June 2021

2020 Urban Water Management Plan

for North Coast County Water District






North Coast County Water District
Serving Pacifica Since 1944

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ABBREVIATIONS

ABAG	Association of Bay Area Governments
ACWD	Alameda County Water District
AF	acre-feet
AWSP	Alternative Water Supply Program
AWWA	American Water Works Association
BARR	Bay Area Regional Reliability Shared Water access Program
BAWSCA	Bay Area Water Supply and Conservation Agency
Bay-Delta Plan	Bay-Delta Plan Phase 1
Cal Water	California Water Service
CalWEP	California Water Efficiency Partnership
CAP	Climate Action Plan
ccf	hundred cubic feet
CCWD	Contra Costa Water District
Census	United States Census
CII	commercial, industrial, and institutional
CIMIS	California Irrigation Management Information System
CUWCC	California Urban Water Conservation Council
CWC	California Water Code
DDW	Division of Drinking Water
Delta	Sacramento-San Joaquin Delta
Demand Study	Regional Demand and Conservation Projections Project
District	North Coast County Water District
DMM	demand management measures
DOF	California Department of Finance
DRA	Drought Risk Assessment
DRT	Drought Response Tool
DSOD	California Division of Safety of Dams
DSS Model	Demand Management Decision Support System Model
DWR	California Department of Water Resources
EBMUD	East Bay Municipal Utility District
EKI	EKI Environment & Water, Inc.
EOP	Emergency Operations Plan
ETo	reference evapotranspiration
°F	degrees Fahrenheit
GPCD	gallons per capita per day
gpf	gallons per flush
gpm	gallons per minute
GSRP	Groundwater Storage and Recovery Project
Guidebook	2020 Urban Water Management Plans Guidebook for Urban Water Suppliers
HET	High-Efficiency Toilet
HHLSM	Hetch Hetchy and Local Simulation Model
HMP	Hazard Mitigation Plan
HOA	Homeowner's Association

HTWTP	Harry Tracy Water Treatment Plant
IPCC	International Panel on Climate Change
ISA	Interim Supply Allocation
ISG	Individual Supply Guarantee
ISL	Interim Supply Limitation
JPA	Joint Powers Authority
kWh/AF	kilowatt hours per acre-foot of water
LCP	Local Coastal Plan Policies Relating to Sea-Level Rise Adaptation
LCSD	Lower Crystal Springs Dam
LOS	Level of Service
LVE	Lose Vaqueros Reservoir Expansion
MCL	Maximum Contaminant Level
MG	million gallons
MGD	million gallons per day
MID	Modesto Irrigation District
MMWD	Marin Municipal Water District
MWELO	Model Water Efficient Landscape Ordinance
NCCWD	North Coast County Water District
PG&E	Pacific Gas & Energy
Plan	Urban Water Management Plan
PREP	Crystal Springs Purified Water
R-GPCD	residential gallons per capita per day
RWS	Regional Water System
SB X7-7	The Water Conservation Act of 2009 or Senate Bill X7-7
SFPUC	San Francisco Public Utilities Commission
SMP	Surface Mining Permit
Strategy	BAWSCA Long Term Reliable Water Supply Strategy
State	State of California
State Board	State Water Resources Control Board
SVCW	Silicon Valley Clean Water
SWAP	Shared Water Access Program
SWRCB	State Water Resources Control Board
Target	water use target
TDS	total dissolved solids
TID	Turlock Irrigation District
Title 22	California Code of Regulations, Title 22
TRVA	Tuolumne River Voluntary Agreement
USD	Union Sanitary District
USEPA	United States Environmental Protection Agency
UWMP	Urban Water Management Plan
UWMP Act	Urban Water Management Planning Act
WCIP	Water Conservation Implementation Plan
WQD	Water Quality Division
WSA	Water Supply Assessment
WSCP	Water Shortage Contingency Plan
WSAP	Water Shortage Allocation Plan

WSIP	Water System Improvement Program

1 INTRODUCTION AND OVERVIEW

This chapter discusses the importance and uses of this Urban Water Management Plan (UWMP or Plan), the relationship of this Plan to the California Water Code (CWC), the relationship of this Plan to other local and regional planning efforts, and how this Plan is organized and developed in general accordance with the UWMP Guidebook 2020 (Guidebook; DWR, 2021).

1.1 Background and Purpose

The North Coast County Water District (referred to herein as the District or NCCWD) is located on the western slopes of the coastal mountains of San Mateo County, overlooking the Pacific Ocean. The District's service area closely corresponds with the boundary of the City of Pacifica. The District delivers water to residential, commercial, and governmental customers and purchases all its potable water supplies from the San Francisco Public Utilities Commission (SFPUC). As of 2020, the District serves 12,261 water connections within its service area. Additionally, the District serves recycled water to customers for landscape irrigation uses via its recycled water system.

This UWMP is a foundational document and source of information about NCCWD's historical and projected water demands, water supplies, supply reliability and potential vulnerabilities, water shortage contingency planning, and demand management programs. Among other things, it is used as:

- A long-range planning document for water supply and system planning; and
- A source for data on population, housing, water demands, water supplies, and capital improvement projects used in:
    - Regional water resource management plans prepared by wholesale water suppliers and other regional planning authorities (as applicable),
    - General Plans prepared by cities and counties, and
    - Statewide and broad regional water resource plans prepared by the California Department of Water Resources (DWR), the State Water Resources Control Board (State Board or SWRCB), or other state agencies.

NCCWD's last UWMP was completed in 2016, referred to herein as the "2015 UMWP." An amendment to the 2015 UWMP was published in 2018 to address comments from DWR. This Plan is an update to the 2015 UWMP and carries forward information that remains current and is relevant to this Plan and provides additional information as required by amendments to the UWMP Act (CWC § 10610 – 10657). Although this Plan is an update to the 2015 UWMP, it was developed to be a self-contained, stand-alone document and does not require readers to reference information contained in previous updates.

1.2 Urban Water Management Planning and the California Water Code

The UWMP Act requires urban water suppliers to prepare an UWMP every five years and to submit this plan to the DWR, the California State Library, and any city or county within which the supplier provides water supplies. All urban water suppliers, 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 annually are required to prepare an UWMP (CWC § 10617).

The UWMP Act was enacted in 1983. Over the years it has been amended in response to water resource challenges and planning imperatives confronting California. A significant amendment was made in 2009 as a result of the governor's call for a statewide 20 percent reduction in urban water use by 2020, referred to as "20x2020," the Water Conservation Act of 2009, and "SB X7-7." This amendment required urban retail water suppliers to establish water use targets for 2015 and 2020 that would result in statewide water savings of 20 percent by 2020. Beginning in 2016, urban retail water suppliers were required to comply with the water conservation requirements in SB X7-7 to be eligible for state water grants or loans. Chapter 5 of this plan contains the data and calculations used to determine compliance with these requirements.

A subsequent substantial revision to the UWMP Act was made in 2018 through a pair of bills (i.e., Assembly Bill 1668 and Senate Bill 606), referred to as "Making Water Conservation a California Way of Life" or the "2018 Water Conservation Legislation." These changes include, among other things, additional requirements for Water Shortage Contingency Plans (WSCPs), expansion of dry year supply reliability assessments to a five-year drought period, establishment of annual drought risk assessment procedures and reporting, and new conservation targets referred to as "annual water use objectives," which will require retailers to continue to reduce water use beyond the 2020 SB X7-7 targets.

As applicable, the District's 2020 UWMP reflects the following significant revisions to the UWMP Act that have been made since 2015.

- ***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.
- ***Drought Risk Assessment***. The Drought Risk Assessment (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.
- ***Energy Analysis.*** UWMPs are now required to include water system energy usage information that can be readily obtained.
- ***Seismic Risk***. The Water Code now requires suppliers to specifically address seismic risk to various water system facilities and to have a mitigation plan.
- ***Water Shortage Contingency Plan***. In 2018, the Legislature modified the UWMP laws to require a WSCP with specific elements.
- ***Groundwater Supplies Coordination***. Water Code now requires suppliers' 2020 UWMPs to be consistent with Groundwater Sustainability Plans, in areas where those plans have been completed by the Groundwater Sustainability Agencies.
- ***Lay Description***. The Legislature included a new statutory requirement for suppliers to include a lay description of the fundamental determinations of the UWMP, especially regarding water service reliability, challenges ahead, and strategies for managing reliability risks.

The UWMP Act contains numerous other requirements that an UWMP must satisfy. Appendix A to this Plan lists each of these requirements and where in the Plan they are addressed.

1.3 Relationship to Other Planning Efforts

This Plan provides information specific to water management and planning by the District. However, water management does not happen in isolation; there are other planning processes that integrate with the UWMP to accomplish urban planning. Some of these relevant planning documents include relevant city and county General Plans, District Water Master Plans, recycled water facility plans, integrated resource plans, Integrated Regional Water Management Plans, and others. This Plan is informed by and helps to inform these other planning efforts. In particular, this Plan utilizes information contained in General Plans, climate action plans, local hazard mitigation plans, and local and regional water resource plans to the extent data from these plans are applicable and available.

1.4 Plan Organization

The organization of this Plan follows the same sequence as outlined in the Guidebook (DWR, 2021).

- Chapter 1 - Introduction
- Chapter 2 - Plan Preparation
- Chapter 3 - System Description
- Chapter 4 - Water Use Characterization
- Chapter 5 - SBX7-7 Baseline, Targets
- Chapter 6 - Water
- Chapter 7 - Water Service Reliability and Drought Risk Assessment
- Chapter 8 - Water Shortage Contingency Planning
- Chapter 9 - Demand Management Measures
- Chapter 10 - Plan Adoption, Submittal, and Implementation

In addition to these ten chapters, this Plan includes several appendices providing supporting documentation and supplemental information. Pursuant to CWC § 10644(a)(2), this Plan utilizes the standardized forms, tables, and displays developed by DWR for the reporting of water use and supply information required by the UWMP Act. This Plan also includes additional tables, figures, and maps to augment the set developed by DWR, as appropriate. The table headers indicate if the table is part of DWR's standardized set of submittal tables.

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

Although not required by the UWMP Act, in the Guidebook (DWR, 2021), DWR recommends that all suppliers that are participating in, or may participate in, receiving water from a proposed project that is considered a "covered action" under the Delta Plan—such as a (1) multiyear water transfer; (2) conveyance facility; or (3) new diversion that involves transferring water through, exporting water from, or using water in the Sacramento-San Joaquin Delta (Delta)—provide information in their UWMP to demonstrate consistency with the Delta Plan policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (California Code of Regulations, Title 23, Section 5003).

The SFPUC, the District's wholesale agency, has made a legal determination that this requirement does not apply to their water sources.[1]

1.6 Lay Description

☑ ***CWC § 10630.5***

Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.

This Urban Water Management Plan (UWMP or Plan) is prepared for the North Coast County Water District (also referred to as the District or NCCWD), which serves drinking water to 12,261 customer service connections. This UWMP serves as a foundational planning document and includes descriptions of historical and projected water demands, and water supplies and reliability over a 20-year planning horizon. This document also describes the actions the District is taking to promote water conservation, both by the District itself and affiliated agencies (referred to as "demand management measures"), and includes a plan to address potential water supply shortages such as drought or other impacts to supply availability (the "Water Shortage Contingency Plan"). This UWMP is updated every five years in accordance with state requirements under the Urban Water Management Planning Act and amendments (Division 6 Part 2.6 of the California Water Code [CWC] § 10610 – 10656). Past plans developed for the District are available on the California Department of Water Resources (DWR) Water Use Efficiency Data Portal website: https://wuedata.water.ca.gov/. This document includes 10 chapters, which are summarized below.

Chapter 1 - Introduction and Overview

This chapter presents the background and purpose of the UWMP, identifies the Plan organization, and provides this lay description overview of the document.

Chapter 2 - Plan Preparation

This chapter discusses key structural aspects related to the preparation of the UWMP and describes the coordination and outreach conducted as part of the preparation of the Plan, including coordination with local agencies (i.e., the City of Pacifica, Bay Area Water Supply and Conservation Agency [BAWSCA]), water wholesalers (i.e., San Francisco Public Utilities Commission [SFPUC]), and the public.

Chapter 3 - System Description

This chapter provides a description of the District's water system and the service area, including information related to the climate, population, and demographics. NCCWD is located in San Mateo County, and the service area closely corresponds with the boundary of the City of Pacifica. The District has a population of approximately 38,331 and has a Mediterranean coastal climate characterized by cool dry summers and mild wet winters. Most of the precipitation falls during late autumn, winter, and spring, averaging 30 inches of rainfall annually. Much of the District is "built out," allowing for only modest

[1] Email from BAWSCA, dated February 9, 2021.

population and employment increases in the future assuming continuation of current zoning and densities.

Chapter 4 - Water Use Characterization

This chapter provides a description and quantifies the District's current and projected demands through the year 2045. The District provides drinking water (also referred to as "potable water") and recycled water to customers. This chapter details total water demand and potable demand. Recycled water demand is discussed further in Chapter 6. Water demands refer not only to the water used by customers, but also includes the water used as part of the system maintenance and operation, as well as unavoidable losses inherent in the operation of a water distribution system. Total water demand within the District was 855 million gallons (MG) per year on average between 2016 and 2020. Accounting for historical water use, expected population increase and other growth, climatic variability, water conservation, and other assumptions, water demand within the District is projected to decrease to 819 MG by 2045, a reduction of 4.4 percent compared to the 2016-2020 average.

Chapter 5 - SBX7-7 Baseline, Targets

In this chapter, the District demonstrates compliance with its per capita water use target for the year 2020. The Water Conservation Act of 2009 (Senate Bill X7-7) was enacted in November 2009 and requires the state of California to achieve a 20 percent reduction in urban per capita water use by December 31, 2020. To achieve this statewide reduction, each urban retail water supplier was required to establish water use targets for 2015 and 2020 using methodologies established by DWR. The District is in compliance with its 2020 water use target of 124 gallons per capita per day (GPCD), having reduced its potable water use in 2020 to 65 GPCD.

Chapter 6 - Water Supply Characterization

This chapter presents an analysis of the District's water supplies, as well as an estimate of water-related energy-consumption. The intent of this chapter is to present a comprehensive overview of the District's water supplies, estimate the volume of available supplies over the UWMP planning horizon, and assess the sufficiency of the District's supplies to meet projected demands under "normal" hydrologic conditions.

The District's potable water supply is purchased water from the SFPUC Regional Water System (RWS). The District's contractual allocation of water (known as its Individual Supply Guarantee [ISG]) is 3.84 million gallons per day (MGD), or approximately 1,402 MG per year.

The District currently holds appropriative water rights, issued by the California State Water Resources Control Board (SWRCB), to divert and use water from South Fork San Pedro Creek. The District is authorized to divert and use up to 362.7 acre-feet or 118.2 MG of water annually. The District, however, is currently not using surface water from South Fork San Pedro Creek. In addition to its surface water rights, the District is investigating options to develop groundwater supplies in the San Pedro Valley Groundwater Basin to expand its local supply portfolio.

The District delivers recycled water produced by the City of Pacifica at the City's Calera Creek Water Recycling Plant (CCWRP). During 2020, the District supplied approximately 16 MG through its recycled water system to six customers and residential recycled water filling station at its offices. Of this 16 MG recycled water demand, approximately 9 MG was met by recycled water and 7 MG was met by supplemental potable water. This volume also includes approximately 7 MG of deliveries that are wheeled on behalf of SFPUC through the District's system to the Sharp Park Golf Course, which is owned and

operated by the San Francisco Recreation and Parks Department and is not included in the District's gross water demand or supply. The District is evaluating areas to expand its recycled water system to serve additional irrigation customers. The projected recycled water demand in 2045 is 9 MG, not accounting for these potential additional future customers or the recycled water wheeled to the Sharp Park Golf Course.

Calculation and reporting of water system energy intensity is a new requirement for the 2020 UWMPs. Energy intensity is defined as the net energy used for water treatment, conveyance, and distribution for all water entering the distribution system, less the amount of energy produced within the water system itself. Accounting for the energy produced by the District's potable water system, the energy intensity for the District is estimated to be 1,574.6 kilowatt hours per million gallons (kWh/MG).

Chapter 7 - Water Service Reliability and Drought Risk Assessment

This chapter assesses the reliability of the District's water supplies, with a specific focus on potential constraints, such as water supply availability, water quality, and climate change. The intent of this chapter is to identify any potential constraints that could affect the reliability of the District's supply (such as drought conditions) to support the District's planning efforts to ensure that it can meet projected demands. Water service reliability is assessed during normal, single dry-year, and multiple dry-year hydrologic conditions. Based on this analysis, the District expects the available supplies to be sufficient to meet projected demands in normal year conditions; however, significant shortfalls are projected in dry year conditions, which if realized would require the District to enact its Water Shortage Contingency Plan. Numerous uncertainties exist in the assumptions that drive the projected dry year shortage estimates, and the District anticipates revising its water service reliability assessment within the next five years as some of these uncertainties are resolved.

Chapter 8 - Water Shortage Contingency Planning

This chapter describes the Water Shortage Contingency Plan (WSCP) for the District. The WSCP serves as a standalone document to be engaged in the case of a water shortage event, such as a drought or supply interruption, and defines specific policies and actions that will be implemented at various shortage level scenarios. For example, implementing customer water budgets and surcharges, or restricting landscape irrigation to specific days and/or times. Consistent with DWR requirements, the WSCP includes six levels to address shortage conditions ranging from up to 10 percent to greater than 50 percent shortage.

Chapter 9 - Demand Management Measures

This chapter includes descriptions of past and planned conservation programs that the District operates within each Demand Management Measure (DMM) category outlined in the UWMP Act, specifically: (1) water waste prevention ordinances, (2) metering, (3) conservation pricing, (4) public education and outreach, (5) distribution system water loss management, (6) water conservation program coordination and staffing support, and (7) "other" DMMs. The District has developed a suite of conservation programs and policies, which address each DMM category. Additionally, the District participates in water conservation programs offered by BAWSCA. Through implementation of the DMMs, NCCWD has been able to significantly reduce water demands in its service area and help its customers to achieve water and cost savings.

Chapter 10 - Plan Adoption, Submittal, and Implementation

This chapter provides information on a public hearing, the adoption process for the UWMP, the adopted UWMP submittal process, plan implementation, and the process for amending the adopted UWMP.

NCCWD adopted the UWMP during a Board of Directors meeting on 16 June 2021. In addition, this chapter provides information on the adoption of the included WSCP. This UWMP and the WSCP were submitted to DWR within 30 days of adoption and by the 1 July 2021 deadline.

2 PLAN PREPARATION

This chapter discusses the type of Urban Water Management Plan (UWMP or Plan) the North Coast County Water District (also referred to as the District or NCCWD) has prepared and includes information that will apply throughout the Plan. Coordination and outreach during the development of the Plan is also discussed.

2.1 Basis for Preparing a Plan

☑ ***CWC § 10617***

"Urban water supplier" means 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 subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

☑ ***CWC § 10620***

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.

☑ ***CWC § 10621 (a)***

Each urban water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update.

☑ ***CWC § 10621 (f)(1)***

Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.

☑ ***CWC § 10644 (a)(2)***

The plan, or amendments to the plan, submitted to the department … shall include any standardized forms, tables, or displays specified by the department.

In 2020, the District provided water to 12,261 service connections and served 914 million gallons (MG) of potable water (Table 2-1). Per California Water Code (CWC) § 10617, an urban water supplier is defined as a supplier that provides water for municipal purposes to more than 3,000 customers or supplies more than 3,000 acre-feet (approximately 978 million gallons [MG]) of water annually. The District meets the criteria based on the number of customers served. While the District supplied less than 3,000 acre-feet in 2020, it has supplied more than 3,000 acre-feet as recently as 2014. The District is therefore obligated under CWC § 10621(f) to develop and submit an UWMP to the California Department of Water Resources (DWR) by 1 July 2021.

As a water system that provides drinking water for human consumption, NCCWD is regulated as a Public Water System by the State Water Resources Control Board (SWRCB), Division of Drinking Water. Table 2-1 lists the District's Public Water System (PWS) identification number. The SWRCB requires that water agencies report water usage and other relevant PWS information via the electronic Annual Reports to the Drinking Water Program (ARDWP). These data are used by the state to determine, among other things,

whether an urban retail water supplier has reached the threshold (3,000 or more connections or 3,000 acre-feet of water supplied) for submitting an UWMP.

Table 2-1 Public Water Systems (DWR Table 2-1)

Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020
4110025	North Coast County Water District	12,261	919
	TOTAL	12,261	919

NOTES:
(a) Volumes are in units of MG.
(b) Volumes are rounded to the nearest MG.
(c) Source for number of connections is from the District's Master Meter File dated 16 December 2020.
(d) Volume of water supplied includes both potable and recycled water.

This Plan has been prepared in general accordance with the format suggested in the California DWR UWMP Guidebook (Guidebook; DWR, 2021). Text from the UWMP Act has been included in text boxes at beginning of relevant chapters of this UWMP. The information presented in the respective UWMP chapters and the associated text, figures, tables, and charts are collectively intended to fulfill the requirements of that sub-section of the UWMP Act. To the extent practicable, supporting documentation has also been provided in Appendices Appendix A through Appendix M. Other sources for the information contained herein are provided in the references section of the document.

Per CWC § 10644(a)(2), selected information for the 2020 UWMP updates must be presented in standardized tables for electronic submittal to DWR. Text and tables in the main body of the UWMP document have been cross-referenced to the companion DWR tables.

Per the Guidebook, the UWMP preparer is requested to complete a checklist of specific UWMP requirements to assist the DWR review of the submitted UWMP. The completed checklist is included in Appendix A.

2.2 Regional Planning

Regional planning can deliver mutually beneficial solutions to all agencies involved by reducing costs for the individual agency, assessing water resources at the appropriate geographic scale, and allowing for solutions that cross jurisdictional boundaries. NCCWD participates in regional water resources planning initiatives as a member of the Bay Area Water Supply and Conservation Agency (BAWSCA), which represents the 26 member agencies that purchase wholesale water supplies from the San Francisco Public Utilities Commission (SFPUC). As discussed in Section 2.5.1, the District also participates in the regional water reliability planning and conservation programming provided by BAWSCA.

2.3 Individual or Regional Planning and Compliance (Regional Alliance)

Urban water suppliers may elect to prepare individual or regional UWMPs and report on the requirements of SB X7-7 (2009 California Conservation Act) individually or as a member of a "Regional Alliance." NCCWD has elected to prepare an individual UWMP based solely on its distribution service area (see Table 2-2).

Table 2-2 Plan Identification (DWR Table 2-2)

Select Only One	Type of Plan		Name of RUWMP or Regional Alliance *if applicable*
X	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)		
NOTES:			

2.4 Basis for Reporting and Units of Measure

☑ ***CWC § 10608.20 (a) (1)***

Urban retail water suppliers…may determine the targets on a fiscal year or calendar year basis.

As shown in Table 2-3, NCCWD is a retail water supplier and information presented in this UWMP is reported on a calendar year basis. The unit of measure for reporting water volumes is million gallons (MG) and is maintained consistently throughout the Plan, unless otherwise noted.

Further, consistent with the Guidebook, the terms "water use", "water consumption", and "water demand" are used interchangeably in this UWMP.

Table 2-3 Supplier Identification (DWR Table 2-3)

Type of Supplier	
	Supplier is a wholesaler
X	Supplier is a retailer
Fiscal or Calendar Year	
X	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)	
Units of measure used in UWMP	
Unit	MG
NOTES:	

2.5 Coordination and Outreach

As described below and in Chapter 1, this UWMP has been prepared in coordination with the City of Pacifica, BAWSCA, the BAWSCA member agencies, the SFPUC, the public, and other appropriate entities.

2.5.1 Role of BAWSCA and the UWMP Common Language

Among its other functions, BAWSCA represents the District and the 25 other water districts, cities, and utilities, collectively referred to as the "Wholesale Customers", in negotiations and other coordination efforts with the SFPUC. Together with the SFPUC, BAWSCA developed common language for inclusion in each Wholesale Customers' 2020 UWMP regarding the following common issues:

- Description of BAWSCA;
- Regional Water Demand and Conservation Projections;
- Long Term Reliable Water Supply Strategy;
- Making Conservation a Way of California Life Strategic Plan
- Tier One Drought Allocations;
- Tier Two Drought Allocations;
- SFPUC Regional Water System
- Individual Supply Guarantees (ISGs);
- 2028 SFPUC Decisions (formerly 2018 SFPUC Decisions);
- Reliability of the Regional Water System;
- Climate Change;

- SFPUC's Efforts to Develop Alternative Water Supplies
- SFPUC's Decision to use Bay-Delta Plan Scenario in UWMP Submittal Tables;
- Bay Delta Plan Implementation Starting Year;
- SFPUC's Decision to Present Both Modeling Results in its UWMP;
- Rate Impacts of Water Shortages; and
- BAWSCA Conservation Programs.

For clarification purposes, and as shown below, the common language provided by BAWSCA and SFPUC is shown in grey font and has been indented for emphasis; it is otherwise presented unchanged from the original text. As a result, there may be some redundancy in the information presented and the number of times that certain terms are abbreviated or defined. A description of BAWSCA's role generally and related to the 2020 UWMP development process is provided below.

> BAWSCA provides regional water reliability planning and conservation programming for the benefit of its 26 member agencies that purchase wholesale water supplies from the San Francisco Public Utilities Commission (SFPUC). Collectively, the BAWSCA member agencies deliver water to over 1.8 million residents and nearly 40,000 commercial, industrial and institutional accounts in Alameda, San Mateo and Santa Clara Counties.
>
> BAWSCA also represents the collective interests of these wholesale water customers on all significant technical, financial, and policy matters related to the operation and improvement of the SFPUC's Regional Water System (RWS).
>
> BAWSCA's role in the development of the 2020 Urban Water Management Plan (UWMP) updates is to work with its member agencies and the SFPUC to seek consistency among UWMP documents.

2.5.2 Wholesale Coordination

☑ ***CWC § 10631 (h)***

An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).

The SFPUC is a wholesale water supplier to all the BAWSCA member agencies and is the only wholesale water supplier to NCCWD. As part of the coordination effort for the 2020 UWMP, and in compliance with CWC § 10631(h), NCCWD supplied BAWSCA with its water demand projections through 2045 for transmittal to the SFPUC.

Additionally, as described in more detail in Chapter 7, the District has relied upon the water supply reliability projections provided by the SFPUC for the purposes of analyzing the reliability of its SFPUC supplies during normal and dry years through 2045 (Table 2-4).[2]

Table 2-4 Water Supplier Information Exchange (DWR Table 2-4)

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
NOTES:

2.5.3 Agency Coordination

☑ ***CWC § 10620 (d) (3)***

Each urban water supplier shall 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.

☑ ***CWC § 10621 (b)***

Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

☑ ***CWC § 10631 (a)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

As a member of BAWSCA and the BAWSCA Water Management Representative Committee, NCCWD has coordinated closely with BAWSCA and its 25 other member agencies throughout the update of NCCWD's UWMP. Between 12 February 2021 and 9 April 2021, NCCWD attended a series of five webinars on supply reliability hosted by BAWSCA. During the webinars, BAWSCA and the member agencies reviewed the water supply reliability projections provided by the SFPUC, as well as the updated dry year Wholesale Agency allocations described in Section 7.1.1.1. NCCWD also attends monthly water management

[2] Information provided by the SFPUC and BAWSCA included in Appendix G.

meetings with BAWSCA and its member agencies that, among other topics, include discussion of items pertinent to the preparation of the 2020 UWMPs.

The District also coordinated and met with the City of Pacifica, the land use authority within the District's service area and the wastewater agency that treats wastewater collected from the District's service area and produces recycled water for the District's recycled water program.

In addition, the District notified local and regional water retailers and public agencies of the District's intent to prepare this 2020 UWMP (and the Water Shortage Contingency Plan [WSCP]) and the associated public hearing. A total of 31 agencies and groups received notices, including the City of Pacifica, San Mateo County, SFPUC, the North Coast Fire Authority, BAWSCA, and BAWSCA member agencies. A complete list of cities, counties, and other agencies receiving the public hearing notification from NCCWD as required per CWC § 10621 (b) are listed in Table 10-1 in Chapter 10 of this Plan and Appendix B.

Copies of correspondence with other agencies is provided in Appendix B.

2.5.4 Public Participation

☑ ***CWC § 10642***

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

Water suppliers are required by the UWMP Act to encourage active involvement of the community within the service area prior to and during the preparation of its UWMP. The UWMP Act also requires water suppliers to make a draft of the UWMP available for public review and to hold a public hearing regarding the findings of the UWMP prior to its adoption. In addition to sending notices to the various agencies listed in Table 10-1 and Appendix B, the District also notified the public of the District's intent to adopt its UWMP. The Public Review Draft of the 2020 UWMP was made available on the District's website (https://www.nccwd.com/) on 1 June 2021.

On 2 June 2021 and 9 June 2021, the District published notices in the *Pacifica Tribune* informing the public that the 2020 UWMP as well as the WSCP would be available for public review at the District offices and on the District's website, consistent with requirements of California Government Code 6066.[3] The notice

[3] Government Code section 6066. Publication of notice pursuant to this section shall be once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such publication dates, are sufficient. The period

also informed the public that the 2020 UWMP and WSCP public hearings would be held at the District's offices on 16 June 2021.

Public participation in the development of the District's 2020 UWMP is summarized in Appendix C.

of notice commences upon the first day of publication and terminates at the end of the fourteenth day, including therein the first day.

3 SYSTEM DESCRIPTION

☑ ***CWC § 10631 (a)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

Describe the service area of the supplier, including current and projected population, climate, and other social, economic, and demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available. The description shall include the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.

This chapter provides a description of the North Coast County Water District (also referred to herein as the District or NCCWD) water system and service area, including its climate, population, demographics, and land uses to help in understanding various elements of water supply and demand.

3.1 General Description

NCCWD is an independent special district that has served the City of Pacifica and its residents since 1944. A map of the District's service area boundaries in relation to the City of Pacifica boundaries is shown in Figure 3-1. The District purchases all its potable water from the San Francisco Public Utility Commission (SFPUC) Regional Water System (RWS). Water distribution, water conservation, and maintenance of water quality are the District's main water resource functions, as treated water purchased from the SFPUC RWS does not require further water treatment.

Deliveries from the SFPUC RWS are delivered to the District's service area via a 21-inch water supply pipeline originating at the SFPUC's Harry Tracy Water Treatment Plant (HTWTP). The District pumps its water from its Main Pump Station located at the HTWTP through the 21-inch pipeline that generally parallels Skyline Boulevard in a northerly direction for approximately three miles to Sharp Park Road. The District also has emergency intertie connections with three neighboring water purveyors: the City of Daly City, the City of San Bruno, and Westborough Water District. The District has two interties with each agency for a total of six interties.

The District's potable water distribution system delivers water to 32 pressure zones through approximately 130 miles of pipelines, 11 active storage tanks with a total capacity of 18.25 million gallons (MG), and four booster pump stations (including the Main Pump Station). Each of the District's pump stations have permanent standby generators. The District's current distribution system and service area is shown on Figure 3-2.

In total, the District delivers approximately 2.5 million gallons per day of potable water. The District delivers potable water to residential, commercial, governmental, and landscape customers. Residential customers account for over 90 percent of the District's service connections and approximately 75 percent of its potable water demands.

NCCWD has also been supplying disinfected tertiary recycled water to irrigation customers since 2013. The District receives a portion of the total amount of tertiary recycled water produced annually from the City of Pacifica's Calera Creek Water Recycling Plant (CCWRP), under an Agreement between the City and the District. The District's recycled water customers in Pacifica include the SFPUC (Sharp Park Golf Course)[4], Fairway Park, Oceana High School, Ingrid B. Lacy Middle School, and several streetscape areas. In 2015, the District also began offering recycled water for irrigation use to residential customers by establishing a recycled water filling station at its corporation yard located at its main office. A detailed description of the District's recycled water program is provided in Chapter 6. The District's recycled water service area and current distribution system is shown on Figure 3-3.

As required by the UWMP Act, specific information about the District's service area population and climate is provided below.

3.2 Service Area Boundary Map

NCCWD is located on the western slopes of the coastal mountains of San Mateo County, overlooking the Pacific Ocean. Its boundaries closely correspond to the City of Pacifica boundaries, with small portions located in unincorporated San Mateo County. In general, the District is bounded by the City of Daly City on the north; Skyline Boulevard and the City of South San Francisco on the east; Montara Mountain on the south; and the Pacific Ocean on the west. From north to south, the District is approximately 6.5 miles in length. The service area extends approximately one mile inland from the coast in the northern area to as much as three miles inland in the southern area. The total area of the district is approximately 11.3 square miles. The District's water service area and the City of Pacific boundaries are shown on Figure 3-1.

The areas of the District that are located in unincorporated San Mateo County are mostly parks and open space lands, without water service connections, including portions of Golden Gate National Recreation Area lands (Sweeney Ridge) to the east and San Pedro Valley County Park to the south. These areas are uninhabited according to voter files and the US Census data. The District's 12,261 water service connections are almost exclusively within the City's urban area. One exception is a service connection for sales to the City of San Bruno; this connection is located at the District's Main Pump Station at SFPUC's HTWTP and serves the Crystal Springs Apartments, located near HTWTP in San Bruno.

3.3 Service Area Climate

Pacifica has a semi-arid Mediterranean coastal climate typified by cool summers and mild winters. The warmest months of the year are August and September, and the coldest months are December and January. The average daily maximum temperature in September is 71.5°F, while the average daily maximum temperature in December is 56.8°F. As shown in Table 3-1 and the associated chart, the average annual precipitation in Pacifica is approximately 30.0 inches, as reported by the Western Regional Climate Center (1983-2012). Approximately 90 percent of the precipitation occurs between November and April.

[4] Sharp Park Golf Course, while it is located within Pacifica, it is owned and operated by the San Francisco Recreation and Parks Department. As such, recycled water that is used on Sharp Park Golf Course is wheeled through the District's recycled water distribution system on behalf of the SFPUC but is not part of the District's Gross Water Supply.

Rainfall amounts vary widely from year to year. Available precipitation records (1983-2012) show a low of 15.88 inches in 1990 and a high of 49.98 inches in 1998.

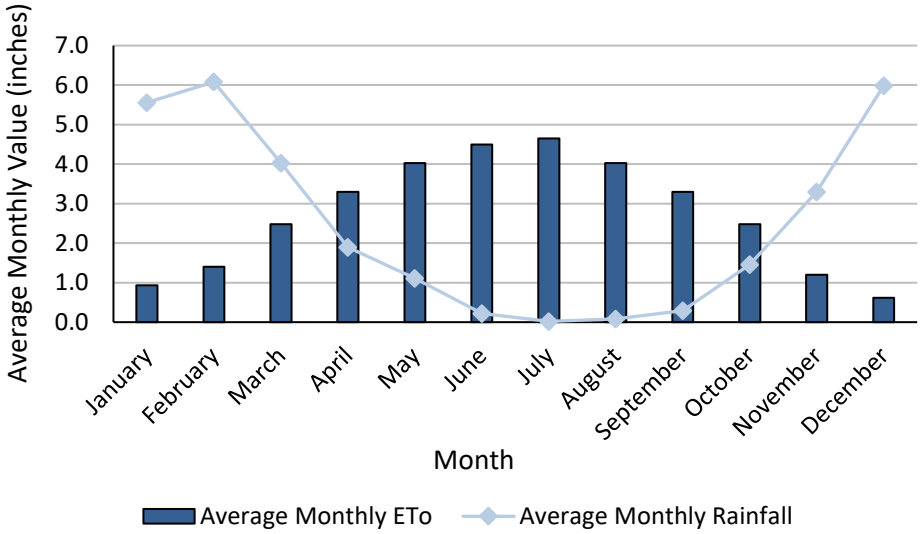
Because of the District's location in the Coastal Fog Belt, evapotranspiration (ETo) rates are very low in comparison to other areas of California, particularly during the summer months. Consequently, landscape irrigation requirements and urban water consumption in general in the coastal region of San Mateo County (including Pacifica) are among the lowest in the State.

Table 3-1 Climate Characteristics

Month	Average Temperature		Standard Average ETo (inches)	Average Rainfall (inches)
	Min (°F)	Max (°F)		
January	46	56.9	0.93	5.56
February	46.4	58.8	1.40	6.08
March	46.8	60.9	2.48	4.03
April	47.7	63	3.30	1.90
May	49.7	65.2	4.03	1.11
June	51.5	68.4	4.50	0.22
July	52.8	69.9	4.65	0.02
August	53.5	70.5	4.03	0.08
September	54	71.5	3.30	0.29
October	53.1	68.8	2.48	1.46
November	49.8	62	1.20	3.30
December	46.4	56.8	0.62	5.99
Annual	**49.8**	**64.4**	**33.00**	**30.0**

NOTES:
(a) Rainfall and temperature data for Pacifica 4 SSE monitoring station, from Western Regional Climate Center; 1983 - 2012.
(b) Eto (Reference Evapotranspiration) rates in inches/month from California Irrigation Management Information System (CIMIS) reference evapotranspiration Zones Map for Zone 1: Coastal Plains Heavy Fog Belt.

Chart 3-1 Average Monthly Climatic Conditions



3.3.1 Climate Change Considerations

☑ ***CWC § 10630***

It is the intention of the Legislature, in enacting this part, to permit levels of water management planning… while accounting for impacts of climate change.

Projections of climate change in California indicate a further intensification of wet and dry extremes and shifting temperature. Within the County of San Mateo, the average temperature is expected to increase 3.2°F to 5.4°F by 2090 (San Mateo County, 2016; Cal EMA et al., 2012).

Changing climate can affect both water uses and supplies. For example, extreme and higher temperatures can lead to increases in water use; declining snowpack and earlier runoff patterns could result in changes in stream flows and reservoir operations; projection of frequent, severe, prolonged droughts could lead to not only less surface water available, but also exacerbating ongoing stressors in groundwater basins. Some of these pressures are already apparent in California as of 2021.

Several sections in the California Water Code (CWC) relevant to UWMPs refer to climate change. Pursuant to CWC requirements and the UWMP Guidebook, this Plan incorporates climate change considerations into following relevant sections:

- Chapter 3 – System Description,
- Chapter 4 – Water Use Characterization,
- Chapter 6 – Water Supply Characterization, and
- Chapter 7 – Water Service Reliability and Drought Risk Assessment.

In addition, this Plan incorporates the following documents by reference that includes information on climate change hazards and mitigation actions within the District's water service area:

- City of Pacifica Climate Action Plan (CAP; City of Pacifica, 2014),
- City of Pacifica Local Coastal Plan Policies Relating to Sea-Level Rise Adaptation (LCP; City of Pacifica, 2018), and
- County of San Mateo Hazard Mitigation Plan (HMP; San Mateo County, 2016)

The City's CAP discusses actions to be taken to increase resiliency in the event of climate change impacts including sea level rise, wildfire, extreme heat, and regional droughts. As part of its mitigation actions to sea level rise, the District and the City of Pacifica partnered with other local entities and the County of San Mateo Office of Sustainability[5] to launch the Sea Change San Mateo County (SMC) Initiative.[6] The Sea Level Rise Vulnerability Assessment completed in 2018 (San Mateo County, 2018) is the first step of the Sea Change SMC Initiative and provides an overview of what is at risk from current and future flooding in the County. The assessment identified future erosion impacts along the City of Pacifica coastline.

In 2019, as a result of the Sea Change convenings, the cities and County of San Mateo formed a Flood and Sea Level Rise Resiliency District to address sea level rise, flooding, coastal erosion, and large-scale storm water infrastructure improvements through integrated regional planning, investment, and project implementation.

