	4.76	4.76	4.20	4.20
San Bruno	2.03	1.74	1.74	1.54	1.54
San Jose	2.86	2.45	2.45	2.16	2.16
Santa Clara	2.86	2.45	2.45	2.16	2.16
Stanford	1.61	1.38	1.38	1.22	1.22
Sunnyvale	7.26	6.23	6.23	5.49	5.49
Westborough	0.54	0.46	0.46	0.41	0.41
Total	**99.2**	**85.1**	**85.1**	**75.1**	**75.1**

Table K1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2045, *With* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	162.8	162.8	162.8	162.8	162.8
Wholesale RWS Supply Available	88.7	88.7	88.7	75.4	75.4
Percent Cutback	46%	46%	46%	54%	54%

Table K2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2045, *With* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations				
Consecutive Dry Year	1st	2nd	3rd	4th	5th
ACWD	4.97	4.97	4.97	4.22	4.22
Brisbane/GVMID	0.49	0.49	0.49	0.41	0.41
Burlingame	2.56	2.56	2.56	2.17	2.17
Coastside	0.72	0.72	0.72	0.61	0.61
CalWater Total	16.73	16.73	16.73	14.22	14.22
Daly City	1.87	1.87	1.87	1.59	1.59
East Palo Alto	1.58	1.58	1.58	1.34	1.34
Estero	2.39	2.39	2.39	2.03	2.03
Hayward	12.07	12.07	12.07	10.26	10.26
Hillsborough	1.78	1.78	1.78	1.51	1.51
Menlo Park	2.34	2.34	2.34	1.99	1.99
Mid-Peninsula	1.59	1.59	1.59	1.36	1.36
Millbrae	1.74	1.74	1.74	1.48	1.48
Milpitas	4.11	4.11	4.11	3.49	3.49
Mountain View	5.41	5.41	5.41	4.60	4.60
North Coast	1.28	1.28	1.28	1.09	1.09
Palo Alto	5.88	5.88	5.88	5.00	5.00
Purissima Hills	1.17	1.17	1.17	1.00	1.00
Redwood City	4.85	4.85	4.85	4.12	4.12
San Bruno	1.75	1.75	1.75	1.49	1.49
San Jose	2.45	2.45	2.45	2.08	2.08
Santa Clara	2.45	2.45	2.45	2.08	2.08
Stanford	1.47	1.47	1.47	1.25	1.25
Sunnyvale	6.59	6.59	6.59	5.61	5.61
Westborough	0.46	0.46	0.46	0.39	0.39
Total	**88.7**	**88.7**	**88.7**	**75.4**	**75.4**

Section 3: Drought Allocations *Without* Bay-Delta Plan

Table L: RWS Supply Available to the Wholesale Customers (Combined Tables 4a-4f from the SFPUC's March 30th letter) *Without* Bay-Delta Plan (mgd)[h]

	2020	2025	2030	2035	2040	2045
Projected Purchases[i]	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 1st Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 2nd Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 3rd Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 4th Dry Year	132.2	146.0	147.9	151.9	156.3	139.1
Consecutive 5th Dry Year	132.2	146.0	147.9	151.9	156.3	139.1

[h] The SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. However, the SFPUC has indicated that sufficient supplies are available to meet wholesale RWS demand so long as they reasonably stay within 2020 and 2040 levels. The SFPUC's modeling does not indicate cutbacks will be required till the 4th and 5th consecutive dry year at 2045 levels.

[i] Values for 2020 are actual purchases. This row aligns with what is labeled as an "Average Year" in Tables 4a-4f in the SFPUC's March 30th letter. However, these values do not represent an average year and instead are actual purchases for 2020 or projected purchases for 2025 through 2045.

Table M: Wholesale RWS Demand (Combined Totals from Tables A and B) (mgd)

	2020	2025	2030	2035	2040	2045
Projected Purchases[i]	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 1st Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 2nd Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 3rd Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 4th Dry Year	132.2	146.0	147.9	151.9	156.3	162.8
Consecutive 5th Dry Year	132.2	146.0	147.9	151.9	156.3	162.8

Table N: Percent Cutback to the Wholesale Customers *Without* Bay-Delta Plan

	2020	2025	2030	2035	2040	2045
Projected Purchases[i]	0%	0%	0%	0%	0%	0%
Consecutive 1st Dry Year	0%	0%	0%	0%	0%	0%
Consecutive 2nd Dry Year	0%	0%	0%	0%	0%	0%
Consecutive 3rd Dry Year	0%	0%	0%	0%	0%	0%
Consecutive 4th Dry Year	0%	0%	0%	0%	0%	15%
Consecutive 5th Dry Year	0%	0%	0%	0%	0%	15%

Table O1: Basis of Water Supply Data [For Tables 7-1 and 7-4], Base Year 2045, *Without* Bay-Delta Plan (mgd)

Consecutive Dry Year	1st	2nd	3rd	4th	5th
Wholesale RWS Demand	162.8	162.8	162.8	162.8	162.8
Wholesale RWS Supply Available	162.8	162.8	162.8	139.1	139.1
Percent Cutback	0%	0%	0%	Tier 2 Plan	Tier 2 Plan

Table O2: Individual Agency Drought Allocations [For Tables 7-1 and 7-4], Base Year 2045, *Without* Bay-Delta Plan (mgd)

	Wholesale RWS Drought Allocations					Tier 2 Drought Cutback
Consecutive Dry Year	1st	2nd	3rd	4th	5th	
ACWD	9.11	9.11	9.11	8.20	8.20	10.0%
Brisbane/GVMID	0.89	0.89	0.89	0.74	0.74	16.8%
Burlingame	4.69	4.69	4.69	4.02	4.02	14.3%
Coastside	1.33	1.33	1.33	1.19	1.19	10.0%
CalWater Total	30.70	30.70	30.70	26.73	26.73	12.9%
Daly City	3.43	3.43	3.43	3.01	3.01	12.4%
East Palo Alto	2.89	2.89	2.89	2.68	2.68	7.3%
Estero	4.38	4.38	4.38	3.94	3.94	10.0%
Hayward	22.14	22.14	22.14	18.67	18.67	15.7%
Hillsborough	3.26	3.26	3.26	2.93	2.93	10.2%
Menlo Park	4.29	4.29	4.29	3.58	3.58	16.5%
Mid-Peninsula	2.93	2.93	2.93	2.63	2.63	10.0%
Millbrae	3.20	3.20	3.20	2.54	2.54	20.7%
Milpitas	7.53	7.53	7.53	6.55	6.55	13.1%
Mountain View	9.93	9.93	9.93	8.91	8.91	10.3%
North Coast	2.34	2.34	2.34	2.11	2.11	10.0%
Palo Alto	10.79	10.79	10.79	9.71	9.71	10.0%
Purissima Hills	2.15	2.15	2.15	1.41	1.41	34.5%
Redwood City	8.90	8.90	8.90	7.92	7.92	11.1%
San Bruno	3.21	3.21	3.21	2.60	2.60	19.1%
San Jose	4.50	4.50	4.50	2.95	2.95	34.5%
Santa Clara	4.50	4.50	4.50	2.95	2.95	34.5%
Stanford	2.70	2.70	2.70	2.27	2.27	16.0%
Sunnyvale	12.10	12.10	12.10	10.11	10.11	16.5%
Westborough	0.84	0.84	0.84	0.76	0.76	10.0%
Total	**162.8**	**162.8**	**162.8**	**139.1**	**139.1**	

Attachment B: Updated 2020 UWMP Drought Cutbacks

The January 22, 2021, SFPUC Regional Water System (RWS) Supply Reliability Letter (Supply Reliability Letter) provides RWS supplies available to the Wholesale Customers under two scenarios: (1) With Bay-Delta Plan, and (2) Without Bay-Delta Plan. Your agency must choose which scenario to use for your agency's 2020 UWMP submittal tables. However, you may discuss both scenarios in the body of your agency's UWMP. The purpose of this attachment is to provide further detail about your agency's allocation of total RWS supplies available to the Wholesale Customers under both scenarios.

Data Sources for Projected RWS Purchases

Supply allocations are based on projected RWS purchases provided to BAWSCA by the Member Agencies. Following the completion of the Demand Study in June 2020, BAWSCA used the results to develop a table for each Member Agency listing possible supplies and total demand for 2025, 2030, 2035, 2040, and 2045. BAWSCA populated the tables with total demand after passive conservation and entered active conservation, as calculated in the agencies' DSS Model, as a source of supply. Multi-source agencies were asked to complete the table with supply projections, including from the RWS, to meet total demand. Single-source agencies were offered the opportunity to review the tables upon request. Because active conservation was treated as a source of supply, projected RWS purchases are after passive and active conservation.

Water Management Representatives (WMRs) received a draft copy of all projected wholesale RWS purchase requests as part of the January 7, 2021 WMR meeting agenda packet and meeting slides. Agencies were asked to notify BAWSCA if changes were necessary regarding their purchase requests prior to BAWSCA sending those purchase requests to the SFPUC. Purchase requests were transmitted to the SFPUC via a letter dated January 15, 2021 for use in their 2020 UWMP efforts.

Note that the projected RWS purchases used by BAWSCA for fiscal years 2020-21 and for 2021-22 were provided to Christina Tang, BAWSCA's Finance Manager, by each Member Agency in January 2021. This annual reporting is part of the SFPUC's wholesale rate setting process. Member Agencies have provided BAWSCA with these projected purchases annually for the past 10 years.

UWMP Tables 7-1 and 7-5

UWMP Table 7-1 requests supply reliability for a normal year, a single dry year, and multiple (five) dry years. Tables 3, 4, 5, and 6 provided in the Supply Reliability Letter will help your agency complete UWMP Table 7-1. The Drought Risk Assessment (DRA) in UWMP Table 7-5 also requests a five-year drought sequence but specifies years 2021 through 2025. Supply Reliability Letter Tables 9 and 10 will help your agency complete UWMP Table 7-5.

The Supply Reliability Letter provides four tables for completing UWMP Table 7-1. The Supply Reliability Letter Tables 3 (with Bay-Delta Plan) and 4 (without Bay-Delta Plan) use 2020 as the base year. Depending on which scenario you choose, these will be the basis for your agency's five-year DRA (UWMP Table 7-5). The Supply Reliability Letter Tables 5 (with Bay-Delta Plan) and 6 (without Bay-Delta Plan) use 2025 as the base year. Depending on which scenario you choose, these will be the basis for UWMP Tables 7-2 through 7-4. Your agency may submit multiple UWMP Tables 7-1 with different base years (see Figure 1 below).

Attachment B: Updated 2020 UWMP Drought Cutbacks

Figure 1: Footnote from Draft UWMP Table 7-1

Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a Supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.

Total RWS supplies available to the Wholesale Customers in the first through fifth consecutive dry years in Supply Reliability Letter Table 3 align with those in Table 9 of the same letter. Similarly, Supply Reliability Letter Table 4 aligns with Table 10 of the same letter.

Table A below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Tables 7-1and 7-5.

Table A: Wholesale Customer Drought Cutbacks Based on a Single Dry Year and Multiple Dry Years (Base Year 2020)

	(a)	(b)	(c)	(d)	(e)	(f)	(g)
(1)	Projected SF RWS Wholesale Purchases	132.2 MGD	138.6 MGD	140.8 MGD	140.8 MGD	140.8 MGD	140.8 MGD
(2)	Supply Available to the Wholesale Customers	Percent Cutback on Wholesale RWS Purchases					
		2020	**2021**	**2022**	**2023**	**2024**	**2025**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
(4)	132.5 MGD	0.0%	-4.4%	-5.9%	-5.9%	-5.9%	-5.9%
(5)	82.8 MGD	-37.4%	-40.3%	-41.2%	-41.2%	-41.2%	-41.2%
(6)	74.5 MGD	-43.7%	-46.3%	-47.1%	-47.1%	-47.1%	-47.1%

Table A, column (a), rows 3 through 6 lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative actual wholesale RWS purchases for 2020. In years when the Bay-Delta Plan is not in effect, sufficient RWS supplies will be available to meet the Wholesale Customers' purchase requests assuming that they are between the 2020 and 2025 projected levels. As such, RWS supply available to the Wholesale Customers in the 2021 and 2022 is equal to the cumulative projected wholesale RWS.. Projected RWS purchases for years 2021 and 2022 were provided to Christina Tang, BAWSCA's Finance Manager, by the Member Agencies in January 2021. The SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. Additionally, the Tier 2 Plan calculates each agencies' Allocation Factor once at the onset of a drought and it remains the same until the shortage condition is over. Therefore, wholesale RWS demand in 2023 through 2025 is assumed to be static based on the 2022 projected demand.

Table B below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Table 7-1.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table B: Wholesale Customer Drought Cutbacks Based on a Single Dry Year and Multiple Dry Years (Base Year 2025)

	(a)	(b)	(c)	(d)	(e)	(f)
(1)	Projected SF RWS Wholesale Purchases	146.0 MGD	146.0 MGD	146.0 MGD	146.0 MGD	146.0 MGD
(2)	Supply Available to the Wholesale Customers	Percent Cutback on Wholesale RWS Purchases				
		2025	**2026**	**2027**	**2028**	**2029**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	0.0%
(4)	132.5 MGD	-9.2%	-9.2%	-9.2%	-9.2%	-9.2%
(5)	82.8 MGD	-43.3%	-43.3%	-43.3%	-43.3%	-43.3%
(6)	74.5 MGD	-49.0%	-49.0%	-49.0%	-49.0%	-49.0%

Table B, column (a), rows 3 through 6 lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative projected wholesale RWS purchases for 2025 through 2029. The SFPUC's modeling approach does not allow for varying demands over the course of a dry year sequence. Additionally, the Tier 2 Plan calculates each agencies' Allocation Factor once at the onset of a drought and it remains the same until the shortage condition is over. Therefore, wholesale RWS demand is assumed to be static between 2025 and 2029 based on the 2025 projected demand.

To complete UWMP Tables 7-1 and 7-5, reference tables in the Supply Reliability Letter to identify total RWS supplies available to the Wholesale Customers and apply the percent cutback in the corresponding year of the drought sequence using Tables A and B. For example, in Supply Reliability Letter Table 3, in the 5th consecutive year of a drought, the volume available to the Wholesale Customers is 74.5 MGD. To calculate RWS supplies available to your agency in 2025 using table A, locate the row with 74.5 MGD on the table – row 6 – and the column for 2025 – column (g). Then apply the percent cutback to your agency's RWS demand in 2025.

A list of purchase projections by agency are provided in Tables C, D, E, and F. The table also indicates the percent cutback that should be applied based on total RWS supplies available to the Wholesale Customers. Tables C and E use Scenario 1: With Bay-Delta Plan. Tables D and F use Scenario 2: Without Bay-Delta Plan. Tables C and D use 2020 as the base year and Tables E and F use 2025 as the base year.

BAWSCA understands that agencies are updating projected demands for their 2020 UWMPs and that projected RWS purchases may change from what was previously provided. Additionally, BAWSCA recognizes that not all Member Agencies will choose the same scenario for their UWMP supply reliability tables. For both reasons, projected RWS purchases in each Member Agency's 2020 UWMP may not add up to total Wholesale demands in the SFPUC's 2020 UWMP. This is consistent with direction given by the Department of Water Resources, which encourages suppliers use the UWMP tables to represent what they believe to be the most likely supply reliability scenario and to characterize the five-consecutive year drought in a manner that is best suited for understanding and managing their water service reliability and individual agency level of risk tolerance.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table C: Scenario 1: With Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2020)

	2020 (184 MGD)		2021 (157.5 MGD)		2022 (132.5 MGD)		2023 (74.5 MGD)		2024 (74.5 MGD)		2025 (74.5 MGD)	
Agency	Actual Purchases	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.87	0.0%	9.44	0.0%	9.46	-5.9%	9.46	-47%	9.46	-47%	9.46	-47%
Brisbane/GVMID	0.64	0.0%	0.62	0.0%	0.65	-5.9%	0.65	-47%	0.65	-47%	0.65	-47%
Burlingame	3.48	0.0%	3.34	0.0%	3.35	-5.9%	3.35	-47%	3.35	-47%	3.35	-47%
Coastside	1.02	0.0%	1.54	0.0%	1.23	-5.9%	1.23	-47%	1.23	-47%	1.23	-47%
CalWater Total	29.00	0.0%	29.66	0.0%	29.81	-5.9%	29.81	-47%	29.81	-47%	29.81	-47%
Daly City	3.97	0.0%	4.00	0.0%	4.01	-5.9%	4.01	-47%	4.01	-47%	4.01	-47%
East Palo Alto	1.57	0.0%	1.63	0.0%	1.69	-5.9%	1.69	-47%	1.69	-47%	1.69	-47%
Estero	4.34	0.0%	4.48	0.0%	4.51	-5.9%	4.51	-47%	4.51	-47%	4.51	-47%
Hayward	13.92	0.0%	14.47	0.0%	15.12	-5.9%	15.12	-47%	15.12	-47%	15.12	-47%
Hillsborough	2.62	0.0%	2.95	0.0%	3.05	-5.9%	3.05	-47%	3.05	-47%	3.05	-47%
Menlo Park	2.96	0.0%	2.92	0.0%	2.93	-5.9%	2.93	-47%	2.93	-47%	2.93	-47%
Mid-Peninsula	2.66	0.0%	2.65	0.0%	2.80	-5.9%	2.80	-47%	2.80	-47%	2.80	-47%
Millbrae	1.90	0.0%	1.95	0.0%	2.15	-5.9%	2.15	-47%	2.15	-47%	2.15	-47%
Milpitas	5.92	0.0%	5.88	0.0%	5.34	-5.9%	5.34	-47%	5.34	-47%	5.34	-47%
Mountain View	7.67	0.0%	7.80	0.0%	8.05	-5.9%	8.05	-47%	8.05	-47%	8.05	-47%
North Coast	2.37	0.0%	2.58	0.0%	2.66	-5.9%	2.66	-47%	2.66	-47%	2.66	-47%
Palo Alto	9.75	0.0%	9.44	0.0%	9.66	-5.9%	9.66	-47%	9.66	-47%	9.66	-47%
Purissima Hills	1.75	0.0%	1.97	0.0%	2.02	-5.9%	2.02	-47%	2.02	-47%	2.02	-47%
Redwood City	8.76	0.0%	8.72	0.0%	9.07	-5.9%	9.07	-47%	9.07	-47%	9.07	-47%
San Bruno	0.95	0.0%	3.39	0.0%	3.40	-5.9%	3.40	-47%	3.40	-47%	3.40	-47%
San José	4.26	0.0%	4.31	0.0%	4.51	-5.9%	4.51	-47%	4.51	-47%	4.51	-47%
Santa Clara	3.27	0.0%	3.29	0.0%	3.50	-5.9%	3.50	-47%	3.50	-47%	3.50	-47%
Stanford	1.43	0.0%	1.40	0.0%	1.54	-5.9%	1.54	-47%	1.54	-47%	1.54	-47%
Sunnyvale	9.33	0.0%	9.35	0.0%	9.45	-5.9%	9.45	-47%	9.45	-47%	9.45	-47%
Westborough	0.82	0.0%	0.84	0.0%	0.81	-5.9%	0.81	-47%	0.81	-47%	0.81	-47%
Wholesale Total	**132.2**	**132.2†**	**138.6**	**138.6†**	**140.8**	**132.5†**	**140.8**	**74.5†**	**140.8**	**74.5†**	**140.8**	**74.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table D: Scenario 2: Without Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2020)

	2020 (184 MGD)		**2021** (157.5 MGD)		**2022** (132.5 MGD)		**2023** (132.5 MGD)		**2024** (132.5 MGD)		**2025** (132.5 MGD)	
Agency	Actual Purchases	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.87	0.0%	9.44	0.0%	9.46	-5.9%	9.46	-5.9%	9.46	-5.9%	9.46	-5.9%
Brisbane/GVMID	0.64	0.0%	0.62	0.0%	0.65	-5.9%	0.65	-5.9%	0.65	-5.9%	0.65	-5.9%
Burlingame	3.48	0.0%	3.34	0.0%	3.35	-5.9%	3.35	-5.9%	3.35	-5.9%	3.35	-5.9%
Coastside	1.02	0.0%	1.54	0.0%	1.23	-5.9%	1.23	-5.9%	1.23	-5.9%	1.23	-5.9%
CalWater Total	29.00	0.0%	29.66	0.0%	29.81	-5.9%	29.81	-5.9%	29.81	-5.9%	29.81	-5.9%
Daly City	3.97	0.0%	4.00	0.0%	4.01	-5.9%	4.01	-5.9%	4.01	-5.9%	4.01	-5.9%
East Palo Alto	1.57	0.0%	1.63	0.0%	1.69	-5.9%	1.69	-5.9%	1.69	-5.9%	1.69	-5.9%
Estero	4.34	0.0%	4.48	0.0%	4.51	-5.9%	4.51	-5.9%	4.51	-5.9%	4.51	-5.9%
Hayward	13.92	0.0%	14.47	0.0%	15.12	-5.9%	15.12	-5.9%	15.12	-5.9%	15.12	-5.9%
Hillsborough	2.62	0.0%	2.95	0.0%	3.05	-5.9%	3.05	-5.9%	3.05	-5.9%	3.05	-5.9%
Menlo Park	2.96	0.0%	2.92	0.0%	2.93	-5.9%	2.93	-5.9%	2.93	-5.9%	2.93	-5.9%
Mid-Peninsula	2.66	0.0%	2.65	0.0%	2.80	-5.9%	2.80	-5.9%	2.80	-5.9%	2.80	-5.9%
Millbrae	1.90	0.0%	1.95	0.0%	2.15	-5.9%	2.15	-5.9%	2.15	-5.9%	2.15	-5.9%
Milpitas	5.92	0.0%	5.88	0.0%	5.34	-5.9%	5.34	-5.9%	5.34	-5.9%	5.34	-5.9%
Mountain View	7.67	0.0%	7.80	0.0%	8.05	-5.9%	8.05	-5.9%	8.05	-5.9%	8.05	-5.9%
North Coast	2.37	0.0%	2.58	0.0%	2.66	-5.9%	2.66	-5.9%	2.66	-5.9%	2.66	-5.9%
Palo Alto	9.75	0.0%	9.44	0.0%	9.66	-5.9%	9.66	-5.9%	9.66	-5.9%	9.66	-5.9%
Purissima Hills	1.75	0.0%	1.97	0.0%	2.02	-5.9%	2.02	-5.9%	2.02	-5.9%	2.02	-5.9%
Redwood City	8.76	0.0%	8.72	0.0%	9.07	-5.9%	9.07	-5.9%	9.07	-5.9%	9.07	-5.9%
San Bruno	0.95	0.0%	3.39	0.0%	3.40	-5.9%	3.40	-5.9%	3.40	-5.9%	3.40	-5.9%
San José	4.26	0.0%	4.31	0.0%	4.51	-5.9%	4.51	-5.9%	4.51	-5.9%	4.51	-5.9%
Santa Clara	3.27	0.0%	3.29	0.0%	3.50	-5.9%	3.50	-5.9%	3.50	-5.9%	3.50	-5.9%
Stanford	1.43	0.0%	1.40	0.0%	1.54	-5.9%	1.54	-5.9%	1.54	-5.9%	1.54	-5.9%
Sunnyvale	9.33	0.0%	9.35	0.0%	9.45	-5.9%	9.45	-5.9%	9.45	-5.9%	9.45	-5.9%
Westborough	0.82	0.0%	0.84	0.0%	0.81	-5.9%	0.81	-5.9%	0.81	-5.9%	0.81	-5.9%
Wholesale Total	**132.2**	**132.2†**	**138.6**	**138.6†**	**140.8**	**132.5†**	**140.8**	**132.5†**	**140.8**	**132.5†**	**140.8**	**132.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table E: Scenario 1: With Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2025)