Chapters 4, 6, and 7 of this Plan discuss the potential impacts of climate change on water demand and water sources. As detailed in Chapter 6 and Chapter 9 of this Plan, NCCWD has established a robust recycled water program and a water conservation program to increase drought resiliency. NCCWD continues to plan for future water needs and enhance the resiliency of its water system.

3.4 Service Area Population and Demographics

The following sections present the current and projected population estimates, demographics, and employment projections for the service area.

3.4.1 Service Area Population

The historical and projected population data from 2000 through 2045 for the District's water service area are shown in Table 3-2 and the associated chart. As discussed above, the population served by the District is closely represented by the population within the boundaries of the City of Pacifica. Consistent with DWR requirements, the historical and current population served by the District has been estimated herein using data published by the California Department of Finance (DOF) for the City of Pacifica. Population data for the City of Pacifica has fluctuated in recent years. In 2000, DOF reported a population of 38,392 based on US Census data. The population decreased to an estimated 36,887 in 2005. Population increased to 37,234 in 2010 and to an estimated 38,757 in 2015. The current 2020 DOF population estimate is reported as 38,331, a slight decrease from the 2015 population.

The District's service area is largely built out and no major developments within the service area are currently planned. Population projections were based the growth projections assumed in Association of

[5] https://www.smcsustainability.org/climate-ready

[6] https://seachangesmc.org/

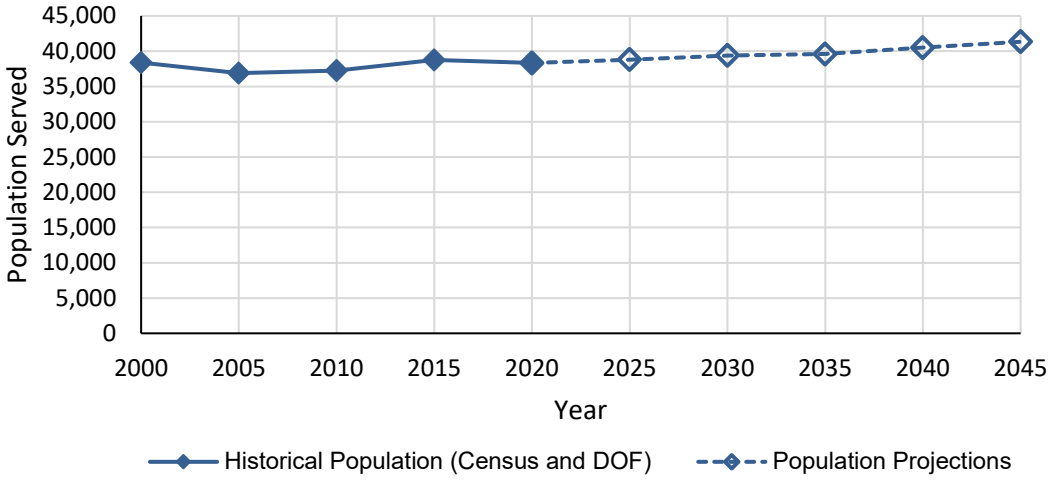
Bay Area Governments (ABAG) 2019 population estimates for the City of Pacifica through 2040.[7] These annual growth projections were 0.24 percent between 2020 to 2025, 0.30 percent from 2025 to 2030, 0.11 percent from 2030 to 2035, and 0.45 percent from 2035 to 2040. While the ABAG 2019 projections did not extend beyond 2045, the population was assumed to continue to grow at an annual rate of 0.45 percent between 2040 and 2045.

Table 3-2 Population - Current and Projected (DWR Table 3-1)

Population Served	2020	2025	2030	2035	2040	2045
	38,331	38,790	39,380	39,600	40,510	41,330

NOTES:
(a) Population for 2020 was estimated using DOF population estimates for the City of Pacifica.
(b) Population projections for 2025 through 2045 were based on growth projections assumed in the ABAG 2019 population estimates, rounded to the nearest 10 persons.
(c) Historical population from 2010 through 2020 is documented in Table 4-1.

Chart 3-2 Current and Projected Population



3.4.2 Service Area Demographics and Housing Characteristics

Demographics for the City of Pacifica are summarized in Table 3-3. These data are from the U.S. Census American Community Survey 2019 5-Year Estimates.[8] Relative to the rest of California, the City of

[7] http://projections.planbayarea.org/data

[8] U.S. Census Bureau, 2019. *2019 American Community Survey 5-year Estimates Data Profile*, dated 2019. Retrieved from: https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/2019/.

Pacifica's population is slightly older and slightly less racially diverse. Educational attainment and median household income in City of Pacifica are higher than for the state as a whole.

The age profile of the City of Pacifica's stock of housing is older than California as a whole; only 9.2 percent of homes were built after 1990 compared to 25.5 percent for all of California. Homes built after 1990 are more likely to have plumbing fixtures meeting current state and federal water and energy efficiency standards.

Table 3-3 Demographic and Housing Characteristics

Demographics (a)	City of Pacifica	California
Age and Sex		
Persons under 5 years	6.2%	6.2%
Persons under 18 years	19.2%	23.0%
Persons 65 years and older	17.1%	14.0%
Median Age	42.5	36.5
Female persons	49.5%	50.3%
Race and Hispanic Origin		
White alone	62.9%	59.7%
Black or African American alone	2.5%	5.8%
American Indian and Alaska Native alone	0.4%	0.8%
Asian alone	20.7%	14.5%
Native Hawaiian and Other Pacific Islander alone	2.0%	0.4%
Two or More Races	3.8%	4.9%
Hispanic or Latino	7.9%	39.0%
White alone, not Hispanic or Latino	52.0%	37.2%
Families & Living Arrangements		
Persons per household	2.82	2.95
Living in same house 1 year ago, percent of persons age 1 year+	90.5%	87.1%
Language other than English spoken at home, age 5 years+	26.2%	44.2%
Education		
High school graduate or higher, persons age 25 years+	95.5%	83.3%
Bachelor's degree or higher, persons age 25 years+	45.7%	33.9%
Income & Poverty		
Median Household Income (2019 dollars)	$125,500	$75,235
Per capita income in past 12 months (2019 dollars)	$53,104	$36,955
Persons in poverty	4.6%	13.4%
Housing	**City of Pacifica**	**California**
Year Housing Built		
2014 or Later	0.3%	1.7%
2010 to 2013	0.4%	1.7%
2000 to 2009	3.4%	11.2%
1990 to 1999	5.1%	10.9%
Before 1990	90.8%	74.5%

NOTES:
(a) Demographic data per the U.S. Census Bureau website, https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles, accessed March 2021.

3.4.3 Projected Employment

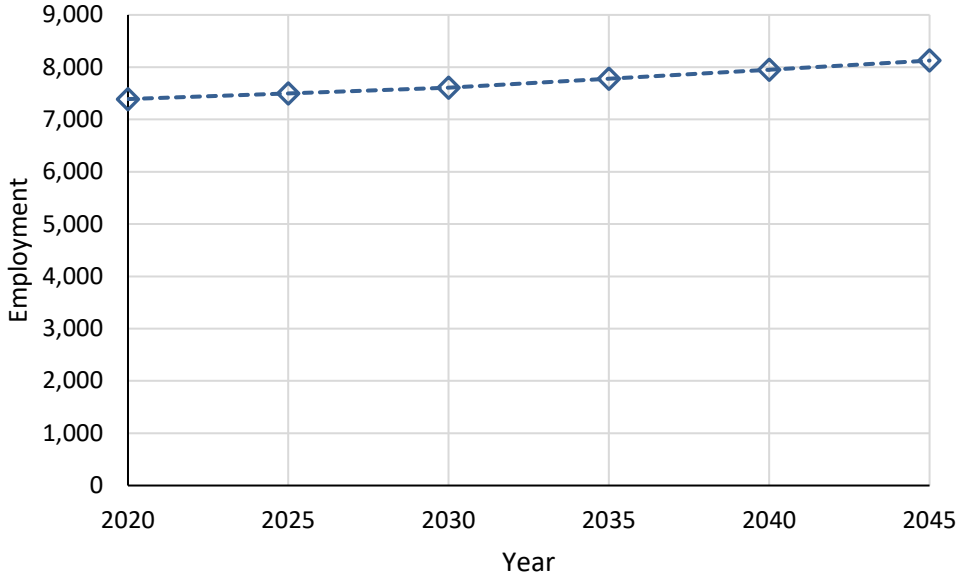
As shown in Table 3-4 and associated chart, current employment within the service area is estimated to be 7,391 jobs. An annual employment growth rate of 0.30 percent is expected between 2020 and 2030. After 2035, an annual employment growth rate of 0.44 percent is anticipated. The projections are based on 2013 ABAG projections and are consistent with the City of Pacifica's 2014 Draft General Plan.

Table 3-4 Employment - Current and Projected

	2020	2025	2030	2035	2040	2045
Service Area Employment	7,391	7,498	7,611	7,777	7,952	8,126

NOTES:
(a) Employment projections are based on 2013 ABAG projections.

Chart 3-4 Current and Projected Employment



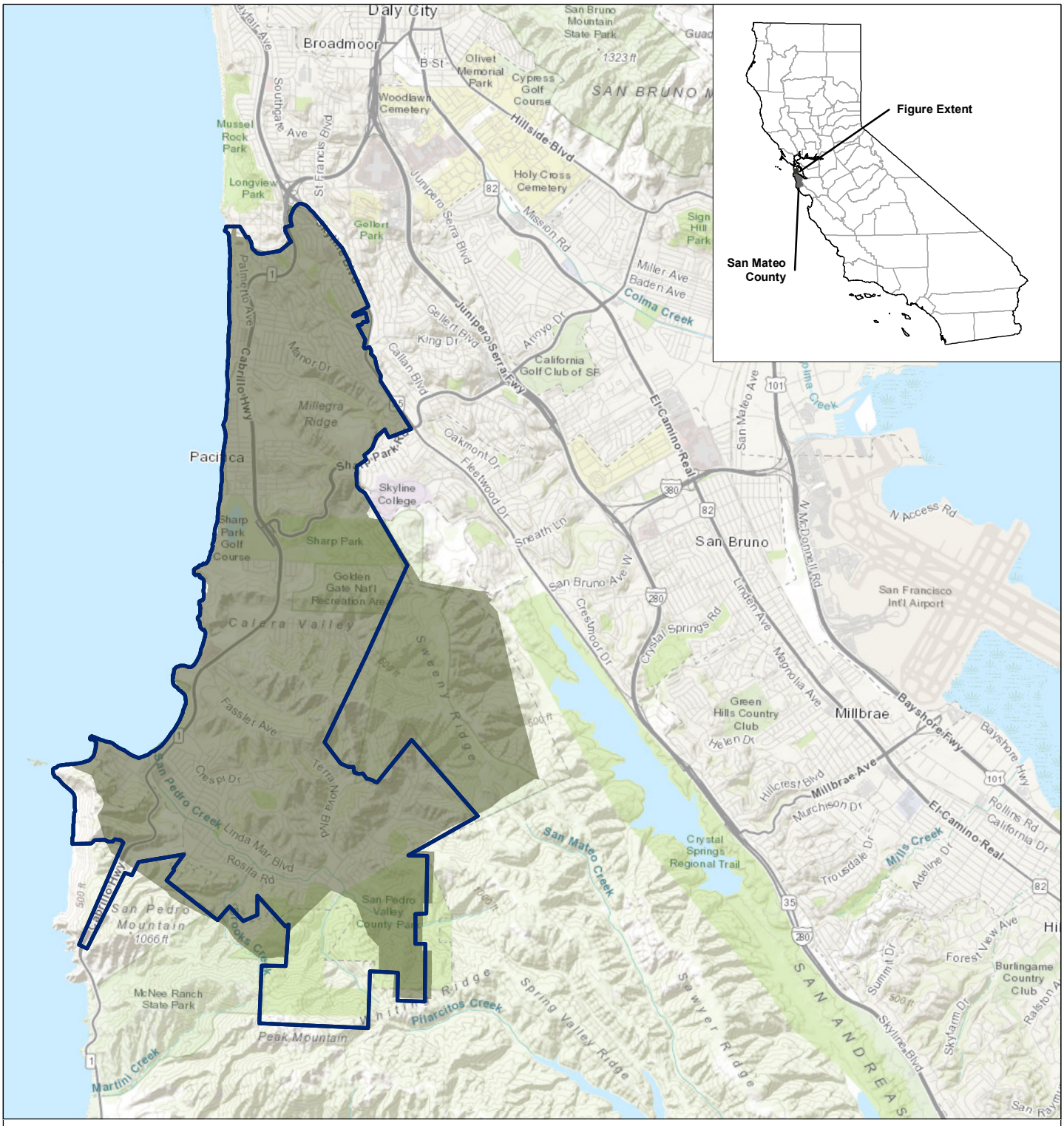
3.5 Land Uses within Service Area

General Plans are required by State law to guide land use and development within cities (California Government Code Section 65030.1). The "Land Use" section of the City of Pacifica General Plan details

current and projected land use. Figure 3-4 (Figure 4-1 from the 2014 Draft General Plan) provides an existing land use map for the City of Pacifica.[9]

Based on the 2014 Draft General Plan, the current land use distribution includes 47 percent open space, 26 percent residential uses, 16 percent vacant/undeveloped, 5 percent public/commercial/institutional uses, 5 percent agricultural uses, 1 percent commercial uses, and less than one percent all other use. Large portions of the vacant and undeveloped lands have constraints on their development potential given environmental factors such as slope and sensitive species. As such, future development projections within the NCCWD service area are limited and largely associated with infill.

[9] The City's General Plan and its Land Use section can be accessed at https://www.cityofpacifica.org/depts/planning/general_plan_update/default.asp



Legend

- North Coast County Water Distric Servica Area Boundary
- City of Pacifica Sphere of Influence

N

0 1.25 2.5

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North Coast Count Water District Service Area Map

North Coast County Water District
2020 Urban Water Management Plan

Sources

World Topographic base map provided by ArcGIS Online.
District Boundary provided by District on 18 November 2020.

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Figure 3-1

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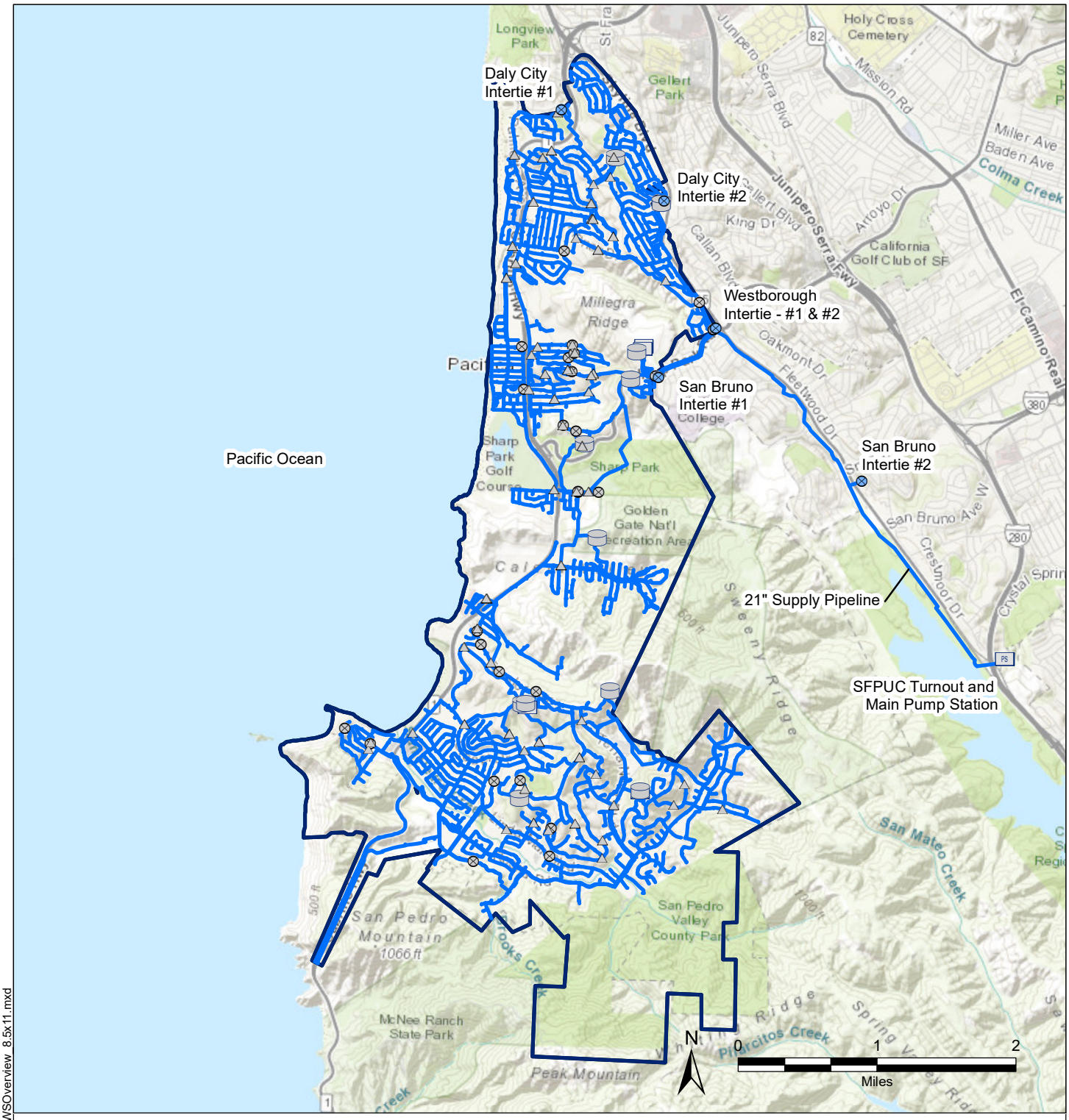

Legend

- Interties
- Pressure Reducing Valves
- Tanks
- Pumps
- Closed Valves
- Water Distribution Piping
- North Coast County Water Distric Servica Area Boundary

Sources

World Topographic base map provided by ArcGIS Online.
District Boundary provided by District on 18 November 2020.

Potable Water Distribution System

North Coast County Water District
2020 Urban Water Management Plan

eki environment & water

June 2021
EKI C00019.03
Figure 3-2

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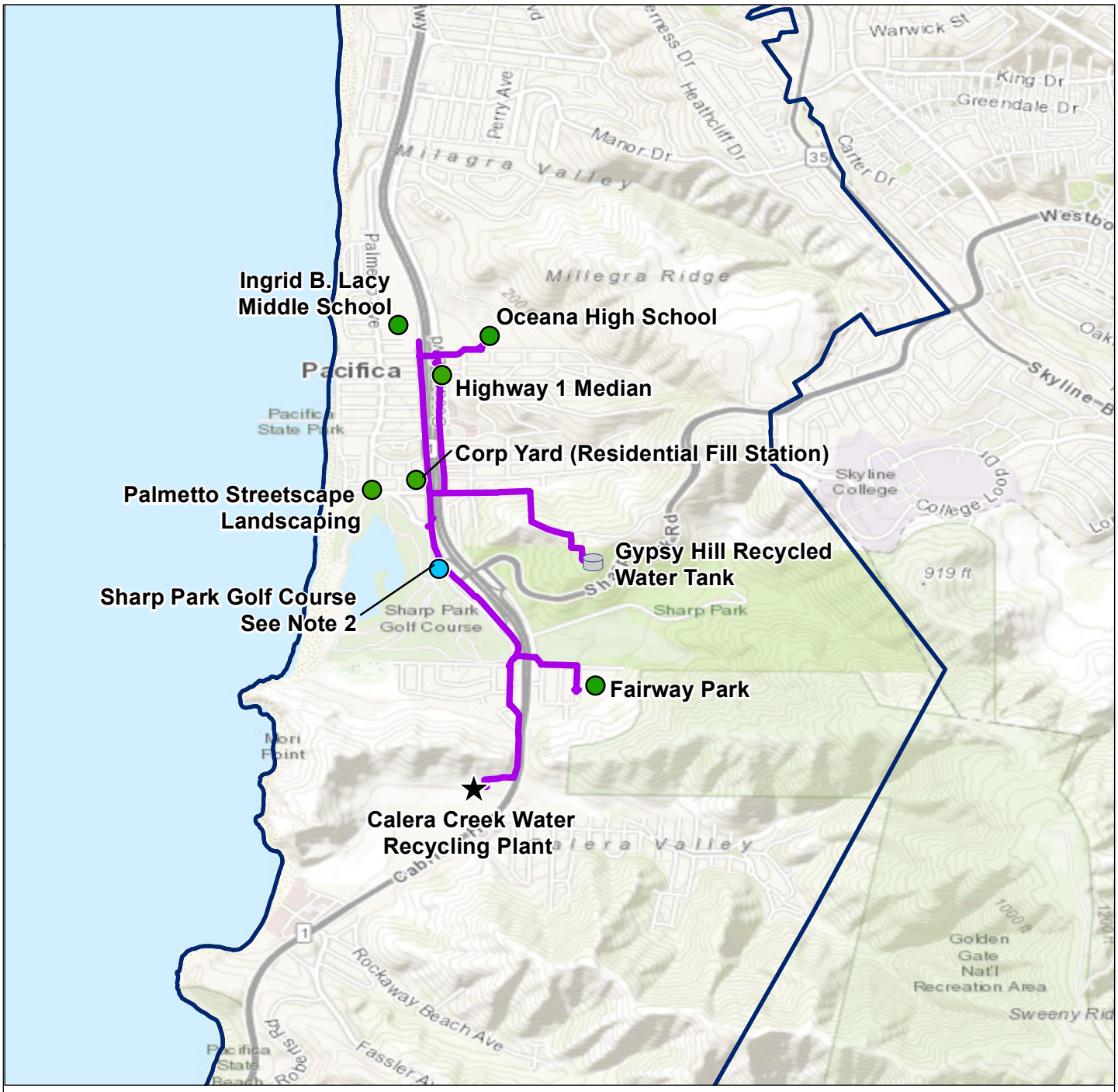

Legend

- Gyspy Hill Recycled Water Tank
- North Coast County Water Distric Servica Area Boundary
- Recycled Water Pipeline
- District Recycled Water Customers and Fill Station
- SFPUC Recycled Water Customer

Abbreviations

RW = Recycled Water
SFPUC = San Fransisco Public Utility Commission

Notes

1. All locations are approximate.
2. Sharp Park Golf Course, while it is located within Pacifica, it is owned and operated by the San Francisco Recreation and Parks Department. As such, recycled water that is used on Sharp Park Golf Course is wheeled through the District's recycled water distribution system on behalf of the SFPUC, but is not part of the District's Gross Water Supply.

Sources

1. Shapefiles provided by the District.
2. Basemap provided by ESRI.
3. District Boundary provided by District on 18 November 2020.

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Recycled Water Distribution System

North Coast County Water District
2020 Urban Water Management Plan

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June 2021
EKI C00019.03
Figure 3-3

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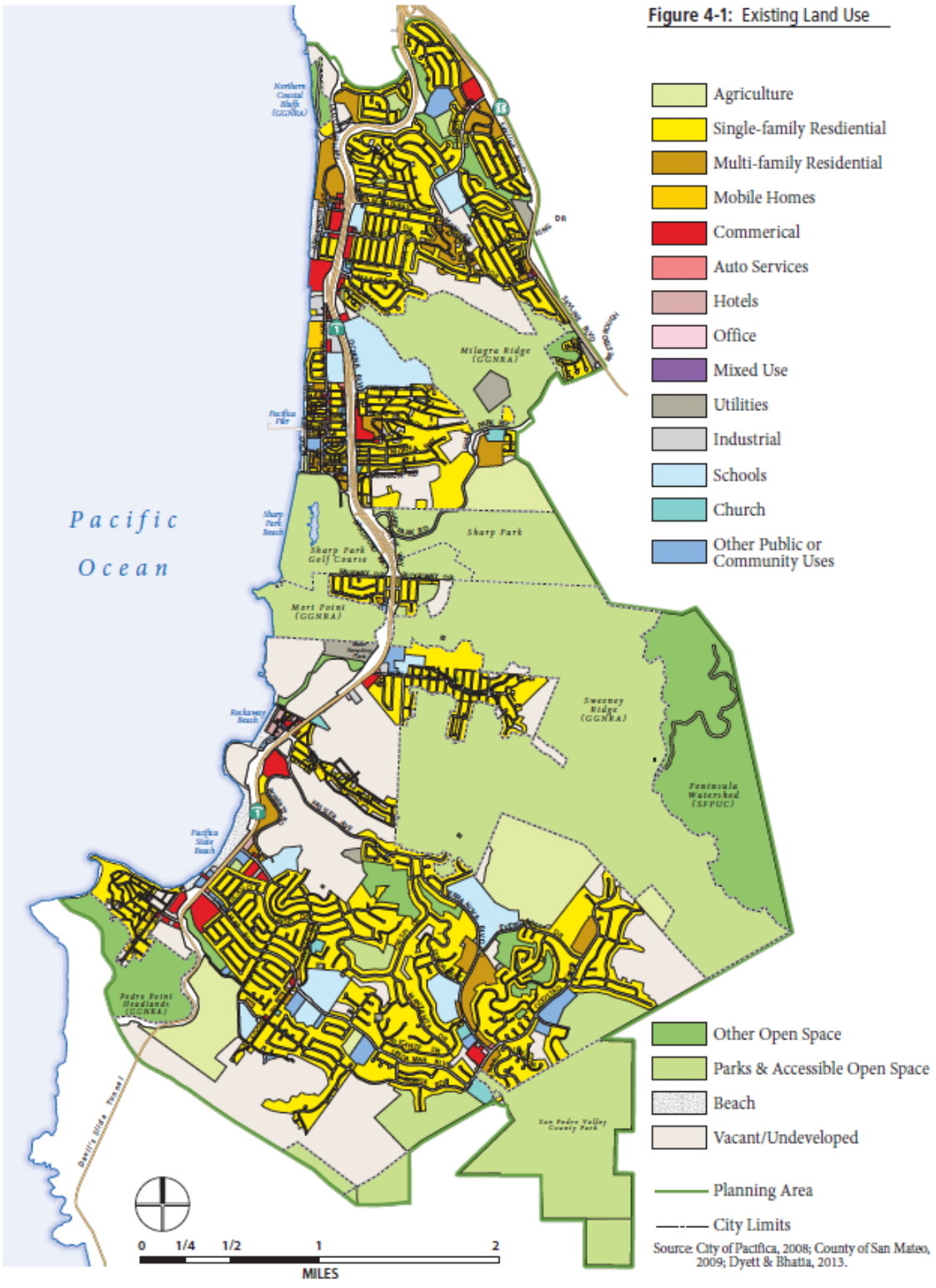


Figure 3-4 Existing Land Use (Figure 4-1 from the 2014 Draft General Plan)

4 WATER USE CHARACTERIZATION

This chapter provides a description and quantifies the North Coast County Water District's (also referred to herein as the District or NCCWD) past, current, and projected water uses through 2045. For the purposes of the Urban Water Management Plan (UWMP or Plan), the terms "water use" and "water demand" are used interchangeably.

4.1 Non-Potable Versus Potable Water Use

This Plan maintains a clear distinction between recycled and potable water uses and supplies. Recycled water is addressed comprehensively in Chapter 6, but a summary of recycled water demand is included in Table 4-5 of this chapter. The primary focus of this chapter is the historical and projected potable water uses in the District.

4.2 Past, Current, and Projected Water Use by Sector

☑ ***CWC § 10631 (d)***

(1) For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(J) Distribution system water loss.

(2) The water use projections shall be in the same five-year increments described in subdivision (a)

(4)(A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area

4.2.1 Past and Current Potable Water Use

The District's total water demand is equal to the total volume of potable water the District purchases from the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS). The District's total

water demand includes water consumed by metered accounts in the service area (metered water use), unmetered water use, and the water that is lost within the distribution system (losses).

Table 4-1 and the associated charts show trends in potable water demand and per capita potable water use between 2010 and 2020. Between 2014 and 2016, calls for water use cutbacks locally and the mandatory state-wide restrictions issued by the State Water Resources Control Board (SWRCB) in response to the recent historic drought led to a significant decline in total water demand (i.e., a 22 percent reduction between 2013 and 2016). A slow rebound in water demand has been observed since 2016 following the drought. The District's total water demand was 914 million gallons (MG) in 2020, a decrease from 1,172 MG from 2011 despite slight population growth during this period.

Table 4-1 Current and Historical Water Demand and Per Capita Water Demand

Year	Potable Water Demand (MG)	Service Area Population	Per Capita Potable Water Use (GPCD)
2010	1,092	37,234	80
2011	1,172	37,591	85
2012	869	37,999	63
2013	1,033	38,363	74
2014	1,004	38,533	71
2015	815	38,757	58
2016	807	38,819	57
2017	851	38,671	60
2018	868	38,665	61
2019	835	38,579	59
2020	914	38,331	65

NOTES:
(a) Volumes are in units of MG
(b) Volumes are rounded to the nearest MG and totals may not sum exactly due to rounding.
(c) Detailed potable water demand data from 2016 through 2020 are documented in Table 4-2.
(d) Service area population data are estimated using the California Department of Finance (DOF) Table E-4 for the City of Pacifica.
(e) Per capita potable water use is calculated by dividing the total annual potable water demand by the service area population and the number of days in a year.

Chart 4-1A Current and Historical Water Demand and Population

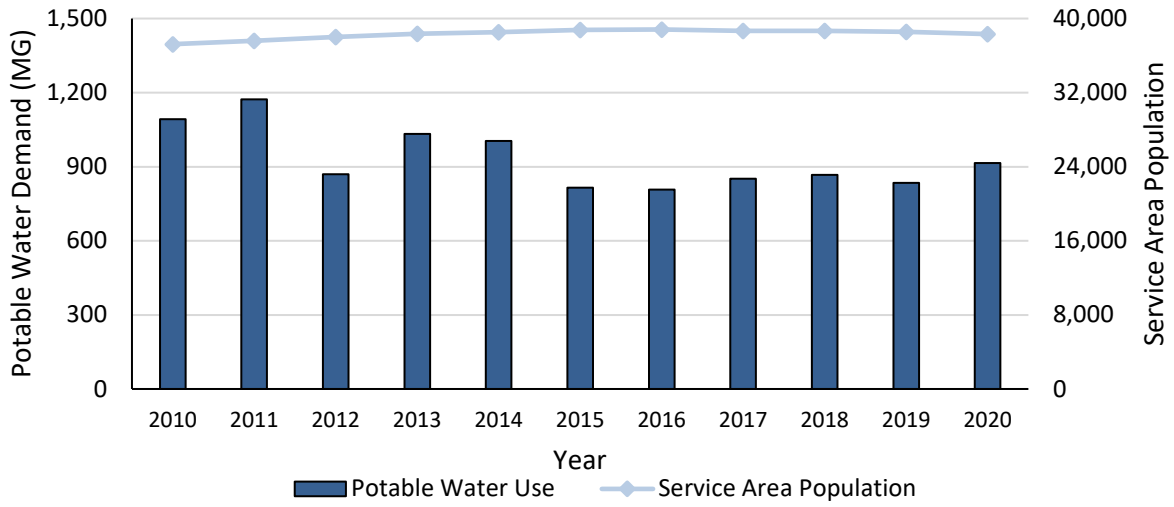
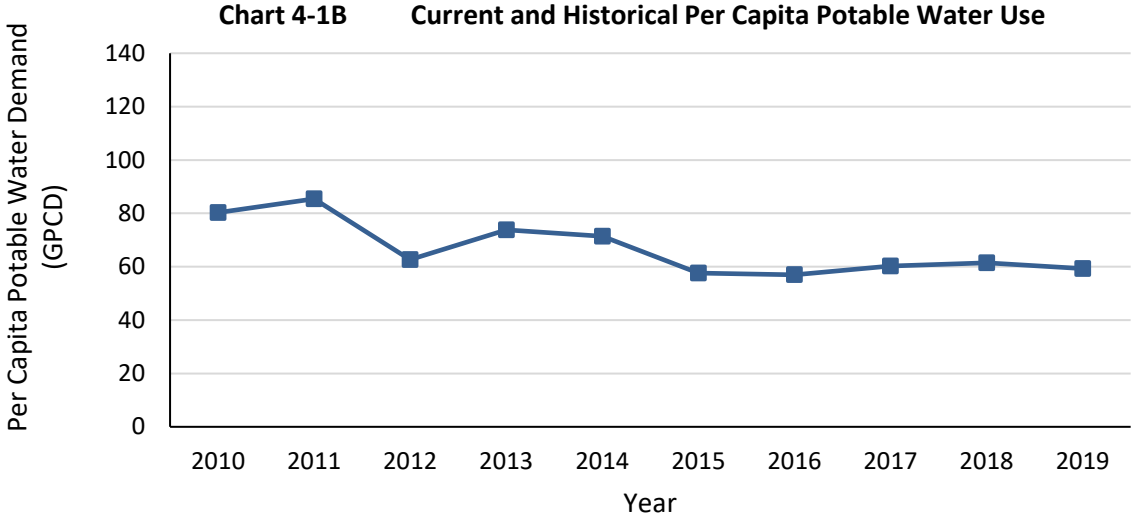


Chart 4-1B Current and Historical Per Capita Potable Water Use



Potable water demand within the District's water service area is measured using water meters that are installed at each customer account. Records of past and current water use at each account are maintained by the District for billing purposes. Potable water demand within the District's service area is tracked and reported on a bimonthly basis for the following sectors:

- Single Family Residential: Single-family, detached dwelling units that are individually metered.
- Multi-Family Residential: Two or more dwelling units contained within one building or several buildings within one complex. Water use is predominately for indoor water uses; irrigation water use for multiple family sites are usually separately metered and listed in the landscape sector.
- Commercial: Includes commercial customers that provides or distributes a product or service. Landscape irrigation water use at these sites is usually separately metered and listed in the landscape sector.
- Institutional/Governmental: Includes connections dedicated to public service, including schools and other government facilities. Landscape irrigation water use at these sites is usually separately metered and listed in the landscape sector.
- Landscape: Water connections supplying water exclusively for landscape irrigation uses associated with multiple family residential customers (i.e., Homeowner Associations; HOAs) and other irrigation sites.
- Sales to other agencies: Water sales made to the City of San Bruno to serve the Crystal Springs Apartments located in San Bruno, near the SFPUC Harry Tracy Water Treatment Plant.
- Other Potable – Port Meters: Water connections supplying water for uses associated with the ports in Pacifica.
- Other Potable - Fire Standby Use: Water meters that supply water exclusively for fire suppression or fire system maintenance.

As shown in Table 4-2 and the associated charts, the District's potable water use is largely associated with residential accounts. Over the last five years, the single family and multi-family residential sectors together accounted for an average of 75 percent of the potable water demand in the District's service area; the single family residential sector has accounted for over 61 percent of the District's potable water demand over the last five years. The commercial and institutional/governmental sectors collectively accounted for approximately 11 percent, the landscape sector accounted for 3 percent, water sales to the City of San Bruno accounted for 2 percent, and other uses accounted for less than 1 percent over the last five years.

Table 4-2 Demands for Potable and Non-Potable Water – Actual (DWR Table 4-1)

Use Type	Additional Description *(as needed)*	Level of Treatment When Delivered	Volume				
			2016	2017	2018	2019	2020
Single Family		Drinking Water	522	527	510	512	558
Multi-Family		Drinking Water	116	108	114	113	123
Commercial		Drinking Water	69	74	71	74	63
Institutional/ Governmental		Drinking Water	26	28	31	29	31
Landscape		Drinking Water	18	22	24	22	28
Sales/Transfers/Exchanges to other Suppliers	Sales to San Bruno	Drinking Water	16	16	17	10	10
Other Potable	Fire Standby Use	Drinking Water	0	1	2	1	1
Other Potable	Port Meter Use	Drinking Water	2	1	0	0	0
Losses		Drinking Water	38	73	99	74	101
		TOTAL	807	850	868	835	914

NOTES:
(a) Volumes are in units of MG.
(b) Volumes are rounded to the nearest MG and may not sum due to rounding.
(c) Water demand was obtained from NCCWD's monthly water consumption vs. production worksheet.
(d) Water loss reported in Table 4-3 is apparent and real losses. Losses reported here are the difference between total demand and metered consumption and thus includes unmetered water consumption and distribution system water losses. Losses include potable water used for supplemental recycled water, which is unmetered (see Section 6.5).
(e) Demands reported are potable water demand. Besides recycled water, the District does not have other non-potable water use. This table and Table 4-2 exclude demands from recycled water. See Table 4-5 and Table 6-4 for recycled water demands.

Chart 4-1A Annual Water Demand by Sector: 2016-2020

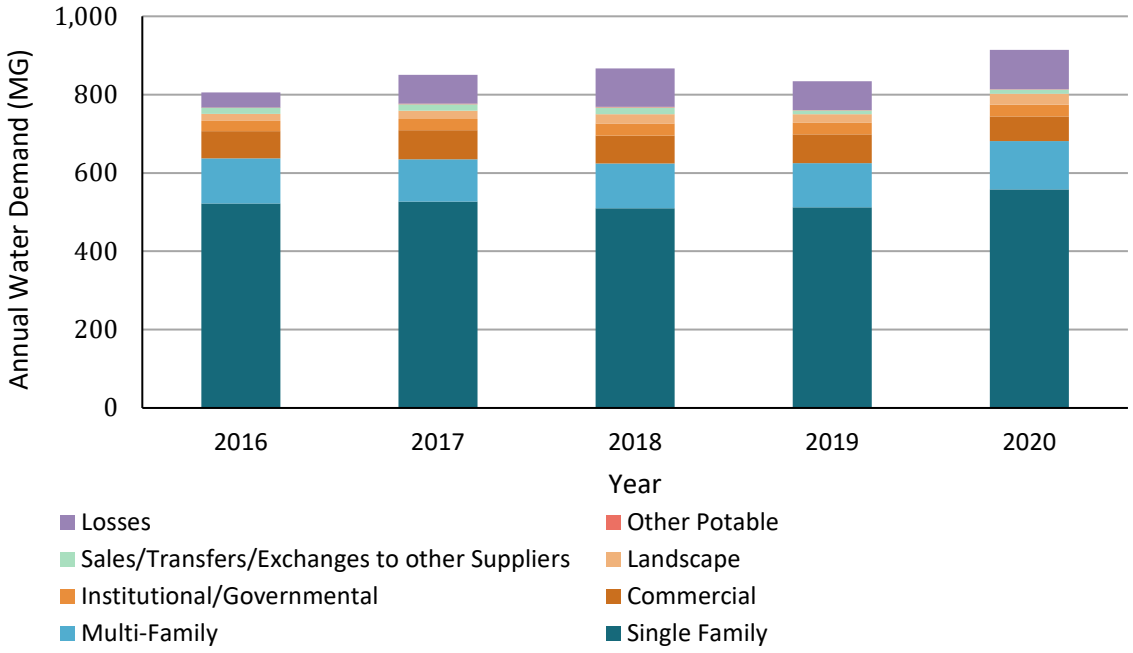
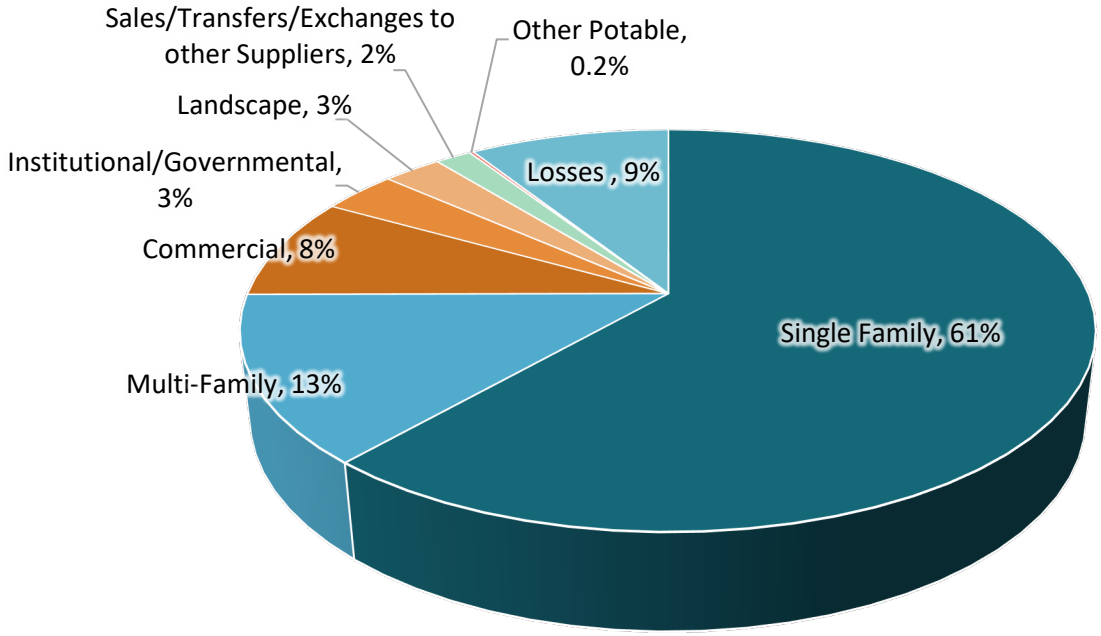


Chart 4-2B Percentage of Total Water Demand by Sector: 2016-2020



4.2.2 Distribution System Water Loss

☑ ***CWC § 10631 (3)***

(A) The distribution system water loss shall be quantified for each of the five years preceding the plan update, in accordance with rules adopted pursuant to Section 10608.34.