	2025 (184 MGD)		2026 (82.8 MGD)		2027 (74.5 MGD)		2028 (74.5 MGD)		2029 (74.5 MGD)	
Agency	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.68	0%	7.68	-43.3%	7.68	-49%	7.68	-49%	7.68	-49%
Brisbane/GVMID	0.89	0%	0.89	-43.3%	0.89	-49%	0.89	-49%	0.89	-49%
Burlingame	4.33	0%	4.33	-43.3%	4.33	-49%	4.33	-49%	4.33	-49%
Coastside	1.40	0%	1.40	-43.3%	1.40	-49%	1.40	-49%	1.40	-49%
CalWater Total	29.99	0%	29.99	-43.3%	29.99	-49%	29.99	-49%	29.99	-49%
Daly City	3.57	0%	3.57	-43.3%	3.57	-49%	3.57	-49%	3.57	-49%
East Palo Alto	1.88	0%	1.88	-43.3%	1.88	-49%	1.88	-49%	1.88	-49%
Estero	4.07	0%	4.07	-43.3%	4.07	-49%	4.07	-49%	4.07	-49%
Hayward	17.86	0%	17.86	-43.3%	17.86	-49%	17.86	-49%	17.86	-49%
Hillsborough	3.26	0%	3.26	-43.3%	3.26	-49%	3.26	-49%	3.26	-49%
Menlo Park	3.55	0%	3.55	-43.3%	3.55	-49%	3.55	-49%	3.55	-49%
Mid-Peninsula	2.86	0%	2.86	-43.3%	2.86	-49%	2.86	-49%	2.86	-49%
Millbrae	2.29	0%	2.29	-43.3%	2.29	-49%	2.29	-49%	2.29	-49%
Milpitas	6.59	0%	6.59	-43.3%	6.59	-49%	6.59	-49%	6.59	-49%
Mountain View	8.60	0%	8.60	-43.3%	8.60	-49%	8.60	-49%	8.60	-49%
North Coast	2.34	0%	2.34	-43.3%	2.34	-49%	2.34	-49%	2.34	-49%
Palo Alto	10.06	0%	10.06	-43.3%	10.06	-49%	10.06	-49%	10.06	-49%
Purissima Hills	2.09	0%	2.09	-43.3%	2.09	-49%	2.09	-49%	2.09	-49%
Redwood City	8.46	0%	8.46	-43.3%	8.46	-49%	8.46	-49%	8.46	-49%
San Bruno	3.24	0%	3.24	-43.3%	3.24	-49%	3.24	-49%	3.24	-49%
San José	4.50	0%	4.50	-43.3%	4.50	-49%	4.50	-49%	4.50	-49%
Santa Clara	4.50	0%	4.50	-43.3%	4.50	-49%	4.50	-49%	4.50	-49%
Stanford	2.01	0%	2.01	-43.3%	2.01	-49%	2.01	-49%	2.01	-49%
Sunnyvale	9.16	0%	9.16	-43.3%	9.16	-49%	9.16	-49%	9.16	-49%
Westborough	0.86	0%	0.86	-43.3%	0.86	-49%	0.86	-49%	0.86	-49%
Wholesale Total	**146.0**	**146.0†**	**146.0**	**82.8†**	**146.0**	**74.5†**	**146.0**	**74.5†**	**146.0**	**74.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table F: Scenario 2: Without Bay-Delta Plan - Projected Wholesale Customer RWS Demand and Percent Cutback for a Single Dry Year and Multiple Dry Years (Base Year 2025)

	2025 (184 MGD)		2026 (157.5 MGD)		2027 (157.5 MGD)		2028 (157.5 MGD)		2029 (132.5 MGD)	
Agency	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback	Projected Demand	Drought Cutback
ACWD	7.68	0.0%	7.68	0.0%	7.68	0.0%	7.68	0.0%	7.68	-9.2%
Brisbane/GVMID	0.89	0.0%	0.89	0.0%	0.89	0.0%	0.89	0.0%	0.89	-9.2%
Burlingame	4.33	0.0%	4.33	0.0%	4.33	0.0%	4.33	0.0%	4.33	-9.2%
Coastside	1.40	0.0%	1.40	0.0%	1.40	0.0%	1.40	0.0%	1.40	-9.2%
CalWater Total	29.99	0.0%	29.99	0.0%	29.99	0.0%	29.99	0.0%	29.99	-9.2%
Daly City	3.57	0.0%	3.57	0.0%	3.57	0.0%	3.57	0.0%	3.57	-9.2%
East Palo Alto	1.88	0.0%	1.88	0.0%	1.88	0.0%	1.88	0.0%	1.88	-9.2%
Estero	4.07	0.0%	4.07	0.0%	4.07	0.0%	4.07	0.0%	4.07	-9.2%
Hayward	17.86	0.0%	17.86	0.0%	17.86	0.0%	17.86	0.0%	17.86	-9.2%
Hillsborough	3.26	0.0%	3.26	0.0%	3.26	0.0%	3.26	0.0%	3.26	-9.2%
Menlo Park	3.55	0.0%	3.55	0.0%	3.55	0.0%	3.55	0.0%	3.55	-9.2%
Mid-Peninsula	2.86	0.0%	2.86	0.0%	2.86	0.0%	2.86	0.0%	2.86	-9.2%
Millbrae	2.29	0.0%	2.29	0.0%	2.29	0.0%	2.29	0.0%	2.29	-9.2%
Milpitas	6.59	0.0%	6.59	0.0%	6.59	0.0%	6.59	0.0%	6.59	-9.2%
Mountain View	8.60	0.0%	8.60	0.0%	8.60	0.0%	8.60	0.0%	8.60	-9.2%
North Coast	2.34	0.0%	2.34	0.0%	2.34	0.0%	2.34	0.0%	2.34	-9.2%
Palo Alto	10.06	0.0%	10.06	0.0%	10.06	0.0%	10.06	0.0%	10.06	-9.2%
Purissima Hills	2.09	0.0%	2.09	0.0%	2.09	0.0%	2.09	0.0%	2.09	-9.2%
Redwood City	8.46	0.0%	8.46	0.0%	8.46	0.0%	8.46	0.0%	8.46	-9.2%
San Bruno	3.24	0.0%	3.24	0.0%	3.24	0.0%	3.24	0.0%	3.24	-9.2%
San José	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	-9.2%
Santa Clara	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	0.0%	4.50	-9.2%
Stanford	2.01	0.0%	2.01	0.0%	2.01	0.0%	2.01	0.0%	2.01	-9.2%
Sunnyvale	9.16	0.0%	9.16	0.0%	9.16	0.0%	9.16	0.0%	9.16	-9.2%
Westborough	0.86	0.0%	0.86	0.0%	0.86	0.0%	0.86	0.0%	0.86	-9.2%
Wholesale Total	**146.0**	**146.0†**	**146.0**	**146.4†**	**146.0**	**146.8†**	**146.0**	**147.1†**	**146.0**	**132.5†**

† Total supply available to the Wholesale Customers after drought cutback.

Attachment B: Updated 2020 UWMP Drought Cutbacks

UWMP Table 7-4

Supply Reliability Letter Tables 7 and 8 will help your agency complete UWMP Table 7-4. Table G below provides a summary of the Member Agencies' RWS supply drought cutbacks under each of the four supply availability conditions and is intended to help you complete UWMP Table 7-4. The table assumes (1) the Tier 2 Plan will be used to allocate supplies available to the Wholesale Customers when average Wholesale Customers' RWS shortages are greater than 10 and up to 20 percent, and (2) an equal percent reduction will be shared across all Wholesale Customers when average Wholesale Customers' RWS shortages are 10 percent or less or greater than 20 percent.

Table G: Drought Cutbacks Based on Projected Demands Under All Water Supply Availability Conditions

	(a)	(b)	(c)	(d)	(e)	(f)
(1)	Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
(2)	Supply Available to the Wholesale Customers	% Cutback on Wholesale RWS Purchases				
		2025	**2030**	**2035**	**2040**	**2045**
(3)	157.5 MGD	0.0%	0.0%	0.0%	0.0%	-3.2%
(4)	132.5 MGD	-9.3%	-10.4%	Tier 2 Avg. -14%*	Tier 2 Avg. -16%*	Tier 2 Avg. -19%*
(5)	82.8 MGD	-43.3%	-44.0%	-45.5%	-47.0%	-49.1%
(6)	74.5 MGD	-49.0%	-49.6%	-51.0%	-52.3%	-54.2%

* Calculated average. Individual agency cutbacks are calculated in Table H.

Table G, column (a) lists total RWS supplies available to the Wholesale Customers as provided in the Supply Reliability Letter tables. Row 1 provides cumulative projected wholesale RWS purchases for 2025, 2030, 2035, 2040, and 2045.

Tables H, I, J and K provide additional detail by agency for each of the four supply availability conditions listed in Table G. To complete UWMP Table 7-4, reference Table 7 or 8 (depending on which Bay-Delta Plan scenario you choose) in the Supply Reliability Letter to identify total RWS supplies available to the Wholesale Customers and apply the percent cutback in the corresponding year using Table G or input the volumetric drought allocation using Tables H, I, J and K below.

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table H: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 157.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2035**	**2040**	**2045**
ACWD	7.68	7.68	7.68	7.68	8.82
Brisbane/GVMID	0.89	0.89	0.88	0.89	0.87
Burlingame	4.33	4.40	4.47	4.58	4.54
Coastside	1.40	1.38	1.36	1.33	1.28
CalWater Total	29.99	29.74	29.81	30.27	29.71
Daly City	3.57	3.52	3.49	3.46	3.32
East Palo Alto	1.88	1.95	2.10	2.49	2.80
Estero	4.07	4.11	4.18	4.23	4.24
Hayward	17.86	18.68	19.75	20.82	21.43
Hillsborough	3.26	3.25	3.26	3.26	3.15
Menlo Park	3.55	3.68	3.87	4.06	4.15
Mid-Peninsula	2.86	2.84	2.88	2.89	2.83
Millbrae	2.29	2.50	2.45	2.82	3.10
Milpitas	6.59	6.75	7.03	7.27	7.29
Mountain View	8.60	8.90	9.20	9.51	9.61
North Coast	2.34	2.33	2.34	2.34	2.27
Palo Alto	10.06	10.15	10.28	10.51	10.44
Purissima Hills	2.09	2.09	2.12	2.13	2.08
Redwood City	8.46	8.49	8.64	8.74	8.62
San Bruno	3.24	3.22	3.20	3.20	3.11
San José	4.50	4.50	4.50	4.50	4.35
Santa Clara	4.50	4.50	4.50	4.50	4.35
Stanford	2.01	2.18	2.35	2.53	2.61
Sunnyvale	9.16	9.30	10.70	11.44	11.71
Westborough	0.86	0.85	0.85	0.84	0.82
Wholesale Total	**146.0**	**147.9**	**151.9**	**156.3**	**157.5**

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table I: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 132.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2035**	**2040**	**2045**
ACWD	6.97	6.88	6.91	6.91	8.20
Brisbane/GVMID	0.81	0.79	0.73	0.73	0.72
Burlingame	3.93	3.94	3.96	3.89	3.80
Coastside	1.27	1.24	1.22	1.20	1.19
CalWater Total	27.21	26.65	26.46	25.69	24.69
Daly City	3.24	3.15	3.04	3.01	2.98
East Palo Alto	1.70	1.75	1.97	2.30	2.62
Estero	3.69	3.68	3.76	3.87	3.77
Hayward	16.20	16.74	17.32	17.69	18.07
Hillsborough	2.96	2.92	2.90	2.75	2.56
Menlo Park	3.22	3.30	3.37	3.33	3.26
Mid-Peninsula	2.59	2.54	2.59	2.62	2.54
Millbrae	2.07	2.24	2.16	2.32	2.45
Milpitas	5.98	6.05	6.25	6.31	6.35
Mountain View	7.80	7.97	8.28	8.49	8.34
North Coast	2.12	2.09	2.11	2.11	2.11
Palo Alto	9.13	9.09	9.26	9.46	9.71
Purissima Hills	1.89	1.87	1.42	1.38	1.32
Redwood City	7.67	7.61	7.89	7.70	7.49
San Bruno	2.94	2.88	2.56	2.51	2.45
San José	4.08	4.03	3.03	2.91	2.76
Santa Clara	4.08	4.03	3.03	2.91	2.76
Stanford	1.82	1.95	2.06	2.13	2.16
Sunnyvale	8.31	8.33	9.46	9.51	9.43
Westborough	0.78	0.76	0.76	0.76	0.76
Wholesale Total	**132.5**	**132.5**	**132.5**	**132.5**	**132.5**