(B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.

(C) In the plan due July 1, 2021, and in each update thereafter, data shall be included to show whether the urban retail water supplier met the distribution loss standards enacted by the board pursuant to Section 10608.34.

Distribution system water losses for the previous five years are summarized in Table 4-3. Water loss is the sum of apparent and real losses. Apparent loss is associated with metering inaccuracies, billing and administrative errors, authorized unmetered uses (e.g., system flushing and firefighting), and unauthorized uses. Real loss is associated with physical water lost through line breaks, leaks and seeps, and overflows of storage tanks. Since 2016, urban retail water suppliers have been required under CWC § 10608.34 and California Code of Regulations (CCR) § 638.1 et seq to quantify distribution system water losses using the American Water Works Association (AWWA) Free Water Audit Software (referred to as "water loss audit reports"). The water loss audit reports submitted to DWR provide the basis for the 2016-2019 estimates shown in Table 4-3 and are available through DWR's Water Use Efficiency Data Portal. The District's 2020 water loss audit report had not been completed at the time this Plan was prepared. The 2020 estimate shown in Table 4-3 is therefore drawn from the District's preliminary draft water loss audit results.

CWC § 10631 (3)(c) requires that this UWMP demonstrate whether the distribution loss standards enacted by the SWRCB pursuant to CWC § 10608.34 have been met. However, the SWRCB has yet to establish these standards, and thus consistency with these standards cannot be demonstrated herein.

Table 4-3 Last Five Years of Water Loss Reporting (DWR Table 4-4)

Reporting Period Start Date	Volume of Water Loss
01/2016	36
01/2017	71
01/2018	96
01/2019	80
01/2020	98

NOTES:
(a) Volumes are in units of MG.
(b) Volumes are rounded to the nearest MG.
(c) Water losses for 2016, 2017, 2018, 2019 are reported in the District's AWWA Water Loss Audit Reports.
(d) Water loss for 2020 is an estimate based on the District's preliminary draft water loss audit results.

4.2.3 Projected Water Use

In 2020, future water demands for the District's service area were projected by the Bay Area Water Supply and Conservation Agency (BAWSCA) on behalf of the District in the *Regional Water Demand and Conservation Projections Report* (BAWSCA, 2020). Future water demands were projected using the Demand Management Decision Support System Model (DSS Model) and were a function of the population and employment projections within the District's service area. A detailed description of the DSS Model and the associated demand and conservation projection methodology is provided in the *Regional Water Demand and Conservation Projections Report* (BAWSCA, 2020b). A brief description of BAWSCA's 2020 demand projections is provided below.

> In June 2020, BAWSCA completed the Regional Water Demand and Conservation Projections Report (Demand Study).[10] The goal of the Demand Study was to develop transparent, defensible, and uniform demand and conservation savings projections for each wholesale customer using a common methodology to support both regional and individual agency planning efforts and compliance with the new statewide water efficiency targets required by Assembly Bill (AB) 1668 and Senate Bill (SB) 606.

[10] Phase III Final Report: http://bawsca.org/uploads/pdf/BAWSCA_Regional_Water_Demand_and_Conservation%20Projections%20Report_Final.pdf

> Through the Demand Study process, BAWSCA and the wholesale customers (1) quantified the total average-year water demand for each BAWSCA member agency through 2045, (2) quantified passive and active conservation water savings potential for each individual wholesale customer through 2045, and (3) identified 24 conservation programs with high water savings potential and/or member agency interest. Implementation of these conservation measures, along with passive conservation, is anticipated to yield an additional 37.3 MGD of water savings by 2045. Based on the revised water demand projections, the identified water conservation savings, increased development and use of other local supplies by the wholesale customers, and other actions, the collective purchases of the BAWSCA member agencies from the SFPUC are projected to stay below 184 MGD through 2045.
>
> As part of the Demand Study, each wholesale customer was provided with a demand model that can be used to support ongoing demand and conservation planning efforts, including UWMP preparation.

In 2021, as part of the 2020 UWMP update, the District's DSS Model was revised to account for changes to the population projections since the demand projections were estimated by BAWSCA. The 2021 DSS Model update included revised population projections consistent with the population projections presented in Section 3.4.1.

As described further in Section 4.2.4, passive and active water conservation savings associated with existing water uses in the District's service area have been subtracted from the water demand projections. The passive conservation savings account for anticipated reductions in water use due to the ongoing effects of appliance standards and plumbing codes. The active water conservation savings accounted for in the DSS Model are based on the District's planned demand management measures (DMMs) that are described in Chapter 9.

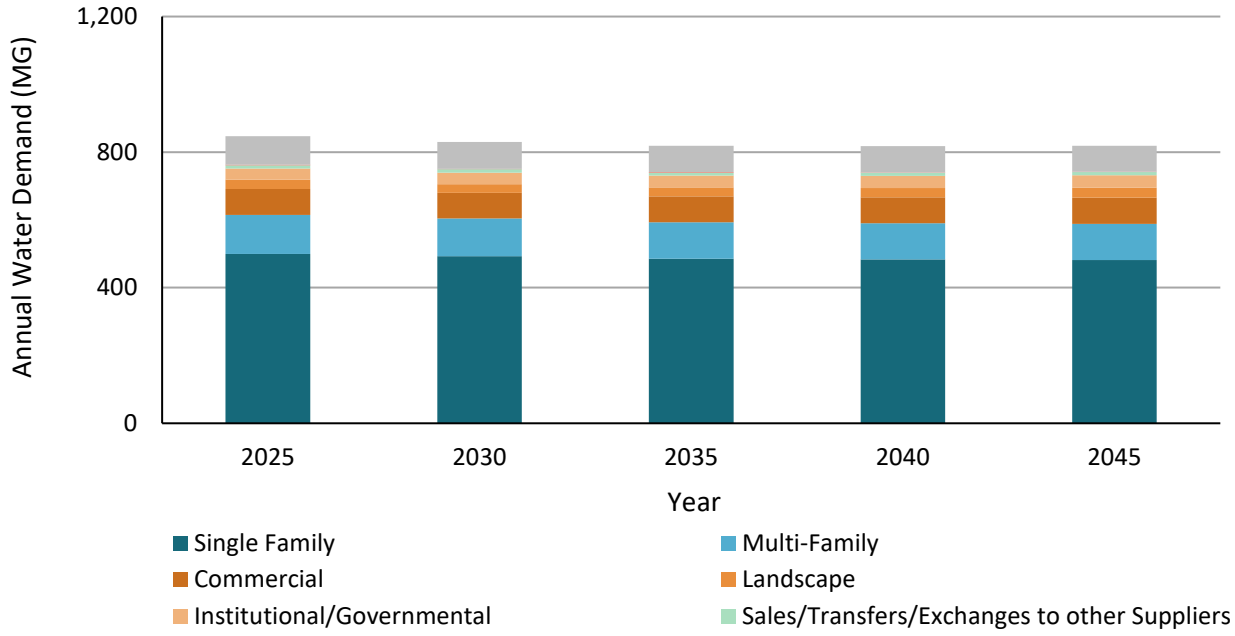
Projected water uses by sector through 2045 are summarized in Table 4-4 and associated chart according to the 2021 DSS Model results.

Table 4-4 Use for Potable and Non-Potable Water - Projected (DWR Table 4-2)

Use Type	Additional Description *(as needed)*	Projected Potable Water Use				
		2025	2030	2035	2040	2045
Single Family		500	493	485	483	482
Multi-Family		115	111	108	107	107
Commercial		77	76	76	76	77
Landscape		27	26	26	27	30
Institutional/Governmental		33	34	35	36	37
Sales/Transfers/Exchanges to other Suppliers	Sales to San Bruno	10	10	9	9	9
Other Potable	Fire Standby and Port Meter Use	1	1	1	1	1
Losses		84	79	77	77	77
TOTAL		846	830	818	817	819

NOTES:
(a) Volumes are in units of MG.
(b) Volumes are rounded to the nearest MG and may not sum due to rounding.
(c) Projected water demands are estimated using the DSS Model provided to the District on 25 June 2020 and updated in January 2021 to reflect population projections shown in Table 3-2.
(d) Sales to City of San Bruno for use by the Crystal Springs Apartments are included within the Institutional/Governmental demand projections in the DSS Model. To provide separate projections for this use category, the 2019 San Bruno water sales were used as a baseline demand, projected consistently with the multi-family use projections, and subtracted from the total institutional/governmental demands.
(e) Demands reported are potable water demand. Besides recycled water, the District does not have other non-potable water use. This table exclude demands from recycled water. See Table 6-4 for recycled water demands.

Chart 4-4 Current and Projected Potable Water Demand by Sector



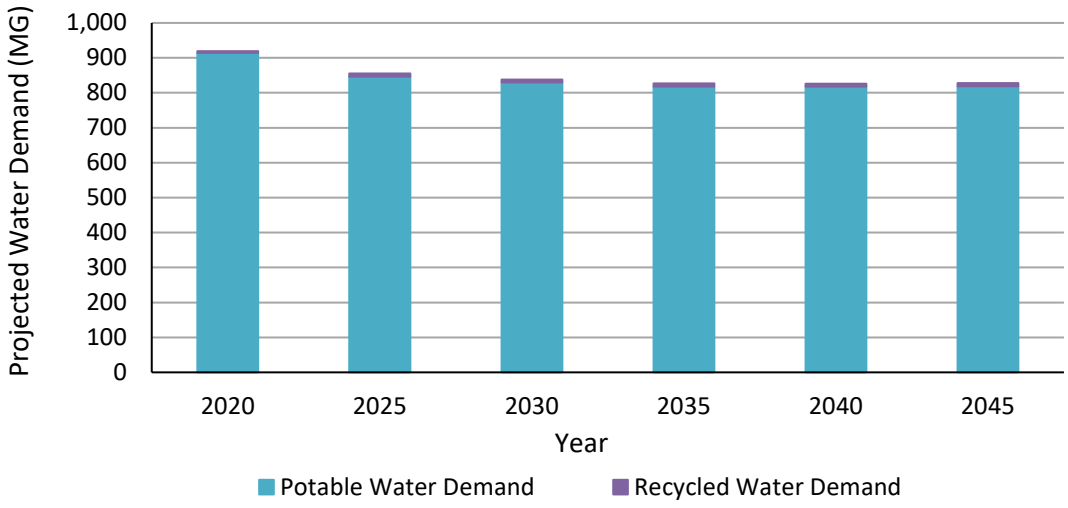
Future water demands are expected to be comprised of both potable water use and recycled water use, as shown in Table 4-5 and associated chart. The District is actively investigating opportunities to expand its recycled water use. However, as discussed in Chapter 6 of this Plan, given the uncertainty in planning and schedule of these effort, there is currently no projected increase in recycled water demands for the District through the year 2045.

Table 4-5 Total Water Use (Potable and Non-Potable) (DWR Table 4-3)

	2020	2025	2030	2035	2040	2045 (opt)
Potable Water, Raw, Other Non-potable (*From DWR Tables 4-1 and 4-2)*	914	846	830	818	817	819
Recycled Water Demand (*From DWR Table 6-4)*	5	9	9	9	9	9
TOTAL WATER USE	919	855	838	827	826	828

NOTES:
(a) Water use volumes are in units of MG.
(b) Volumes are rounded to the nearest MG. Totals may not sum exactly due to rounding.
(c) The District's Total Water Use does not include potable and recycled water deliveries that are wheeled through the District's distribution system on behalf of SFPUC to the Sharp Park Golf Couse, which is owned and operated by the San Francisco Recreation and Parks Department.
(d) Supplemental potable supply used to meet recycled water demands in 2020 (4 MG) is included in the Potable Water, Raw, Other Non-potable volumes.

Chart 4-5 Current and Projected Total Water Use



4.2.4 Future Water Savings in Projected Water Use

☑ ***CWC § 10631 (d) (4)***

(A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.

(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:

(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.

(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.

As affirmed in Table 4-6, both future water savings (discussed below) and lower income residential demands (discussed in Section 4.2.5) are included in the projections of future water use.

Table 4-6 Inclusion in Water Use Projections (DWR Table 4-5)

Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook)	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.	Chapters 8 and 9
Are Lower Income Residential Demands Included In Projections?	Yes

"Passive conservation" refers to water savings resulting from actions and activities that do not depend on direct financial assistance or educational programs implemented by water suppliers. These savings result primarily from: (1) the natural replacement of existing plumbing fixtures with water-efficient models required under current plumbing code standards,[11] (2) the installation of water-efficient fixtures and equipment in new buildings and retrofits as required under CALGreen Building Code Standards, [12] and (3) inclusion of low-water use landscaping and high-efficiency irrigation systems to minimize outdoor water

[11] Including the California Energy Commission Title 20 appliance standards for toilets, urinals, faucets, and showerheads – The appliance standards determine what can be sold in California and therefore will impact both new construction and replacement fixtures in existing homes.

[12] The City of Pacifica requires that all new and modified structures comply with the mandatory CALGreen Requirements, as described on the City's website:

https://www.cityofpacifica.org/depts/planning/green_building/default.asp, accessed on 10 February 2021.

use in new connections and projects in accordance with the State's Model Water Efficient Landscape Ordinance (MWELO).

"Active conservation" refers to water savings resulting from the District's implementation of water conservation programs, education programs, and the offering of financial incentives (e.g., rebates). The District's current and planned active conservation programs, or DMMs, are discussed in Chapter 9.

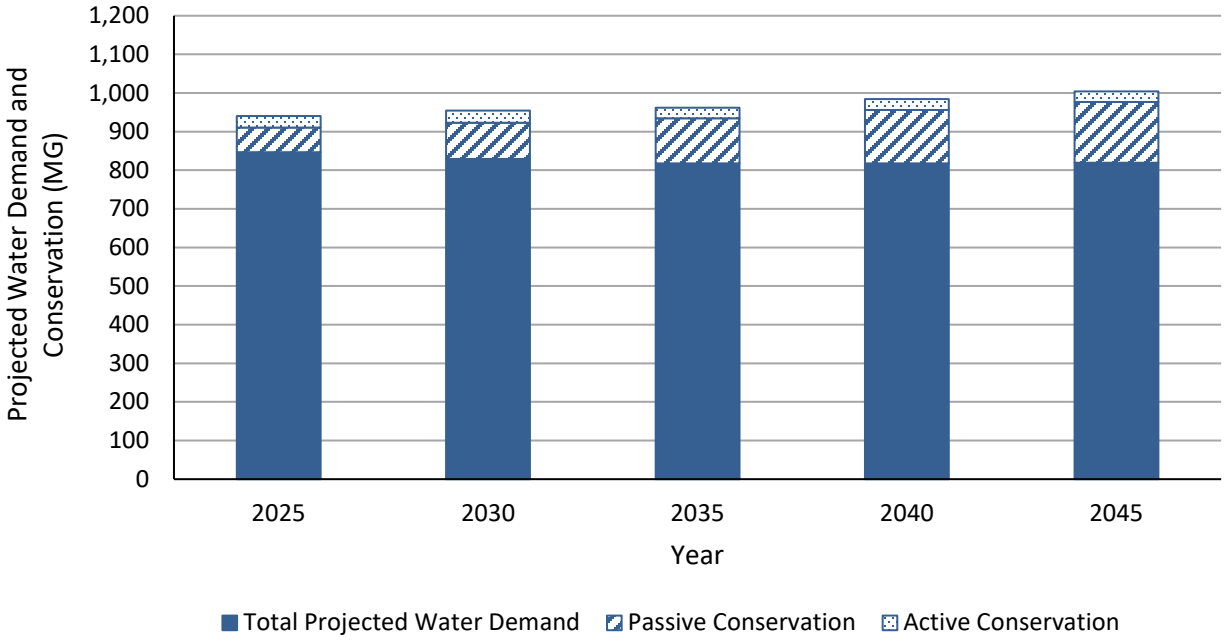
As part of the 2021 DSS Model update, passive and active savings within District's service area are subtracted from water demand projections. As shown in Table 4-7 and the associated charts, by 2045 it is estimated that passive conservation savings will reduce total projected potable water demand by 158 MG per year within the District's service area and active conservation will further reduce demands by 27 MG per year (i.e., the total 2045 demand will be reduced from 1,004 MG to 819 MG).

Table 4-7 Projected Potable Water Demand and Projected Passive and Active Water Conservation

Water Conservation Type	Projected Potable Water Demand (MG)				
	2025	2030	2035	2040	2045
Projected Water Demand without Conservation	940	955	962	984	1,004
Projected Water Conservation					
Passive Conservation	64	93	116	138	158
Active Conservation	29	32	28	28	27
Projected Water Demand after Passive Conservation Savings	876	861	846	846	847
Projected Water Demand after Passive and Active Conservation Savings	846	830	818	817	819

NOTES:
(a) Volumes are in units of MG.
(b) Volumes are rounded to the nearest MG and may not sum exactly due to rounding.
(c) Projected water demands are estimated using the DSS Model based on population and employment projections shown in Tables 3-1 and 3-2.

Chart 4-7 Projected Potable Water Demand and Conservation



4.2.5 Water Use for Lower Income Households

☑ ***CWC § 10631.1***

(a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirements under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

The water demands presented in Section 4.2.3 include projected future water use by lower income households. Per Health and Safety Code 50079.5, a lower income household is defined as household with lower than 80 percent of the City's median income. The U.S. Census American Community Survey 2019 5-Year Estimates indicates approximately 40 percent of the City of Pacifica's housing units served residents with less than 80 percent of the $125,500 median income (Table 3-3).[13]

[13] U.S. Census Bureau, 2019. *2015-2019 American Community* Survey *5-year Estimates*, dated 2019. Retrieved from: https://data.census.gov/cedsci/.

Based on the above criteria, it is assumed that approximately 40 percent of the residential water demand in the NCCWD service area will be associated with lower income households. Table 4-8 includes the estimates of total potable future water use for lower income households and includes active and passive savings.

Table 4-8 Projected Potable Water Demand of Lower-Income Households

Lower-Income Water Demand	2025	2030	2035	2040	2045
Single Family	200	197	194	193	193
Multifamily	46	45	43	43	43

NOTES:
(a) Volumes are in units of MG.
(b) Volumes are rounded to the nearest MG.
(c) Projected potable water demands for lower income households were estimated as a percentage of water demand for single family and multifamily residential in Table 4-4. The percentage is based on the number of total households within Pacifica, per U.S. Census American Community Survey 2019 5-Year Estimates. Demands include passive and active conservation.

4.2.6 Characteristic Five-Year Water Use

☑ ***CWC § 10635(b)(3)***

(b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following…

(3) A comparison of the total water supply sources available to the water supplier with ***the total projected water use for the drought period.*** (Emphasis added).

A critical component of the new statutory in CWC § 10635(b) language is the requirement to prepare a five-year Drought Risk Assessment (DRA; see 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 DRA is based on the District's demand

projections from the 2021 DSS Model accounting for active and passive conservation savings. The forecast for the next five years is shown in Table 4-9.

Table 4-9 Characteristic Five-Year Water Use

	2021	2022	2023	2024	2025
Total Water Use Forecast	841	842	847	852	846

NOTES:
(a) Water use volumes are in units of MG.
(b) Volumes are rounded to the nearest MG.
(c) Demands include passive and active conservation.

4.3 Water Use Sectors Not Included in the Demand Projections

Historical and projected water demands for the water use sectors described in CWC § 10631(d)(1)(G) through (I) and listed below were not included in District's water demand calculations because they are not applicable to the District:

- Industrial;
- Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; and
- Agricultural.

4.3.1 Industrial

The District does not sell potable water to any industrial water users and does not expect to in the future.

4.3.2 Saline Water Intrusion Barriers, Groundwater Recharge, and Conjunctive Use

The District does not use water for saline water intrusion barriers and does not currently participate in active groundwater recharge activities or a conjunctive use program.

4.3.3 Agricultural

The District does not sell water to agricultural customers and does not expect to in the future.

4.4 Climate Change Impacts to Demand

☑ ***CWC § 10635(b)***

(4) 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.

Hotter and drier weather may lead to an increased demand in landscape irrigation. The DSS Model assesses the sensitivity of NCCWD's water demand to weather and then incorporates predicted weather and climate change data into demand projections. Therefore, the demand projections presented above include considerations of climate change.

A description of the weather and climate change data incorporated into the DSS Model is provided in Section 3.6 of the BAWSCA Demand Study (BAWSCA, 2020b). Based on data published by the International Panel on Climate Change (IPCC) and the California's Fourth Climate Change Assessment San Francisco Bay Area Summary Report (Ackerly et al., 2018), a predicted annual mean temperature increase of 1.7°F was incorporated into the DSS Model demand forecast.

4.5 Coordinating Water Use Projections

☑ ***CWC § 10631 (h)***

An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available.

The District provides the SFPUC with water use projections annually as part of reporting to the BAWSCA Annual Surveys and other BAWSCA-led water demand and supply coordination efforts as dictated by the 2009 Water Supply Agreement. As part of the coordination effort for the 2020 UWMP, and in compliance with CWC § 10631(h), the District supplied BAWSCA with its water demand projections through 2045 for transmittal to the SFPUC.

4.6 Urban Water Use Objective

☑ ***CWC § 10609.20***

(a) Each urban retail water supplier shall calculate its urban water use objective no later than January 1, 2024, and by January 1 every year thereafter.

(b) The calculation shall be based on the urban retail water supplier's water use conditions for the previous calendar or fiscal year.

☑ ***CWC § 10609.22***

(a) An urban retail water supplier shall calculate its actual urban water use no later than January 1, 2024, and by January 1 every year thereafter.

(b) The calculation shall be based on the urban retail water supplier's water use for the previous calendar or fiscal year.

☑ ***CWC § 10609.24***

(a) An urban retail water supplier shall submit a report to the department no later than January 1, 2024, and by January 1 every year thereafter. The report shall include all of the following:

(1) The urban water use objective calculated pursuant to Section 10609.20 along with relevant supporting data.

(2) The actual urban water use calculated pursuant to Section 10609.22 along with relevant supporting data.

(3) Documentation of the implementation of the performance measures for CII water use.

(4) A description of the progress made towards meeting the urban water use objective.

(5) The validated water loss audit report conducted pursuant to Section 10608.34.

(b) The department shall post the reports and information on its internet website.

(c) The board may issue an information order or conservation order to, or impose civil liability on, an entity or individual for failure to submit a report required by this section.

Following the 2014-2016 drought, the State of California developed the "Making Water Conservation a California Way of Life" framework to address the long-term water use efficiency requirements called for in executive orders issued by Governor Brown. In May of 2018, AB 1668 and SB 606 went into effect, which built upon the executive orders implementing new urban water use objectives for urban retail water suppliers.

SB 606 and AB 1668 establish guidelines for efficient water use and a framework for the implementation and oversight of the new standards, which must be in place by 2022. The bills call for creation of new urban efficiency standards for indoor use, outdoor use, and water loss, as well as any appropriate variances for unique local conditions.

The indoor water use standard will be 55 gallons per person per day (gallons per capita per day, or GPCD) until January 2025; the standard will become stronger overtime, decreasing to 50 GPCD in January 2030. Water use standards for the remaining components will be adopted by the State Water Resources Control Board by regulation no later than June 30, 2022. Using the adopted standards, each urban retail water agency will annually, beginning January 1, 2024, calculate its own objective.

Table 4-10 and the associated chart summarize the estimated potable indoor and outdoor residential demand as part of the District's total potable water demand shown above in Table 4-5. Furthermore, Table 4-10 shows the per capita projected indoor residential water demand based on the population projections described in Section 3.4.1. These estimates show that the District's residential indoor water use is projected to be well below the indoor water use standard.

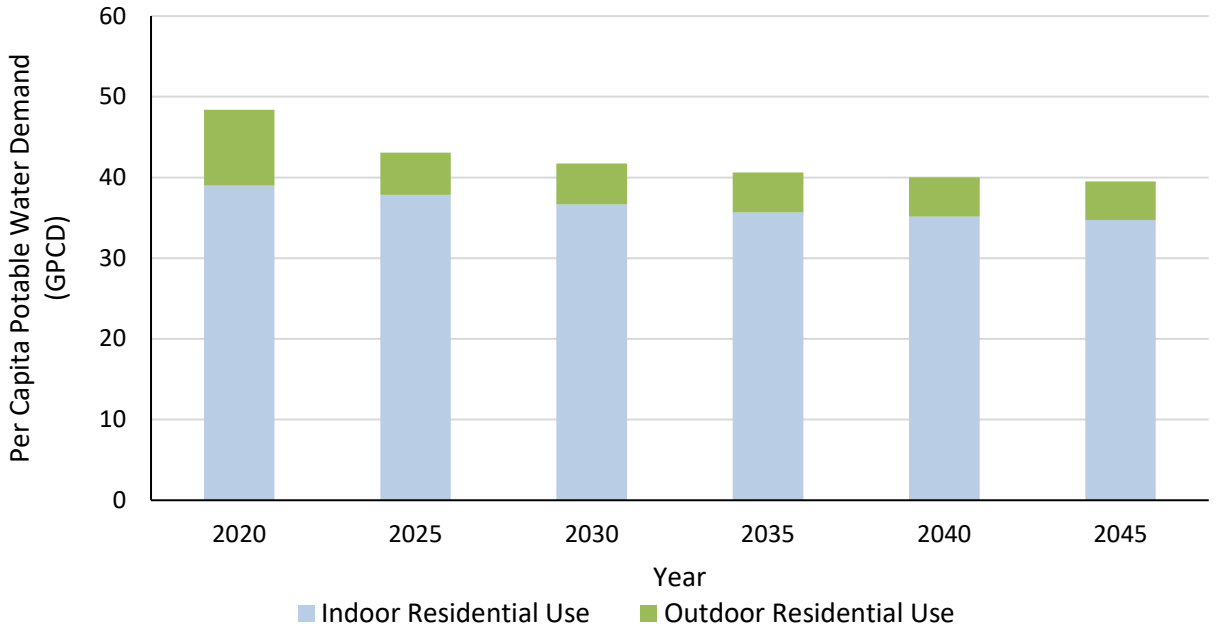
In the past two decades, the District has made significant strides in reducing its per capita potable water demand above and beyond targets delineated by the Water Conservation Act (see Chapter 5). The District plans to continue to implement conservation efforts to meet new legislative requirements as part of the "Making Water Conservation a California Way of Life" framework. Potable water demand reductions will be achieved through implementation of DMMs, as discussed in Chapter 9. The District could potentially reduce potable demands through expansion of the District's recycled water program, as discussed in Chapter 6, although the potential reductions associated with an expanded recycled water program have not been quantified. The District will continue to monitor per capita water demand to ensure that its compliance targets are being met.

Table 4-10 Current and Projected Residential Per Capita Water Use

Year	Residential Potable Water Demand (MG)	Service Area Population	Per Capita Residential Potable Water Use (GPCD)	Approximate Per Capita Indoor Residential Potable Water Use (GPCD)	Approximate Per Capita Outdoor Residential Potable Water Use (GPCD)
2020	681	38,579	48	39	9.4
2025	615	39,084	43	38	5.3
2030	604	39,654	42	37	5.1
2035	593	40,032	41	36	4.9
2040	591	40,414	40	35	4.9
2045	588	40,800	40	35	4.8

NOTES:
(a) Service area population is detailed in Table 3-2.
(b) Residential potable water is detailed in Table 4-2 and Table 4-4 and includes single family and multi-family residential.
(c) Per capita potable water demand is calculated by dividing the annual residential potable water demand by the service area population and the number of days in a year.
(d) Indoor residential water use is approximately 88 percent of total residential potable water use and is estimated from the DSS Model. Outdoor residential water use is approximately 12 percent of total residential potable water use but does not include metered multifamily residential irrigation accounts.

Chart 4-10 Current and Projected Indoor and Outdoor Residential Per Capita Potable Water Use



5 SBX7-7 BASELINE, TARGETS, AND 2020 COMPLIANCE

☑ ***CWC § 10608.24 (b)***

Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

☑ ***CWC § 10608.28***

(a) An urban retail water supplier may meet its urban water use target within its retail service area, or through mutual agreement, by any of the following:

(1) Through an urban wholesale water supplier.

(2) Through a regional agency authorized to plan and implement water conservation, including, but not limited to, an agency established under the Bay Area Water Supply and Conservation Agency Act (Division 31 (commencing with Section 81300)).

(3) Through a regional water management group as defined in Section 10537.

(4) By an integrated regional water management funding area.

(5) By hydrologic region.

(6) Through other appropriate geographic scales for which computation methods have been developed by the department.

(b) A regional water management group, with the written consent of its member agencies, may undertake any or all planning, reporting, and implementation functions under this chapter for the member agencies that consent to those activities. Any data or reports shall provide information both for the regional water management group and separately for each consenting urban retail water supplier and urban wholesale water supplier.

With the adoption of the Water Conservation Act of 2009, also known as Senate Bill (SB) X7-7, the state is required to reduce urban water use by 20 percent by the year 2020. Each urban retail water supplier was required to develop a baseline daily per capita water use ("baseline water use") in their 2010 Urban Water Management Plan (UWMP) and establish per capita water use targets for 2015 and 2020 to help the state achieve the 20 percent reduction.

In support of implementing the requirements of SBx7-7, the Department of Water Resources (DWR) produced a set of methodologies for developing baseline and compliance water use and targets, which are included in Methodologies for Calculating Baseline and Compliance Urban Per Capita Water, California Department of Water Resources Division of Statewide Integrated Water Management Water Use and Efficiency Branch (Methodologies; DWR, 2016b).

In this chapter, the District demonstrates compliance with its 2020 per capita water use target. Compliance will be verified by the DWR review of the SB X7-7 Verification and Compliance forms submitted with this Urban Water Management Plan (UWMP or Plan). These forms are included with this Plan in Appendix D and Appendix E.

5.1 Updates to the 2015 UWMP Calculations

The District has not made any changes to methodologies used in its 2015 UWMP pertaining to SB X7-7. However, the District did correct erroneous population data for 2003 and 2004 used to calculate the

5 Year Baseline in SB X7-7 Table 5 (Appendix D). As discussed in Section 5.3, this correction changed the 5 Year Average Baseline reported in the 2020 UWMP from 91 to 90 gallons per capita per day (GPCD).

5.2 Service Area Population

Urban retail water suppliers must estimate their service area population in a manner that is consistent with DWR requirements. For water suppliers whose boundaries correspond by 95 percent or more with a city or census designated place, population estimates prepared by the California Department of Finance (DOF) may be used. Where this is not the case, water suppliers may use the DWR Population Tool or estimate their population using other methods, provided these methods comply with Methodology 2 – Service Area Population – of DWR's Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use.

As discussed in Chapter 3, the population served by the District is closely represented by the population within the boundaries of the City of Pacifica. Portions of the service area located outside of the City's boundaries in unincorporated San Mateo County are uninhabited according to voter files and the US Census data. Therefore, service area population has been estimated using data published by the DOF for the City of Pacifica.

5.3 Baseline Periods, Baseline GPCD, and Confirmed 2020 Target

Table 5-1 shows the District's 5- and 10-year baseline periods, its baseline GPCD for these periods, and its confirmed 2020 target. The data used to calculate the baseline and target GPCD values are provided in Appendix D.

Table 5-1 Baselines and Targets Summary (DWR Submittal Table 5-1)

Baseline Period	Start Year	End Year	Average Baseline GPCD*	Confirmed 2020 Target*
10-15 year	1996	2005	89	124
5 Year	2003	2007	90	
NOTES: (a) All values are in Gallons per Capita per Day (GPCD)				

As discussed in Section 5.1, the 5-Year Average Baseline has been updated from 91 to 90 GPCD in the 2020 UWMP as a result of correcting an error in the population data for 2003 and 2004 used to calculate the baseline in the 2015 UWMP.

5.4 Demonstration of Compliance with 2020 Target

Table 5-2 demonstrates the District's compliance with its 2020 GPCD target. The data used to calculate actual 2020 GPCD are provided in Appendix E. The actual 2020 use is 65 GPCD versus a target of 124 GPCD. The actual 2020 GPCD is less than the target GPCD, and the District is therefore in compliance with SB X7-7 requirements.

Table 5-2 2020 Compliance (DWR Submittal Table 5-2)

2020 GPCD			2020 Confirmed Target GPCD	Did Supplier Achieve Targeted Reduction for 2020?
Actual 2020 GPCD	2020 TOTAL Adjustments	Adjusted 2020 GPCD *(Adjusted if applicable)*		
65	0		124	Yes
NOTES: (a) Volumes are reported in gallons per capita per day (GPCD)				

6 WATER SUPPLY CHARACTERIZATION

☑ ***CWC § 10631 (b)*** *A plan shall be adopted in accordance with this chapter that shall do all of the following:*

Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).

This chapter presents an analysis of the North Coast County Water District's (also referred to herein as the District or NCCWD) water supplies, as well as an estimate of water-related energy-consumption. The intent of this chapter is to present a comprehensive overview of the District's water supplies, estimate the volume of available supplies over the Urban Water Management Plan (UWMP or Plan) planning horizon, and assess the sufficiency of the District's supplies to meet projected demands under "normal" hydrologic conditions.

6.1 Purchased or Imported Water

The District's sole source of potable water is purchased water from the City and County of San Francisco's Regional Water System (RWS), operated by the San Francisco Public Utilities Commission (SFPUC or Commission). The District 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 28 April 2009. Per the 2009 Water Supply Agreement, San Francisco has a perpetual commitment (Supply Assurance) to deliver 184 million gallons per day (MGD) to the 24 permanent Wholesale Customers, including NCCWD, collectively.

To maintain consistency with the UWMPs prepared by the SFPUC and the other Bay Area Water Supply and Conservation Agency (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 gray font.

6.1.1 Description of SFPUC RWS

Approximately 85 percent 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 percent 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 2020 Draft UWMP (SFPUC, 2021) and is provided verbatim below.

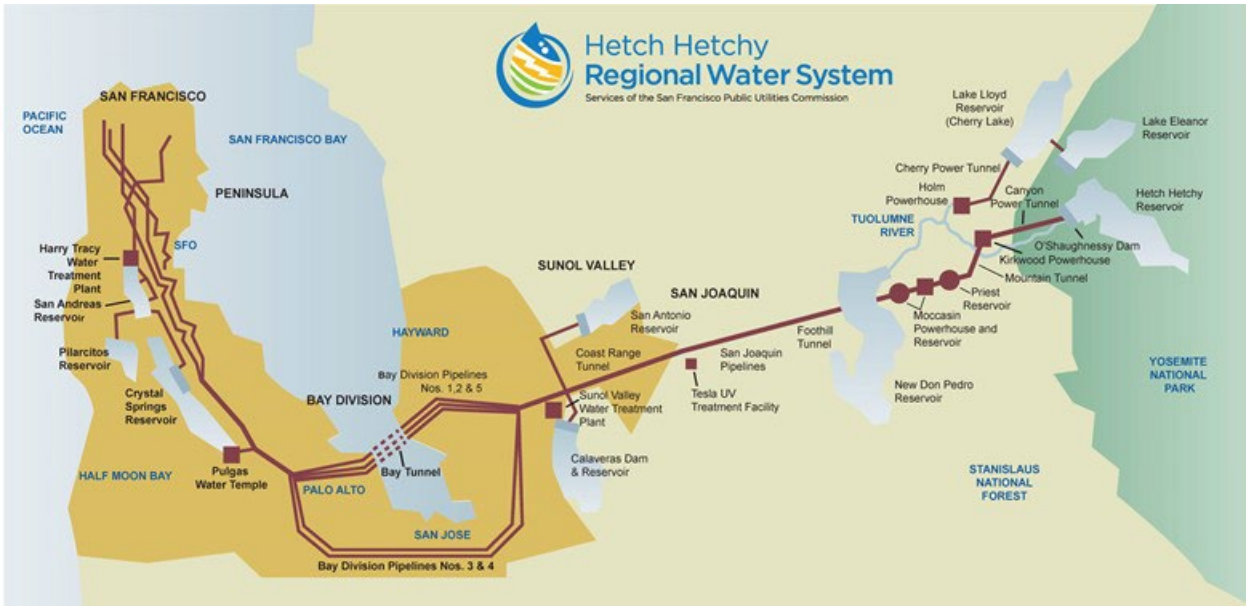


Figure 6-1 Regional Water System

6.1.1.1 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 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.

6.1.1.2 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.

6.1.1.3 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.[14] 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.

[14] The Turlock Irrigation District and Modesto Irrigation District have senior water rights to the City for the Tuolumne River water and are provided the first increment of flow in the Upper Tuolumne River watershed according to the apportionment set forth in the Raker Act of 1913 (38 Stat. 242). The water bank at Don Pedro Reservoir provides a credit and debit system, which allows the City to divert water upstream while meeting its obligations to the Turlock Irrigation District and Modesto Irrigation District. Through this mechanism, the SFPUC may pre-deliver the Turlock Irrigation District's and Modesto Irrigation District's entitlements and credit the water bank so that at other times the SFPUC may retain water upstream while the Turlock Irrigation District and Modesto Irrigation District debit the water bank.

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.

6.1.2 Individual Supply Guarantees

San Francisco has a perpetual commitment (Supply Assurance) to deliver 184 mgd to the 24 permanent Wholesale Customers collectively. San Jose and Santa Clara are not included in the Supply Assurance commitment and each has temporary and

interruptible water supply contracts with San Francisco. The Supply Assurance is allocated among the 24 permanent Wholesale Customers through Individual Supply Guarantees (ISG), which represent each Wholesale Customer's allocation of the 184 mgd Supply Assurance.

The District's Individual Supply Guarantee (ISG) is 3.84 MGD, or approximately 1,402 million gallons (MG) per year. Between 2016 and 2020, the District purchased between 58 percent and 65 percent of its ISG (see Table 6-8 and associated chart).

6.1.3 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 provided 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 Groundwater

☑ ***CWC § 10631***

(b) (4) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information:

(A) The current version of any groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720), any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management for basins underlying the urban water supplier's service area.

(B) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For a basin that has not been adjudicated, information as to whether the department has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to coordinate with groundwater sustainability agencies or groundwater management agencies listed in subdivision (c) of Section 10723 to maintain or achieve sustainable groundwater conditions in accordance with a groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720).

(C) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

As indicated in Table 6-1, groundwater is not currently used by the District as a source of supply. However, the District is evaluating the feasibility of adding groundwater as a supply source. One DWR-defined groundwater basin, the San Pedro Valley Basin (DWR Basin No. 2-036), underlies a portion of the District's service area in the Linda Mar area. The San Pedro Valley Basin is approximately 710 acres in surface area (DWR, 2019) and is defined generally by the spatial extent of Holocene alluvium (Q) mapped by the California Division of Mines and Geology (Wagner et al., 1991). Based on DWR records of groundwater wells, the basin has been used in a limited fashion for domestic and landscape irrigation supply. Being a relatively small basin that has not been developed extensively for groundwater supply, DWR's Bulletin 118 basin description contains no information on the Basin's groundwater level trends, groundwater storage, or water budget. The District intends to continue studying the basin to determine its potential as a future alternative supply source.

Table 6-1 Groundwater Volume Pumped (DWR Table 6-1)

X	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						

6.3 Surface Water

Water that is self-supplied to agencies from streams, lakes, and reservoirs is considered a surface water supply. Although NCCWD's potable water supply is originally derived from surface water, it is categorized as "purchased" water since the water is obtained from the SFPUC RWS.

The District currently holds appropriative water rights, issued by the California State Water Resources Control Board (SWRCB), to divert and use water from South Fork San Pedro Creek. The District's right to divert and use water from South Fork San Pedro Creek is subject to the provisions specified in its License No. 9038 and Permit No. 16962. Combined, License No. 9038 and Permit No. 16962 authorize the District to divert and use 362.7 acre feet (AF) or 118.2 MG of water annually from South Fork San Pedro Creek in normal years. In comparison, the District's total annual right to the use of water from South Fork San Pedro Creek is approximately 8 percent of the District's 1,402 MG per year ISG from the SFPUC. During single or multiple dry years, the yield would be considerably less. For instance, in 1991 production was limited to 9.0 AF or 2.9 MG. The District is not currently using surface water from South Fork San Pedro Creek and has not done so since 1997. The District intends to evaluate future use of surface water from South Fork San Pedro Creek in the next few years to diversify its supply portfolio and provide a direct source of supply to the southern portion of its distribution system.

6.4 Stormwater

NCCWD does not currently, nor does it plan to in the future, use diverted stormwater as part of its water supply portfolio.

6.5 Wastewater and Recycled Water

☑ ***CWC § 10633***

The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier…

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. The City of Pacifica (City) collects and treats wastewater generated in the District's service area. The City owns and operates the Calera Creek Water Recycling Plant (CCWRP) that produces tertiary quality effluent. Since 2013, the District has

received a portion of the tertiary effluent from the CCWRP and distributed it to customers within its service area for the beneficial use of landscape irrigation. This section describes NCCWD's current and potential recycled uses, constraints and challenges, and actions to encourage future expanded use of recycled water.

6.5.1 Recycled Water Coordination

☑ ***CWC § 10633***

… The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.

The City is the sole entity that collects, treats, and disposes of wastewater in the District's service area. NCCWD and the City entered into a long-term cooperative agreement in 2003 regarding recycled water that delineates the responsibilities of each agency. The City agrees to supply disinfected tertiary quality recycled water per Title 22 of California's Code of Regulations (Title 22) to NCCWD for distribution and storage throughout Pacifica to permitted District customers. The District is responsible for maintaining all permits and licenses needed to sell recycled water and installing, operating, and maintaining all components of the recycled water distribution system from the recycled water pump station at CCWRP to the customer connection points. The District coordinates operations of the recycled water system with the City to ensure that the treated effluent meets the Title 22 requirements.

NCCWD has also entered into an agreement with the City and County of San Francisco (San Francisco) for recycled water use at the Sharp Park Golf Course. The Sharp Park Golf Course, while located in the City of Pacifica, is owned and operated by the San Francisco Recreation and Parks Department and is in San Francisco's service area. The Sharp Park Golf Course is the largest recycled water customer, but this water is wheeled through the District's recycled water system on behalf of the SFPUC and is not included in the District's total recycled water demands or supplies, described in Table 6-4. The SFPUC (as part of San Francisco) jointly funded the recycled water project with NCCWD and agreed to accept delivery of and use recycled water at Sharp Park Golf Course for approved irrigation uses on all appropriate portions of the golf course. San Francisco is responsible for all operations and maintenance of the facilities throughout the golf course after the recycled water meter. The District is responsible for all regulatory reporting requirements.

6.5.2 Wastewater Collection, Treatment, and Disposal

☑ ***CWC § 10633 (a)***

A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

☑ ***CWC § 10633 (b)***

A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

The City's wastewater collection system includes approximately 96 miles of gravity sewer mains, four miles of pressure (force) mains, and five sewage pump stations. All wastewater is pumped via the three

largest pump stations (Sharp Park, Linda Mar, and Rockaway) to the City's 4.0 MGD CCWRP. At Sharp Park and Linda Mar pump stations, the wastewater is screened to remove inorganic objects prior to being pumped to the CCWRP.

The first stage of treatment at the CCWRP is a vortex chamber that separates grit from the sewage. Next, the wastewater enters the plant's sequencing batch reactor (SBRs), which provide primary and secondary treatment and nutrient removal. In the SBRs, micro-organisms feed on the organic matter and air is injected to assist the organisms and to mix the contents.

After the organisms consume the sewage and solids, the remaining particles are allowed to settle to the bottom in the form of sludge. Some of the sludge is left in the reactor basins to feed on the next batch of sewage. The rest of the sludge is pumped to a biosolids holding tank. In the biosolids holding tank, the sludge is then thickened and pumped into auto thermal thermophilic aerobic digesters (ATAD). The ATAD organisms live at a high temperature (135 degrees), which kills both SBR organisms and other bacteria normally found in sewage. This disinfects the sludge so it can be recycled as topsoil.

After the sludge settles to the bottom of the SBR basins, water is drawn out from the middle and drained to sand filters. The sand filters provide tertiary treatment and remove any remaining particles. The filtered effluent then passes through the UV disinfection channel. Finally, tertiary treated disinfected effluent is either discharged into the Calera Creek wetlands or used as recycled water.

Discharges from the CCWRP are regulated by the California Regional Water Quality Control Board San Francisco Bay Region Order No. R2-2017-0013 and the National Pollutant Discharge Elimination Systems permit No. CA0038776.

Table 6-2 summarizes the collection of wastewater by the City within the District's service area in 2020. Table 6-3 summarizes the wastewater treatment and disposal within the District's service area in 2020.

6.5.3 Recycled Water System Description

☑ ***CWC § 10633 (c)***

A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

A map of the District's recycled water system is shown in Figure 3-3. Recycled water is distributed via the District's recycled water pump station, located at the CCWRP. The pump station consists of two 700 gallons-per-minute (gpm) pumps. Only one pump runs at any given time and the other serves as a standby pump. The pump station includes a chlorination system, which feeds sodium hypochlorite into the pump discharge to maintain a chlorine residual in the recycled water distribution system.

The distribution system includes a recycled water storage tank to control system pressure and meet the peak demand. The tank is located at Gypsy Hill and has a capacity of 400,000 gallons. Potable water can be added to the recycled water tank if the recycled water produced is not sufficient to meet the demand.

Approximately 17,000 feet (3.25 miles) of recycled water distribution piping connects the recycled water pump station to the recycled water storage tank and customers. The District's current recycled water

customers include the SFPUC (Sharp Park Golf Course),[15] Fairway Park, Oceana High School, Ingrid B. Lacy Middle School, and several streetscape areas. The District also offers recycled water to residential customers at the recycled water filling station located at the corporation yard of the District's main office. In addition, the District installed an 8-inch pipe underneath the pedestrian pathway between the Rockaway Beach neighborhood and Linda Mar Boulevard, which is currently not in service but is intended to facilitate future expansion of the recycled water distribution system.

[15] Sharp Park Golf Course, while it is located within Pacifica, it is owned and operated by the San Francisco Recreation and Parks Department. As such, recycled water that is used on Sharp Park Golf Course is wheeled through the District's recycled water distribution system on behalf of the SFPUC but is not part of the District's gross water supply.

Table 6-2 Wastewater Collected Within Area in 2020 (DWR Table 6-2)

	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 *(optional)*
100%	Percentage of 2020 service area population covered by wastewater collection system *(optional)*

Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected from UWMP Service Area 2020	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party? *(optional)*
City of Pacifica	Metered	780	City of Pacifica	Calera Creek Water Recycling Plant	Yes	No
Total Wastewater Collected from Service Area in 2020:		780				

NOTES:
(a) Volumes are in units of MG
(b) Volumes are rounded to the nearest MG.

Table 6-3 Wastewater Treatment and Discharge Within Service Area in 2020 (DWR Table 6-3)

	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
Calera Creek Water Recycling Plant	Calera Creek Discharge Point 001	Calera Creek	2 417022002	River or creek outfall	No	Tertiary	780	772	5	4	0
						Total	780	772	5	4	0

NOTES:
(a) Volumes are in units of MG.
(b) Volumes are rounded up to the nearest MG.
(c) The volume of recycled water supplied outside the service area includes the volume that is wheeled through the District's system to the SFPUC to serve the Sharp Park Golf Course.
(d) The volumes of recycled water produced was supplemented by potable water as shown in Table 6-4 to meet recycled water demands.

6.5.4 Potential, Current, and Projected Uses of Recycled Water

☑ ***CWC § 10633 (b)***

A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

☑ ***CWC § 10633 (d)***

A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

☑ ***CWC § 10633 (e)***

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 pursuant to this subdivision.

Table 6-4 lists the current and projected uses of recycled water in the District's service area. In 2020, the annual recycled water usage for landscape irrigation customers was approximately 8.6 MG. The 2020 annual use by the Sharp Park golf course, which is wheeled to SFPUC by the District and not considered part of NCCWD's gross water use, was approximately 7.2 MG. The District projects that future recycled water use will remain at current levels. While the District has begun to explore options to expand the recycled water system to add additional customers (see Section 6.5.5), these additional uses cannot be quantified at this time.

Of the total 15.8 MG of recycled water use in 2020, approximately 7.3 MG (46 percent) was supplied by supplemental potable water. This volume of supplemental potable water was estimated based on the difference between metered recycled water use and metered flow pumped from the recycled water pump station. Of this 7.3 MG of total supplemental potable water, 3.9 MG is attributed to NCCWD customer uses and 3.4 MG is attributed to the golf course uses. The supplemental potable water use is included in the "losses" use type in Table 4-2.

The use of supplemental potable water to meet recycled water demand is related to: (1) operational constraints of the CCWRP disinfection system to meet Title 22 requirements for unrestricted reuse with peak winter wastewater flows and (2) operating procedures for the recycled water pump station and chlorine disinfection system agreed upon by NCCWD and SFPUC to limit recycled water production to certain times of day. As discussed in Section 6.5.5, the operational constraints are assumed to be addressed such that the District will not need to rely upon supplemental potable water to meet its projected recycled water uses in the future.

Table 6-4 Recycled Water Direct Beneficial Uses Within Service Area (DWR Table 6-4)

	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 Pacifica
Name of Supplier Operating the Recycled Water Distribution System:	North Coast County Water District
Supplemental Water Added in 2020 (volume)	4
Source of 2020 Supplemental Water	San Francisco Public Utilities Commission

Beneficial Use Type	**Potential** Beneficial Uses of Recycled Water (Describe)	Amount of **Potential** Uses of Recycled Water (Quantity)	General Description of 2020 Uses	Level of Treatment	2020	2025	2030	2035	2040	2045
Landscape irrigation (excludes golf courses)	Landscape irrigation the that can be served existing recycled water distribution system	9 MG	School, Park, Streetscape, and Residential (via fill station) Landscape	Tertiary	5	9	9	9	9	9
				Total:	5	9	9	9	9	9
				2020 Internal Reuse		0				

NOTES:
(a) Volumes are in units of MG.
(b) Volumes are rounded to the nearest MG.
(c) A total of 9 MG was served through the recycled water system in 2020, 5 MG of which was recycled water supplied by the City of Pacifica and the remaining 4 MG was supplemental potable water. The District plans to make operational changes to eliminate the need for use of supplemental potable water in the future.
(d) An additional 7 MG of recycled water served the Sharp Park Golf Course in 2020, however the volume was wheeled through the District's recycled water system on behalf of the SFPUC and is not counted as part of the District's Total Water Supply. Of this additional 7 MG, an estimated 3 MG was served by supplemental potable water.

NCCWD's 2015 UWMP included projected use of recycled water in 2020 and beyond and assumed that the actual 2015 recycled use would increase by 1 MG every five years. Table 6-5 compares the 2020 projected estimates to actual 2020 actual recycled water use, as reported in Table 6-4. The actual 2020 use exceeded the projected 2020 use in the 2015 UWMP, even though the number of recycled water customers has not expanded, as assumed in the 2015 UWMP.

Table 6-5 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual (DWR Table 6-5)

	Recycled water was not used in 2015 nor projected for use in 2020. The supplier will not complete the table below.	
Beneficial Use Type	2015 Projection for 2020	2020 Actual Use
Landscape irrigation (excludes golf courses)	6	9
Total	6	9

NOTES:
(a) Volumes are in units of MG.
(b) Volumes are rounded to the nearest MG.
(c) The 2020 actual use includes uses supplied by supplemental potable water.

6.5.5 Actions to Encourage and Optimize Future Recycled Water Use.

☑ ***CWC § 10633 (g)***

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

As discussed in Section 6.5.4, existing operational constraints at the City of Pacifica's CCWRP and the District's operating procedures for the recycled water pump station and chlorination system limit the volume of recycled water that can be produced and requires the District to rely on supplemental potable water to meet all the District's recycled water demands. As listed in Table 6-6, the District intends to work with the City and SFPUC to address these constraints to ensure that sufficient recycled water can be supplied to meet demands. Based on 2020 uses and production, this will increase recycled water use (and decrease potable water use) by 7.3 MG total between the uses within the District's service area (3.9 MG) and Sharp Golf Course (3.4 MG).

Table 6-6 Methods to Expand Future Recycled Water Use (DWR Table 6-6)

	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
69	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Operational Improvements	Work with the City and SFPUC to address operational constraints that have led to the reliance on supplemental potable water.	2021	4
		Total	4
NOTES: (a) Volumes are in units of MG. (b) Volumes are rounded to the nearest MG.			

The District will continue to encourage the use of the residential recycled water fill station. Increased use of the fill station for residential irrigation uses currently represents the biggest opportunity to expand use of recycled water in the District's service area with the existing recycled water system.

The District is also evaluating the feasibility of expanding its recycled water distribution system to reach additional irrigation customers. However, given that this evaluation is still in development, the potential new uses have not been quantified herein nor included in future recycled water use projections.

6.6 Desalinated Water Opportunities

☑ ***CWC § 10631 (g)*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

NCCWD does not anticipate opportunities for development of desalinated water supplies within the planning horizon of this UWMP and 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.

6.7 Water Exchanges and Transfers

☑ ***CWC § 10631 (c)*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

6.7.1 Exchanges and Transfers

There are potential transfer and exchange opportunities within and outside of the SFPUC RWS. The District does not presently anticipate the need for water right transfers during normal year conditions. However, should that condition change in the future, it is possible that the District could purchase water from another agency or entity either within or outside of the SFPUC RWS.

Within the SFPUC RWS, it is possible to transfer water entitlements or banked water among agencies. The Water Shortage Allocation Plan (WSAP) adopted by all BAWSCA agencies and the SFPUC provides the basis for voluntary transfers of water among BAWSCA agencies during periods when mandatory rationing is in effect on the SFPUC RWS (see Seciton 7.1.1.1). Some BAWSCA agencies have the capacity to rely on groundwater or other sources during dry years and thus may be willing to transfer a portion of their wholesale water entitlement to other BAWSCA agencies in need of supply above their allocations.

Securing water from willing sellers outside the SFPUC RWS is a more complex process than transfers within the RWS, which requires both a contract with the seller agency and approval by the SFPUC. BAWSCA has the authority to plan for and acquire supplemental water supplies and continues to evaluate the feasibility of water transfers as part of its implementation of the BAWSCA's Long Term Reliability Water Supply Strategy (see Section 7.1.3.5).

6.7.2 Emergency Interties

As discussed in Section 3.1 and shown in Figure 3-1, the District has established emergency interties with neighboring agencies to facilitate the short-term transfer of water due to a disruption in normal supply resulting from an event such as an earthquake or other emergency.

6.8 Future Water Projects

☑ ***CWC § 10631*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

(b) (3) For any planned sources of water supply, a description of the measures that are being undertaken to acquire and develop those water supplies.

(f) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in normal and single-dry water years and for a period of drought lasting five consecutive water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

The following sections describe the planned water supply projects to be implemented by both the District's wholesaler SFPUC and the District.

6.8.1 SFPUC Water Supply Projects

The District'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 Objective 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 7.1.3.5.

6.8.2 NCCWD Water Supply Projects

As of the publication of this UWMP, as noted in Table 6-7, the District does not have planned any future water supply projects. As discussed in Sections 6.2, 6.3, and 6.5.4, however, the District is exploring the feasibility to diversify its water supply portfolio and reduce its reliance on purchased water through use of groundwater and surface water and expanded use of recycled water. The District may identify new water supply projects in the future develop any or some combination of these potential new sources.

Table 6-7 Expected Future Water Supply Projects or Programs (DWR Table 6-7)

X	No expected future water supply projects or programs that provide a quantifiable increase to the agency'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.					
	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other suppliers?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Supplier
	Y/N	*If Yes, Supplier Name*				
NOTES:						

6.9 Summary of Existing and Planned Sources of Water

☑ ***CWC § 10631 (b)*** *Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).*

☑ ***CWC § 10631 (b) (4) (D)*** *A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

Table 6-8 provides a summary of the actual source and volume of water supply in the year 2020. The associated chart shows that the District's water supply from the SFPUC RWS has been significantly lower than its ISG over the past five years.

The District plans to continue exclusively purchasing wholesale water from the SFPUC RWS to meet its potable demands. Water supplies from the SFPUC RWS through 2045 are projected to be equivalent to the District's ISG of 1,402 MG, which is the District's contractual entitlement to SFPUC wholesale water and survives in perpetuity. The District's total water supply projections are shown in Table 6-9 and the associated chart in five-year increments through 2045.

Table 6-8 Water Supplies - Actual (DWR Table 6-8)

Water Supply	Additional Detail on Water Supply	2020		
		Actual Volume*	Water Quality Drop Down List	Total Right or Safe Yield* (optional)
Purchased or Imported Water	From SFPUC	914	Drinking Water	1,402
Recycled Water	From CCWRP	5	Recycled Water	
	Total	919		1,402

NOTES:
(a) Volumes are in units of MG.
(b) Volumes are rounded to the nearest MG.
(c) Volumes for both supply sources do not include the volume of water wheeled through NCCWD's potable and recycled water distribution systems to SFPUC to serve Sharp Park Golf Course.
(d) Recycled water supply volume does not include volume of supplemental potable use (4 MG). This volume is included in the Purchased or Imported water volume.

Chart 6-8 Current and Historical SFPUC RWS Water Supply

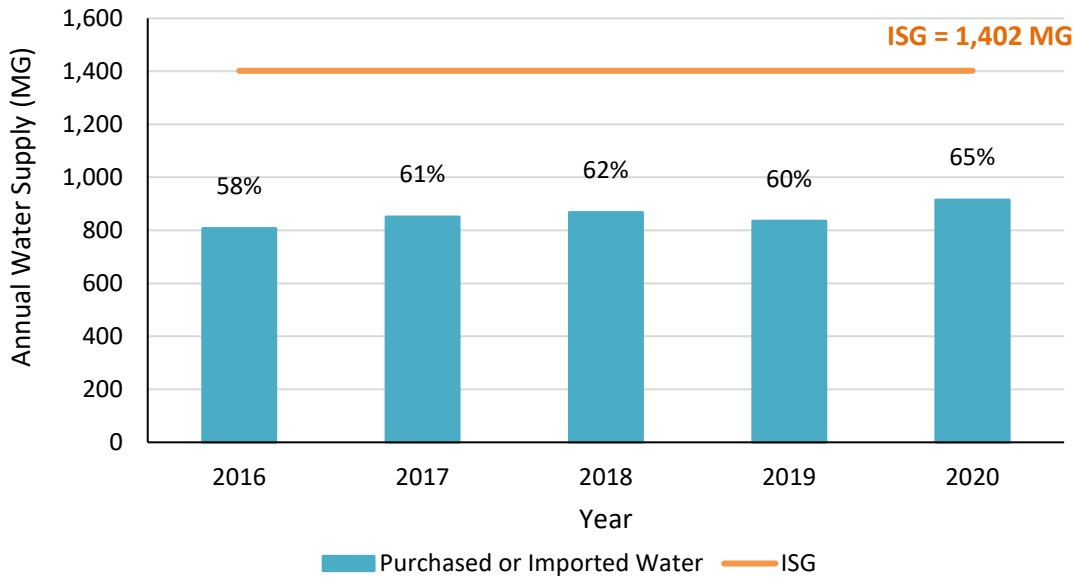
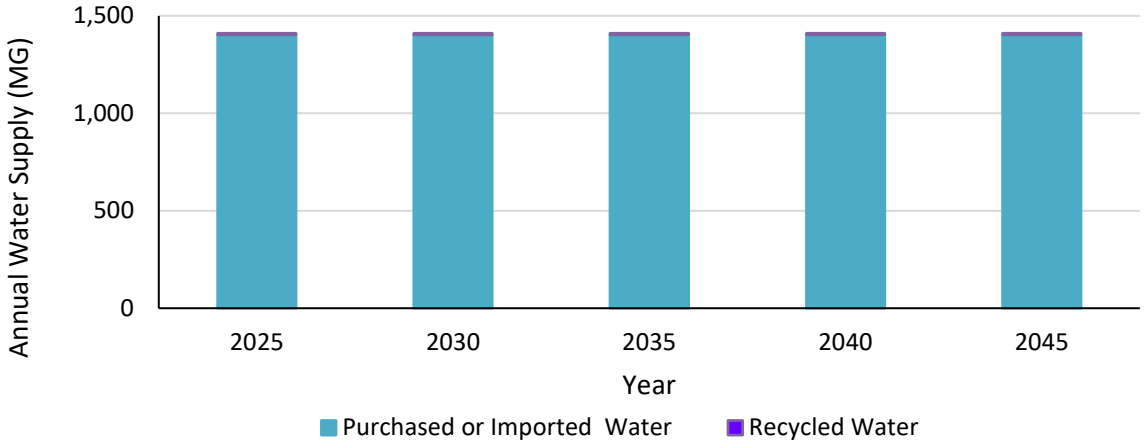


Table 6-9 Water Supplies - Projected (DWR Table 6-9)

Water Supply	Additional Detail on Water Supply	Projected Water Supply									
		2025		2030		2035		2040		2045	
		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Purchased or Imported Water	SFPUC RWS	1,402		1,402		1,402		1,402		1,402	
Recycled Water	CCWRP	9		9		9		9		9	
Total		1,411		1,411		1,411		1,411		1,411	

NOTES:
(a) Volumes are in units of MG.
(b) Volumes are rounded to the nearest MG and may not sum exactly due to rounding.
(c) NCCWD has an ISG of 1,402 MG per year.

Chart 6-9 Projected Water Supply



6.10 Special Conditions

The following sections describe any special conditions relevant to the District's supplies, including climate change, regulatory conditions, and any other locally applicable conditions.

6.10.1 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.

6.10.1.1 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.

Vulnerability Areas	General Overview of Vulnerabilities
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.
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.

6.10.1.2 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.

6.10.2 Regulatory Conditions and Project Development

Emerging regulatory conditions (e.g., issues surrounding the adoption of 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.

The District does not have any current plans to develop additional supply sources. If the District 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.

6.10.3 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). The District does not have any current plans to develop additional supply sources. If NCCWD does move forward with any plans to develop supply projects, locally applicable criteria will be considered, and the associated water supply reliability impacts will be assessed in future UWMP updates.

6.11 Energy Consumption

☑ ***CWC § 10631.2***

(a) In addition to the requirements of Section 10631, an urban water management plan shall include any of the following information that the urban water supplier can readily obtain:
(1) An estimate of the amount of energy used to extract or divert water supplies.
(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.
(3) An estimate of the amount of energy used to treat water supplies.
(4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.
(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.
(6) An estimate of the amount of energy used to place water into or withdraw from storage.
(7) Any other energy-related information the urban water supplier deems appropriate.
(b) The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.
(c) The Legislature finds and declares that energy use is only one factor in water supply planning and shall not be considered independently of other factors.

The "Total Utility Approach" as defined by DWR in the UWMP Guidebook 2020 is used to report water-related energy consumption data for the District. Calendar 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 the District during 2020 based on reported utility bills is 1,439,642 kilowatt hours (kWh). Table 6-10 shows the energy consumed for each MG of water entering the distribution system. The District's water system energy use is almost entirely associated with the pumping and distribution of drinking water. Based on the Total Utility Approach, the District's energy intensity is estimated to be 1,574.6 kilowatt hours per million gallons (kWh/MG).

Given that the wastewater collection, treatment, and disposal systems within the District's service are not under the District's operational control and the energy used to produce and distribute recycled water at

the City's CCWRP is paid for by the City of Pacifica, the District has not calculated the energy associated with the collection and treatment of wastewater and distribution of recycled water.

Table 6-10 Recommended Energy Reporting - Total Utility Approach (DWR Table O-1B)

Urban Water Supplier: *North Coast County Water District*

Water Delivery Product

Retail Potable Deliveries

Enter Start Date for Reporting Period	1/1/2020	Urban Water Supplier Operational Control		
End Date	12/30/2020			
Is upstream embedded in the values reported?	No	Sum of All Water Management Processes	Non-Consequential Hydropower	
Water Volume Units Used	MG	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process (volume unit)		*914*	*0*	*914*
Energy Consumed (kWh)		*1,439,642*	*0*	*1,439,642*
Energy Intensity (kWh/volume)		*1,574.6*	*0.0*	*1,574.6*

Quantity of Self-Generated Renewable Energy

0 kWh

Data Quality

Metered Data

Data Quality Narrative:

Volume of water data is from the SFPUC meters. Energy usage is for water facilities and is from the District's Pacific Gas and Electric energy bills.

Narrative:

Total energy consumption represents the energy consumed for pumping and distribution of drinking water. Energy consumption for the District's offices and corporation yards are not included.

7 WATER SERVICE RELIABILITY AND DROUGHT RISK ASSESSMENT

☑ ***CWC § 10620 (f)***

An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

☑ ***CWC § 10630.5***

Each plan shall include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, what the agency's strategy is for meeting its water needs, the challenges facing the agency, and any other information necessary to provide a general understanding of the agency's plan.

This chapter assesses the reliability of the North Coast County Water District (NCCWD or the District) water supplies, with a specific focus on potential constraints, including purchased and recycled water supply availability, water quality, and climate change. The intent of this chapter is to identify any potential constraints that could affect the reliability of NCCWD's supply during normal, 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 (DRA) to evaluate the District's supply risks under a severe drought period lasting for the next five consecutive years (i.e., through 2025).

The District purchases all of its potable water supply from the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS) and serves specific non-potable irrigation uses with recycled water. The reliability of the SFPUC RWS is anticipated to vary greatly in different year types. NCCWD has relied on the supply reliability estimates provided by the SFPUC for the RWS and the drought allocation structure provided by SFPUC and the Bay Area Water Supply and Conservation Agency (BAWSCA) to estimate available RWS supplies in dry year types through 2045. NCCWD's recycled water supply is expected to be 100 percent reliable in all year types.

7.1 Water Service Reliability Assessment

The following sections describe NCCWD's water service reliability assessment, which presents NCCWD's expected water service reliability for a normal year, single dry year, and five consecutive dry years projections in five-year increments between 2025 and 2045.

7.1.1 Service Reliability - Constraints on Water Sources

As discussed in Chapter 6, the District purchases all its potable water supply from the SFPUC RWS and serves specific non-potable irrigation uses with recycled water. The following narrative discusses potential issues and constraints on water supply availability, water quality, and climate change.

7.1.1.1 Regional Water System Supply Constraints

☑ ***CWC § 10631 (h)*** *A plan shall be adopted in accordance with this chapter and shall do all of the following:*

An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).

Detailed information is provided below regarding potential issues and constraints on the SFPUC RWS supply availability. The source for this information is the common language provided by the SFPUC and BAWSCA (see Appendix F). 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 (Appendix F and Appendix G) the adoption of the 2018 Bay-Delta Plan Amendment is anticipated to impact the reliability of the RWS supplies in the future. The information in gray font below was provided by BAWSCA in coordination with SFPUC and is provided verbatim below.

> 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"[16] 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

[16] "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." (Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Dec. 12, 2018) p.17, fn. 14, available at https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf.)

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 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.[17]

Drought Allocation Methodology

Given the constraints described above, the SFPUC has provided all of the Wholesale Customers with estimates of the RWS reliability in all year types though 2045, as shown in Appendix G. The Tier One Plan describes the method for allocating RWS water between Retail and Wholesale Customers during system-wide shortages of 20 percent 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 development only, 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 percent. SFPUC assumed that Tier One allocations for system-wide shortfalls of 16 percent to 20 percent would apply for shortfalls greater than 20 percent. BAWSCA provided a revised methodology to allocate RWS supplies to the Wholesale Agencies. The inclusion of these revised methodologies, which serve as the basis for UWMP supply reliability analyses, does not imply an agreement by BAWSCA member agencies as to the exact 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 percent are further described below. The information in gray font below was provided by BAWSCA in coordination with SFPUC and is provided verbatim below.

7.1.1.1.1.1 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.

[17] California Natural Resources Agency, "Voluntary Agreements to Improve Habitat and Flow in the Delta and its Watersheds," available at 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 Retail18) 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 percent 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 percent. As discussed below, the WSAP specifies that SFPUC and the Wholesale agencies "will meet and discuss how to implement incremental reductions above the 20% reduction" before making a final determination of allocations above the 20% reduction. For the purposes of the 2020 UWMP supply reliability analysis, SFPUC and BAWSCA assumed that Tier One allocations for system-wide shortfalls of 16 percent to 20 percent would apply for all shortfalls greater than 20 percent. The analysis included herein does 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 of greater than 20 percent.

7.1.1.1.1.2 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

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

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 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.

7.1.1.1.1.3 Revised Drought Allocation Plan

As detailed by BAWSCA in multiple memos and workshops (included in Appendix G), the Tier Two Plan was not designed for RWS shortages greater than 20 percent.[19] In a memorandum dated 18 February 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 percent. The revised methodology developed by BAWSCA allocates the wholesale 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.
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 G. While this allocation methodology has been used herein, the District notes per BAWSCA's memoranda dated February 18, 2021 (Appendix G):

> "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."

As such, this allocation method is only intended to serve as the preliminary basis for the 2020 UWMP supply reliability analysis. The analysis provided herein does not in any way imply an agreement by BAWSCA member agencies as to the exact allocation methodology (see Section 7.1.3.5 and Appendix J). BAWSCA member agencies are in discussions about jointly developing an allocation method that would consider additional equity factors in the event that SFPUC is not able to deliver its contractual supply volume and cutbacks to the RWS supply exceed 20 percent.

7.1.1.2 Recycled Water Supply Availability

The District expects to meet specific non-potable irrigation water uses with recycled water. The District considers recycled water to be a reliable and stable water supply source 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).

[19] 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%.

7.1.1.3 Water Quality

☑ ***CWC § 10634***

The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

Impaired water quality also has the potential to affect water supply reliability. NCCWD has and will continue to meet or exceed 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 State Water Resources Control Board (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 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.

NCCWD routinely monitors the water that is served to customers to ensure that water delivered to customers meets these drinking water standards. The results of this testing are reported to the SWRCB DDW following each test and are summarized annually in Water Quality Reports (also known as "Consumer Confidence Reports"), which are provided to customers by mail and made available on the District's website: https://nccwd.com/departments/water-quality.html.

As discussed in Chapter 6, all the District's potable water is supplied by the SFPUC RWS, most of which originates at the Hetch Hetchy Reservoir in the Sierra Nevada Mountains. The Hetch Hetchy Reservoir is considered a very high-quality water source due to low total dissolved solid (TDS) concentrations and other factors. Additional water supplies from the Alameda and Peninsula sources come from areas with restricted access to protect the source water quality.

The SFPUC's Water Quality Division (WQD) regularly collects and tests water samples from reservoirs and designated sampling points throughout the RWS to ensure that the SFPUC's water meets or exceeds federal and state drinking water standards. In 2019, the WQD conducted more than 53,650 drinking water tests in the sources and transmission systems. This is in addition to the extensive treatment process control monitoring performed by the SFPUC's certified operators and online instruments. The SFPUC also has online instruments providing continuous water quality monitoring at numerous locations.

Given NCCWD's and SFPUC's proactive monitoring and management of water quality, water quality is not expected to impact the reliability of the District's available supplies within the planning horizon (i.e., through 2045).

7.1.1.4 Climate Change

☑ ***CWC § 10631 (b) (1)***

…For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.

Section 6.10.1 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 directly factored into the District's assessment of its supply reliability.

7.1.2 Service Reliability - Year Type Characterization

☑ ***CWC § 10631 (b)***

Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following:

☑ ***CWC § 10631 (b)(1)***

A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.

☑ ***CWC § 10635 (a)***

Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

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, and
- A five-consecutive year drought represents the driest five-year period in the historical record.

Identification of dry year periods consistent with the UWMP Guidebook 2020 methodology is provided in the language and supply projections provided by BAWSCA and the SFPUC in Appendix F and Appendix G and as presented in Table 7-1, Table 7-2, and Table 7-3. The data and methods used to develop these dry year supply availabilities are described in the sections, below.

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

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 7-2 and Section 7.1.1.2
			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			
NOTES:			

7.1.2.1 SFPUC Supply Modeled RWS Dry Year Supply Availability

As described in SFPUC's 2020 Draft UWMP (SFPUC, 2021), SFPUC used the Hetch Hetchy and Local Simulation Model (HHLSM) to estimate SFPUC RWS supply availability for water service reliability assessment and the drought risk assessment (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 G 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 of 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 include 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 to continue delivering water, although at reduced levels, during each year of the five-consecutive year drought and the remaining years of the design drought (SFPUC, 2021).

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 SFPUC decided to present the water reliability analysis with full implementation of the Bay-Delta Plan Amendment in the SFPUC 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.
>
> Although the SWRCB has stated it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, given the current level of uncertainty, it is assumed for the purposes of the SFPUC's draft UWMP that the Bay-Delta Plan Amendment will be fully implemented starting in 2023.

As shown in Appendix G, SFPUC also 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 million gallons per day (MGD) from the SFPUC watersheds for retail and Wholesale Customers, consistent with SFPUC's contractual obligation. According to the 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 guidance from SFPUC and BAWSCA, NCCWD's UWMP presents results for the water service reliability assessment using projected demands on the RWS for both water supply scenarios: (1) with full implementation of the Bay-Delta Plan Amendment in 2023 and (2) without implementation of the Bay-Delta Plan Amendment. Consistent with SFPUC's approach, NCCWD has included the results of the with Bay Delta Plan Amendment scenario in the DWR UWMP submittal tables.

SFPUC modeling results for the with Bay-Delta Plan Amendment 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. These results show total Wholesale RWS supply shortfalls ranging from 36 percent to 54 percent 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 same SFPUC letter. These results indicated that the SFPUC would be able to meet 100 percent of Wholesale projected purchases during all year types except during the fourth and fifth consecutive dry years for base year 2045 when 15 percent Wholesale supply shortages are projected.

7.1.2.2 NCCWD's Year-Type Characterization

As discussed in Section 6.1.2, in accordance with the SFPUC's perpetual obligation to the District's Supply Assurance, the District has an Individual Supply Guarantee (ISG) of 3.84 MGD, or 1,402 million gallons (MG) per year. SFPUC is obligated to provide NCCWD with up to 100 percent of the District's ISG during normal years.

Using the SFPUC modeling results presented in the of 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 7.1.1.1. As discussed therein, for the purposes for the 2020 UWMP supply reliability analysis only, Wholesale Agency drought allocations assume an equal percent reduction across all agencies when the average Wholesale Customers' RWS shortages are greater than 20 percent.

Based on this methodology BAWSCA provided individual agency drought allocations for the scenario that assumes the implementation of the Bay-Delta Plan Amendment (Scenario 1) in 2023 in Tables F2, G2, H2, I2, J2, and K2 of the BAWSCA updated drought allocation memorandum data April 1, 2021 (Appendix G), which are reproduced for NCCWD in Table 7-2, below, for base year 2025 through 2045. Supply volumes shown in Table 7-2 are used for the projected dry-year RWS supplies shown in Table 7-5 and Table 7-7.

BAWSCA also provided individual agency drought allocations for the without Bay-Delta Plan Amendment scenario (Scenario 2) in Tables N and O2 of the April 1, 2021 memorandum (Appendix G), which are reproduced for NCCWD in Table 7-3 and used for the projected dry-year RWS supplies shown in Table 7-6 and Table 7-8.

Table 7-2 NCCWD's SFPUC RWS Supply Availability During Normal and Dry Years for Based Years 2025 through 2045, Scenario 1 "With Bay-Delta Plan Amendment" (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	1,402	544	544	540	544	544	467
2030	1,402	467	467	464	464	464	467
2035	1,402	467	467	464	464	464	467
2040	1,402	467	467	464	464	409	398
2045	1,402	467	467	464	427	409	398

NOTES:
(a) Volumes are in units of MG.
(b) Volumes are rounded to the nearest MG and totals may not sum exactly due to rounding.
(c) Source Tables G2, H2, I2, J2, and K2 of the BAWSCA updated drought allocation memorandum data April 1, 2021.
(d) Results reflect scenario with Bay-Delta Plan Amendment implemented in 2023 and the use projected RWS purchases.

Table 7-3 NCCWD's SFPUC RWS Supply Availability During Normal and Dry Years for Based Years 2025 through 2045, Scenario 2 "Without Bay-Delta Plan"

Base Year	Normal Year	Single Dry Year	Multiple Dry Years				
			Year 1	Year 2	Year 3	Year 4	Year 5
2025	1,402	854	854	854	854	854	854
2030	1,402	854	854	854	854	854	854
2035	1,402	854	854	854	854	854	854
2040	1,402	854	854	854	854	854	854
2045	1,402	854	854	854	854	770	770

NOTES:
(a) Volumes are in units of MG.
(b) Volumes are rounded to the nearest MG and totals may not sum exactly due to rounding.
(c) Source Tables N and O2 of the BAWSCA updated drought allocation memorandum data April 1, 2021.
(d) Results reflect scenario without Bay-Delta Plan Amendment implemented in 2023 and the use projected RWS purchases.

As mentioned above, recycled water supplies are assumed to be 100 percent reliable during all year types.