Attachment B: Updated 2020 UWMP Drought Cutbacks

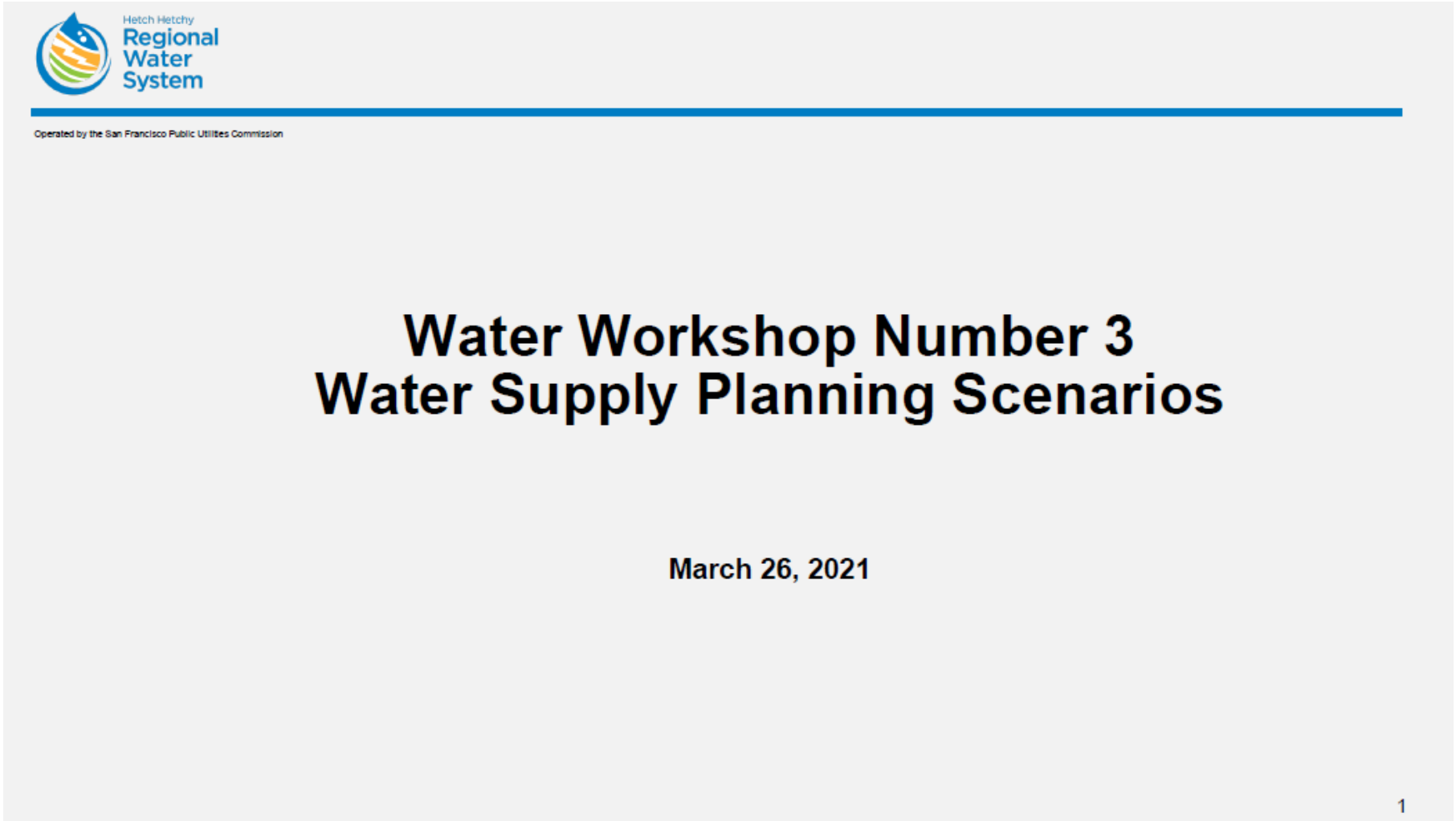
Table J: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 82.8 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2035**	**2040**	**2045**
ACWD	4.36	4.30	4.19	4.07	4.64
Brisbane/GVMID	0.51	0.50	0.48	0.47	0.45
Burlingame	2.45	2.46	2.44	2.43	2.39
Coastside	0.79	0.77	0.74	0.71	0.68
CalWater Total	17.00	16.65	16.25	16.03	15.62
Daly City	2.02	1.97	1.90	1.83	1.75
East Palo Alto	1.06	1.09	1.14	1.32	1.47
Estero	2.31	2.30	2.28	2.24	2.23
Hayward	10.13	10.46	10.77	11.03	11.26
Hillsborough	1.85	1.82	1.78	1.73	1.66
Menlo Park	2.01	2.06	2.11	2.15	2.18
Mid-Peninsula	1.62	1.59	1.57	1.53	1.49
Millbrae	1.30	1.40	1.34	1.49	1.63
Milpitas	3.74	3.78	3.83	3.85	3.83
Mountain View	4.88	4.98	5.01	5.04	5.05
North Coast	1.33	1.30	1.28	1.24	1.19
Palo Alto	5.71	5.68	5.61	5.57	5.49
Purissima Hills	1.18	1.17	1.15	1.13	1.10
Redwood City	4.80	4.76	4.71	4.63	4.53
San Bruno	1.83	1.80	1.75	1.70	1.63
San José	2.55	2.52	2.45	2.38	2.29
Santa Clara	2.55	2.52	2.45	2.38	2.29
Stanford	1.14	1.22	1.28	1.34	1.37
Sunnyvale	5.19	5.21	5.83	6.06	6.16
Westborough	0.49	0.48	0.46	0.45	0.43
Wholesale Total	**82.8**	**82.8**	**82.8**	**82.8**	**82.8**

Attachment B: Updated 2020 UWMP Drought Cutbacks

Table K: Drought Allocations when Total Supplies Available to the Wholesale Customers are Equal to 74.5 MGD

Projected SF RWS Wholesale Purchases	146.0 MGD	147.9 MGD	151.9 MGD	156.3 MGD	162.8 MGD
	Drought Allocation (MGD)				
Agency	**2025**	**2030**	**2035**	**2040**	**2045**
ACWD	3.92	3.87	3.77	3.66	4.17
Brisbane/GVMID	0.46	0.45	0.43	0.42	0.41
Burlingame	2.21	2.21	2.19	2.18	2.15
Coastside	0.71	0.70	0.67	0.64	0.61
CalWater Total	15.30	14.98	14.62	14.43	14.05
Daly City	1.82	1.77	1.71	1.65	1.57
East Palo Alto	0.96	0.98	1.03	1.19	1.32
Estero	2.08	2.07	2.05	2.02	2.00
Hayward	9.11	9.41	9.69	9.92	10.14
Hillsborough	1.66	1.64	1.60	1.55	1.49
Menlo Park	1.81	1.86	1.90	1.94	1.96
Mid-Peninsula	1.46	1.43	1.41	1.38	1.34
Millbrae	1.17	1.26	1.20	1.34	1.47
Milpitas	3.36	3.40	3.45	3.47	3.45
Mountain View	4.39	4.48	4.51	4.53	4.54
North Coast	1.19	1.17	1.15	1.12	1.07
Palo Alto	5.14	5.11	5.04	5.01	4.94
Purissima Hills	1.06	1.05	1.04	1.02	0.99
Redwood City	4.31	4.28	4.24	4.17	4.08
San Bruno	1.65	1.62	1.57	1.53	1.47
San José	2.30	2.27	2.21	2.14	2.06
Santa Clara	2.30	2.27	2.21	2.14	2.06
Stanford	1.03	1.10	1.15	1.21	1.24
Sunnyvale	4.67	4.69	5.25	5.45	5.54
Westborough	0.44	0.43	0.41	0.40	0.39
Wholesale Total	**74.5**	**74.5**	**74.5**	**74.5**	**74.5**


Hetch Hetchy
Regional
Water
System
Operated by the San Francisco Public Utilities Commission
Water Workshop Number 3
Water Supply Planning Scenarios
March 26, 2021
1

Hetch Hetchy Regional Water System

Introduction

- Ten water supply planning scenarios were run using our HHLSM system modeling tool and the Regional Water System Supply and Demand Worksheet.
- For each scenario the ultimate result is either a surplus or deficit of supply, and each scenario produces different results, demonstrating the effect of the choices that are made.
- The assumptions and results for each scenario will be displayed in this presentation.
- The presentation concludes with a summary table of the bottom-line results for all the scenarios.

2

The Ten Scenarios

I. Previous Demand Estimates
II. Current Conditions
III. Tuolumne River Voluntary Agreement
IV. Bay-Delta Plan
V. Bay-Delta Plan with Alternative Water Supply Projects
VI. Bay-Delta Plan with Alternative Water Supply Projects and Modified Rationing Policy
VII. Bay-Delta Plan with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought
VIII. Water Quality Certification (401) with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought
IX. NGO scenario 1: Current system, 198 mgd constant demand, Bay-Delta Plan flows
X. NGO Scenario 2: Current system, 223 mgd constant demand, 7 ½ year design drought, Bay-Delta Plan flows

3

I. Prior Demand Estimates

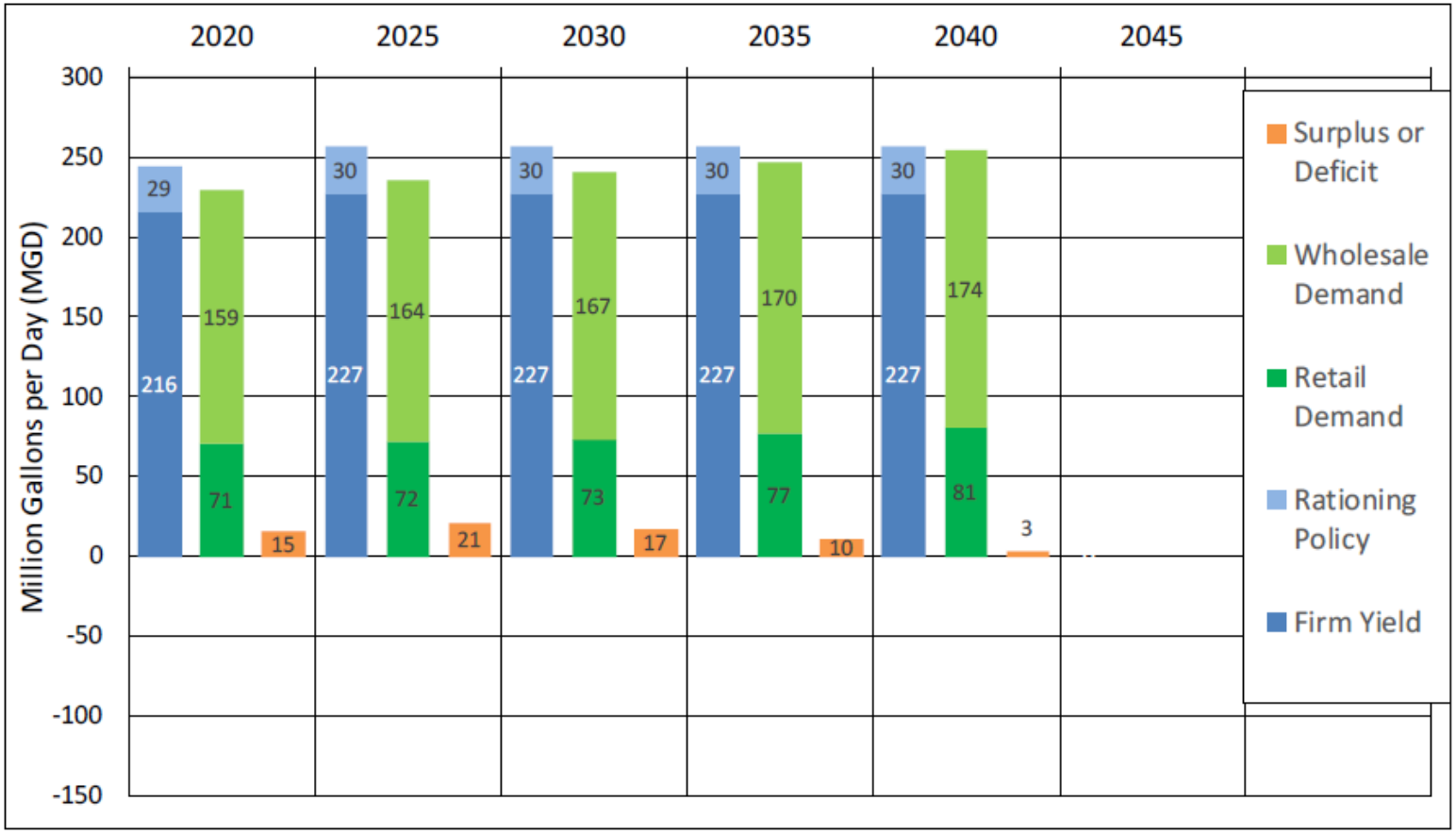
- Includes retail demand projections from the 2015 Urban Water Management Plan
- Includes 2015 purchase projections from wholesale customers
- Includes current side agreement on flows in the lower Tuolumne River
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	2020	2025	2030	2035	2040	2045
Total Yield:	245	257	257	257	257	NA
RWS Demand:	230	236	241	247	255	NA
Lower Tuolumne Contribution:	NA	NA	NA	NA	NA	NA
Surplus or Deficit:	15	21	17	10	3	NA