7.1.3 Service Reliability – Supply and Demand Comparison

☑ ***CWC § 10635 (a)***

Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

The following sections compare the District's projected water demands, described in Chapter 4, with the District's projected water supply availability during normal, single dry, and multiple dry years to assess the reliability of the District's water supplies. The District's available supply is presented under both scenarios described above: (1) with full implementation of the Bay-Delta Plan Amendment in 2023 and (2) without implementation of the Bay-Delta Plan Amendment.

7.1.3.1 Water Supply – All Year Types

☑ ***CWC § 10631 (b)***

Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following:

☑ ***CWC § 10631 (b)(1)***

A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.

☑ ***CWC § 10635 (a)***

Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

Table 7-4 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 4-5, respectively. The District is expected to have adequate water supplies during normal years to meet its projected demands through 2045 under both scenarios.

Table 7-4 Normal Year Supply and Demand Comparison, Both Scenario 1 and 2 (DWR Table 7-2)

	2025	2030	2035	2040	2045
Supply totals *From DWR Table 6-9*	1,411	1,411	1,411	1,411	1,411
Demand totals *From DWR Table 4-3*	855	838	827	826	828
Difference	556	572	584	585	583

NOTES:
(a) Volumes are in units of MG.
(b) Volumes are rounded to the nearest MG and totals may not sum exactly due to rounding.
(c) Supplies and demands include potable and recycled water.
(d) Supply reflects ISG for NCCWD (1,402 MG) and projected recycled water demand (9 MG).

7.1.3.2 Water Supply – Dry-Year Types

The reliability of the RWS is anticipated to vary greatly in different year types. As described above and detailed in Appendix G, NCCWD has relied on the supply reliability estimates provided by the SFPUC for the RWS and the drought allocation structure provided by SFPUC and BAWSCA to estimate available RWS supplies in dry year types through 2045.

Table 7-5 shows the projected supply and demand totals for the single dry year assuming implementation of the Bay-Delta Plan Amendment in 2023 (Scenario 1).

Table 7-5 Single Dry Year Supply and Demand Comparison, Scenario 1 "With Bay-Delta Plan Amendment" (DWR Table 7-3)

	2025	2030	2035	2040	2045
Supply totals	552	549	552	552	476
Demand totals	855	838	827	826	828
Difference	(303)	(289)	(274)	(273)	(352)

NOTES:
(a) Volumes are in units of MG.
(b) Volumes are rounded to the nearest MG and totals may not sum exactly due to rounding.
(c) Source for SFPUC supply is included in Table 7-2.
(d) Supplies and demands include potable and recycled water.

Table 7-6 shows the projected supply and demand totals for the single dry year without implementation of the Bay-Delta Plan Amendment (Scenario 2).

Table 7-6 Single Dry Year Supply and Demand Comparison, Scenario 2 "Without Bay-Delta Plan Amendment"

	2025	2030	2035	2040	2045
Supply totals	863	863	863	863	863
Demand totals	846	830	818	817	819
Difference	16	33	45	45	44

NOTES:
(a) Volumes are in units of MG.
(b) Volumes are rounded to the nearest MG and totals may not sum exactly due to rounding.
(c) Source for SFPUC supply is included in Table 7-3.
(d) Supplies and demands include potable and recycled water.

7.1.3.3 Water Service Reliability - Five Consecutive Dry Years

Based on the supply reliability estimates and allocation structure provided by SFPUC and BAWSCA, Table 7-7 shows the District's projected supply and demand totals for multiple dry year periods extending five years with implementation of the Bay-Delta Plan Amendment in 2023 (Scenario 1).

Table 7-7 Multiple Dry Years Supply and Demand Comparison, Scenario 1 "With Bay-Delta Plan Amendment" (DWR Table 7-4)

		2025	2030	2035	2040	2045
First year	Supply totals	552	549	552	552	476
	Demand totals	855	838	827	826	828
	Difference	(303)	(289)	(274)	(273)	(352)
Second year	Supply totals	476	472	472	472	476
	Demand totals	855	838	827	826	828
	Difference	(379)	(366)	(354)	(354)	(352)
Third year	Supply totals	476	472	472	472	476
	Demand totals	855	838	827	826	828
	Difference	(379)	(366)	(354)	(354)	(352)
Fourth year	Supply totals	476	472	472	417	406
	Demand totals	855	838	827	826	828
	Difference	(379)	(366)	(354)	(409)	(421)
Fifth year	Supply totals	476	472	436	417	406
	Demand totals	855	838	827	826	828
	Difference	(379)	(366)	(391)	(409)	(421)

NOTES:
(a) Volumes are in units of MG.
(b) Volumes are rounded to the nearest MG and may not sum exactly due to rounding.
(c) Supplies and demands include potable and recycled water.
(d) Source for SFPUC supply is included in Table 7-2.

Table 7-8 shows the District's projected supply and demand totals for multiple dry year periods extending five years without the Bay-Delta Plan Amendment (Scenario 2).

Table 7-8 Multiple Dry Years Supply and Demand Comparison, Scenario 2 "Without Bay-Delta Plan Amendment"

		2025	2030	2035	2040	2045
First year	Supply totals	863	863	863	863	863
	Demand totals	855	838	827	826	828
	Difference	8	24	36	37	35
Second year	Supply totals	863	863	863	863	863
	Demand totals	855	838	827	826	828
	Difference	8	24	36	37	35
Third year	Supply totals	863	863	863	863	863
	Demand totals	855	838	827	826	828
	Difference	8	24	36	37	35
Fourth year	Supply totals	863	863	863	863	779
	Demand totals	855	838	827	826	828
	Difference	8	24	36	37	(49)
Fifth year	Supply totals	863	863	863	863	779
	Demand totals	855	838	827	826	828
	Difference	8	24	36	37	(49)

NOTES:
(a) Volumes are in units of MG.
(b) Supplies and demands include potable and recycled water.
(c) Source for SFPUC supply is included in Table 7-3.

7.1.3.4 Uncertainties in Dry Year Water SFPUC RWS Supply Projections

As shown in Table 7-5 and Table 7-7, significant water supply shortfalls are currently projected in future single and multiple dry years if the Bay-Delta Plan Amendment is implemented. However, numerous uncertainties remain in the implementation of the Bay-Delta Plan Amendment. The water supply projections presented above likely represent a worst-case scenario in which the Bay-Delta Plan Amendment is implemented without the SFPUC and the State Water Resources Control Board (SWRCB) reaching a Voluntary Agreement and do not account for implementation of SFPUC's Alternative Water Supply Program (AWSP), described in more detail below. Under this supply scenario, SFPUC appears not to be able to meet its contractual obligations (i.e., Level of Service goals) and the District's forecasted demands during droughts.

As shown in Table 7-6 and Table 7-8, the SFPUC-provided water supply reliability projections for without the Bay-Delta Plan Amendment likely represent a highly optimistic water supply reliability outcome. These projections indicate that without the Bay-Delta Plan Amendment, SFPUC would be able to supply 100 percent of projected RWS demands in all year types through 2045, except for the 4th and 5th consecutive dry year in 2045, during which 94 percent of NCCWD's projected would be met. The large disparity in projected water supply reliability between these two scenarios demonstrate the current level uncertainty.

In addition to these two UWMP scenarios, in a 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 (presentation included as Appendix H). 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 shown herein.

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.* The SFPUC is continuing negotiations with the SWRCB on implementation of the Bay-Delta Plan Amendment for water supply cutbacks, particularly during droughts. The 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 next (i.e., 2025) UWMP depending on the outcome of ongoing negotiations, as the shortages under the TVRA would be less than the with Bay-Delta Plan Amendment scenario (example provided in Appendix H).
- *Benefits of the AWSP are not accounted for in current supply projections.* As discussed in Section 7.1.3.5 and Appendix F, SFPUC is exploring options to increase its supplies through the AWSP. Implementation of feasible projects developed under the AWSP is not yet reflected in the supply reliability scenarios presented herein and is anticipated to reduce the projected RWS supply shortfalls (Appendix H).
- *Methodology for Tier One and Tier Two Wholesale drought allocations have not been established for wholesale shortages greater than 20 percent.* As discussed in Section 7.1.1.1, the current Tier One and Tier Two Plans are not designed for RWS supply shortages of greater than 20 percent. For UWMP planning purposes per BAWSCA guidance, the Tier One Wholesale share for a 16 percent to 20 percent supply reduction (62.5 percent) has been applied for reductions greater than 20 percent, and an equal percent reduction has been applied across all Wholesale agencies for Tier Two. 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 if SFPUC is unable to deliver its contractual supply volume and cutbacks to the RWS supply exceed 20 percent.
- *RWS demands are subject to change.* The RWS supply availability is dependent upon the 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. Many BASCWA agencies have refined their projected demands during the UWMP process after these estimates were provided to SFPUC. Furthermore, the RWS demand projections are subject to change in the future based upon 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 UWMP appear severe in the with Bay-Delta Plan scenario, the actual frequency and duration of such shortfalls are uncertain. Based on the HHLSM simulations provided by BAWSCA

for the with Bay-Delta Plan Amendment scenario (Appendix G), rationing is anticipated to be required 20 percent of years for base year 2025 through 2035, 23 percent of all years for base year 2040, and 25 percent of years for base year 2045. In addition to the supply volumes, the above listed uncertainties would also impact the projected frequency and duration of shortfalls.

As such, in addition to evaluating local options to increase supply reliability, NCCWD 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 UWMP when new information becomes available.

The above uncertainties notwithstanding, BAWSCA's current drought allocation cutbacks will require the District to apply its Water Shortage Contingency Plan (WSCP) Stage 6 for water use restrictions above 50 percent (see Appendix I) and will affect NCCWD's short- and long-term water management decisions. As described further below (Section 7.1.3.5), NCCWD is working independently and with the other BAWSCA agencies to identify regional mitigation measures to improve reliability for regional and local water supplies and meet its customers' water needs. If conditions for large drought cutbacks to the RWS persist, NCCWD will need to implement additional demand management practices to invoke strict restrictions on potable water use and accelerate efforts to develop alternative supplies of water.

The NCCWD recommends that users of its 2020 UWMP contact District 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.

7.1.3.5 Strategies and Actions to Address Dry Year Supply Shortfalls

Although there remains significant uncertainty in future supply availability, discussed above, the NCCWD, 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 and Other Regional Strategies and Actions

7.1.3.5.1.1 Dry Year 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.

7.1.3.5.1.2 Alternative Water Supply Program

As discussed, below, BAWSCA has taken steps to ensure that SFPUC develop 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[20], 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

[20] 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.

projections. State and federal grants and 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.

7.1.3.5.1.3 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)[21], 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 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.

NCCWD Actions and Strategies

In addition to the management tools and options discussed below, the District has been involved directly and through BAWSCA to advocate for an alternative to the Bay-Delta Plan Amendment, including submitting letters and testimony (see Appendix J) that identify, among other things, the significant impact to local water supply reliability.

Further, as part of this UWMP process, the District submitted letters to both BAWSCA and SFPUC (see Appendix J) enumerating concerns regarding the fact that the SFPUC RWS supply allocations do not meet the Level of Service Goals included in the WSA (see Section 7.1.1.1) and, therefore, SFPUC is not meeting its contractual obligations to the Wholesale Customers.

The District's letter to BAWSCA further states that while it is applying BAWSCA's revised Tier Two allocation methodology for RWS shortages greater than 20 percent for preliminary planning purposes, NCCWD is not agreeing to, nor adopting, the revised Tier Two methodology. Among other issues, NCCWD notes that the revised Tier Two methodology has inequitable results, penalizes the District's prior investment in water conservation efforts, and threatens the health and safety of its customers.

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

As described in Section 7.1.4, the District is committed to developing a long-term supply reliability strategy, including evaluation of alternative supply sources and continued commitment to the District's comprehensive water conservation program.

7.1.4 Management Tools and Options

At a regional level, NCCWD 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 7.1.3.5.

In addition to supporting SFPUC and BAWSCA, NCCWD has been evaluating options to expand its local supply portfolio through the potential use of surface water and groundwater and the expanded recycled water use (see Chapter 6).

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

7.2 Drought Risk Assessment

In addition to the long-term water service reliability assessment presented above, the DRA evaluates the District's supply risks under a severe drought period lasting for the next five consecutive years after the assessment is completed, i.e., from 2021 through 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 to the DRA, NCCWD 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 4.2.6 and is based upon the Decision Support System (DSS) Model results discussed in Section 4.2.3.

The available potable water supplies assumed in the DRA relies on information provided by SFPUC and BAWSCA and are based upon the same methodology and assumptions used for the long-term water service reliability assessment (Section 7.1) for the "worst-case" water supply scenario (Appendix G). The available RWS water supplies used for the DRA are estimated 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 January 22, 2021 SFPUC letter in Appendix G). Details of how the District's available supplies are then estimated as part of the DRA are provided below.

7.2.2 DRA Individual Water Source Reliability

As described in Chapter 6, NCCWD purchases imported surface water from the SFPUC RWS to meets its potable water demands.

The District's available potable water supplies during the five-consecutive-year drought are based upon information provided by SFPUC and BAWSCA included in Appendix G, as indicated in Section 7.1.2 based upon the "worst-case" scenario when the Bay-Delta Plan Amendment is implemented in 2023 (Scenario 1). Specifically, based on the modeling results presented in the March 30, 2021 SFPUC letter, BAWSCA provided individual agency drought allocation volumes for 2021 to 2025 in Table F2 of the April 1, 2021 BAWSCA drought allocation tables, which are reproduced for NCCWD in Table 7-9, below, and serve as the basis for the RWS Reliability in the DRA.

Table 7-9 NCCWD 2020 Base Year SFPUC RWS Multiple Dry Year Drought Allocations

	2021	2022	2023	2024	2025
NCCWD Drought Allocation	942	971	515	515	515

NOTES:
(a) Volumes are in units of MG.
(b) Volumes are rounded to the nearest MG.
(c) Source: Table F2 from the BAWSCA drought allocation tables dated April 1, 2021.
(d) Five consecutive year drought assumed to start in 2021.
(e) Scenario reflects implementation of the Bay-Delta Plan Amendment in 2023.
(f) 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. Volumes for 2021 and 2022 reflect the District's near-term projected purchases previously provided to BAWSCA.
(g) Per system-wide shortages are projected starting in 2023, Wholesale RWS demand is assumed to be static for the remainder of the drought sequence per the Water Supply Agreement.

As shown in Table 7-9, 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 7.1.1.1) specifies that each agencies' Allocation Factor would be calculated once 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 as shown in Table 7-9.

The District considers recycled water to be a reliable and stable water supply source 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 7-10 provides a comparison of the water supply sources available to NCCWD to the total projected water use for an assumed drought period of 2021 through 2025. The District 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.

NCCWD has developed a WSCP (Chapter 8 and Appendix I) 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 NCCWD will implement to reduce demands and further ensure supply reliability at various levels of water shortage. NCCWD intends to implement its WSCP to reduce water use and address the supply shortfalls.

Given the current uncertainty discussed in Section 7.1.3.4, NCCWD could update its DRA prior to the 2025 UWMP update if significant new information becomes available. CWC § 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. NCCWD 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, NCCWD expects that SFPUC will provide more specific information and a refined estimate of the Bay-Delta Plan Amendment impacts to the SFPUC supply. The District will also have more information regarding the available uses of the local groundwater basin and potential expansion of its recycled water system by the 2025 UWMP update. Further, it is anticipated that 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.

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

Table 7-10 Five-Year Drought Risk Assessment Tables to Address Water Code 10635(b) (DWR Table 7-5)

2021	Total
Total Water Use	849
Total Supplies	950
Surplus/Shortfall w/o WSCP Action	101
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	101
Resulting % Use Reduction from WSCP action	0%

Table 7-10 Five-Year Drought Risk Assessment Tables to Address Water Code 10635(b) (DWR Table 7-5)

2022	Total
Total Water Use	850
Total Supplies	979
Surplus/Shortfall w/o WSCP Action	129
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	129
Resulting % Use Reduction from WSCP action	0%

2023	Total
Total Water Use	855
Total Supplies	523
Surplus/Shortfall w/o WSCP Action	(331)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	332
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	39%

Table 7-10 Five-Year Drought Risk Assessment Tables to Address Water Code 10635(b) (DWR Table 7-5)

2024	Total
Total Water Use	860
Total Supplies	523
Surplus/Shortfall w/o WSCP Action	(337)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	337
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	39%

2025	Total
Total Water Use	855
Total Supplies	523
Surplus/Shortfall w/o WSCP Action	(332)
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	332
Revised Surplus/(shortfall)	0
Resulting % Use Reduction from WSCP action	39%

NOTES:
(a) Volumes are in units of MG.
(b) Volumes are rounded to the nearest MG and may not sum exactly due to rounding.
(c) Total Supplies include volume of potable water from SFPUC as shown on Table 7-9 and Non-Potable water as described in Section 7.1.1.2.

8 WATER SHORTAGE CONTINGENCY PLANNING

The Water Shortage Contingency Plan (WSCP) for the North Coast County Water District (NCCWD or District) is included as Appendix I. The WSCP serves as a standalone plan that will be implemented in the case of a water shortage event, such as a drought or supply interruption, and defines specific policies and actions that will be implemented at various shortage level scenarios. The primary objective of the WSCP is to ensure that NCCWD has in place the necessary resources and management responses needed to protect health and human safety, minimize economic disruption, and preserve environmental and community assets during water supply shortages and interruptions. Consistent with California Water Code (CWC) § 10632, the WSCP includes six levels to address shortage conditions ranging from up to 10 percent to greater than 50 percent shortage, identifies a suite of demand mitigation measures for NCCWD to implement at each level, and identifies procedures for NCCWD to annually assess whether a water shortage is likely to occur in the coming year, among other things.

A summary of the key elements of the WSCP, including water shortage levels and demand-reduction actions is shown in Table 8-1, Table 8-2, and Table 8-3. Additional details are provided in Appendix I.

Table 8-1 Water Shortage Contingency Plan Levels (DWR Table 8-1)

Shortage Level	Percent Shortage Range	Shortage Response Actions
No-Drought	N/A	• Includes water waste prohibitions effective at all times.
1	Up to 10%	• Declaration by the Board of Directors upon the determination that (1) the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use of up to 10% due to water supply shortages or an emergency or (2) local conditions impacting the quantity or quality of NCCWD's water supply warrant the need for a reduction in water use of up to 10%. • Includes implementation of mandatory restrictions on end uses (see Table 8-2) as well as agency actions (see Table 8-3).

Shortage Level	Percent Shortage Range	Shortage Response Actions
2	Up to 20%	• Declaration by the Board of Directors upon the determination that (1) the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use of up to 20% due to water supply shortages or an emergency or (2) local conditions impacting the quantity or quality of NCCWD's water supply warrant the need for a reduction in water use of up to 20%. • Includes implementation of mandatory restrictions on end uses (see Table 8-2) as well as agency actions (see Table 8-3).
3	Up to 30%	• Declaration by the Board of Directors upon the determination that (1) the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use of up to 30% due to water supply shortages or an emergency or (2) local conditions impacting the quantity or quality of NCCWD's water supply warrant the need for a reduction in water use of up to 30%. • Includes implementation of mandatory restrictions on end uses (see Table 8-2) as well as agency actions (see Table 8-3).
4	Up to 40%	• Declaration by the Board of Directors upon the determination that (1) the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use of up to 40% due to water supply shortages or an emergency or (2) local conditions impacting the quantity or quality of NCCWD's water supply warrant the need for a reduction in water use of up to 40%. • Includes implementation of mandatory restrictions on end uses (see Table 8-2) as well as agency actions (see Table 8-3).

Shortage Level	Percent Shortage Range	Shortage Response Actions
5	Up to 50%	• Declaration by the Board of Directors upon the determination that (1) the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use of up to 50% due to water supply shortages or an emergency or (2) local conditions impacting the quantity or quality of NCCWD's water supply warrant the need for a reduction in water use of up to 50%. • Includes implementation of mandatory restrictions on end uses (see Table 8-2) as well as agency actions (see Table 8-3).
6	>50%	• Declaration by the Board of Directors upon the determination that (1) the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use of up to >50% due to water supply shortages or an emergency or (2) local conditions impacting the quantity or quality of NCCWD's water supply warrant the need for a reduction in water use of up to >50%. • Includes implementation of mandatory restrictions on end uses (see Table 8-2) as well as agency actions (see Table 8-3).
NOTES:		

Table 8-2 Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement ?
No Drought	Other	--	1. Hoses shall be equipped with a shut-off valve for washing vehicles, sidewalks, walkways, or buildings. 2. Ornamental fountains shall use only re-circulated or recycled water. 3. Potable water shall not be applied in any manner to any driveway, sidewalk, or other hard surface except when necessary to address immediate health or safety concerns. 4. Potable water shall not be used to water outdoor landscapes in a manner that causes more than incidental runoff onto non-irrigated areas, walkways, roadways, parking lots, or other hard surfaces. 5. Potable water shall not be applied to outdoor landscapes during and up to 48 hours after measurable rainfall. 6. Potable water shall not be used to irrigate ornamental turf on public street medians. 7. Hotels and motels shall provide guests an option whether to launder towels and linens daily. Hotels and motels shall prominently display notice of this option in each bathroom using clear and easily understood language. 8. Restaurants and other food service operations shall serve water to customers only upon request. 9. Customers are obligated to fix leaks, breaks, or malfunctions in lines, fixtures, or facilities. Loss or escape of water through breaks, leaks, or malfunctions in the water user's plumbing, distribution, or irrigation system is prohibited for any period time after such water waste should have reasonably been discovered and corrected. Leaks, breaks, or malfunctions shall be corrected in no more than five days of District notification. The District, at its sole discretion, may temporarily shut off service if unable to contact the account holder on record. 10. Recreational water features shall be covered when not in use. 11. Single-pass cooling systems on new construction shall not be allowed. 12. Other measures as may be approved by the State Water Resources Control Board or Board of Directors Resolution.	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement ?
1	Other	5%	1. Continue with "no drought" restrictions and prohibitions except where superseded by more stringent requirements. 2. Restrict landscape irrigation to specific times. 3. Prohibit outdoor watering with potable water more than 15 minutes per day and 2 days per week. 4. Restrict water use for decorative water features such as fountains. 5. Allow filling of recreational water features (e.g., swimming pools and spas) only when an appropriate cover is in place. 6. Use of water through a hose or pressure washer to clean of any building or home is prohibited, except prior to painting or if required for health or safety purposes. 7. Require repair of leaks, breaks, or malfunctions in lines, fixtures, or facilities within 2 days. 8. Hosing down or washing down vehicles is prohibited, unless using a bucket and/or rinsing with an automatic shut-off hose nozzle. 9. Other measures approved by the Board of Directors.	Yes
2	Other	15%	1. Continue with Stage 1 restrictions and prohibitions except where superseded by more stringent requirements. 2. Prohibit outdoor watering with potable water more than 10 minutes per day and 1 day per week. 3. Prohibit use of potable water for construction and dust control. 4. Prohibit vehicle washing except at facilities using recycled or recirculating water. 5. Commercial kitchens required to use pre-rinse spray valves. 6. Prohibit filling of recreational water features (e.g., swimming pools and spas). 7. Require repair of leaks, breaks, or malfunctions in lines, fixtures, or facilities within 1 day. 8. Other measures as may be approved by the Board of Directors.	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement ?
3	Other	25%	1. Continue with Stage 2 restrictions and prohibitions except where superseded by more stringent requirements. 2. Prohibit all landscape irrigation of ornamental and private landscapes with potable water, except as required to keep trees alive. 3. Water use shall not exceed Stage 3 water budgets for each customer. 4. No new water-using landscape may be installed by any customer. 5. No new potable water service shall be provided, including temporary meters or permanent meters 6. Water use shall not exceed water allocations established by NCCWD for each customer. 7. Other measures as may be approved by the Board of Directors.	Yes
4	Other	35%	1. Continue with Stage 3 restrictions and prohibitions except where superseded by more stringent requirements. 2. Water use shall not exceed Stage 4 water budgets for each customer. 3. Other measures approved by the Board of Directors.	Yes
5	Other	45%	1. Continue with Stage 4 restrictions and prohibitions except where superseded by more stringent requirements. 2. Water use shall not exceed Stage 5 water budgets for each customer. 3. Other measures approved by the Board of Directors.	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement ?
6	Other	53%	1. Continue with Stage 5 restrictions and prohibitions except where superseded by more stringent requirements. 2. Water use shall not exceed Stage 6 water budgets for each customer. 3. Other measures approved by the Board of Directors.	Yes

NOTES:
(a) The percentages listed in this table are the cumulative savings for each shortage level with implementation of corresponding supply augmentation and other agency actions in Table 8-3. Detailed saving estimates based on end use, response action, and implementation rates can be found in Attachment B of Appendix I.
(b) Table 8-2 lists each demand reduction action as "other" because they represent a suite of demand reduction actions for each shortage level that include multiple categories of demand reduction actions provided in the DWR drop down menu.

Table 8-3 Supply Augmentation and Other Actions (DWR Table 8-3)

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 *(optional)*
1	Other	5%	1. Inform customers that there is a water shortage emergency and the list of actions they can take to reduce water use (e.g., via direct mail, media campaign, website, bill inserts, etc.). 2. Offer water use surveys. 3. Promote rebates on high-efficiency plumbing fixtures and devices such as toilets. 4. Promote rebates for Turf Replacement. 5. Audit and reduce water system loss. 6. Promote use of residential recycled water fill station. 7. Coordination with BAWSCA and SFPUC. 8. Schedule staff for enforcement and customer service.
2	Other	15%	1. Continue with actions and measure from Stage 1. 2. Implement or modify drought rate structure as allowed by adopted Rate and Fee Schedule. 3. Decrease line flushing 4. Increase public outreach, including hosting public events and workshops. 5. Increase public outreach including information regarding fines or penalties for non-compliance. 6. Increase leak detection. 7. Accelerate water conservation program implementation.
3	Other	25%	1. Continue with actions and measures from Stage 2. 2. Increase water waste patrols. 3. Develop mandatory water allocation program for all accounts and notice those accounts appropriately. 4. Impose an excess water use charge with the implementation of water allocations. 5. Require fixture retrofits prior to review of customer hardship exemptions from prohibitions and restrictions. 6. Establish moratorium on new connections and new landscaping.

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 *(optional)*
4	Other	35%	1. Continue with actions and measures from Stage 3. 2. Switch to more frequent (e.g., monthly) billing. 3. Suspend water service to landscape accounts.
5	Other	45%	1. Continue with actions and measures from Stage 4.
6	Other	53%	1. Continue with actions and measures from Stage 5.
NOTES: (a) The percentages listed in this table are the cumulative savings for each shortage level with implementation of corresponding demand reduction measures in Table 8-2. Detailed saving estimates based on end use, response action, and implementation rates can be found in in Attachment B of Appendix I. (b) Table 8-3 lists each supply augmentation method or other actions by water supplier action as "other" because they represent a suite of actions by the water supplier for each shortage level that include multiple categories of actions provided in the DWR drop down menu.			

9 DEMAND MANAGEMENT MEASURES

☑ ***CWC § 10631 (e)***

Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:

(i) Water waste prevention ordinances.

(ii) Metering.

(iii) Conservation pricing.

(iv) Public education and outreach.

(v) Programs to assess and manage distribution system real loss.

(vi) Water conservation program coordination and staffing support.

(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.

This section provides an overview of North Coast County Water District's (NCCWD or District) current and planned demand management measures (DMMs), which include specific types and groupings of water conservation measures typically implemented by water suppliers. NCCWD administers several of its DMMs through past participation in California Urban Water Conservation Council (CUWCC) Best Management Practices (BMPs) (succeeded by the California Water Efficiency Partnership [CalWEP]) and currently with the Bay Area Water Supply & Conservation Agency's (BAWSCA's) Regional Water Conservation Program. The following sections describe BAWSCA's Regional Water Conservation Program and the nature and extent of the specific DMMs implemented by NCCWD.

9.1 Regional Water Conservation

NCCWD participates in BAWSCA's Regional Water Conservation Program, as a part of its overall water conservation program.

> BAWSCA manages a Regional Water Conservation Program comprised of several programs and initiatives that support and augment member agencies' and customers' efforts to use water more efficiently. These efforts extend limited water supplies that are available to meet both current and future water needs; increase drought reliability of the existing water system; and save money for both the member agencies and their customers.
>
> The implementation of the Regional Water Conservation Program builds upon both the Water Conservation Implementation Plan (WCIP, completed in September 2009) and

the Regional Demand and Conservation Projections Project (Demand Study, completed in June of 2020). These efforts include both Core Programs (implemented regionally throughout the BAWSCA service area) and Subscription Programs (funded by individual member agencies that elect to participate and implement them within their respective service areas).

BAWSCA's Core Conservation Programs include organizing classes open to the public on topics such as water efficient landscape education and water-wise gardening, assistance related to automated metering infrastructure, and other associated programs that work to promote smart water use and practices. BAWSCA's Subscription Programs include numerous rebate programs, educational programs that can be offered to area schools, technical assistance to member agencies in evaluating water loss, and programs to train and certify contractors employed to install water efficient landscape. In total, BAWSCA offers 22 programs to its member agencies and that number continues to grow over time.

Each fiscal year, BAWSCA prepares an Annual Water Conservation Report that documents how all of BAWSCA's 26 member agencies have benefitted from the Core Conservation Programs. Additionally, the report highlights how all 26 member agencies participate in one or more of the Subscription Programs offered by BAWSCA, such as rebates, water loss management and large landscape audits. The Demand Study indicates that through a combination of active and passive conservation, 37.3 MGD will be conserved by BAWSCA's member agencies by 2045.

Following the 2014-2016 drought, the State of California (State) developed the "Making Water Conservation a California Way of Life" framework to address the long-term water use efficiency requirements called for in executive orders issued by Governor Brown. In May of 2018, AB 1668 and SB 606 (collectively referred to as the efficiency legislation) went into effect, which built upon the executive orders implementing new urban water use objectives for urban retail water suppliers.

Although the BAWSCA Regional Water Conservation Program was designed and available at a regional level, most of the implementation of the individual programs within the NCCWD service area is done by NCCWD staff.

The Core Programs provided as a part of the Regional Water Conservation Program include conservation measures that benefit from regional implementation and provide overall regional benefit and are funded through the annual BAWSCA budget. The Subscription Programs are conservation measures that individual agencies must elect to participate in and whose benefits are primarily realized within individual water agency service areas. As such, the Subscription Programs are funded by individual member agencies, based on their participation level. NCCWD is actively participating in the following Subscription Programs:

- EarthCapades School Assembly Program
- Water Conservation School Education Program
- Rain Barrel Rebate
- Lawn Be Gone! Turf Replacement Rebates
- Lawn Be Gone! Inspection Services Program
- Water Efficient Landscape Classes

- Customer Meter Testing Program

NCCWD's implementation of, and participation in, the Core and Subscription Programs are described in detail, below, as they relate to NCCWD's implementation of the DMMs.

9.2 Agency Water Conservation

☑ ***CWC § 10631 (e)***

Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years.

NCCWD implements all of the DMMs as described in the following sections.

9.2.1 DMM 1 – Water Waste Prevention Ordinances

The NCCWD prohibits water waste by customers as well as other non-essential uses of water in conjunction with water rationing programs. In August 2014, NCCWD Board of Directors declared Stage 2 of the 2010 Water Shortage Contingency Plan (WSCP) under Ordinance 2014-56 and later amended with Ordinance 2015-57, which included prohibitions that targeted water waste and discretionary outdoor uses. These prohibitions were in place until the Board of Directors enacted Ordinance 2017-58 in April 2017. These ordinances, including the water waste prohibitions are included in Appendix K.

As part of the 2020 WSCP Update (Chapter 8 and Appendix I), prohibitions to prevent water waste are included as Stage 0, or non-drought, of NCCWD's WSCP, and remain in place at all times, irrespective of water supply conditions. Stage 0, or non-drought, of NCCWD's WSCP includes the following water waste prohibitions:

- Hoses must be equipped with a shut-off valve for washing vehicles, sidewalks, walkways, or buildings.
- Ornamental fountains shall use only re-circulated or recycled water.
- Potable water shall not be applied in any manner to any driveway, sidewalk, or other hard surface except when necessary to address immediate health or safety concerns.
- Potable water shall not be used to water outdoor landscapes in a manner that causes more than incidental runoff onto non-irrigated areas, walkways, roadways, parking lots, or other hard surfaces.
- Potable water cannot be applied to outdoor landscapes during and up to 48 hours after measurable rainfall.
- Potable water shall not be used to irrigate ornamental turf on public street medians.
- Hotels and motels shall provide guests an option whether to launder towels and linens daily. Hotels and motels shall prominently display notice of this option in each bathroom using clear and easily understood language.
- Restaurants and other food service operations shall serve water to customers only upon request.

- Obligation to fix leaks, breaks or malfunctions in lines, fixtures or facilities. Loss or escape of water through breaks, leaks, or malfunctions in the water user's plumbing, distribution or irrigation system is prohibited for any period time after such water waste should have reasonably been discovered and corrected. Leaks, breaks, or malfunctions must be corrected in no more than five days of District notification. The District, at its sole discretion, may temporarily shut off service if unable to contact the account holder on record.
- Recreational water features shall be covered when not in use.
- Single-pass cooling systems on new construction shall not be allowed.
- Other measures as may be approved by the State Water Resources Control Board or Board of Directors Resolution.

In subsequent stages of the WSCP, the water waste prohibitions become increasingly restrictive to respond to water shortages.

9.2.2 DMM 2 – Metering

☑ ***CWC § 526 (a)***

Notwithstanding any other provision of law, an urban water supplier that, on or after January 1, 2004, receives water from the federal Central Valley Project under a water service contract or subcontract … shall do both of the following:

(1) On or before January 1, 2013, install water meters on all service connections to residential and nonagricultural commercial buildings constructed prior to January 1, 1992, located within its service area.

(2) On and after March 1, 2013, or according to the terms of the Central Valley Project water contract in operation, charge customers for water based on the actual volume of deliveries, as measured by a water meter.

☑ ***CWC § 527 (a)***

(a) An urban water supplier that is not subject to Section 526 shall do both of the following:

(1) Install water meters on all municipal and industrial service connections located within its service area on or before January 1, 2025.

NCCWD has installed water meters on each water service connection. Customers can access water data through NCCWD's online water billing tool. Customer meters are read on a bi-monthly basis. Some non-residential and multi-family customers also have separate irrigation meters to monitor water use for landscape irrigation separately from indoor uses. In June 2010, NCCWD Resolution No. 1032 passed requiring all new multi-unit residential, commercial, and mixed-use developments, and condominium conversion projects to install individual water meters for each separate unit for new or expanded water service. Under the June 2010 NCCWD Resolution No. 1033, the District required that certain existing multi-unit residential, commercial, and mixed-use developments that provide water through a master meter install individual water meters for each residential unit, commercial unit, common area, and irrigation use.

9.2.3 DMM 3 – Conservation Pricing

NCCWD's current water rate structure for all customers includes a monthly fixed meter charge and a tiered water consumption charge based on water usage. The water consumption charge is tiered such that customers are billed at a lower rate for efficient water use and a higher rate for high water use. Effective November 2016, the rate structure for the water consumption charge includes four tiers of bi-monthly water use for single-family residential customers: (Tier 1) 0 to 5 hundred cubic feet (ccf), (Tier 2) 6 to 10 ccf, (Tier 3) 11 to 19 ccf, and (Tier 4) greater than 19 ccf. All other customer classes are billed at uniform volumetric charges. This tiered pricing structure is always in place and is not dependent on water shortage. A rate study is currently underway and is anticipated to be finalized in Fall of 2021.

9.2.4 DMM 4 – Public Education and Outreach

NCCWD implements several public education and outreach initiatives with support from the BAWSCA Regional Water Conservation Program. Specific initiatives include:

- EarthCapades School Assembly Program: NCCWD facilitates the school assemblies performed by EarthCapades at schools within its service area. The EarthCapades performances combine age-appropriate state science standards with circus skills, juggling, music, storytelling, comedy, and audience participation to teach environmental awareness, water science, and conservation. EarthCapades assemblies are designed to include local water source and watershed education and specific information pertaining to the NCCWD service area. NCCWD and BAWSCA provide specific information to EarthCapades regarding the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS) and other topics (e.g., recycled water). EarthCapades integrates this information into the specific scripts used for assemblies conducted within the NCCWD service area. Since partnering with EarthCapades in 2019, NCCWD facilitated and paid for eight EarthCapades assemblies in FY 2019-2020 and seven shows in FY 2020-2021. The District continues to participate in the program.
- Water Conservation School Education Program: The water conservation school education program, formerly known as the Water-Wise school education program, is provided by Resource Action Programs (a contractor to BAWSCA) to 5th grade students within the NCCWD service area. Resource Action Programs works directly with teachers and schools to provide them with turn-key, in-classroom water conservation curriculum and indoor and outdoor water conservation kits (i.e., the Water-Wise Kits). The Water-Wise curriculum has been designed to be easily implemented by teachers, and easily understood and taken back into the home by the students. The Water-Wise Kits include water saving devices that can be installed at the student's homes (e.g., low-flow showerheads and faucet aerators) and a water audit that the students can perform with their parents.

  The students are provided with the motivation, information, and tools they need to perform an in-home water audit. The information and material provided to the teachers and students also includes methods that can be used to quantify the water savings as a result of installing the equipment contained in the kit and performing the recommended, water-conserving actions. After the student performs the audit and installs the water and energy saving devices, affidavits

signed by the parents are returned to the school, collected by the teacher, and forwarded to Resource Action Programs for documentation of measure implementation and the estimated water savings. Resource Action Programs then prepares a final report for distribution to NCCWD. NCCWD has participated in the Water-Wise School Education Program every year between 2016 and 2020 and distributed a total of 908 kits.

- Water-Wise Garden Contest: In 2016, 2017, and 2018 NCCWD held the Water-Wise Garden Contest for customers to showcase their native and drought tolerant landscaping. The goal of the contest was to encourage customers throughout the service area to adopt water efficient gardening habits, showcase water conservation efforts, and promote BAWSCA's Lawn Be Gone! rebate program. Though the contest was not held in 2019 or 2020, the contest will return in 2021.
- Water efficient landscape education classes: NCCWD hosts spring and fall Water-Efficient Landscape Education Classes developed by BAWSCA that are free to the public and are designed to introduce homeowners and landscape professionals to the concepts of sustainable landscape design. The classes focus on creating beautiful, water-efficient gardens as an alternative to lawns. Examples of specific class topics include "Lawn Replacement 101", "Propagating and Landscaping with Succulents", and "Drought-tolerant Native Plant and Pollinator Gardens" among others. This program was implemented in 2015 and continued through 2020 by use of a virtual platform.
- Water Awareness Month Poster Contest: In 2016 through 2020 NCCWD held the Water Awareness Month Poster Contest for students of elementary age that attend schools in the District's service area. The posters must depict a scene of the contest theme, along with a creative slogan or conservation message. The winning posters are made into a school year calendar for the community.
- Hosting information booths at fairs and public events: NCCWD sets up information booths at large public events to distribute information regarding NCCWD's water conservation programs including rebate programs, landscape programs, and fixture giveaways. Each year the NCCWD sponsors the Pacifica Beach Coalition's Earth Day Eco-Fest and California Coastal Cleanup. The District has participated in other city-wide events including library events, festivals, and parades.
- Online account access: NCCWD's Online Customer Portal allows customers to track water usage, request service and water audits, and to pay bills electronically.
- Informative website, online tools, or social media: NCCWD maintains pages on its website (www.nccwd.com) that are dedicated to water conservation. The website provides information regarding its rebate programs, water-saving fixture giveaways, water regulations, conservation tips and links to interactive tools. The website also contains various informational videos and educational materials. NCCWD also posts outreach materials on its social media accounts such as Facebook and Nextdoor.
- Media campaigns and other outreach: NCCWD encourages water conservation and markets its rebate programs through methods including newsletters, pamphlets, flyers, and informative conservation sheets at the NCCWD facilities.

9.2.5 DMM 5 – Programs to Assess and Manage Distribution System Real Loss

As discussed in Section 4.2.1, distribution system water loss was estimated to be approximately 9 percent of total water demand between 2016 and 2020, based on available data between 2016 and 2020.

NCCWD has trained staff and equipment to detect leaks in the distribution system. Staff routinely perform visual inspections, respond to public complaints, and perform repairs immediately when leaks are detected. Distribution losses have decreased as a result of NCCWD's pipeline replacement program as well as the water meter replacement and leak detection programs. In addition, as discussed in Section 6.5.5, the District intends to reduce the need to supplement recycled water supplies with potable water through operational modifications. As these potable uses are currently accounted for in the reported losses, these operational changes will reduce distribution system losses.

9.2.6 DMM 6 – Water Conservation Program Coordination and Staffing Support

Regional planning and coordination efforts are handled by BAWSCA with input from agency representatives.

Contact information for NCCWD's conservation program is listed below:

Phone: 650-355-3462

Email: info@nccwd.com

NCCWD estimated that its total water conservation program budget for Fiscal Year (FY) 2019-20 was $105,000. Of the total conservation program budget, $15,000 went towards public outreach, $25,000 went towards supplies, and $65,000 went towards rebates, including the cost for participation in the Subscription Programs through BAWSCA's Regional Water Conservation Program.

9.2.7 DMM 7 – Other DMMs

Other DMMs provided by the NCCWD, in addition to those discussed above, include the following:

- HET Rebates: The NCCWD locally administers a HET Rebate Program for its residential and commercial customers. As part of this program, NCCWD offers customers a Up to a $60 Rebate for replacing a high-volume toilet (i.e., 3.5 gallons per flush [gpf], or more) with a qualifying toilet (1.28 gpf or less). Up to two rebates are allowed per single family home while twenty-five (25) are allowed per commercial and multi-unit account. Between 2016 and 2020, NCCWD provided a total of 481 rebates.
- High-Efficiency Residential Washing Machine Rebates: NCCWD locally administered a High-Efficiency Residential Washing Machine Rebate program for its residential customers which, through joint participation with Pacific Gas & Electric (PG&E), included a rebate of up to $150 to customers that purchase a qualifying washing machine.[22] The High-Efficiency Residential Washing Machine Rebate program was one of the Subscription Programs available to BAWSCA member agencies. Between July 2015 and December 2017, NCCWD provided 190 washing machine rebates

[22] PG&E currently contributes $50 of the total $150 rebate. Total rebate value has varied from year to year.

to its customers. The High-Efficiency Residential Washing Machine Rebate program was discontinued in December 2017.

- Rain Barrel Rebate: The NCCWD locally administers the joint San Mateo Countywide Water Pollution Prevention Program and BAWSCA Rain Barrel rebate program for its customers. As part of this program, NCCWD offers customers the following rebates for installing rain barrels:
    - Rain barrels with a 50-99 gallon capacity: $50 (+ additional $50 from participating member agencies);
    - Rain barrels with a 100-199 gallon capacity: $100 (+ additional $50 from participating member agencies); and
    - Rain barrels with a 200+ gallon capacity: $150 (+ additional $50 from participating member agencies).

  To obtain the rebate, an application with purchase receipt and post-installation photos must be submitted to BAWSCA via mail. Between 2016 and 2020, NCCWD provided a total of 261 rebates.
- Residential Water Use Audits: The NCCWD administers residential indoor and landscape water use audits to residential and commercial accounts. Moving forward NCCWD will use Waterfluence to conduct these surveys and provide personalized reports.
- Large Landscape Outdoor Water Surveys: NCCWD staff conduct large landscape water surveys as needed in the service area.
    - During the recent drought, between 2015 to 2018, this program was primarily focused on outdoor water use at schools. District staff worked closely with school district staff to identify and fix issues.
    - This program will be offered to large landscape customers during FY 2021-2022
- Lawn Be Gone! Turf Replacement Rebates: The NCCWD locally administers the BAWSCA Lawn Be Gone! turf replacement rebate program for its residential and commercial customers. The NCCWD offers its residential customers $4 per square foot of turf removed up to a maximum $2,500 rebate (maximum implemented in July 2020) and $4 per square foot for large landscape rebates for Multi-Family and Home Owner's Associations up to a maximum of $25,000. In order to qualify for participation in the Lawn Be Gone! Program, the new landscape must include at least 50 percent live plant coverage, with the difference completed in permeable hardscape, and all plants must be low water use plants from the BAWSCA-approved plant list. This program offers NCCWD's customers a financial incentive to reduce their outdoor water use and create permanent and lasting water savings. Also, because eligible landscapes must include front yards and areas visible to the public, this program has an educational and public-outreach element (i.e., demonstrating to the wider public that low water use landscaping can be an attractive alternative to lawns and encouraging conversations about responsible water use among neighbors). NCCWD began participating in the program in 2011, and budgets $45,000 to $65,000 per year for Lawn Be Gone! rebates. Between 2016 and 2020 approximately 45,314 square feet of turf has been replaced under this program within the NCCWD service area.

- Water-saving fixtures giveaway: NCCWD offers its residential customers free water saving fixtures. The NCCWD encourages its customers to pick up and utilize the following free water saving fixtures and items from its office:
    - Bathroom Faucet Aerator – uses 1.0 gallons per minute (gpm);
    - Kitchen Faucet Aerator – uses 1.5 gpm;
    - ADA Compliant Low-Flow Handheld Showerhead;
    - Shower Timer
    - 2.5 Gallon Buckets
    - Toilet Leak Detection Dye Tablets
    - Automatic Shut-Off Hose Nozzle
    - Sprinkler/Rain Gauge
    - Practical Plumbing Handbook
    - Moisture Meters

  NCCWD gave out 15,360 individual water saving fixtures and items between 2016 and 2020.
- Residential Recycled Water Fill Station: NCCWD residential customers can bring containers to the designated recycled water fill station located at the NCCWD office. Upon completion of mandatory training and procedures for first time users, customers are permitted to take up to 100 gallons of recycled water per visit. At this time there are no limits on the number of visits allowed per day for all customers. Between 2016 and 2020, NCCWD supplied nearly 61,000 gallons of recycled water through the fill station.
- CII Water Survey: Commercial surveys for hotels, restaurants, and business are conducted by staff as requested.
- School Building Retrofit: In response to request for retrofits, NCCWD ordered aerators for a school's bathrooms and provided pre-rinse spray nozzles for lunchrooms.

9.3 Implementation over the Past Five Years

Table 9-1 and the associated chart summarizes the DMMs implemented by NCCWD and the extent of implementation (e.g., number of kits, number of rebates) for each of the programs each year between 2016 and 2020. Through implementation of the DMMs, NCCWD has been able to significantly reduce water demands in its service area and help its customers to achieve water and cost savings.

9.4 Implementation to Achieve Water Use Targets

☑ ***CWC § 10631 (e)***

Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) (A) … The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

NCCWD implemented all of the DMMs described in Section 9.2 to achieve its Senate Bill (SB) X7-7 water use targets. As shown in Chapter 5, NCCWD's water use in 2020 was 65 gallons per capital per day (GPCD), which is substantially lower than its SB X7-7 water use target of 124 GPCD.

9.5 Urban Water Use Objectives (Future Requirement)

CWC § 10609 requires that urban retail water suppliers develop new water use objectives that are based on specific standards for certain water use sectors. These water use objectives will not be developed until 2023. Suppliers are encouraged in this UWMP cycle to consider how they will align their conservation management actions in order to meet these future obligations.

NCCWD intends to continue and expand implementation of the DMMs discussed above and will continue to participate in BAWSCA's Regional Water Conservation Program. Going forward NCCWD will participate in additional BAWSCA programs than those discussed above, including the large meter testing program and the large landscape audit program.

> BAWSCA led its member agencies in a multi-year effort to develop and implement a strategy to meet these new legislative requirements. BAWSCA's Making Conservation a Way of Life Strategic Plan (Strategic Plan) provided a detailed roadmap for member agencies to improve water efficiency. BAWSCA implementing the following elements of the Strategic Plan:

- Conducted an assessment of the agencies' current practices and water industry best practices for three components of the efficiency legislation that, based on a preliminary review, present the greatest level of uncertainty and potential risk to the BAWSCA agencies. The three components were:
    1. Development of outdoor water use budgets in a manner that incorporates landscape area, local climate, and new satellite imagery data.
    2. Commercial, Industrial, and Institutional water use performance measures.
    3. Water loss requirements.
- Organized an Advanced Metering Infrastructure symposium to enable information exchange, including case studies, implementation strategies, and data analysis techniques.

- Initiated a regional CII audit pilot program, which BAWSCA aims to complete in 2021.[23]
- Implemented a regional program for water loss control to help BAWSCA agencies comply with regulatory requirements and implement cost-effective water loss interventions.
- Engaged with the SFPUC to audit meter testing and calibration practices for SFPUC's meters at BAWSCA agency turnouts.

Finally, BAWSCA's Demand Study developed water demand and conservation projections through 2045 for each BAWSCA agency. These projects are designed to provide valuable insights on long-term water demand patterns and conservation savings potential to support regional efforts, such as implementation of BAWSCA's Long-Term Reliable Water Supply Strategy.

As described in Section 4.2, NCCWD's 2021 Decision Support System Model (DSS) Model estimates projected water demands and quantifies passive and active conservation water savings potential. As discussed in Section 4.6, the DSS Model projections demonstrate that per capita indoor residential potable water use within the NCCWD is expected to be below the indoor use standards presented in the legislation.

[23] Efforts on the CII audit pilot program stalled in March 2020 due to the COVID 19 pandemic and related shelter-in-place orders.

Table 9-1 Summary of DMMs and Implementation over the Past Five Years (2015-2020)

DMM Category	Program or Activity	Target Sector	Nature of Implementation	Extent of Implementation
1	Water Waste Prevention Ordinances	SF, MF, CII and IRR	Prohibition of water uses to prevent water waste included under Stage 0 of the WSCP are in place at all times, irrespective of water supply condition.	State mandated prohibitions on certain end of use actions were in effect until 2017 when Ordinance 2017-58 rescinded the prohibitions. With the adoption of the 2020 WSCP these waste prohibitions will be put back into place and remain prohibited at all times.
2	Metering	SF, MF, CII and IRR	All water service connections are metered.	All accounts are metered and read on a bimonthly basis.
3	Conservation Pricing	SF, MF, CII and IRR	The water consumption charge is tiered such that customers are billed at a lower rate for efficient water use and a higher rate for high water use. Effective November 2016, the rate structure for the water consumption charge includes four tiers of bi-monthly water use for all SF residential accounts.	Single family residential: (1) 0 to 5 hundred cubic feet (ccf) (2) 6 to 10 ccf (3) 11 to 19 ccf; and (4) greater than 19 ccf All other accounts are charge a single rate per ccf used.
4	School Education Program: Earth Capades	SF and MR	School assemblies that teach water science and conservation to students, including local water source and watershed education and specific information pertaining to the NCCWD service area. The NCCWD participates through the BAWSCA Regional Water Conservation Program.	2016-2018: Not participating 2019: 8 assemblies 2020: 7 assemblies
4	Water-Wise School Education Kits and Curriculum	SF and MF	Fifth grade teachers are provided with a water conservation curriculum. Kits are distributed to 5th grade students that enable them to install water saving devices and perform a water audit in their home. NCCWD participates through the BAWSCA Regional Water Conservation Program.	2016: 256 kits 2017: 4 schools, 215 kits 2018: 3 schools, 194 kits 2019: 3 schools, 158 kits 2020: 3 schools, 85 kits
4	Water Efficient Landscape Education Classes	SF and MF	NCCWD advertises a series of Water-Efficient Landscape Education Classes developed by BAWSCA that are free to the public and are designed to introduce homeowners and landscape professionals to the concepts of sustainable landscape design. The classes focus on creating beautiful, water-efficient gardens as an alternative to lawns.	2016: 0 classes 2017: 2 classes 2018: 4 classes 2019: 5 classes 2020: 2 classes
4	Information Booths at Public Events	SF, MF, CII and IRR	At public events, NCCWD distributes information and materials to participants regarding its water conservation programs.	2016: 4 events 2017: 4 events 2018: 4 events 2019: 5 events 2020: 0 (sponsored Earth Day event)

DMM Category	Program or Activity	Target Sector	Nature of Implementation	Extent of Implementation
4	Other Public Outreach	SF and MF	NCCWD maintains pages on its website (www.nccwd.com) that are dedicated to water conservation. The website provides information regarding its rebate programs, water-saving fixture giveaways, water regulations, conservation tips and links to interactive tools. The website also contains various informational videos and educational materials.	Ongoing implementation between 2016-2020
5	Programs to Assess and Manage Distribution System Real Loss	Non-revenue	NCCWD has an active program to manage loss, which includes staff trained to perform regular visual inspections and responds to public complaints. NCCWD staff consistently monitor billing reports to compare with water purchases to identify distribution system losses. Repairs are performed immediately when leaks are detected.	Ongoing implementation between 2016-2020
7	High Efficiency Toilet Rebate	SF, MF, and CII	Up to a $60 Rebate for replacing a high-volume toilet (i.e., 3.5 gallons per flush (gpf), or more) with a qualifying toilet (1.28 gallons or less per flush). Up to two rebates are allowed per single family home while twenty-five (25) are allowed per commercial and multi-unit account	2016: 96 rebates 2017: 84 rebates 2018: 105 rebates 2019: 125 rebates 2020: 71 rebates
7	Rain Barrel Rebate Program	SF and MF	NCCWD offers customers the following rebates for installing rain barrels: (1) Rain barrels with a 50 - 99 gallon capacity: $50 (+ additional $50 from participating member agencies); (2) Rain barrels with a 100- 199 gallon capacity: $100 (+ additional $50 from participating member agencies); and (3) Rain barrels with a 200 gallon capacity: $150 (+ additional $50 from participating member agencies).	2016: 192 rebates 2017: 32 rebates 2018: 19 rebates 2019: 6 rebates 2020: 12 rebates
7	Large Landscape Water Surveys	CII and IRR	NCCWD staff conduct large landscape water surveys as needed in the service area.	Ongoing program collaboration with City of Pacifica and schools between 2016-2020.
7	Water Use Audits	SF, MF, and CII	The NCCWD administers indoor and landscape water use	2016: 254 audits/leak checks 2017: 336 audits/leak checks 2018: 594 audits/leak checks 2019: 525 audits/leak checks 2020: 775 audits/leak checks
7	Lawn Be Gone! Rebate Program	SF, MF, and CII	Customers are offered $4 per square foot (sq. ft.)of turf removed and replaced with water-efficient landscaping, up to a $2,500 rebate (maximum implemented July, 2020). The new landscape must include at least 50 percent live plant coverage, permeable hardscape, and all plants must be low water use plants from the BAWSCA-approved plant list. NCCWD participates through the BAWSCA Regional Water Conservation Program.	2016: 15 rebates, 15,230 sq. ft 2017: 8 rebates, 16,356 sq. ft. 2018: 6 rebates, 5,947 sq. ft. 2019: 1 rebate, 6,250 sq. ft 2020: 2 rebates, 1,531 sq. ft.
7	Free Water-Saving Fixtures	SF and MF	NCCWD offers its residential customers free water saving fixtures.	2016: 7,044 fixtures 2017: 512 fixtures 2018: 3,688 fixtures 2019: 2,200 fixtures 2020: 1,916 fixtures

DMM Category	Program or Activity	Target Sector	Nature of Implementation	Extent of Implementation
7	Residential Recycled Water Fill Station	SF and MF	NCCWD residential customers can bring up to 100-gallon containers to the designated recycled water fill station located at the NCCWD office. There is no limit on number of visits a customer can make per day.	2016: 23,919 gallons 2017: 13,786 gallons 2018: 16,549 gallons 2019: 6,522 gallons 2020: 59 gallons

10 PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

Preparation of the Urban Water Management Plan (UWMP) and the Water Shortage Contingency Plan (WSCP) began in April 2020 for completion in July 2021, with notifications and interactions between stakeholders as discussed further below.

10.1 Notification of UWMP Preparation

☑ ***CWC § 10621 (b)***

Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

Between January and February 2021, the North Coast County Water District (NCCWD) sent a letter to 54 recipients from 31 entities, including the San Francisco Public Utilities Commission (SFPUC), Bay Area Water Supply and Conservation Agency (BAWSCA), each BAWSCA member agency, San Mateo County, and other local agencies informing them that the NCCWD was in the process of updating its UWMP and WSCP and soliciting their input in the update process. A listed of the entities contacted is provided in Table 10-1 and Appendix B. The letter was sent more than 60 days before the public hearing as required by code. A sample outreach letter is included in Appendix B.

Table 10-1 Notification to Cities and Counties (DWR Table 10-1)

City Name	60 Day Notice	Notice of Public Hearing
City of Pacifica	X	X
County Name	**60 Day Notice**	**Notice of Public Hearing**
San Mateo County	X	X
Other Agency Name	**60 Day Notice**	**Notice of Public Hearing**
Note (a)		
NOTES: (a) See Appendix B for the full list of cities and agencies that NCCWD notified.		

10.2 Notification of Public Hearing

☑ ***CWC § 10642***

Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan and the water shortage contingency plan. Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.

10.2.1 Notice to Cities and Counties

On 19 May 2021, NCCWD sent a letter to each of the above-mentioned entities informing them of the locations the Public Review Draft 2020 UWMP and the updated WSCP would be available for review and welcoming their input and comments on the document. The Public Review Draft 2020 UWMP and the WSCP was available for public review at the City of Pacifica (City) Hall and on the City's website 1 June 2021. The letter also informed the agencies that the UWMP and WSCP public hearing would be occurring at the District offices on 16 June 2021. A sample copy of the notification letters is included in Appendix B.

10.2.2 Notice to the Public

NCCWD issued public notifications soliciting public input during the preparation of 2020 UWMP and the WSCP.

On 2 June 2021 and 9 June 2021, NCCWD published notices in the *Pacifica Tribune* informing the public that the 2020 UWMP and the WSCP would be available for public review at the District's offices and on the NCCWD's website, consistent with requirements of California Government Code 6066. The notice also informed the public that the 2020 UWMP and WSCP public hearing would be held at the District offices on 16 June 2021. Copies of the newspaper announcements are included in Appendix C.

10.3 Public Hearing and Adoption

☑ ***CWC § 10608.26***

(a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:

(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.

(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.

(3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.

As described above, the NCCWD informed the public and the appropriate agencies of: (1) its intent to prepare a UWMP and the associated WSCP, (2) where the UWMP and WSCP were available for public review, and (3) when the public hearing regarding the UWMP and WSCP would be held.

This UWMP was adopted by Resolution 1119 by the Board of Directors during its 16 June 2021 Board of Director's meeting. The WSCP included as Appendix I was adopted by Resolution 1118 during the same meeting. Copies of the resolutions are included in Appendix L and Appendix M, respectively.

10.4 Plan Submittal

☑ ***CWC § 10621***

(f) (1) Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.

☑ ***CWC § 10635 (c)***

The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

☑ ***CWC § 10644***

(a) (1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1) shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.

(b) If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its water shortage contingency plan prepared pursuant to subdivision (a) of Section 10632 no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.

A copy of the adopted 2020 UWMP and associated WSCP will be provided to the Department of Water Resources (DWR), the California State Library, San Mateo County, and the City of Pacifica within 30 days of the adoption. An electronic copy of the adopted 2020 UWMP will be submitted to DWR using the DWR

online submittal tool. The updated 2020 UWMP will be submitted to DWR by 1 July 2021. Furthermore, if the WSCP is amended, each of the steps for notification, public hearing, adoption, and submittal will also be followed for the amended document no later than 30 days after adoption.

10.5 Public Availability

☑ ***CWC § 10645***

(a) Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

(b) Not later than 30 days after filing a copy of its water shortage contingency plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

A copy of the adopted 2020 UWMP and the WSCP will be available for public review in the District offices during normal business hours and on the NCCWD's website within 30 days of filing the plan with DWR.

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APPENDIX A
COMPLETED UWMP CHECKLIST

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	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	Chapter 1
x	x	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	Section 1.6
x	x	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	Section 2.1 and Table 2-1
x	x	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	Section 1.3, Section 2.5.3, Section 10.1, and Table 10-1

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	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 2.5.4
x		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	Section 2.5.2 and Table 2-4
	x	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
x	x	Section 3.1	10631(a)	Describe the water supplier service area.	System Description	Chapter 3
x	x	Section 3.3	10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3
x	x	Section 3.4	10631(a)	Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045.	System Description	Section 3.4.1 and Table 3-2
x	x	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 and Table 3-3

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	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 and Table 3-1
x	x	Section 3.5	10631(a)	Describe the land uses within the service area.	System Description	Section 3.5
x	x	Section 4.2	10631(d)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2, Table 4-2, Table 4-4, and Table 4-5
x	x	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 4.2.2 and Table 4-3
x	x	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 4.2.4 and Table 4-7
x	x	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 4.2.4
x	optional	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 4.2.2 and Table 4-3
x	optional	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 4.2.5 and Table 4-8
x	x	Section 4.5	10635(b)	Demands under climate change considerations must be included as part of the drought risk assessment.	System Water Use	Section 4.4

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x		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	Chapter 5
x		Chapter 5	10608.24(a)	Retail suppliers shall meet their water use target by December 31, 2020.	Baselines and Targets	Section 5.4 and Table 5-2
	x	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
x		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 5.4 and Table 5-2
x		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 5.3

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x		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 SBX7-7 2020 Compliance Form.	Baselines and Targets	Appendix E
x	x	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	Section 7.1.1 and Section 7.1.2
x	x	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	Section 6.10.1 and Section 7.1.1.3
x	x	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	Chapter 6
x	x	Section 6.1.1	10631(b)(3)	Describe measures taken to acquire and develop planned sources of water.	System Supplies	Section 6.8
x	x	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	Section 6.8, Section 6.9, Table 6-8 and Table 6-9

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	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
x	x	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	N/A
x	x	Section 6.2.2	10631(b)(4)(B)	Describe the groundwater basin.	System Supplies	N/A
x	x	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	N/A
x	x	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	N/A

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	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	N/A
x	x	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	N/A
x	x	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 6.7
x	x	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 (Recycled Water)	Section 6.5.2, Section 6.5.3, and Table 6-3
x	x	Section 6.2.5	10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.2 and Table 6-3
x	x	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 (Recycled Water)	Section 6.5.4 and Table 6-4

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	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 (Recycled Water)	Section 6.5.4, Table 6-4, and Table 6-5
x	x	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 (Recycled Water)	Section 6.5.4, Section 6.5.5, and Table 6-6
x	x	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 6.5.4, Section 6.5.5, and Table 6-6
x	x	Section 6.2.6	10631(g)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6
x	x	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 (Recycled Water)	Section 6.5.2, Table 6-2, and Table 6-3
x	x	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 6.8 and Table 6-7

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	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 6.11 and Table 6-10
x	x	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 7.1.1.3
x	x	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
x	x	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
x	x	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

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	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
x	x	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	Section 7.2.2
x	x	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
x	x	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	Section 7.2.1
x	x	Chapter 8	10632(a)	Provide a water shortage contingency plan (WSCP) with specified elements below.	Water Shortage Contingency Planning	Appendix I
x	x	Chapter 8	10632(a)(1)	Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP	Water Shortage Contingency Planning	Appendix I; Section 2

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	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	Appendix I; Section 12
x	x	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	Appendix I; Section 4
x	x	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	Appendix I; Section 4
x	x	Section 8.3	10632(a)(3)(A)	Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent 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	Appendix I; Section 5
x	x	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

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	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	Appendix I; Section 6.1
x	x	Section 8.4	10632(a)(4)(B)	Specify locally appropriate demand reduction actions to adequately respond to shortages.	Water Shortage Contingency Planning	Appendix I; Section 6.2
x	x	Section 8.4	10632(a)(4)(C)	Specify locally appropriate operational changes.	Water Shortage Contingency Planning	Appendix I; Section 6.3
x	x	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	Appendix I; Section 6.4
x	x	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	Appendix I; Section 6.6
x	x	Section 8.4.6	10632.5	The plan shall include a seismic risk assessment and mitigation plan.	Water Shortage Contingency Plan	Appendix I; Section 7
x	x	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	Appendix I; Section 8

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	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	Appendix I; Section 8
x		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	Appendix I; Section 9
x	x	Section 8.7	10632(a)(7)(A)	Describe the legal authority that empowers the supplier to enforce shortage response actions.	Water Shortage Contingency Planning	Appendix I; Section 10
x	x	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	Appendix I; Section 10
x	x	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	Appendix I; Section 10
x	x	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	Appendix I; Section 11
x	x	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	Appendix I; Section 11

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x		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	Appendix I; Section 11
x		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	Appendix I; Section 12
x		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	Appendix I; Section 6.4
x	x	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	Appendix I; Section 14
x	x	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	Appendix I; Section 14

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
	x	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
x		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	Section 9.1, Section 9.2, and Section 9.3
x		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 10.3
x	x	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	Section 10.1
x	x	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 10.4

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	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 10.5
x	x	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 10.2.1
x	x	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	Section 10.4
x	x	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 10.4
x	x	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	Section 10.4
x	x	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 10.4

Retail	Wholesale	2020 Guidebook Location	Water Code Section	Summary as Applies to UWMP	Subject	2020 UWMP Location
x	x	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 10.5
x	x	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 10.5
x	x	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
x	x	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 10.4

APPENDIX B
UWMP AGENCY NOTIFICATION LETTERS

Notification Distribution List

Alameda County Water District
Bay Area Water Supply and Conservation Agency
California Water Service Company
City of Brisbane / Guadalupe Valley Municipal Improvement District
City of Burlingame
City of Daly City
City of East Palo Alto
City of Foster City/ Estero Municipal Improvement District
City of Hayward
City of Menlo Park
City of Millbrae
City of Milpitas
City of Mountain View
City of Pacifica
City of Palo Alto
City of Redwood City
City of San Bruno
City of San Jose, San Jose Municipal Water System - North
City of Santa Clara
City of Sunnyvale
Coastwide County Water District
County Name
Mid-Peninsula Water District
North County Fire Authority
Purissima Hills Water District
San Francisco Public Utilities Company
San Mateo County
Stanford University
Town of Hillsborough
Westborough Water District

2400 Francisco Blvd.
P.O. Box 1039
Pacifica, CA 94044
www.nccwd.com

North Coast County Water District
SINCE 1944

STAFF
ADRIANNE CARR, PH.D.
GENERAL MANAGER

SCOTT DALTON
ASSISTANT GENERAL MANAGER
– OPERATIONS

Phone (650) 355-3462
Fax (650 355-0735

January 26, 2021

Nicole Sandkulla
Chief Executive Officer
Bay Area Water Supply & Conservation Agency
155 Bovet Road, #650
San Mateo, CA 94402

Re: **Notice of Preparation of Urban Water Management Plan and Water Shortage Contingency Plan - 2020 Update**

Dear Ms. Sandkulla:

The Urban Water Management Planning Act (California Water Code §10608–10656) requires the North Coast County Water District (NCCWD) to update its Urban Water Management Plan (UWMP) and associated Water Shortage Contingency Plan (WSCP) every 5 years. NCCWD is currently reviewing its existing UWMP and associated WSCP, which were updated in 2016, and considering revisions to the documents. The updated UWMP and WSCP are due by July 1, 2021. We invite your agency's participation in this revision process.

A draft of the 2020 UWMP and WSCP will be made available for public review and a public hearing will be scheduled in the spring of 2021. In the meantime, if you would like more information regarding the District's 2015 UWMP and WSCP and the schedule for updating these documents, or if you would like to participate in the preparation of the 2020 UWMP and WSCP, please contact our office at:

North Coast County Water District
2400 Francisco Blvd.
Pacifica, CA 94044
Phone: (650) 355-3462
acarr@nccwd.com

Sincerely,

Adrianne Carr
General Manager

2400 Francisco Blvd.
P.O. Box 1039
Pacifica, CA 94044
www.nccwd.com

Phone (650) 355-3462
Fax (650 355-0735

May 19, 2021

Nicole Sandkulla
Chief Executive Officer
Bay Area Water Supply & Conservation Agency
155 Bovet Road, #650
San Mateo, CA 94402

Re: **Notice of Public Hearing Urban Water Management Plan and Water Shortage Contingency Plan - 2020 Update**

The Urban Water Management Planning Act (California Water Code §10608–10656) requires the North Coast County Water District (NCCWD) to update its Urban Water Management Plan (UWMP) and associated Water Shortage Contingency Plan (WSCP) every 5 years. NCCWD must also make the draft documents available for public review and hold a public hearing before adopting its UWMP and associated WSCP.

This is to notify you that NCCWD will hold a public hearing on June 16, 2021 at 7:00 p.m. by virtual meeting to consider proposed revisions and updates to the 2020 UWMP and associated WSCP. We invite your agency's participation in the process. In conjunction with the update to the UWMP, the public may also provide input on the urban water use target included in the UWMP, any impacts to the local economy, and NCCWD's method of determining its urban water use target.

The UWMP and associated WSCP will be made available for public review by June 1, 2021 at https://nccwd.com/. Visit https://nccwd.com/board-activities/regular-board-meeting-agendas.html for the Board of Directors meeting agenda and for links to the virtual public hearing. If you have any questions about the 2020 UWMP or WSCP or the process for updating these documents, please contact our office at:

North Coast County Water District
2400 Francisco Boulevard
Pacifica, CA 94044
(650) 355-3462
acarr@nccwd.com

Sincerely,

Adrianne Carr,
General Manager

APPENDIX C
UWMP PUBLIC NOTIFICATION NOTICES

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fied ad, go to services at pacificatribune.com. Deadline is Friday noon for the Wednesday publication.

County Clerk Henry Salgado Deputy Clerk Published in the Pacifica Tribune May 19, 26, June 2 & 9, 2021 No. 2835

PUBLIC NOTICE

FICTITIOUS BUSINESS NAME STATEMENT
File No. 287660
The following persons are doing business as: Likha Acupuncture and Wellness, 1009 Terra Nova Blvd., Pacifica, CA, 94044, 208 Avalon Dr.,Daly City, CA, 94015. Elaine Sta-Iglesia, 208 Avalon Dr.,Daly City, CA, 94015. The registrant(s) commenced to transact business under the fictitious business name(s) listed above on N/A. This business is conducted by an Individual. This statement was filed with Mark Church, County Clerk Recorder of San Mateo County on a date indicated by file stamp. ENDORSED FILED MAY 12, 2021 MARK CHURCH, County Clerk Maria P. Perez Deputy Clerk
Published in the Pacifica Tribune May 19, 26, June 2 & 9, 2021 No. 2845

PUBLIC NOTICE

FICTITIOUS BUSINESS NAME STATEMENT
File No. 287568
The following persons are doing business as: E's Handyman and Landscaping Services, 1700 El Camino Real #15-1,South San Francisco, CA, 94080. Eliseo Anguiano, 1700 El Camino Real #15-1,South San Francisco, CA, 94080. The registrant(s) commenced to transact business under the fictitious business name(s) listed above on N/A. This business is conducted by an Individual. This statement was filed with Mark Church, County Clerk Recorder of San Mateo County on a date indicated by file stamp. ENDORSED FILED MAY 03, 2021 MARK CHURCH, County Clerk Maria Gallardo Deputy Clerk Published in the Pacifica Tribune May 26, June 2, 9 & 16, 2021 No. 2875

PUBLIC NOTICE

-NORTH COAST COUNTY WATER DISTRICT
PUBLIC HEARING ON UPDATE OF URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN
California law requires North Coast County Water District review and update its Urban Water Management Plan (UWMP) every five years. Additionally, the California Department of Water Resources has imposed new requirements for urban water suppliers to adopt a Water Shortage Contingency Plan (WSCP). The Board of Directors will hold a public hearing to consider proposed revisions and updates to its UWMP for 2020-2025 and its WSCP on: June 16, 2021 at 7:00 P.M.
Online: www.zoom.us Webinar ID: 757 5423 6006 Passcode: 284238
By Phone: (646) 558 8656
North Coast County Water District's Draft 2020 UWMP and WSCP will be available for review at www.nccwd.com on June 1, 2021 or earlier.
If you have any questions about North Coast County Water District's UWMP or WSCP, please contact Adrianne Carr, General Manager at (650) 355-3462 or info@nccwd.com
Published in the Pacifica Tribune June 2 & 9, 2021. No.2908

PUBLIC NOTICE

CITY OF PACIFICA NOTICE OF HEARING NOTICE IS HEREBY GIVEN that due to the COVID-19 emergency and State and County Orders relating to COVID-19, the Planning Commission of the City of Pacifica will conduct a public hearing on Monday, June 21, 2021, at 7:00 p.m. as a teleconference meeting only (no physical meeting location). Anyone interested in observing the meeting or providing public comments should refer to the meeting agenda for further details. The City of Pacifica will publish the meeting agenda not less than 72 hours prior to the meeting. The agenda will be available online at https://pacificacityca.iqm2.com and will also be posted in the Planning Department window at 1800 Francisco Boulevard in Pacifica.
This meeting of the Planning Commission is an Essential Governmental Function and is necessary to consider the following essential items of business:
FILE NO. 2020-017 FOR COASTAL DEVELOPMENT PERMIT CDP-423-20, filed by Brian Brinkman on November 30, 2020, for construction of an 838 square-foot (sf) partial second story addition to an existing 1,568-sf, single-story, single-family residence on a 5,000 sf lot at 544 Dolphin Drive (APN 009-162-310) in Pacifica. The project is located in the Coastal Zone. Recommended California Environmental Quality Act (CEQA) status: Class 1 Categorical Exemption, CEQA Guidelines Section 15301; and
FILE NO. 2019-029 FOR TEMPORARY USE PERMIT TUP-2-19, submitted by Kathleen Manning of the Pacifica Historical Society, to allow continued installation of a temporary structure to enclose Ocean Shore Railroad Car No. 1409 and to perform restoration work on the railroad car on a portion of the Vallemar Center shopping center located at 2125 Coast Highway (APN 018-041-010) in Pacifica. Recommended CEQA status: Class 4 Categorical Exemption, CEQA Guidelines Section 15304 (Minor Alterations to Land).
Detailed plans and additional information for all items above are available upon request to the Planning Department. Submit requests for additional information to permittech@pacifica.gov. These items will also be posted 72 hours prior to the meeting on the City's website at: https://pacificacityca.iqm2.com/Citizens
The City of Pacifica will provide special assistance for persons with disabilities upon at least 24 hours advance notice to the City Manager's office (650) 738-7300. If you need sign language assistance or written material printed in a larger font or taped, advance notice is necessary.
Tina Wehrmeister Planning Director Assistant City Manager/ Published in the Pacifica Tribune on June 9, 2021. No. 2939

PUBLIC NOTICE

FICTITIOUS BUSINESS NAME STATEMENT
File No. 287826
The following persons are doing business as: Advection Media, 2281 Oakmont Drive,San Bruno, CA, 94066. Robert J. Keil, 2281 Oakmont Drive,San Bruno, CA, 94066. The registrant(s) commenced to transact business under the fictitious business name(s) listed above on April 18, 2021. This business is conducted by an Individual. This statement was filed with Mark Church, County Clerk Recorder of San Mateo County on a date indicated by file stamp. ENDORSED FILED MAY 27, 2021 MARK CHURCH, County Clerk Maria Gallardo Deputy Clerk Published in the Pacifica Tribune June 2, 9, 16 & 23, 2021 No. 2913

PUBLIC NOTICE

FICTITIOUS BUSINESS NAME STATEMENT
File No. 287799
The following persons are doing business as: Loyal Legacy Barber Studio, 100 N Hill Dr. Ste.37, Brisbane, CA, 94005. Ernest Dale Conway III, 2136 East 5th Street, Benicia, CA. 94510. The registrant(s) commenced to transact business under the fictitious business name(s) listed above on Jan. 1, 2021. This business is conducted by an Individual. This statement was filed with Mark Church, County Clerk Recorder of San Mateo County on a date indicated by file stamp. ENDORSED FILED MAY 26, 2021 MARK CHURCH, County Clerk Maria Gallardo Deputy Clerk. Pacifica Tribune June 9, 16, 23 & 30, 2021 No. 2928

PUBLIC NOTICE

FICTITIOUS BUSINESS NAME STATEMENT
File No. 287693
The following persons are doing business as: Sin Rival Wines, 282 Walnut St., San Bruno, CA, 94066. Ricardo Verdugo Gonzalez, 282 Walnut St., San Bruno, CA, 94066. The registrant(s) commenced to transact business under the fictitious business name(s) listed above on N/A. This business is conducted by an Individual. This statement was filed with Mark Church, County Clerk Recorder of San Mateo County on a date indicated by file stamp. ENDORSED FILED MAY 14, 2021 MARK CHURCH, County Clerk Maria P. Perez Deputy Clerk. Pacifica Tribune June 9, 16, 23 & 30, 2021 No. 2935

PUBLIC NOTICE

FICTITIOUS BUSINESS NAME STATEMENT
File No. 287878
The following persons are doing business as: Nick Johnson, Realtor, 1048 Everglades Dr., Pacifica, CA, 94044, PO Box 754,Pacifica, CA, 94044. Nicholas Johnson, 1048 Everglades Dr., Pacifica, CA. The registrant(s) commenced to transact business under the fictitious business name(s) listed above on 01/26/2011. This business is conducted by an Individual. This statement was filed with Mark Church, County Clerk Recorder of San Mateo County on a date indicated by file stamp. ENDORSED FILED JUN 02, 2021 MARK CHURCH, County Clerk Maria P. Perez Deputy Clerk. Pacifica Tribune June 9, 16, 23 & 30, 2021 No. 2936

PUBLIC NOTICE

FICTITIOUS BUSINESS NAME STATEMENT
File No. 287127 Previous File No.269650
The following persons are doing business as: G&M Auto Body, 482 E. San Bruno Ave, San Bruno, CA, 94066. GM RAM Inc, 482 E. San Bruno Ave, San Bruno, CA, 94066. The registrant(s) commenced to transact business under the fictitious business name(s) listed above on 10/15/1980. This business is conducted by a Corporation. This statement was filed with Mark Church, County Clerk Recorder of San Mateo County on a date indicated by file stamp. ENDORSED FILED Mar 26, 2021 MARK CHURCH, County Clerk Maria Gallardo Deputy Clerk. Pacifica Tribune. Original. Apr. 7, 14, 21 & 28, 2021 No. 2572
June 9, 16, 23 & 30, 2021. No. 2949

CROSSWORD SOLUTIONS

SUDOKU ANSWERS

PUBLIC NOTICE

-NORTH COAST COUNTY WATER DISTRICT
PUBLIC HEARING ON UPDATE OF URBAN WATER MANAGEMENT PLAN AND WATER SHORTAGE CONTINGENCY PLAN

California law requires North Coast County Water District review and update its Urban Water Management Plan (UWMP) every five years. Additionally, the California Department of Water Resources has imposed new requirements for urban water suppliers to adopt a Water Shortage Contingency Plan (WSCP). The Board of Directors will hold a public hearing to consider proposed revisions and updates to its UWMP for 2020-2025 and its WSCP on:

June 16, 2021 at 7:00 P.M.
Online: www.zoom.us Webinar ID: 757 5423 6006
Passcode: 284238
By Phone: (646) 558 8656

North Coast County Water District's Draft 2020 UWMP and WSCP will be available for review at www.nccwd.com on June 1, 2021 or earlier.