4

I. Prior Demand Estimates



5

II. Current Conditions

- Includes updated demand projections for anticipated development in retail service area*
- Includes most recent purchase projections from wholesale customers*
- Includes a total of 9 MGD for San Jose and Santa Clara*
- Includes the 1995 side agreement on flows in the lower Tuolumne River
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

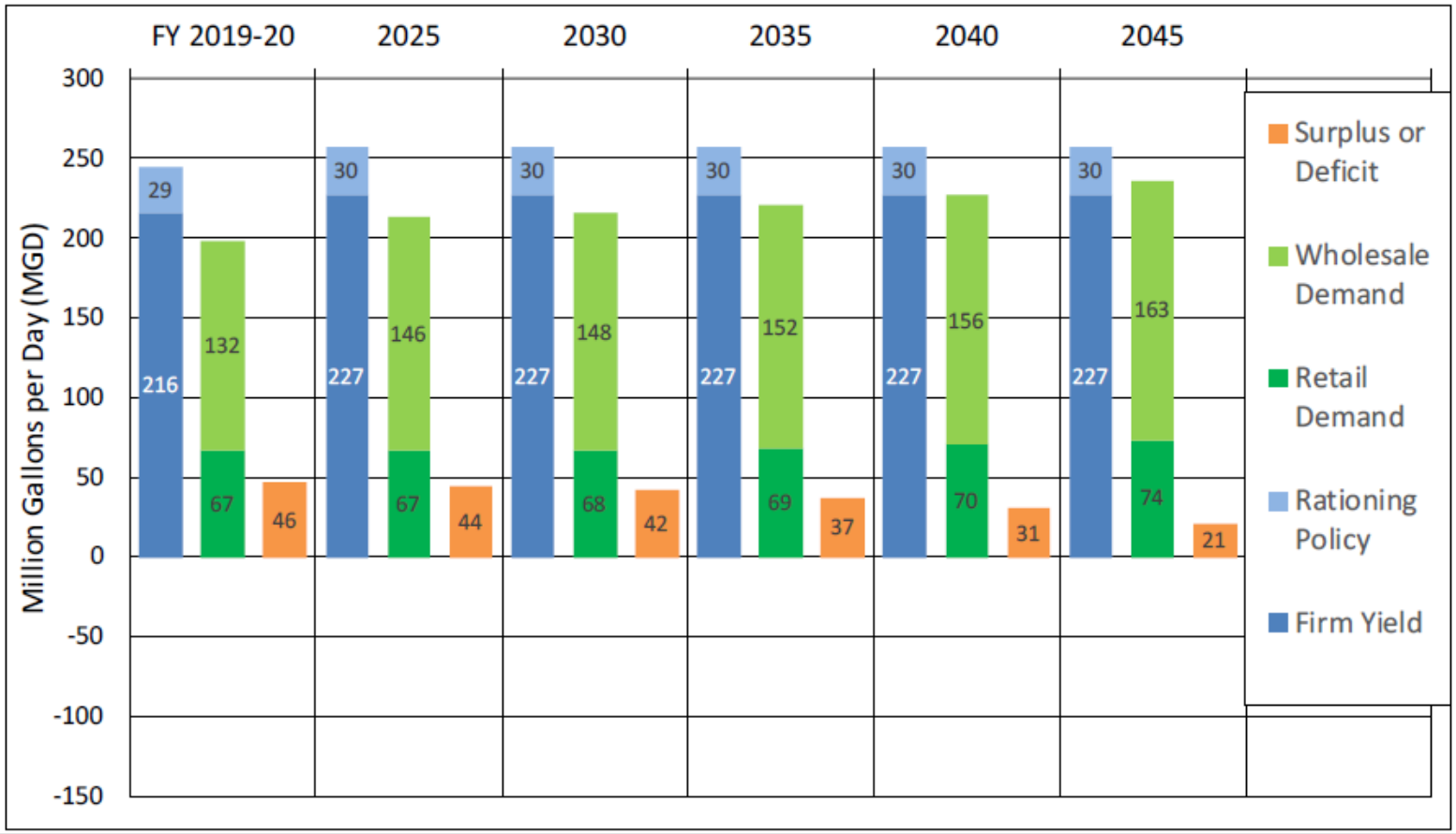
	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	245	257	257	257	257	257
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	NA	NA	NA	NA	NA
Surplus or Deficit:	46	44	42	37	31	21

* Base Conditions in later slides

6

Hetch Hetchy Regional Water System

II. Current Conditions



7

III. Tuolumne River Voluntary Agreement

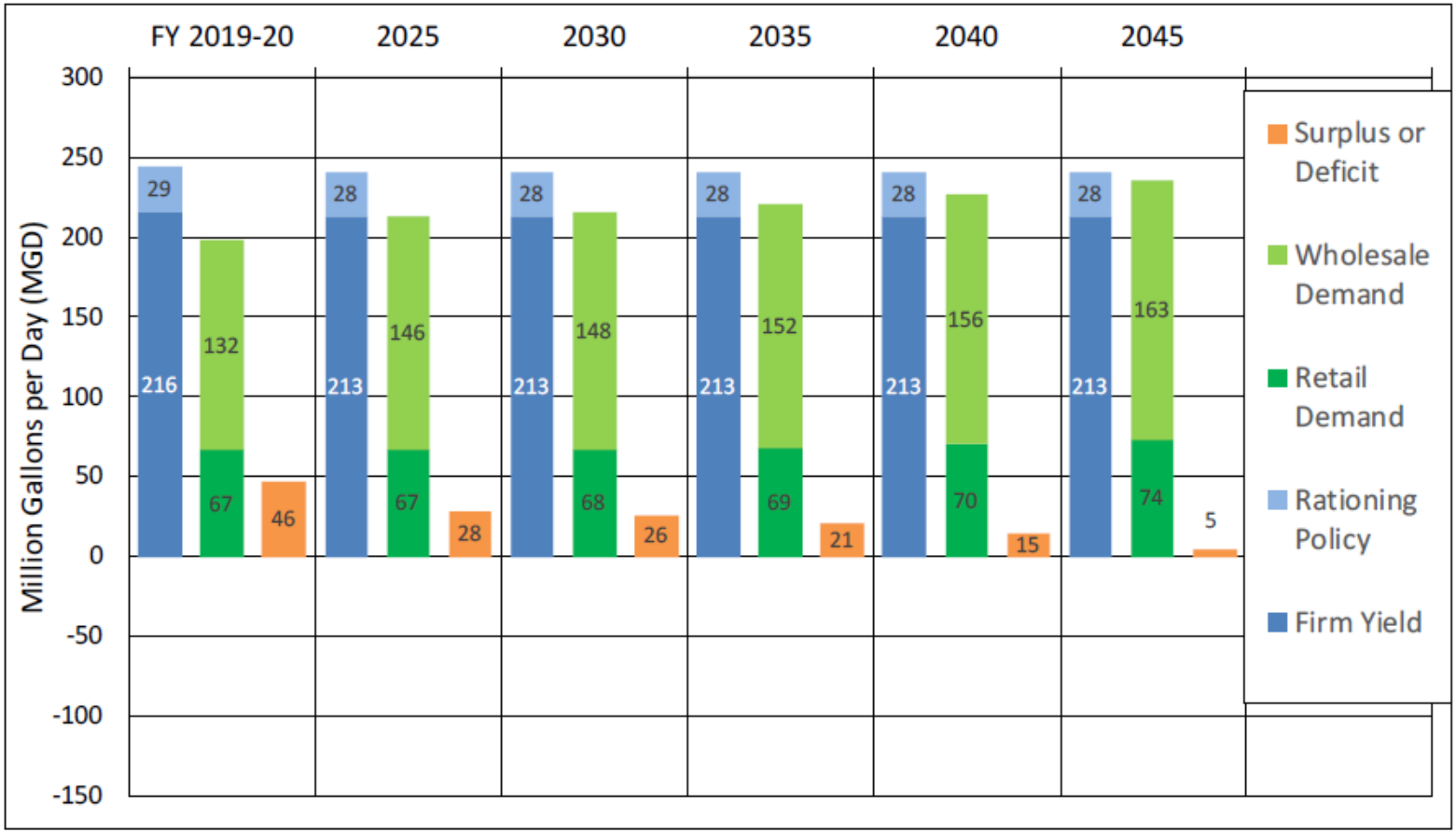
- Base Conditions
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy
- Includes SFPUC contribution to the TRVA, displayed in the graph as a reduction in Firm Yield
- SFPUC contributions are calculated according to the 4th Agreement and assumes continuation of the 1995 side agreement.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	245	241	241	241	241	241
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	14	14	14	14	14
Surplus or Deficit:	46	28	26	21	15	5

8

III. Tuolumne River Voluntary Agreement



9

IV. Bay-Delta Plan

- Base Conditions
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy
- Includes SFPUC contribution to the Bay-Delta Plan displayed in the graph as a reduction in Firm Yield, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.

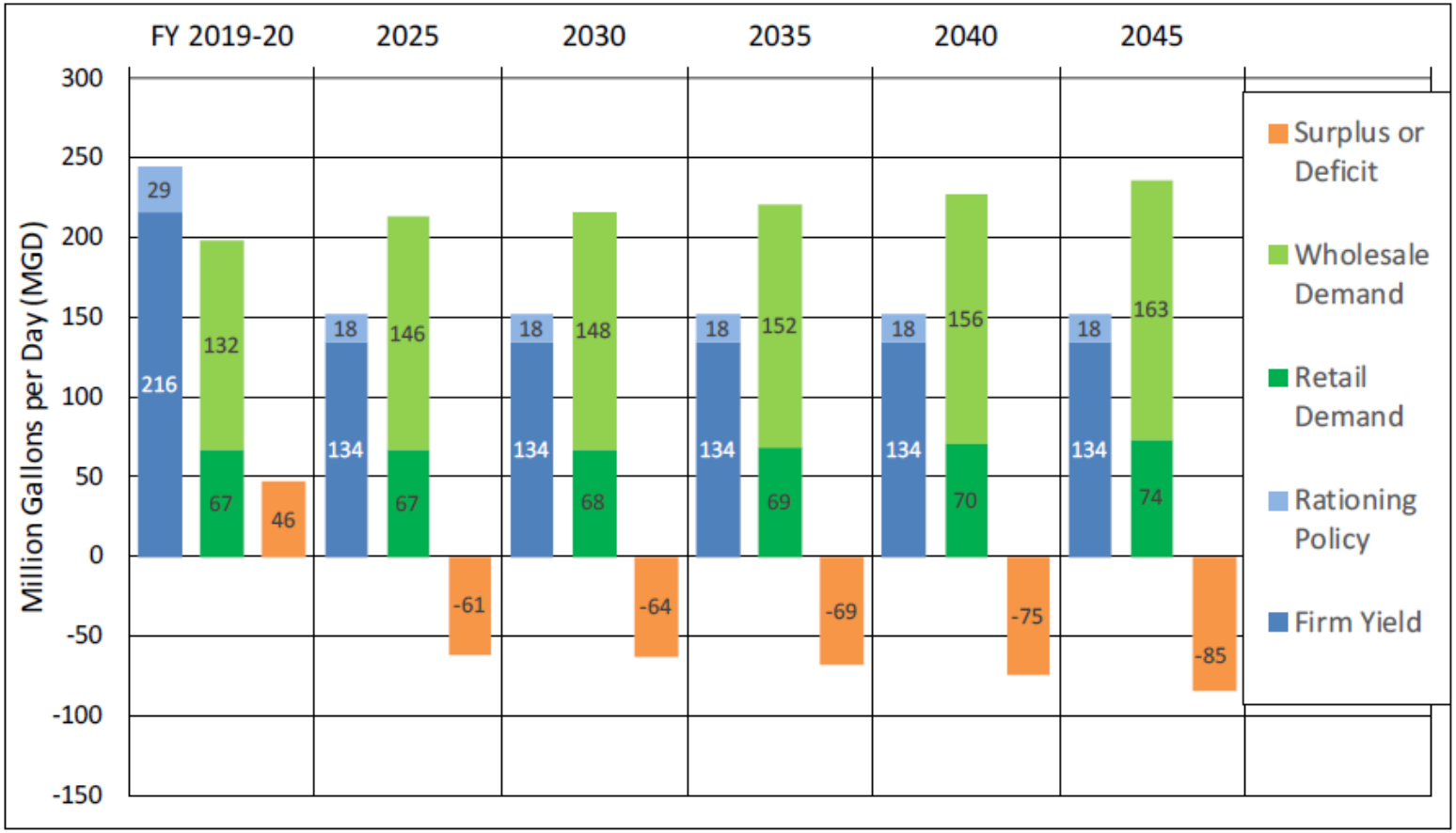
SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	245	152	152	152	152	152
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	93	93	93	93	93
Surplus or Deficit:	46	-61	-64	-69	-75	-85

10

Hetch Hetchy Regional Water System

IV. Bay-Delta Plan



11

V. Bay-Delta Plan with Alternative Water Supply Projects

- Base Conditions
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy
- Includes SFPUC contribution to the Bay-Delta Plan displayed in the graph as a reduction in Firm Yield, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and continuation of the 1995 side agreement.
- Includes a total of 35 MGD of new water supply projects, which are assumed to be added between 2025 and 2040. The firm yield from the new projects is shown separately in the table to demonstrate the estimated development of the projects over time. The new project yield is also included in the Total Yield shown in the table.

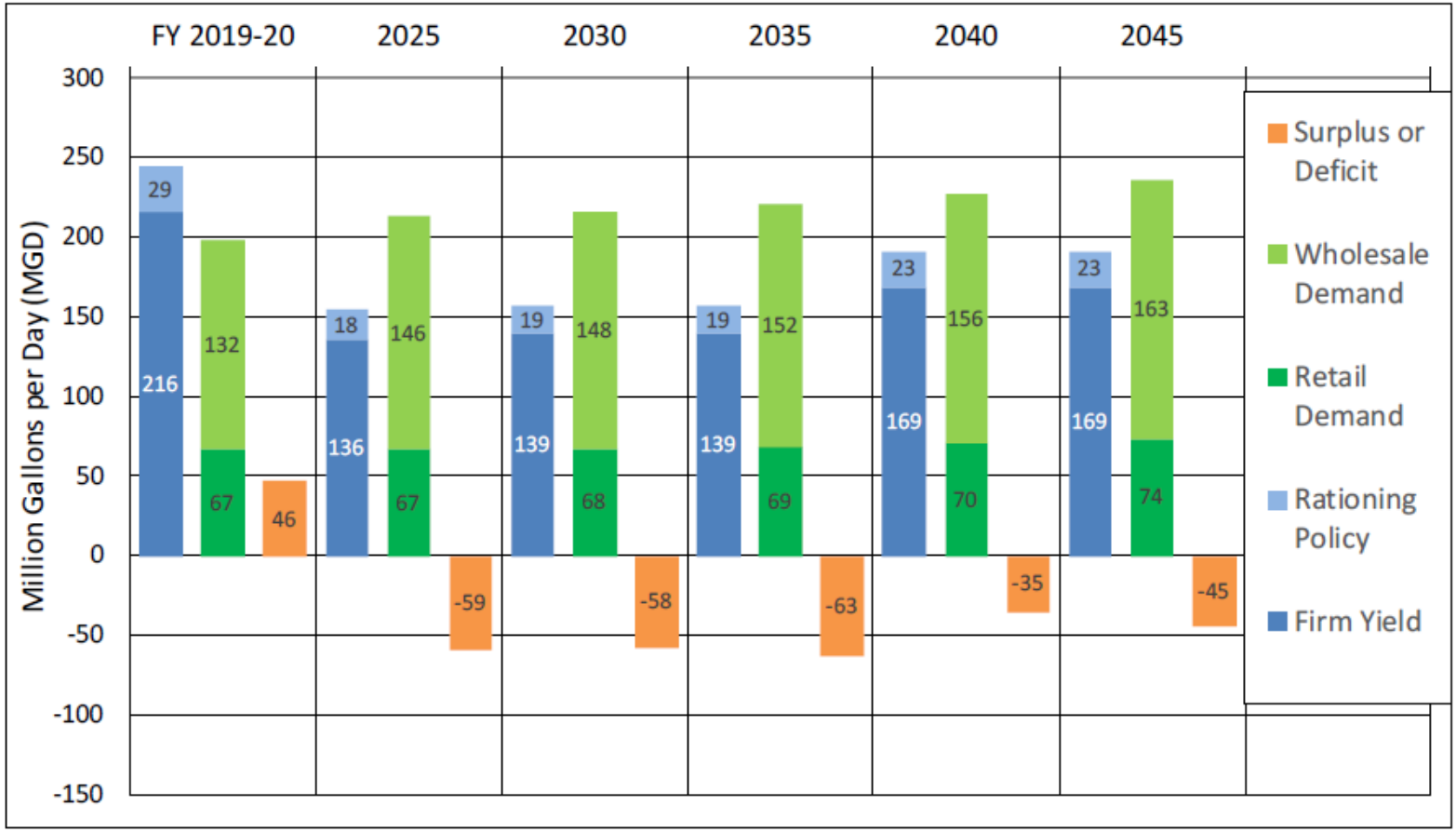
SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	245	154	158	158	192	192
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	93	93	93	93	93
Alternative Water Supply Projects:	NA	2	5	5	35	35
Surplus or Deficit:	46	-59	-58	-63	-35	-45

12

Hetch Hetchy Regional Water System

V. Bay-Delta Plan with Alternative Water Supply Projects



13

VI. Bay-Delta Plan with Alternative Water Supply Projects and Modified Rationing Policy

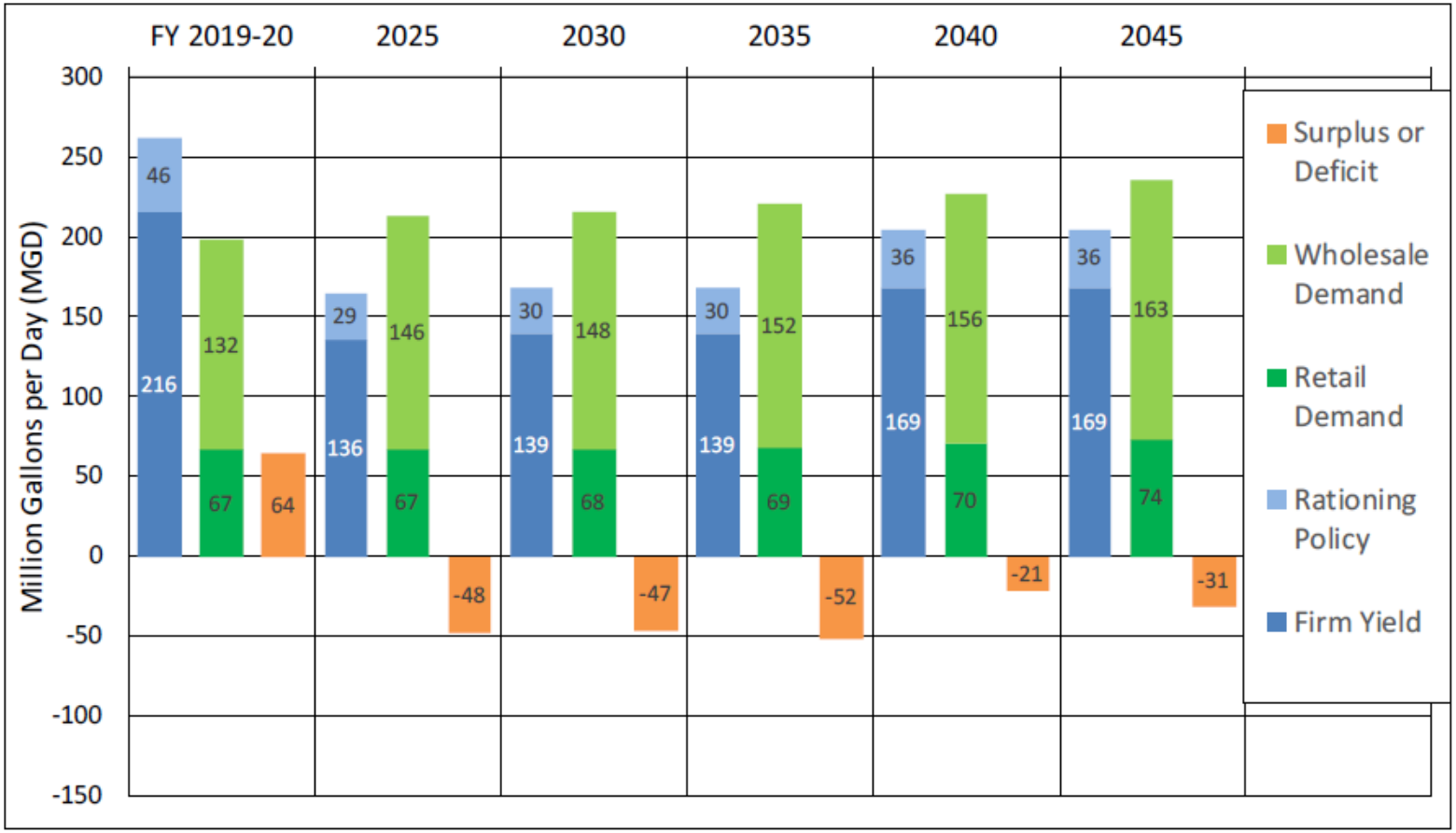
- Base Conditions
- Yield values are based on the 8.5-year design drought
- Includes SFPUC contribution to the Bay-Delta Plan displayed in the graph as a reduction in Firm Yield, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.
- Includes a total of 35 MGD of new water supply projects, as described on slide 12 for scenario V
- Includes 7.5 years of rationing at 20% in the 8.5-year design drought sequence

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	262	165	169	169	205	205
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	93	93	93	93	93
Surplus or Deficit:	64	-48	-47	-52	-21	-31