If you have any questions about North Coast County Water District's UWMP or WSCP, please contact Adrianne Carr, General Manager at (650) 355-3462 or info@nccwd.com

Published in the Pacifica Tribune June 2 & 9, 2021. No.2908

PUBLIC NOTICE

NOTICE OF ADOPTION OF ORDINANCE NO. 863-C.S.
OF THE CITY COUNCIL OF THE CITY OF PACIFICA

PLEASE TAKE NOTICE that on May 24, 2021, the City Council of the City of Pacifica adopted Ordinance No. 863-C.S. entitled:

"AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF PACIFICA TO AMEND SECTION 2-8.05 "CAMPAIGN FILING AND DISCLOSURE REQUIREMENTS" AND ADD SECTION 2-8.06 "ELECTRONIC FILING OF CAMPAIGN DISCLOSURE INFORMATION" WITHIN CHAPTER 8 OF TITLE 2 OF THE PACIFICA MUNICIPAL CODE REGARDING ELECTRONIC AND PAPER METHODS OF FILING CAMPAIGN FINANCE DISCLOSURE STATEMENTS"

FULL TEXT OF ORDINANCE:

WHEREAS, California Government Code Section 84615 provides that a legislative body of local government agency may adopt an ordinance that requires an elected officer, candidate, committee, or other person required to file cam-

"(a) Definitions. The following definitions apply for the purposes of this section:
"Candidate" shall mean a candidate, as that phrase is defined in Section 82007 of the Government Code, for any City elective office.
"Committee" has the meaning set forth in Section 82013 of the Government Code.
"Contribution" has the meaning set forth in Section 82015 of the Government Code.
"Duplicate" shall mean one of two or more identical things; a copy.
"Electronic Filing System" shall mean the electronic online filing and data storage system provided for by the City Clerk for campaign statements, reports, forms, or other documents filed pursuant to Government Code Section 84100 et seq.
"Independent expenditure" has the meaning set forth in Section 82031 of the Government Code.
"Person" has the meaning set forth in Section 82047 of the Government Code.
"Recall" shall mean a recall of an elective officer of the City made pursuant to Division 11 (commencing with Section 11000) of the Elections Code.
(b) Posting of campaign reports and statements on City website. All reports and statements required to be filed with the City Clerk by any candidate or committee under Title 9, Chapter 4, Articles 1 and 2 (commencing with Section 84100) of the Government Code shall be scanned and stored in an electronic format. The reports and statements shall be posted on the City's website no later than two (2) working days after filing. All campaign statements, reports, forms, or other documents filed with the City Clerk pursuant to Chapter 4, "Campaign Disclosures" (commencing with Section 84100) of Title 9 of the California Government Code, as may be subsequently amended, on the City's electronic filing system shall be made available to the public via the City's website as set forth in Section 2-8.06(e), as soon as possible after receipt but no later than two (2) working days after filing. Reports filed with the City Clerk in paper form will be posted as soon as possible after receipt but no later than two (2) working days after filing."

All other subsections of Section 2-8.05 shall remain unchanged.

Section 3. Added. Section 2-8.06 within Chapter 8, "General and Special Municipal Elections" of Title 2, "Administration" of the Pacifica Municipal Code is hereby added to read in its entirety (deletions shown in strikethrough and additions shown in underline) as follows:

"Sec. 2-8.06 Electronic Filing of

tronic Filing System. If, for tec nical reasons, the City's electron filing system is inoperable for a p riod of time or cannot accept a pa ticular type of campaign statemer report, form or other document, elected officer, candidate, comm tee or other person shall timely f that document in paper form w the City Clerk, unless otherwise rected by the City Clerk.
(d) Posting of Data. The City Cl shall ensure that the City's electro ic filing system makes all electro cally-filed campaign statements, ports, forms, or other docume available in a format that provi the greatest public access. data shall be made available f of charge. The data made availa on the City's electronic filing s tem shall be redacted to ensure t street name of the persons or e ty representatives listed on the el tronically filed forms or any b account number required are disclosed.
(e) Administrative Policies Procedures. The City Clerk is thorized to adopt such admi trative policies and procedures deemed necessary to implem this Chapter."
Section 3. Severability. If any tion, subsection, sentence, cl or phase of this Ordinance is any reason held to be invalid, s decision shall not affect the va ty of the remaining portions of Ordinance. The City Council h by declares that it should have opted the Ordinance and each tion, subsection, sentence, cl or phrase thereof, irrespectiv the fact that any one or more tions, subsections, sentence, cl es or phrases be declared unco tutional.
Section 4. Publication. The Clerk is hereby ordered and di ed to certify to the passage of Ordinance by the City Counc the City of Pacifica, California, cause the same to be publishe accordance with State law.
Section 5. Compliance with CE The City Council hereby finds the action to adopt this Ordin is exempt from the provis of the California Environm Quality Act (CEQA) under Se 15061(b)(3) of the CEQA G lines because it can be seen certainty that there is no pos ity the adoption of this Ordin may have a significant effect o environment.
Section 6. Effective Date. This dinance shall be in full force effective thirty (30) days aft adoption and shall be publi and posted as required by law.
PASSED AND ADOPTED 24th day of May, 2021 by the lowing vote:
AYES, Councilmembers:

APPENDIX D
SBX7-7 VERIFICATION FORM

SB X7-7 Table 0: Units of Measure Used in UWMP* *(select one from the drop down list)*
Million Gallons
**The unit of measure must be consistent with Submittal Table 2-3*
NOTES:

SB X7-7 Table-1: Baseline Period Ranges			
Baseline	**Parameter**	**Value**	**Units**
10- to 15-year baseline period	2008 total water deliveries	1,055	Million Gallons
	2008 total volume of delivered recycled water	-	Million Gallons
	2008 recycled water as a percent of total deliveries	0%	**See Note 1**
	Number of years in baseline period[1, 2]	10	Years
	Year beginning baseline period range	1996	
	Year ending baseline period range[3]	2005	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2003	
	Year ending baseline period range[4]	2007	

[1] If the 2008 recycled water delivery is less than 10 percent of total water deliveries, then the 10-15year baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater of total deliveries, the 10-15 year baseline period is a continuous 10- to 15-year period.

[2] The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.

[3] The ending year for the 10-15 year baseline period must be between December 31, 2004 and December 31, 2010.

[4] The ending year for the 5 year baseline period must be between December 31, 2007 and December 31, 2010.

NOTES:

SB X7-7 Table 2: Method for Population Estimates	
Method Used to Determine 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: Service Area Population		
Year		Population
10 to 15 Year Baseline Population		
Year 1	1996	37,640
Year 2	1997	37,873
Year 3	1998	38,097
Year 4	1999	38,183
Year 5	2000	38,392
Year 6	2001	38,309
Year 7	2002	37,903
Year 8	2003	37,513
Year 9	2004	37,215
Year 10	2005	36,887
Year 11		
Year 12		
Year 13		
Year 14		
Year 15		
5 Year Baseline Population		
Year 1	2003	37,513
Year 2	2004	37,215
Year 3	2005	36,887
Year 4	2006	36,691
Year 5	2007	36,702
NOTES:		

SB X7-7 Table 4: Annual Gross Water Use *								
			Deductions					Million Gallons
Baseline Year *Fm SB X7-7 Table 3*		**Volume Into Distribution System** *This column will remain blank until SB X7-7 Table 4-A is completed.*	**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.*	**Annual Gross Water Use**
10 to 15 Year Baseline - Gross Water Use								
Year 1	1996	1,185			-		-	1,185
Year 2	1997	1,205			-		-	1,205
Year 3	1998	1,185			-		-	1,185
Year 4	1999	1,233			-		-	1,233
Year 5	2000	1,202			-		-	1,202
Year 6	2001	1,279			-		-	1,279
Year 7	2002	1,279			-		-	1,279
Year 8	2003	1,270			-		-	1,270
Year 9	2004	1,305			-		-	1,305
Year 10	2005	1,201			-		-	1,201
Year 11	0	-			-		-	-
Year 12	0	-			-		-	-
Year 13	0	-			-		-	-
Year 14	0	-			-		-	-
Year 15	0	-			-		-	-
10 - 15 year baseline average gross water use								**1,234**
5 Year Baseline - Gross Water Use								
Year 1	2003	1,270			-		-	1,270
Year 2	2004	1,305			-		-	1,305
Year 3	2005	1,201			-		-	1,201
Year 4	2006	1,187			-		-	1,187
Year 5	2007	1,116			-		-	1,116
5 year baseline average gross water use								**1,216**

*** Units of measure** (AF, MG , or CCF) must remain consistent throughout the UWMP, as reported in Table 2-3.

NOTES:

SB X7-7 Table 5: Baseline Gallons Per Capita Per Day (GPCD)				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Annual Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	1996	37,640	1,185	86
Year 2	1997	37,873	1,205	87
Year 3	1998	38,097	1,185	85
Year 4	1999	38,183	1,233	88
Year 5	2000	38,392	1,202	86
Year 6	2001	38,309	1,279	91
Year 7	2002	37,903	1,279	92
Year 8	2003	37,513	1,270	93
Year 9	2004	37,215	1,305	96
Year 10	2005	36,887	1,201	89
Year 11	0	-	-	
Year 12	0	-	-	
Year 13	0	-	-	
Year 14	0	-	-	
Year 15	0	-	-	
10-15 Year Average Baseline GPCD				**89**
5 Year Baseline GPCD				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use
Year 1	2003	37,513	1,270	93
Year 2	2004	37,215	1,305	96
Year 3	2005	36,887	1,201	89
Year 4	2006	36,691	1,187	89
Year 5	2007	36,702	1,116	83
5 Year Average Baseline GPCD				**90**
NOTES:				

SB X7-7 Table 6: Baseline GPCD *From Table SB X7-7 Table 5*	*Summary*
10-15 Year Baseline GPCD	89
5 Year Baseline GPCD	90
NOTES:	

SB X7-7 Table 7: 2020 Target Method *Select Only One*		
Target Method		**Supporting Tables**
☐	Method 1	SB X7-7 Table 7A
☐	Method 2	SB X7-7 Tables 7B, 7C, and 7D
☑	Method 3	SB X7-7 Table 7-E
☐	Method 4	Method 4 Calculator *Located in the WUE Data Portal at wuedata.water.ca.gov* Resources *button*
NOTES:		

SB X7-7 Table 7-E: Target Method 3				
Agency May Select More Than One as Applicable	Percentage of Service Area in This Hydrological Region	Hydrologic Region	"2020 Plan" Regional Targets	Method 3 Regional Targets (95%)
☐		North Coast	137	130
☐		North Lahontan	173	164
☐		Sacramento River	176	167
☑	100%	San Francisco Bay	131	124
☐		San Joaquin River	174	165
☐		Central Coast	123	117
☐		Tulare Lake	188	179
☐		South Lahontan	170	162
☐		South Coast	149	142
☐		Colorado River	211	200
			2020 Target *(If more than one region is selected, this value is calculated.)*	**124**
NOTES:				

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target					
5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target[1]	**Calculated 2020 Target [2]**			**Confirmed 2020 Target[4]**
		As calculated by supplier in this SB X7-7 Verification Form	**Special Situations[3]**		
			Prorated 2020 Target	Population Weighted Average 2020 Target	
90	N/A	124			**124**

[1] ***Maximum 2020 Target*** *is 95% of the 5 Year Baseline GPCD except for suppliers at or below 100 GPCD.*

[2] ***Calculated 2020 Target*** *is the target calculated by the Supplier based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target. Supplier may only enter one calculated target.*

[3] ***Prorated targets and population weighted target*** *are allowed for special situations only. These situations are described in Appendix P, Section P.3*

[4] ***Confirmed Target*** *is the lesser of the Calculated 2020 Target (C5, D5, or E5) or the Maximum 2020 Target (Cell B5)*

NOTES:

APPENDIX E
SBX7-7 COMPLIANCE TABLES

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	38,331
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.*	
	914			-		-	**914**

*** 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 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**
914	38,331	**65**
NOTES:		

SB X7-7 Table 9: 2020 Compliance							
Actual 2020 GPCD[1]	Optional Adjustments to 2020 GPCD Enter "0" if Adjustment Not Used Extraordinary Events[1]	Weather Normalization[1]	Economic Adjustment[1]	TOTAL Adjustments[1]	Adjusted 2020 GPCD [1] *(Adjusted if applicable)*	2020 Confirmed Target GPCD [1, 2]	**Did Supplier Achieve Targeted Reduction for 2020?**
65	-	-	-	-	65	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 F
SFPUC AND BAWSCA COMMON LANGUAGE FOR 2020 UWMPS

February 3, 2021

Draft Common Language for BAWSCA Member Agencies' 2020 UWMPs

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 Regional Water System (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.

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% during droughts. If Retail Customer demands are lower than the Retail Customer allocation (resulting in a "positive allocation" to Retail[1]) 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% 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

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

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.

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 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.

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.

Individual Supply Guarantee

San Francisco has a perpetual commitment (Supply Assurance) to deliver 184 mgd to the 24 permanent Wholesale Customers collectively. San Jose and Santa Clara are not included in the Supply Assurance commitment and each has temporary and interruptible water supply

contracts with San Francisco. The Supply Assurance is allocated among the 24 permanent Wholesale Customers through Individual Supply Guarantees (ISG), which represent each Wholesale Customer's allocation of the 184 mgd Supply Assurance.

[Name of Agency's] ISG is _____ mgd.

2028 SFPUC Decisions (formerly 2018 SFPUC Decisions)
[Note: This section is intended to be optional language that individual BAWSCA member agencies may use.]

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.

Reliability of the Regional Water System

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.

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Factors Impacting Supply Reliability

Adoption of the 2018 Bay-Delta Plan Amendment

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"[2] 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 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 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

[2] "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." (Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Dec. 12, 2018) p.17, fn. 14, available at https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf.)

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 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.[3]

Water Supply – All Year Types

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

[3] California Natural Resources Agency, "Voluntary Agreements to Improve Habitat and Flow in the Delta and its Watersheds," available at https://files.resources.ca.gov/voluntary-agreements/.

- 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 WSIP retains this mix of water supply for all year types.

WSIP Dry Year 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 percent system-wide rationing in any one year. 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 (GSR) Project is a strategic partnership between SFPUC and three San Mateo County agencies – the California Water Service Company (serving South San Francisco and Colma), 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, 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 Planning Program

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 Alternative Water Supply Planning Program. 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 Level of Service 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 Alternative Water Supply Planning Program 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[4], which was a potential project identified in the 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 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 acre-feet per year. 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.

[4] 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.

- **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 10-20 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, 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. 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 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.

Projected SFPUC Regional Water System Supply Reliability

The SFPUC will provide tables presenting the projected RWS supply reliability under normal, single dry year, and multiple dry year scenarios.

Climate Change

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.
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),

Vulnerability Areas	General Overview of Vulnerabilities
	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.

Common Language for BAWSCA Member Agencies'

2020 UWMP Updates

BAWSCA

Description of BAWSCA

BAWSCA provides regional water reliability planning and conservation programming for the benefit of its 26 member agencies that purchase wholesale water supplies from the San Francisco Public Utilities Commission (SFPUC). Collectively, the BAWSCA member agencies deliver water to over 1.8 million residents and nearly 40,000 commercial, industrial and institutional accounts in Alameda, San Mateo and Santa Clara Counties.

BAWSCA also represents the collective interests of these wholesale water customers on all significant technical, financial, and policy matters related to the operation and improvement of the SFPUC's Regional Water System (RWS).

BAWSCA's role in the development of the 2020 Urban Water Management Plan (UWMP) updates is to work with its member agencies and the SFPUC to seek consistency among UWMP documents.

Regional Water Demand and Conservation Projections

In June 2020, BAWSCA completed the Regional Water Demand and Conservation Projections Report (Demand Study).[1] The goal of the Demand Study was to develop transparent, defensible, and uniform demand and conservation savings projections for each Wholesale Customer using a common methodology to support both regional and individual agency planning efforts and compliance with the new statewide water efficiency targets required by Assembly Bill (AB) 1668 and Senate Bill (SB) 606.

Through the Demand Study process, BAWSCA and the Wholesale Customers (1) quantified the total average-year water demand for each BAWSCA member agency through 2045, (2) quantified passive and active conservation water savings potential for each individual Wholesale Customer through 2045, and (3) identified 24 conservation programs with high water savings potential and/or member agency interest. Implementation of these conservation measures, along with passive conservation, is anticipated to yield an additional 37.3 MGD of water savings by 2045. Based on the revised water demand projections, the identified water conservation savings, increased development and use of other local supplies by the Wholesale Customers, and other actions, the collective purchases of the BAWSCA member agencies from the SFPUC are projected to stay below 184 MGD through 2045.

As part of the Demand Study, each Wholesale Customer was provided with a demand model that can be used to support ongoing demand and conservation planning efforts, including UWMP preparation.

[1] Phase III Final Report: http://bawsca.org/uploads/pdf/BAWSCA_Regional_Water_Demand_and_Conservation%20Projections%20Report_Final.pdf

Long-Term Reliable 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[2] (BARR), 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 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.

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

Making Conservation a Way of Life Strategic Plan

Following the 2014-2016 drought, the State of California (State) developed the "Making Water Conservation a California Way of Life" framework to address the long-term water use efficiency requirements called for in executive orders issued by Governor Brown. In May of 2018, AB 1668 and SB 606 (collectively referred to as the efficiency legislation) went into effect, which built upon the executive orders implementing new urban water use objectives for urban retail water suppliers.

BAWSCA led its member agencies in a multi-year effort to develop and implement a strategy to meet these new legislative requirements. BAWSCA's Making Conservation a Way of Life Strategic Plan (Strategic Plan) provided a detailed roadmap for member agencies to improve water efficiency. BAWSCA implementing the following elements of the Strategic Plan:

- Conducted an assessment of the agencies' current practices and water industry best practices for three components of the efficiency legislation that, based on a preliminary review, present the greatest level of uncertainty and potential risk to the BAWSCA agencies. The three components were:
    1. Development of outdoor water use budgets in a manner that incorporates landscape area, local climate, and new satellite imagery data.
    2. Commercial, Industrial, and Institutional water use performance measures.
    3. Water loss requirements.
- Organized an Advanced Metering Infrastructure symposium to enable information exchange, including case studies, implementation strategies, and data analysis techniques.
- Initiated a regional CII audit pilot program, which BAWSCA aims to complete in 2021.[3]
- Implemented a regional program for water loss control to help BAWSCA agencies comply with regulatory requirements and implement cost-effective water loss interventions.
- Engaged with the SFPUC to audit meter testing and calibration practices for SFPUC's meters at BAWSCA agency turnouts.

Finally, BAWSCA's Demand Study developed water demand and conservation projections through 2045 for each BAWSCA agency. These projects are designed to provide valuable insights on long-term water demand patterns and conservation savings potential to support regional efforts, such as implementation of BAWSCA's Long-Term Reliable Water Supply Strategy.

[3] Efforts on the CII audit pilot program stalled in March 2020 due to the COVID 19 pandemic and related shelter-in-place orders.

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 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.

SFPUC's Efforts to Develop 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 AWSS efforts.

BAWSCA Conservation Programs

BAWSCA manages a Regional Water Conservation Program comprised of several programs and initiatives that support and augment member agencies' and customers' efforts to use water more efficiently. These efforts extend limited water supplies that are available to meet both current and future water needs; increase drought reliability of the existing water system; and save money for both the member agencies and their customers.

The implementation of the Regional Water Conservation Program builds upon both the Water Conservation Implementation Plan (WCIP, completed in September 2009) and the Regional Demand and Conservation Projections Project (Demand Study, completed in June of 2020). These efforts include both Core Programs (implemented regionally throughout the BAWSCA service area) and Subscription Programs (funded by individual member agencies that elect to participate and implement them within their respective service areas).

BAWSCA's Core Conservation Programs include organizing classes open to the public on topics such as water efficient landscape education and water-wise gardening, assistance related to automated metering infrastructure, and other associated programs that work to promote smart water use and practices. BAWSCA's Subscription Programs include numerous rebate programs, educational programs that can be offered to area schools, technical assistance to member agencies in evaluating water loss, and programs to train and certify contractors employed to install water efficient landscape. In total, BAWSCA offers 22 programs to its member agencies and that number continues to grow over time.

Each fiscal year, BAWSCA prepares an Annual Water Conservation Report that documents how all of BAWSCA's 26 member agencies have benefitted from the Core Conservation Programs. Additionally, the report highlights how all 26 member agencies participate in one or more of the Subscription Programs offered by BAWSCA, such as rebates, water loss management and large landscape audits. The Demand Study indicates that through a combination of active and passive conservation, 37.3 MGD will be conserved by BAWSCA's member agencies by 2045.
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7. Additional language requested by the Member Agencies

SFPUC's Decision to use With Bay-Delta Plan Scenario in UWMP Submittal Tables

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.

Bay-Delta Plan Implementation Starting Year

Because of the uncertainty surrounding implementation of the Bay-Delta Plan Amendment, the water service reliability assessment presented in the SFPUC's draft UWMP looks at two future supply scenarios, both with and without implementation of the Bay-Delta Plan Amendment. Although the SWRCB has stated it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, given the current level of uncertainty, it is assumed for the purposes of the SFPUC's draft UWMP that the Bay-Delta Plan Amendment will be fully implemented starting in 2023.

SFPUC's Decision to Present Both Modeling Results in its UWMP

A key input for the HHLSM model is the anticipated level of demand on the RWS. Supply modeling results presented in the text of the SFPUC's UWMP reflect an input of projected demands on the RWS consisting of (1) projected retail demands on the RWS (total retail demands minus local groundwater and recycled water supplies), and (2) projected Wholesale Customer purchases. The SFPUC has 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, the SFPUC has also conducted modeling based on a demand of 265 mgd in order to facilitate planning that supports meeting this Level of Service goal and their contractual obligations.

APPENDIX G
SFPUC REGIONAL WATER SYSTEM SUPPLY RELIABILITY AND BAWSCA TIER 2 DROUGHT IMPLEMENTATION SCENARIOS

- Memorandum on Updated Drought Cutbacks, dated 18 February 2021 with Attachment B, dated 8 April 2021
- UWMP 2020 Additional Modeling, dated 30 March 2021
- Updated Drought Allocations, dated 1 April 2021
- Memorandum on Regional Water System Supply Reliability and UWMP 2020, dated 2 June 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

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

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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
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: <u>With</u> 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**

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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:

- 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
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**

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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TO: SFPUC Wholesale Customers

FROM: Steven R. Ritchie, Assistant General Manager, Water

DATE: June 2, 2021

RE: Regional Water System Supply Reliability and UWMP 2020

This memo is in response to various comments from Wholesale Customers we have received regarding the reliability of the Regional Water System supply and San Francisco's 2020 Urban Water Management Plan (UWMP).

As you are all aware, the UWMP makes clear the potential effect of the amendments to the Bay-Delta Water Quality Control Plan adopted by the State Water Resources Control Board on December 12, 2018 should it be implemented. Regional Water System-wide water supply shortages of 40-50% could occur until alternative water supplies are developed to replace those shortfalls. Those shortages could increase dramatically if the State Water Board's proposed Water Quality Certification of the Don Pedro Federal Energy Regulatory Commission (FERC) relicensing were implemented.

We are pursuing several courses of action to remedy this situation as detailed below.

Pursuing a Tuolumne River Voluntary Agreement

The State Water Board included in its action of December 12, 2018 a provision allowing for the development of Voluntary Agreements as an alternative to the adopted Plan. Together with the Modesto and Turlock Irrigation Districts, we have been actively pursuing a Tuolumne River Voluntary Agreement (TRVA) since January 2017. We believe the TRVA is a superior approach to producing benefits for fish with a much more modest effect on our water supply. Unfortunately, it has been a challenge to work with the State on this, but we continue to persist, and of course we are still interested in early implementation of the TRVA.

Evaluating our Drought Planning Scenario in light of climate change

Ever since the drought of 1987-92, we have been using a Drought Planning Scenario with a duration of 8.5 years as a stress test of our Regional Water System supplies. Some stakeholders have criticized this methodology as being too conservative. This fall we anticipate our Commission convening a workshop

regarding our use of the 8.5-year Drought Planning Scenario, particularly in light of climate change resilience assessment work that we have funded through the Water Research Foundation. We look forward to a valuable discussion with our various stakeholders and the Commission.

Pursuing Alternative Water Supplies

The SFPUC continues to aggressively pursue Alternative Water Supplies to address whatever shortfall may ultimately occur pending the outcome of negotiation and/or litigation. The most extreme degree of Regional Water System supply shortfall is modeled to be 93 million gallons per day under implementation of the Bay-Delta Plan amendments. We are actively pursuing more than a dozen projects, including recycled water for irrigation, purified water for potable use, increased reservoir storage and conveyance, brackish water desalination, and partnerships with other agencies, particularly the Turlock and Modesto Irrigation Districts. Our goal is to have a suite of alternative water supply projects ready for CEQA review by July 1, 2023.

In litigation with the State over the Bay-Delta Plan Amendments

On January 10, 2019, we joined in litigation against the State over the adoption of the Bay-Delta Water Quality Control Plan Amendments on substantive and procedural grounds. The lawsuit was necessary because there is a statute of limitations on CEQA cases of 30 days, and we needed to preserve our legal options in the event that we are unsuccessful in reaching a voluntary agreement for the Tuolumne River. Even then, potential settlement of this litigation is a possibility in the future.

In litigation with the State over the proposed Don Pedro FERC Water Quality Certification

The State Water Board staff raised the stakes on these matters by issuing a Water Quality Certification for the Don Pedro FERC relicensing on January 15, 2021 that goes well beyond the Bay-Delta Plan amendments. The potential impact of the conditions included in the Certification appear to virtually double the water supply impact on our Regional Water System of the Bay-Delta Plan amendments. We requested that the State Water Board reconsider the Certification, including conducting hearings on it, but the State Water Board took no action. As a result, we were left with no choice but to once again file suit against the State. Again, the Certification includes a clause that it could be replaced by a Voluntary Agreement, but that is far from a certainty.

I hope this makes it clear that we are actively pursuing all options to resolve this difficult situation. We remain committed to creating benefits for the Tuolumne River while meeting our Water Supply Level of Service Goals and Objectives for our retail and wholesale customers.

cc.: SFPUC Commissioners
Nicole Sandkulla, CEO/General Manager, BAWSCA

APPENDIX H
26 MARCH 2021 SFPUC COMMISSION SPECIAL MEETING – WATER WORKSHOP NUMBER 3 WATER SUPPLY PLANNING SCENARIOS SFPUC STAFF PRESENTATION MATERIALS

Hetch Hetchy Regional Water System

Operated by the San Francisco Public Utilities Commission

Water Workshop Number 3
Water Supply Planning Scenarios

March 26, 2021

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.

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

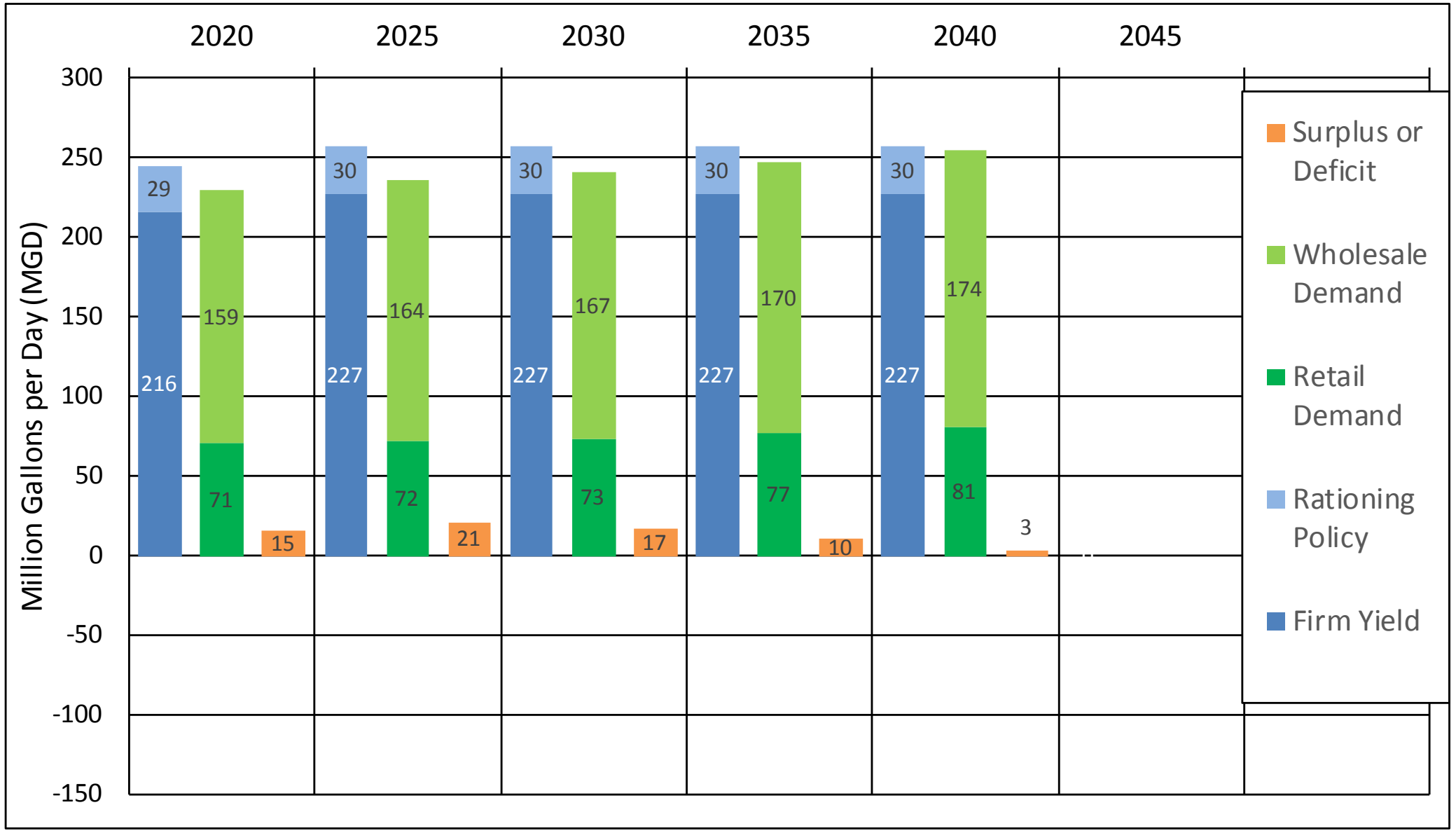
I. Prior Demand Estimates

- 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

I. Prior Demand Estimates



II. Current Conditions

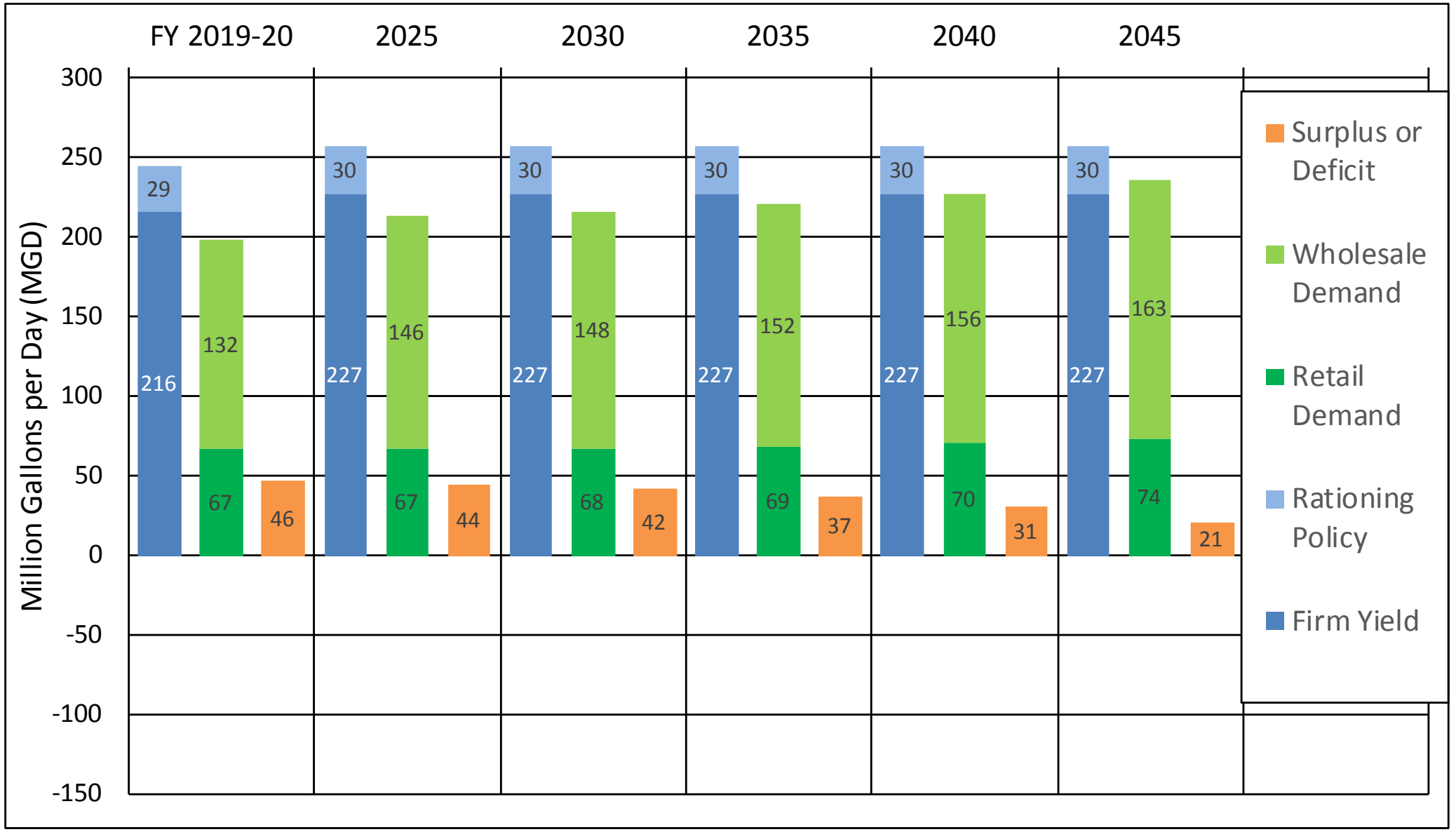
- Includes updated demand projections for anticipated development in retail service area*
- Includes most recent purchase projections from wholesale customers*
- Includes a total of 9 MGD for San Jose and Santa Clara*
- Includes the 1995 side agreement on flows in the lower Tuolumne River
- Yield values 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