14

VI. Bay-Delta Plan with Alternative Water Supply Projects and Modified Rationing Policy



15

VII. Bay-Delta Plan with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought

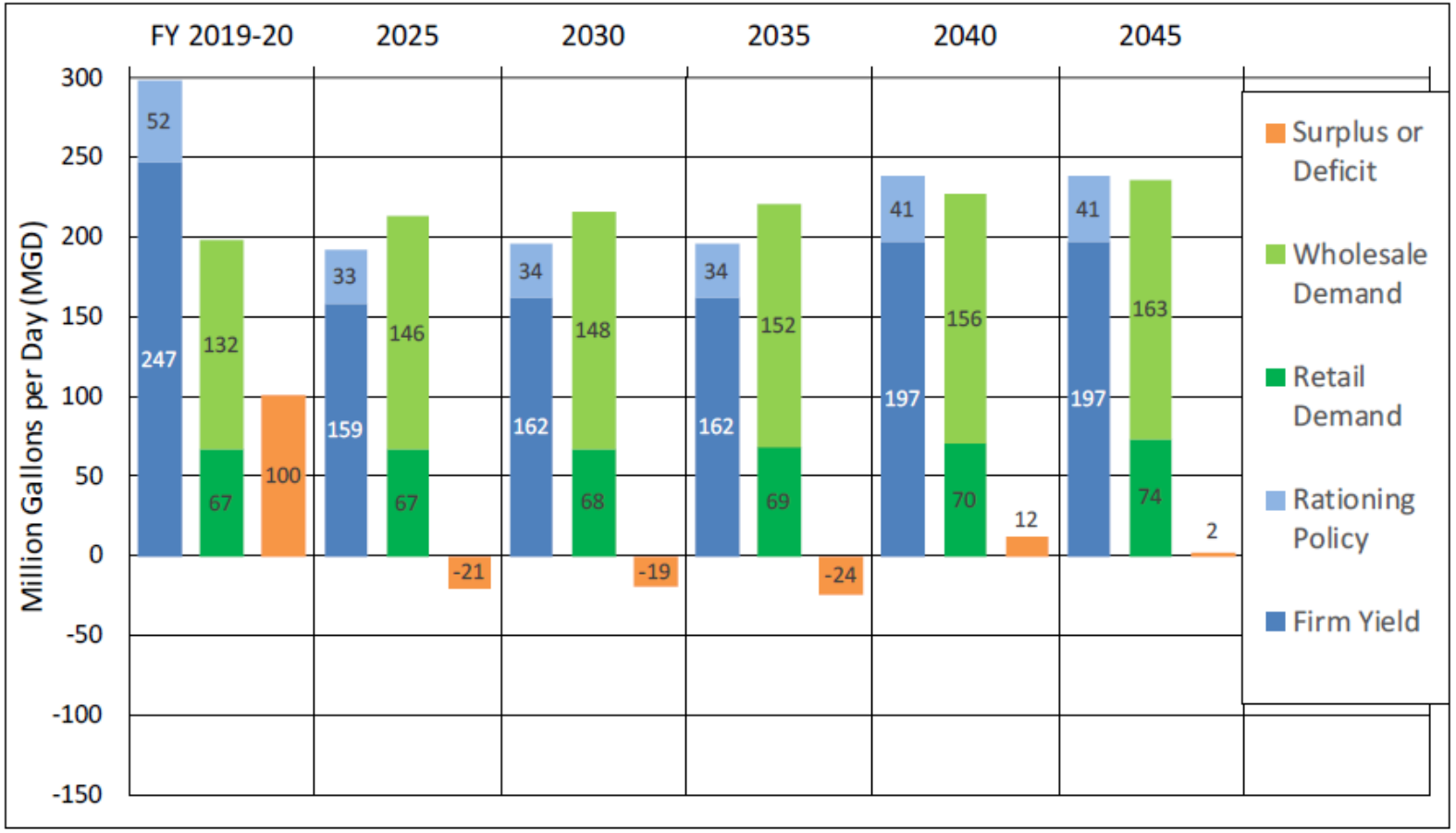
- Base Conditions
- Includes SFPUC contribution to the Bay-Delta Plan displayed in the graph as a reduction in Firm Yield, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.
- Includes a total of 35 MGD of new water supply projects, as described on slide 12 for scenario V
- Yield values are estimated using a 7.5-year design drought
- Includes 6.5 years of rationing at 20% in the 7.5-year design drought sequence.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	299	192	196	196	238	238
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	101	101	101	101	101
Surplus or Deficit:	100	-21	-19	-24	12	2

16

VII. Bay-Delta Plan with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought



17

VIII. Water Quality Certification (401) with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought

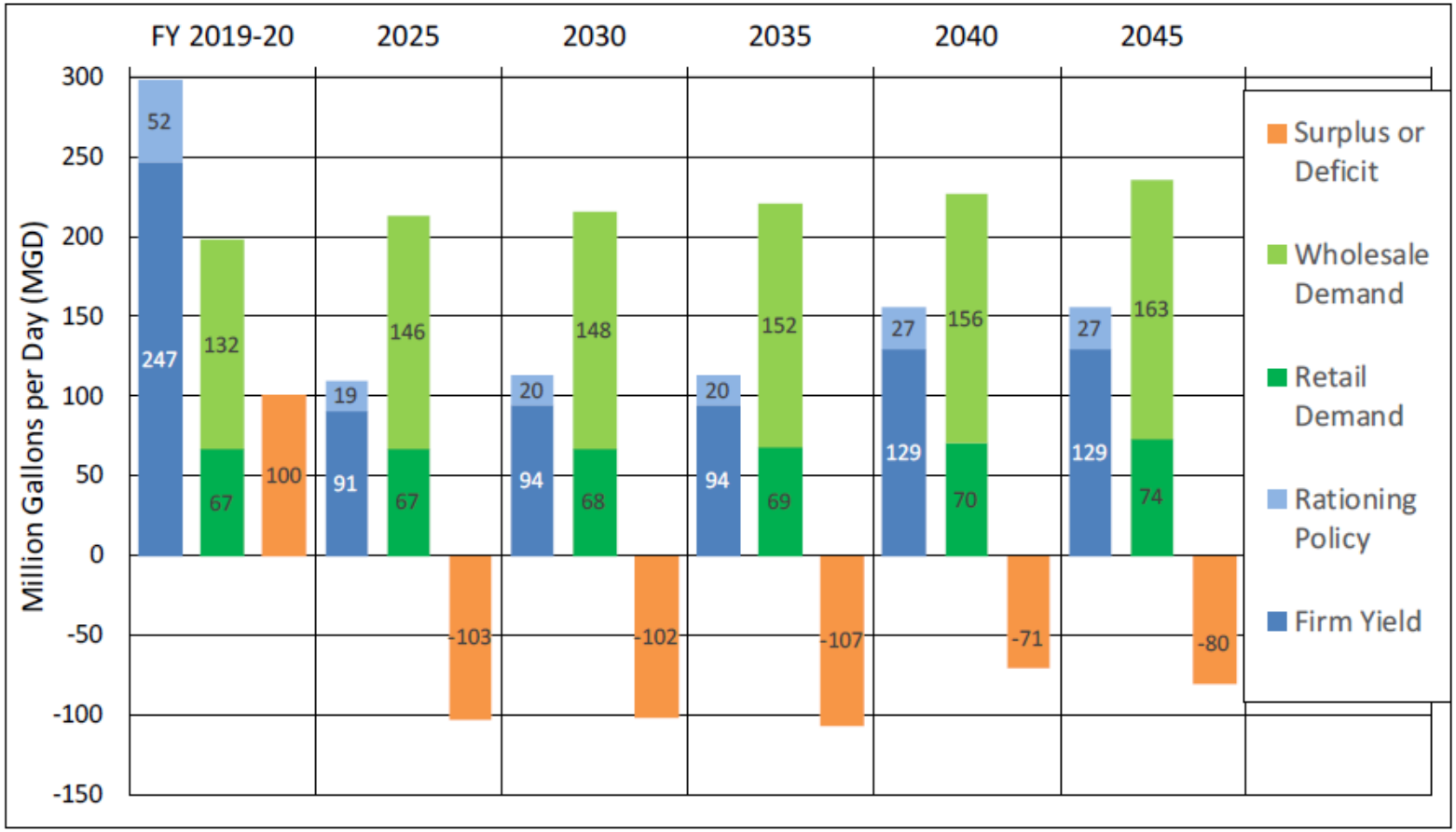
- Base Conditions
- Includes SFPUC contribution to the Section 401 water quality certification on the FERC license displayed in the graph as a reduction in Firm Yield.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.
- Includes a total of 35 MGD of new water supply projects, as described on slide 12 for scenario V
- Yield values are estimated using a 7.5-year design drought
- Includes 6.5 years of rationing at 20% in the 7.5-year design drought sequence.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	299	110	114	114	156	156
RWS Demand:	198	213	215	220	227	236
Lower Tuolumne Contribution:	NA	169	169	169	169	169
Surplus or Deficit:	100	-103	-102	-107	-71	-80

18

VIII. Water Quality Certification (401) with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought



19

IX. NGO scenario 1: Current system, 198 mgd constant demand, Bay-Delta Plan flows

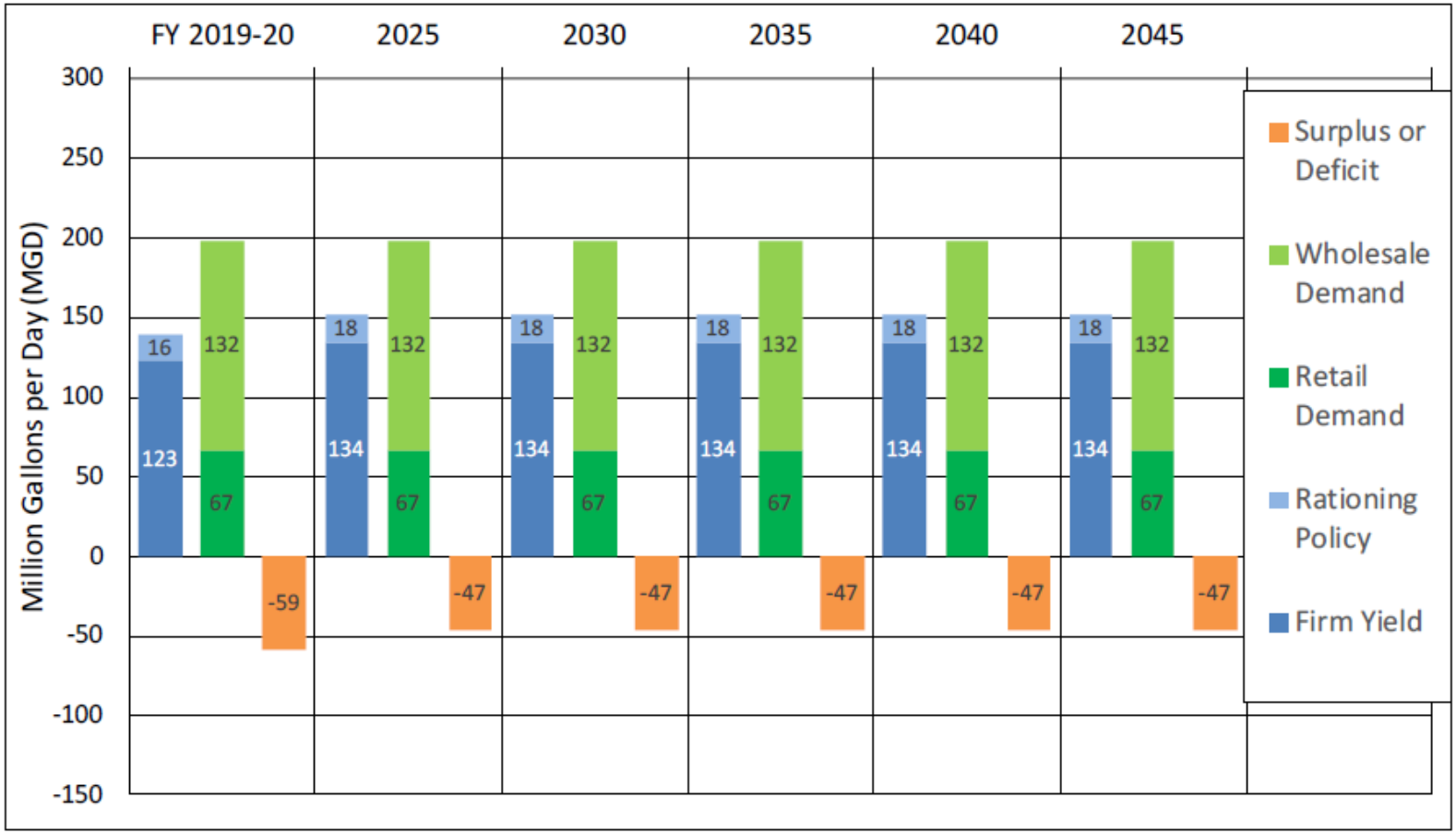
- Assumes that retail and wholesale demand on the RWS remain at the current level of approximately 198 MGD, and that SFPUC contributions to the Bay-Delta Plan are being made now
- Yield values are based on the 8.5-year design drought and the adopted WSIP rationing policy
- Includes SFPUC contribution to the Bay-Delta Plan, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	139	152	152	152	152	152
RWS Demand:	198	198	198	198	198	198
Lower Tuolumne Contribution:	93	93	93	93	93	93
Surplus or Deficit:	-59	-47	-47	-47	-47	-47

20

IX. NGO scenario 1: Current system, 198 mgd constant demand, Bay-Delta Plan flows



21

X. NGO scenario 2: Current system, 223 mgd constant demand, 7½ year design drought, Bay-Delta Plan flows

- Includes an assumed demand of 223 MGD for the SFPUC service area in all years
- Includes a total of 9 MGD for San Jose and Santa Clara
- Includes SFPUC contribution to the Bay-Delta Plan, assuming the flow requirement is 40% of unimpaired flow at La Grange from February through June. Current FERC flow requirements are assumed for the rest of the year. Assumes this contribution begins now.
- SFPUC contributions are calculated according to the 4th Agreement and assuming continuation of the 1995 side agreement.
- Yield values are estimated using a 7.5-year design drought and a truncated version of the adopted WSIP rationing policy

SFPUC Water Supply and Demand Worksheet Results
All values are in million gallons per day (MGD)

	FY 2019-20	2025	2030	2035	2040	2045
Total Yield:	163	176	176	176	176	176
RWS Demand:	223	223	223	223	223	223
Lower Tuolumne Contribution:	101	101	101	101	101	101
Surplus or Deficit:	-59	-47	-47	-47	-47	-47

22

Hetch Hetchy Regional Water System

X. NGO scenario 2: Current system, 223 mgd constant demand, 7½ year design drought, Bay-Delta Plan flows

23

SCENARIO SURPLUSES OR DEFICITS						
SCENARIOS	**FY19-20**	**2025**	**2030**	**2035**	**2040**	**2045**
I. Previous Demand Estimates	15	21	17	10	3	NA
II. Current Conditions	46	44	42	37	31	21
III. Tuolumne River Voluntary Agreement	46	28	26	21	15	5
IV. Bay-Delta Plan	46	-61	-64	-69	-75	-85
V. Bay-Delta Plan with Alternative Water Supply Projects	46	-59	-58	-63	-35	-45
VI. Bay-Delta Plan with Alternative Water Supply Projects and Modified Rationing Policy	64	-48	-47	-52	-21	-31
VII. Bay-Delta Plan with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design	100	-21	-19	-24	12	2
VIII. Water Quality Certification (401) with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought	100	-103	-102	-107	-71	-80
IX. NGO scenario 1: Current system and 198 mgd constant demand and Bay-Delta Plan flows	-59	-47	-47	-47	-47	-47
X. NGO Scenario 2: Current system, 223 mgd constant demand, 7 ½ year design drought and Bay-Delta Plan	-60	-47	-47	-47	-47	-47

24

APPENDIX K – 2020 WATER SHORTAGE CONTIGENCY PLAN

Due to the length of the Water Shortage Contingency Plan, it is included as a separate document.

APPENDIX L – HAYWARD MUNCIPAL CODE – SEC 11-2.47

Below is the weblink to the current ordinance (last accessed on June 30, 2021):

https://library.municode.com/ca/hayward/codes/municipal_code?nodeId=HAYWARD_MUNICIPAL_CODE_CH11PUUT_ART2HAMUWASY_S11-2.47PRWAWAPR

APPENDIX M – HAYWARD MUNICIPAL CODE – BAY FRIENDLY WATER EFFICIENT LANDSCAPE ORDINANCE

Below is the weblink to the current ordinance (last accessed on June 30, 2021):

https://library.municode.com/ca/hayward/codes/municipal_code?nodeId=HAYWARD_MUNICIPAL_CODE_CH10PLZOSU_ART12BIEWAEFLAOR

APPENDIX N – HAYWARD MUNICIPAL CODE – BAY FRIENDLY LANDSCAPING ORDINANCE

Below is the weblink to the current ordinance (last accessed on June 30, 2021):

https://library.municode.com/ca/hayward/codes/municipal_code?nodeId=HAYWARD_MUNICIPAL_CODE_CH10PLZOSU_ART20BIELAOR

APPENDIX O – 2020 WATER AND WASTEWATER SERVICE RATES

HAYWARD

WATER AND WASTEWATER SERVICE RATES

(Effective January 1, 2021)

WATER SERVICES

WATER RATES

Single Family Residential

	Cost Per CCF of Metered Water Consumption
Inside City of Hayward	
1 – 8 ccf (hundred cubic feet)	$5.80
9 – 25 ccf	$7.14
Over 25 cc	$8.41
Outside City of Hayward	
1 – 8 ccf	$6.67
9 – 25 ccf	$8.21
Over 25 ccf	$9.67

2 – 4 Dwelling Units

	Cost Per CCF of Metered Water Consumption Per Dwelling Unit, Based on Average Usage Per Dwelling Unit
Inside City of Hayward	
1 – 8 ccf (hundred cubic feet)	$6.43
9 – 25 ccf	$7.15
Over 25 ccf	$8.52
Outside City of Hayward	
1 – 8 ccf	$7.39
9 – 25 ccf	$8.22
Over 25 ccf	$9.80

Multi-Family (five or more dwelling units per account, including mobile home parks)

	Cost Per CCF of Metered Water Consumption Per Dwelling Unit, Based on Average Usage Per Dwelling Unit
Inside City of Hayward	
1 – 8 ccf (hundred cubic feet)	$6.97
9 – 20 ccf	$7.23
Over 20 ccf	$7.94
Outside City of Hayward	
1 – 8 ccf	$8.02
9 – 20 ccf	$8.31
Over 20 ccf	$9.13

Non-Residential

	Cost Per CCF of Metered Water Consumption
Inside City of Hayward	
1 to 200 ccf	$6.95
Over 200 ccf	$8.29
Outside City of Hayward	
1 to 200 ccf	$7.99
Over 200 ccf	$9.53

Note: hundred cubic feet = approximately 748 gallons of water

Service Charges (Two-Month Billing Period)

Note: These rates went into effect Jan. 1, 2021.

Meter Size	Charge Inside City	Charge Outside City
5/8", Low Income	$11.20	$12.96
5/8"	$32.00	$36.80
3/4"	$43.51	$50.04
1"	$65.91	$75.80
1 1/2"	$144.31	$165.96
2"	$254.00	$292.10
3"	$641.00	$737.15
4"	$1,269.80	$1,460.27
6"	$2,240.00	$2,576.00
8"	$3,101.00	$3,566.15
10"	$3,734.80	$4,295.02

Fire Service Charges (Two Month Billing Period)

Meter Size	Charge Inside City	Charge Outside City
2" and smaller	$25.00	$28.75
4"	$29.00	$33.35
6"	$42.00	$48.30
8"	$42.00	$48.30
10"	$50.00	$57.50

Construction Meters for Temporary Use

Meter Size	Deposit	Service (per month)	Monthly Use	
			Minimum Use	Minimum Charge
3/4"	$300	$6	1,000 cu. ft.	$69.50
3"	$1,600	$62	2,800 cu. ft.	$194.60
4"	$2,600	$97	4,000 cu. ft.	$278.00
6"	$4,200	$194	6,000 cu. ft.	$417.00
Additional fee for failure to report meter readings				$60.00

WASTEWATER SERVICES

SEWER SERVICE CHARGES

Residential Rates (per month)

Standard Residential Living Unit	$35.81 (payable bimonthly at $71.62)
Economy Rate (for bimonthly water consumption of 5 ccf to 8 ccf)	$16.78 (payable bimonthly at $33.56)
Lifeline Rate (for bimonthly water consumption of 4 ccf or less)	$8.39 (payable bimonthly at $16.78)
Multiple Residential Living Unit	$31.87 (payable bimonthly at $63.74)
Mobile Home Unit	$25.06 (payable bimonthly at $50.12)

Commercial and Industrial Rates

The following are rates per hundred cubic feet of water used for the corresponding User Classification Code (UCC) categories of usage:

	Rate per 100 cubic feet of water used with separate irrigation meter	Rate per 100 cubic feet of water used without separate irrigation meter
Meat Products	$12.53	$11.27
Slaughterhouse	$14.39	$12.95
Dairy Product Processor	$10.33	$9.30
Canning and Packing	$7.34	$6.61
Grain Mill	$9.68	$8.71
Bakery	$11.20	$10.08
Fats and Oils	$6.96	$6.26
Beverage Bottling	$6.63	$5.97
Food Manufacturing	$24.74	$22.27
Pulp and Paper Manufacturing	$8.49	$7.64
Inorganic Chemicals	$11.80	$10.62
Paint Manufacturing	$18.42	$16.58
Leather Tanning	$24.27	$21.85
Fabricated Metal	$3.49	$3.14
Eating Place (w/o grease interceptor)	$11.20	$10.08
Eating Place (w/ grease interceptor)	$8.64	$7.78
Commercial Laundry	$6.55	$5.90
Industrial Laundry	$10.19	$9.17
Other Users, including motels, hotels, offices	$6.47	$5.83

Note: All non-critical commercial and industrial users will be included in the above classification that most closely represents the wastewater discharge strength and characteristics in comparison with the domestic wastewater definition in the Regulations, as determined by the Director of Public Works & Utilities. The UCC designation of a particular industry may not necessarily correspond to the Standard Industrial Classification (SIC) assigned for other purposes.

Unclassified and Critical User Rates

Critical users and those whose discharge does not correspond to any UCC because of variations in wastewater constituents or treatment costs shall pay an amount calculated in accordance with the following formula, where:

$$C = V/M\ (160\ C_V + C_B \times BOD + C_S \times SS)$$

C =	Sewer service charge during period for which billing is calculated	
V =	Volume of water consumed in hundred cubic feet (CCF) during period for which the billing is calculated (total of public water service, metered flow, and all private sources, except those meters or services specifically identified for irrigation only)	
BOD =	Average Biochemical Oxygen Demand, in milligrams per liter, from user during period for which the billing is calculated	
SS =	Average Suspended Solids, in milligrams per liter, from user during period for which the billing is calculated	
C_V =	Treatment cost per CCF of water	$3.08518
C_B =	Treatment cost per pound of BOD	$0.72029
C_S =	Treatment cost per pound of SS	$0.96338
M =	160 for users with separate irrigation meter and 178 for users without separate irrigation meter	

The minimum fee for each user shall be that established for one (1) service unit per month

RECYCLED WATER SERVICES

RECYCLED WATER RATES

	Cost Per CCF of Metered Recycled Water Consumption
All ccf (hundred cubic feet)	$5.16

OTHER FEES AND CHARGES

Water Service Deposits

Deposits are based on expected two-month consumption. Contact Revenue Office for information.

Miscellaneous Fees

Account Establishment	$70
After-Hours Meter Activation	$72
Meter Test (up to 1" meter)	$223
Meter Test (1 ½" – 2" meter)	$295
Meter Test (3" meter or larger)	$367

Payment Delinquency Charges

Meter Lock	$92
Meter Removal	$90
Resume Water Service	$25
Returned Check	$25
Noticing Fee	$6
Collection Agency Charge	30%
Late Charge	Contact Collection Officer

Note: If additional repairs/measures are required, additional charges may be assessed.

For More Information

Water and Sewer Service	583-4600
Water and Sewer Billing Questions	583-4600
Collection Officer	583-4624
Water Installation and Facilities Fees/Sewer Connection Fees	583-4722
Wastewater Discharge Permits/Industrial Sewer Charges	881-7900