II. Current Conditions



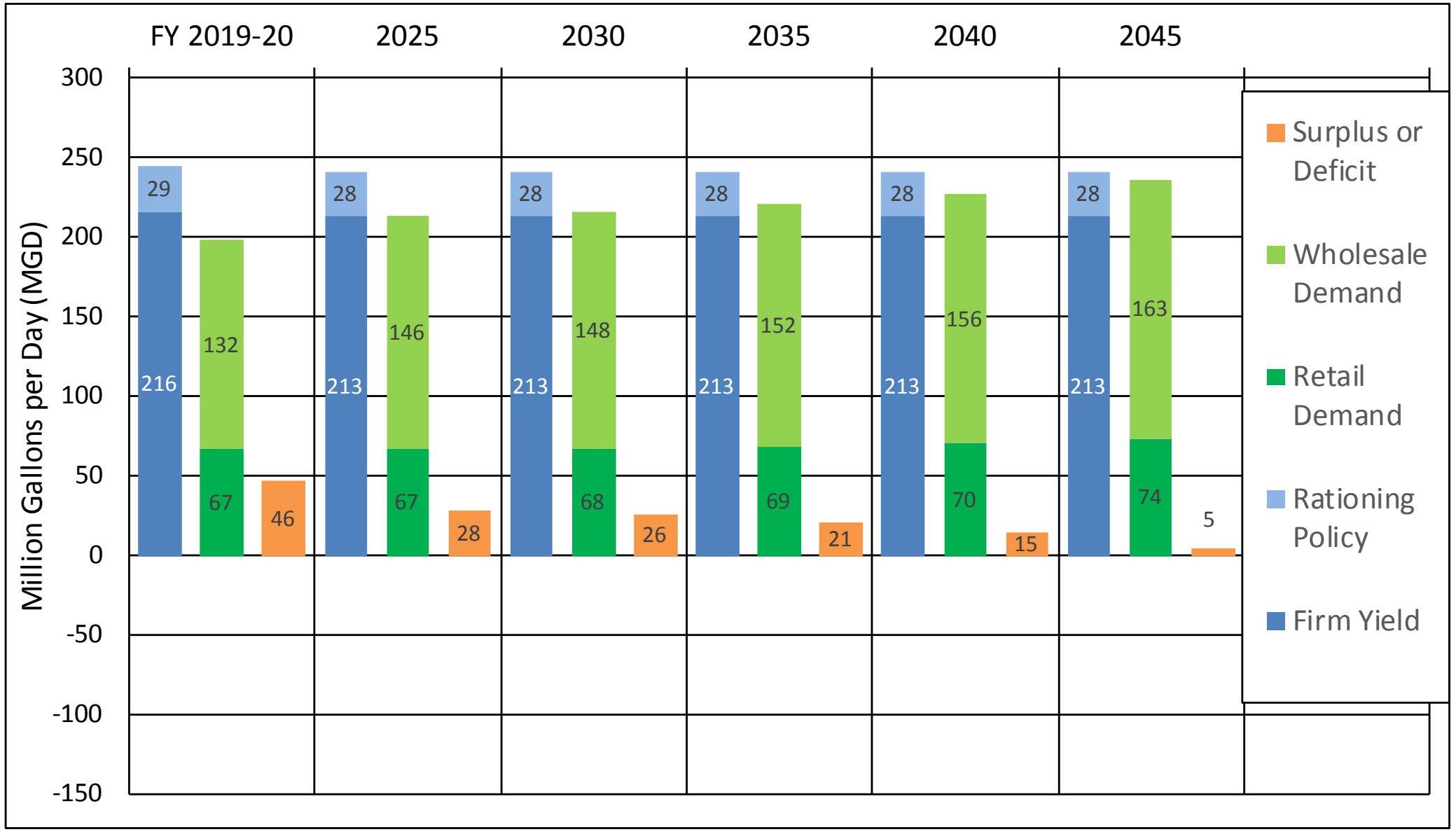
III. Tuolumne River Voluntary Agreement

- 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

III. Tuolumne River Voluntary Agreement



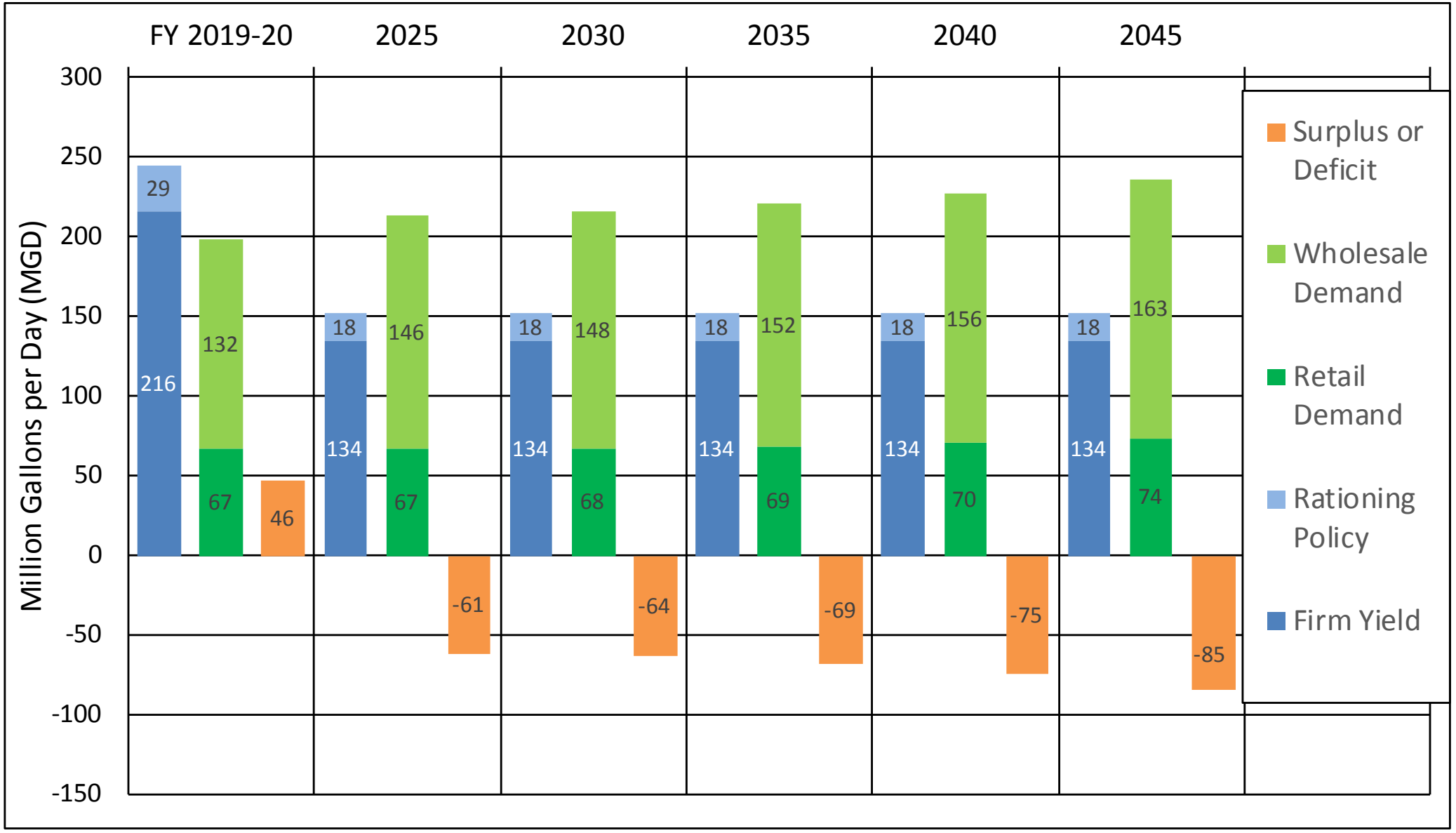
IV. Bay-Delta Plan

- 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

IV. Bay-Delta Plan



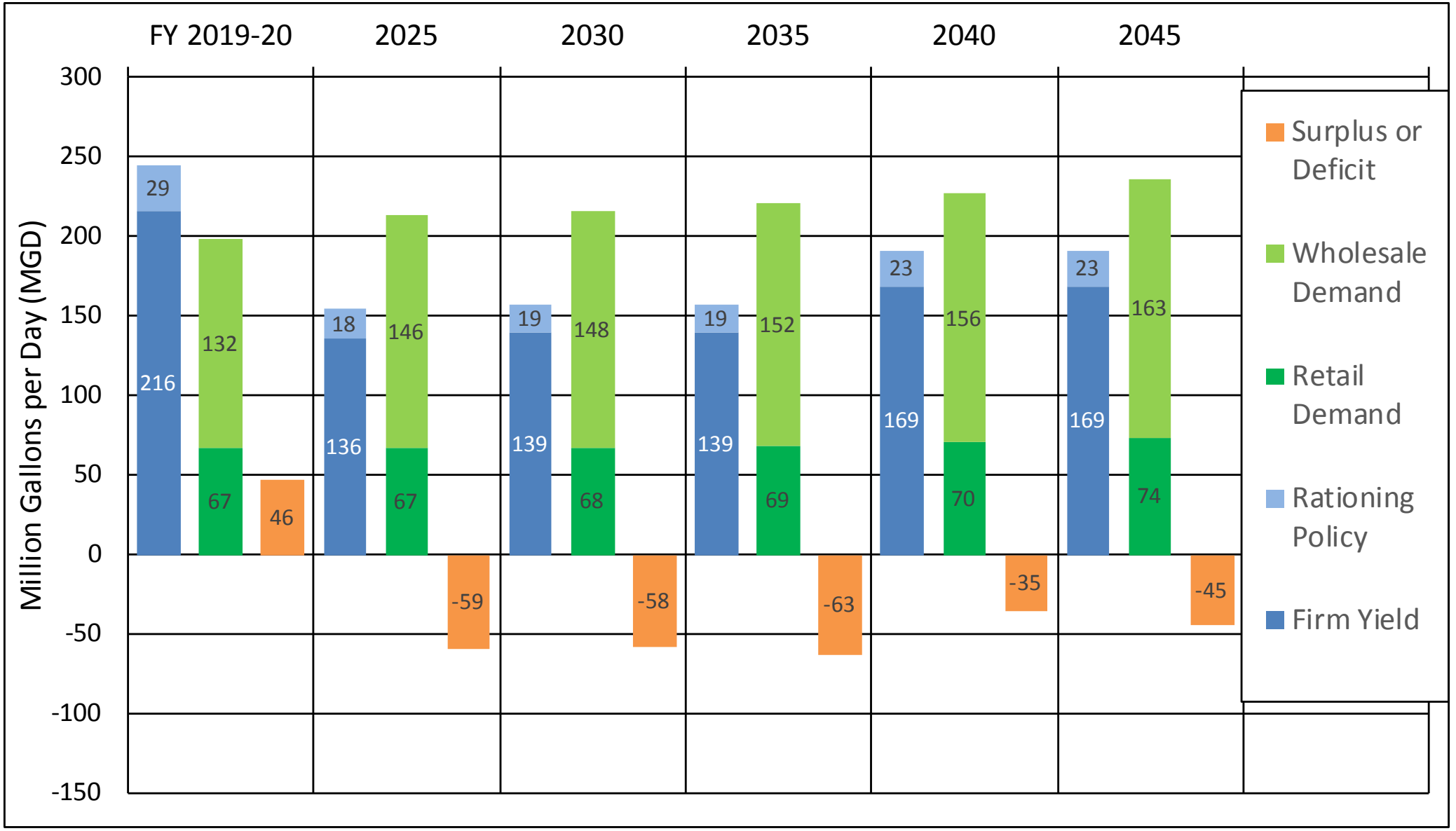
V. Bay-Delta Plan with Alternative Water Supply Projects

- 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

V. Bay-Delta Plan with Alternative Water Supply Projects



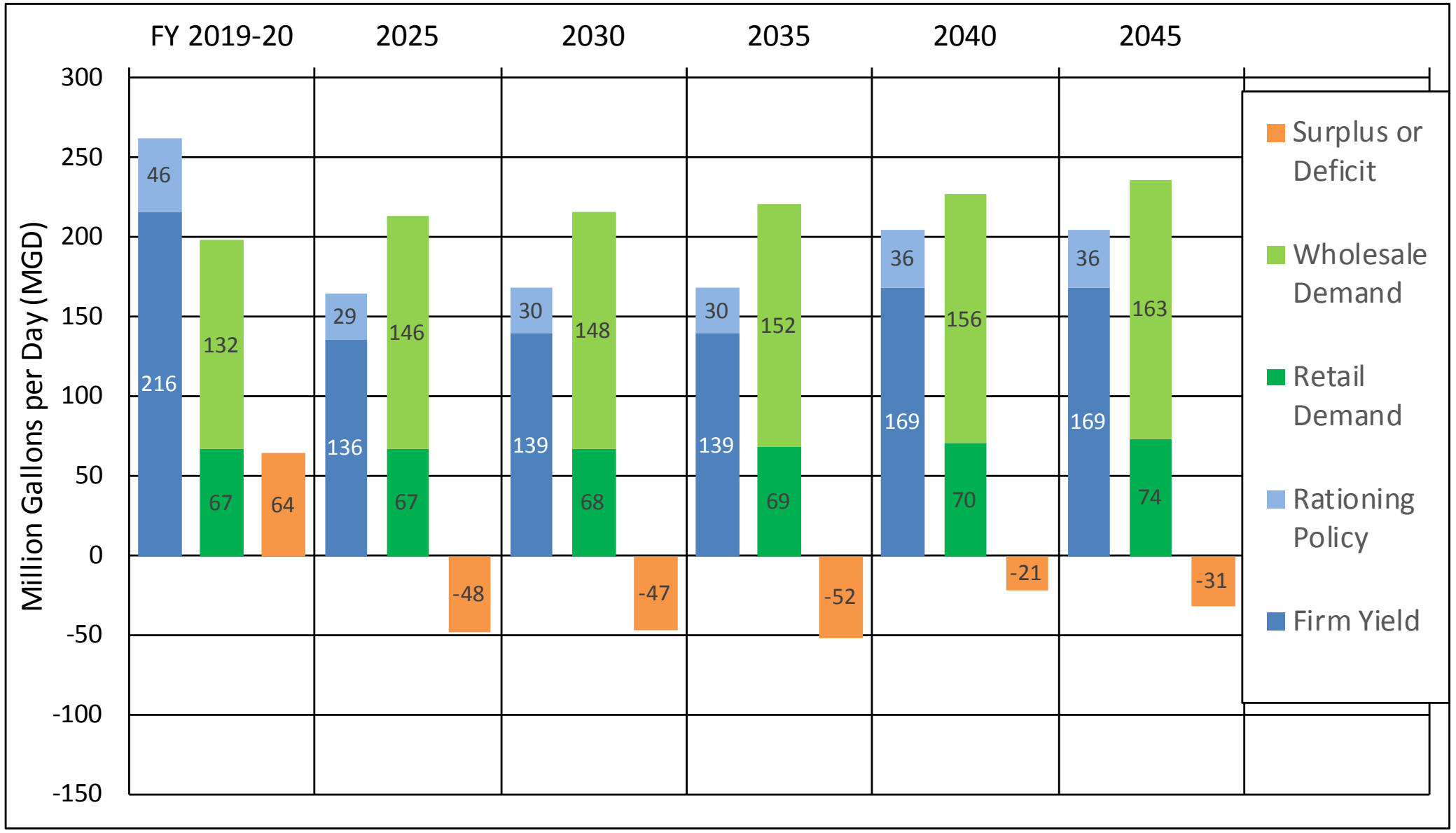
VI. Bay-Delta Plan with Alternative Water Supply Projects and Modified Rationing Policy

- 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

VI. Bay-Delta Plan with Alternative Water Supply Projects and Modified Rationing Policy



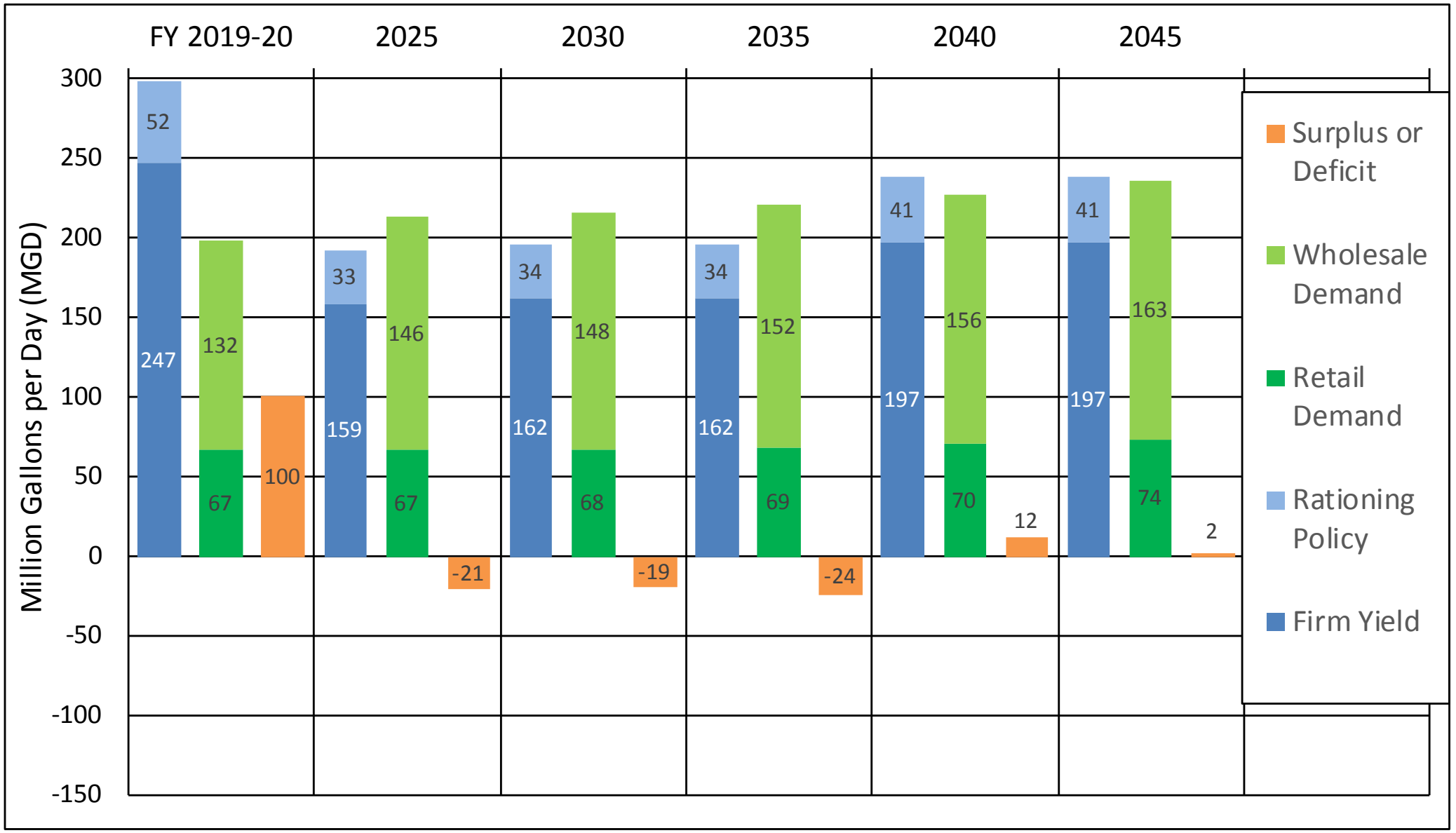
VII. Bay-Delta Plan with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought

- 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

VII. Bay-Delta Plan with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought



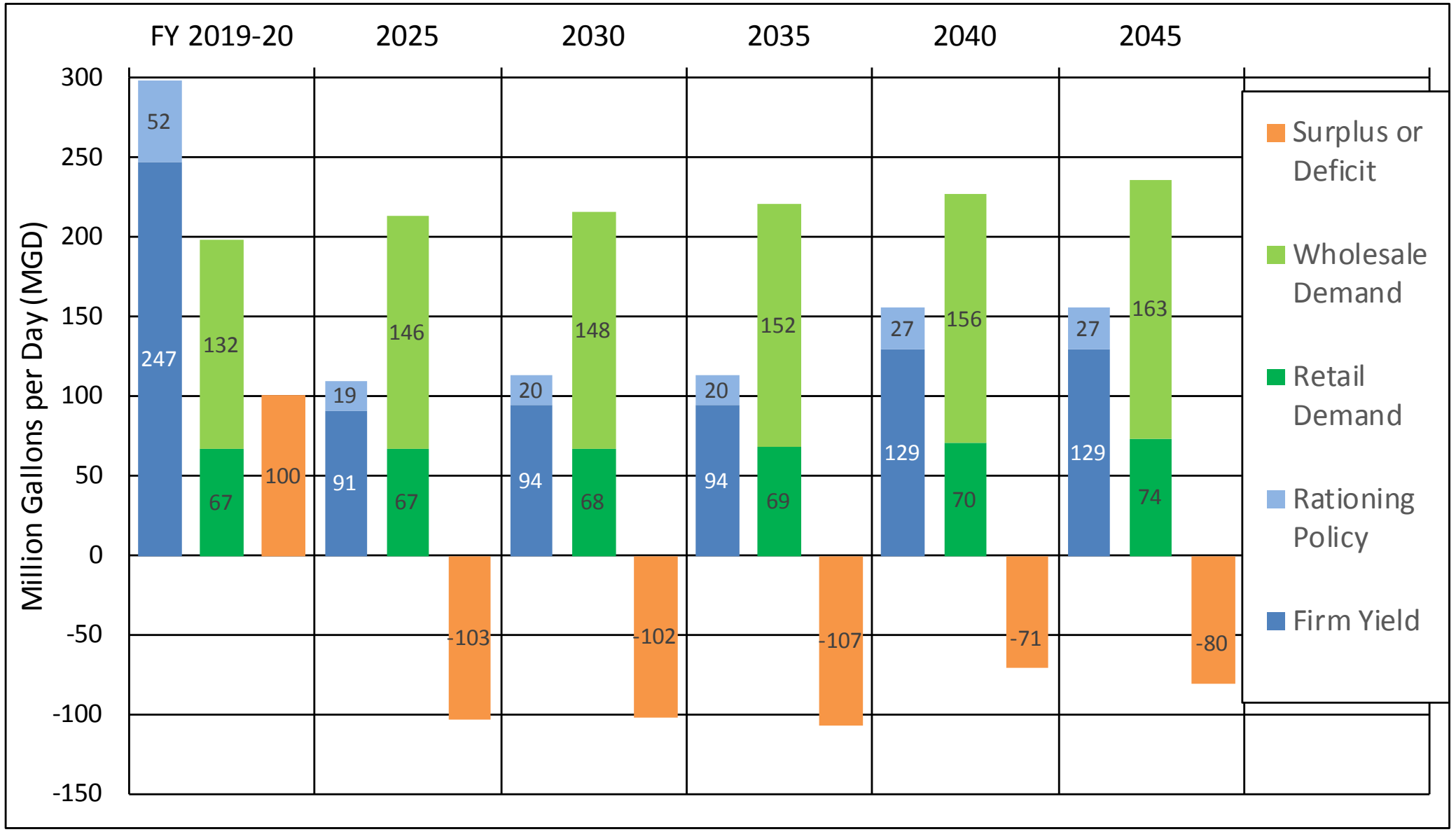
VIII. Water Quality Certification (401) with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought

- 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

VIII. Water Quality Certification (401) with Alternative Water Supply Projects, Modified Rationing Policy and Modified Design Drought



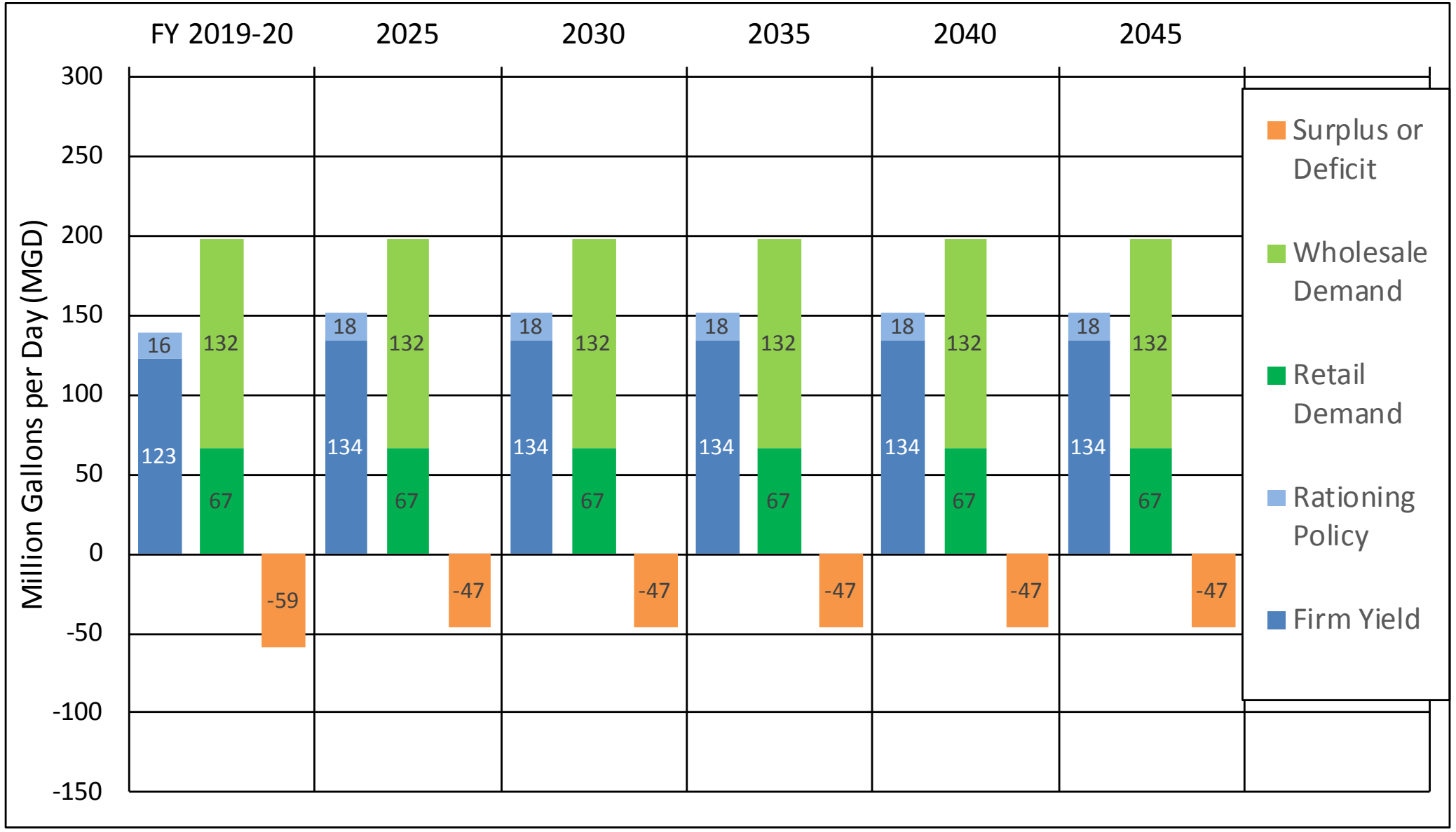
IX. NGO scenario 1: Current system, 198 mgd constant demand, Bay-Delta Plan flows

- 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

IX. NGO scenario 1: Current system, 198 mgd constant demand, Bay-Delta Plan flows



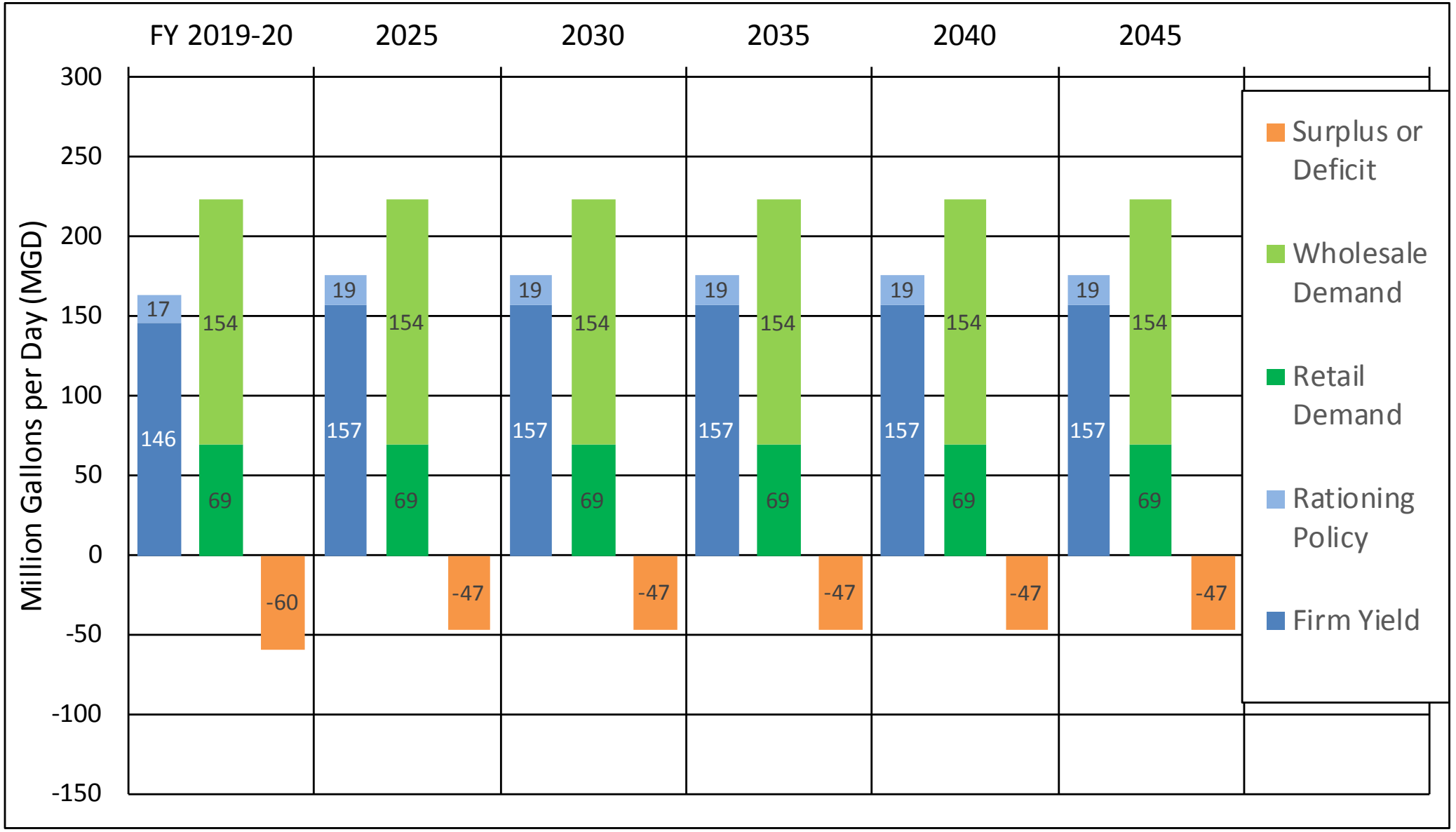
X. NGO scenario 2: Current system, 223 mgd constant demand, 7½ year design drought, Bay-Delta Plan flows

- 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

X. NGO scenario 2: Current system, 223 mgd constant demand, 7½ year design drought, Bay-Delta Plan flows



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

APPENDIX I
WATER SHORTAGE CONTINGENCY PLAN

Water Shortage Contingency Plan
2020 Update

North Coast County Water District

June 2021

TABLE OF CONTENTS

TABLES

ATTACHMENTS

ABBREVIATIONS

Annual Assessment	Supply-Demand Assessment
BAWSCA	Bay Area Water Supply and Conservation Agency
CA	California
CCR	California Code of Regulations
CII	commercial, industrial, and institutional
County HMP	County Hazard Mitigation Plan
CWC	California Code of Regulations
DRA	Drought Risk Assessment
DRT	Drought Response Tool
DWR	Department of Water Resources
EOP	Emergency Operations Plan
ERP	Emergency Response Plan
ft	feet
FY	fiscal year
GPCD	gallons per capita demand
ISG	Individual Supply Guarantee
MG	million gallons
MGD	million gallons per day
NCCWD	North Coast County Water District
RGPCD	residential gallons per capita demand
RWS	Regional Water System
SFPUC	San Francisco Public Utilities Commission
SWRCB	State Water Resources Control Board
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
WSAP	Water Shortage Allocation Plan
WSCP	Water Shortage Contingency Plan

1. WATER SHORTAGE CONTINGENCY PLANNING

☑ ***CWC § 10640***

(a) Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630). The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

(b) Every urban water supplier required to prepare a water shortage contingency plan shall prepare a water shortage contingency plan pursuant to Section 10632. The supplier shall likewise periodically review the water shortage contingency plan as required by paragraph (10) of subdivision (a) of Section 10632 and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

North Coast County Water District's (NCCWD's or the District's) Water Shortage Contingency Plan (WSCP) has been developed to serve as a flexible framework of planned response measures to mitigate future water supply shortages. This WSCP builds upon and supersedes the WSCP that was presented in the 2015 Urban Water Management Plan (UWMP). Updates to the current WSCP reflect key lessons learned during the recent drought. This WSCP also intends to improve District's ability to respond effectively and efficiently in the event of a future water supply shortage.

As such, NCCWD developed this WSCP based on the following guiding principle:

> *Eliminate water waste, prioritize the reduction of non-essential water uses, and preserve water uses that are essential to the health, safety, welfare, and economic vitality of NCCWD's customers during periods of water shortage.*

Practically, this principle guides NCCWD to ask for a need-based, shared contribution from all its customers towards meeting water use reduction goals during periods of water shortage. It further directs NCCWD to focus its water conservation efforts on reducing discretionary water uses such as outdoor irrigation, while attempting to preserve uses that are essential to health and safety such as drinking, cooking, and sanitary activities and minimize economic and other impacts to its residential and commercial customers. The WSCP focuses on potable water uses because there are ample supplies of recycled water available even during a drought.

2. WATER SUPPLY RELIABILITY ANALYSIS

☑ ***CWC § 10632 (a) (1)*** *The analysis of water supply reliability conducted pursuant to Section 10635.*

This section provides a summary of the water supply reliability analysis in Chapter 7 of NCCWD's 2020 UWMP, recognizing that the WSCP is intended to be a standalone document that can be adopted and amended independently.

NCCWD relies on the San Francisco Public Utilities Commission (SFPUC) Regional Water System (RWS) for all of its potable water supply. In accordance with the SFPUC's perpetual obligation to NCCWD's Supply Assurance, NCCWD has an Individual Supply Guarantee (ISG) of 3.84 million gallons per day (MGD), or 1,402 million gallons (MG) per year. NCCWD also uses recycled water for non-potable uses. Recycled water currently supplies less than 1 percent of NCCWD's total demand and is anticipated remain at approximately 1 percent of NCCWD's total demand by 2045.[1] The recycled water supply is expected to be 100 percent reliable in all year types.

NCCWD's supply reliability relies largely on the reliability of the SFPUC RWS. The SFPUC has committed to, among other things, meeting the retail and Wholesale Customers' average annual water demand during non–drought years and meeting dry-year delivery needs while limiting rationing to a maximum 20 percent system-wide reduction in water service during extended droughts. However, several potential constraints have been identified on the future supply availability of the SFPUC RWS. One of the key factors is the adoption of the 2018 Bay-Delta Plan Amendment. If the Bay-Delta Plan Amendment is implemented, the SFPUC is anticipated to have sufficient supplies to meet the projected water demands in normal years but would experience significant supply shortages in single dry years or multiple dry years.

Based on the current allocation methodology[2] and SFPUC's projected dry year cutbacks, NCCWD is anticipated to experience up to a 352 MG (43 percent) supply shortfall in single dry years by 2045 and up to 421 MG (51 percent) supply shortfall in multiple dry years by 2045 if the Bay-Delta Plan is implemented.

However, numerous uncertainties remain in the implementation of the Bay-Delta Plan Amendment and the allocation of the available supply between the Wholesale Customers of the SFPUC's RWS. The resultant actual supply reliability and the frequency of supply shortfalls for NCCWD cannot be known currently. NCCWD has placed high priority on working with SFPUC and the Bay Area Water Supply and Conservation Agency (BAWSCA) to better refine the estimates of RWS supply reliability and may revise its UWMP accordingly. The SFPUC and BAWSCA have also been taking various actions to improve the

[1] Note that the District is considering expanding its recycled water system, but potential additional uses have not been quantified.

[2] The SFPUC and the Wholesale Customers have negotiated and adopted a plan to allocate the RWS supply during system-wide shortages of 20 percent or less. To address the instances where the supply shortfalls are projected to be greater than 20 percent, BAWSCA has developed a revised methodology to allocate the RWS supply. This allocation method is intended to serve as the preliminary basis for the 2020 UWMP supply reliability analysis and does not in any way imply an agreement by BAWSCA member agencies as to the exact allocation methodology. Details on the SFPUC RWS supply reliability are provided by the SFPUC and the BAWSCA and are documented in Sections 7.1 through 7.2 as well as Appendix G of the 2020 UWMP.

reliability of the RWS supply, including implementing a number of dry year water supply projects, exploring alternative water supplies, and implementing Long-Term Reliable Water Supply Strategy recommendations.

As part of the supply reliability analysis, NCCWD has conducted a Drought Risk Assessment (DRA), which evaluates the effects on available water supply sources of an assumed five-year drought commencing the year after the assessment is completed (i.e., from 2021 through 2025). NCCWD's supply is expected to be sufficient to meet demands in the first two year of the assumed drought (i.e., 2021 and 2022). Shortages are projected to begin in 2023 of the DRA with the implementation of the Bay-Delta Plan Amendment and continue through 2025. The largest shortfall is estimated to be 337 MG (39 percent) in 2024.

NCCWD has developed this WSCP 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 NCCWD will implement to reduce demands and further ensure supply reliability at various levels of water shortage.

3. PRIOR DROUGHT ACTIONS

The District has historically developed different strategies for reducing water demand during water shortages. NCCWD's actions in response to the recent severe drought that occurred in California between 2014 and 2017 are discussed below.

On 1 April 2015, Governor Brown issued the fourth in a series of Executive Orders regarding actions necessary to address California's severe drought conditions. Executive Order B-29-15 directed the State Water Resources Control Board (SWRCB) to impose the first ever mandatory restrictions on urban water suppliers to achieve a statewide 25 percent reduction in potable urban water usage through February 2016. The Executive Order also required commercial, industrial, and institutional (CII) users to implement water efficiency measures, prohibited irrigation with potable water of ornamental turf in public street medians, and prohibited irrigation with potable water outside newly constructed homes and buildings that were not delivered by drip or microspray systems, along with numerous other directives.

On 5 May 2015, the SWRCB adopted Resolution 2015-0032 that mandated minimum actions by water suppliers and their customers to conserve water supplies into 2016 and assigned a mandatory water conservation savings goal to each water supplier based on their R-GPCD. The Office of Administrative Law approved the regulations and modified the CWC on 18 May 2015. On 2 February 2016, the SWRCB voted to extend the emergency regulations until October 2016 with some modifications. On 9 May 2016, the Governor issued Executive Order B-37-16, which directed the SWRCB to extend the emergency regulations through the end of January 2017 as well as make certain water use restrictions permanent. On 18 May 2016, the SWRCB adopted Resolution 2016-0029 that adjusted the water conservation savings goal and replaced the February 2016 emergency regulation. The SWRCB is expected to take separate action to make some of the requirements of the regulations permanent in response to the Executive Order.

CWC § 865(c) required water suppliers to reduce its water use relative to its 2013 water use. The mandatory conservation standards included in CWC § 865(c) ranged from 8 percent for suppliers with an R-GPCD below 65 R-GPCD, up to 36 percent for suppliers with an R-GPCD of greater than 215 GPCD. As with previous emergency drought regulations adopted by the SWRCB in 2014, the new water conservation regulation was primarily intended to reduce outdoor urban water use. Based on their R-GPCD, NCCWD was required to reduce water use by 8 percent relative to its 2013 water use.

In August 2014, prior to the 2015 SWRCB Resolution, NCCWD Board of Directors declared Stage 2 of the 2010 WSCP to respond to 2014 SWRCB actions under Ordinance 2014-56, which called for a 12 percent reduction and included prohibitions that targeted water waste and discretionary outdoor uses. On June 2015, the Board of Directors passed ordinance 2015-57 amending Ordinance 2014-56 to include the targeted 8 percent reduction imposed by the SWRCB. This stage of action remained in place through April 2017 to meet the 2015 SWRCB mandated reduction target.

NCCWD surpassed the 8 percent reduction targets. During the June 2015 through October 2016 compliance period, NCCWD surpassed its water use reduction target with a cumulative savings of 17 percent relative to its 2013 use.

In June 2016, NCCWD adopted its 2015 UWMP and associated WSCP update.[3] In April 2017, the Governor Brown ended the drought State of Emergency. On 19 April 2017, Ordinance 2017-58 revoked NCCWD's drought declaration and ended the implementation of NCCWD's WSCP.

[3] The NCCWD 2015 UWMP, which included the associated WSCP, was amended and adopted in January 2018. The Amended 2015 UWMP was published in February 2018.

4. ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

☑ ***CWC § 10632 (a) (2)***

The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:

(A) The written decision-making process that an urban water supplier will use each year to determine its water supply reliability.

(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:

(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.

(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.

(iii) Existing infrastructure capabilities and plausible constraints.

(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.

(v) A description and quantification of each source of water supply.

☑ ***CWC § 10632.1***

An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.

☑ ***CWC § 10632.2***

An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan, as identified in subdivision (a) of Section 10632, or reasonable alternative actions, provided that descriptions of the alternative actions are submitted with the annual water shortage assessment report pursuant to Section 10632.1. Nothing in this section prohibits an urban water supplier from taking actions not specified in its water shortage contingency plan, if needed, without having to formally amend its urban water management plan or water shortage contingency plan.

On an annual basis beginning by July 1, 2022, NCCWD will conduct an Annual Supply-Demand Assessment (Annual Assessment) to identify whether there is likely to be a water shortage condition in the following year. Because NCCWD's sole source of potable water supply is from the SFPUC RWS, the evaluation of District supplies for a particular year will be based on information provided by the SFPUC or BAWSCA. NCCWD will conduct the Annual Assessment as part of a coordinated effort lead by SFPUC and BAWSCA. The procedure used in conducting an Annual Assessment is outlined in Attachment A of this WSCP.

As part of the Annual Assessment process, the District will provide unconstrained demand information to BAWSCA and SFPUC incorporating water demand from development projects which will be completed in the coming year. As part of this effort, the District will coordinate with the City of Pacifica to identify if any projects that will have an impact on water demands.

5. WATER SHORTAGE LEVELS

☑ ***CWC § 10632 (a) (3)***

(A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.

(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross-reference relating its existing categories to the six standard water shortage levels.

Consistent with the requirements of CWC § 10632(a)(3), this WSCP is based on the six water shortage levels (also referred to as "stages") shown in Table 5-1, in addition to a no-drought stage that is effective at all times to prevent water waste. These shortage stages are intended to address shortage caused by any condition, including the catastrophic interruption of water supplies. Table 5-1 summarizes the water supply reductions and supply conditions associated with each stage of action.

Table 6-1 and Table 6-2 describes the costumer restrictions and prohibitions and consumption reduction methods (i.e., the actions to be taken by NCCWD staff) associated with each stage of action. Specific prohibitions and consumption reduction methods are discussed in more detail below. The monthly and cumulative annual water savings impacts associated with each restriction, prohibition and consumption reduction method were quantitatively estimated using the Drought Response Tool (DRT) for each stage of action (see Section 6.6).

Table 5-1 Water Shortage Contingency Plan Levels (DWR Table 8-1)

Shortage Level	Percent Shortage Range	Shortage Response Actions
No-Drought	N/A	• Includes water waste prohibitions effective at all times.
1	Up to 10%	• Declaration by the Board of Directors upon the determination that (1) the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use of up to 10% due to water supply shortages or an emergency or (2) local conditions impacting the quantity or quality of NCCWD's water supply warrant the need for a reduction in water use of up to 10%. • Includes implementation of mandatory restrictions on end uses (see Table 6-1) as well as agency actions (see Table 6-2).

Shortage Level	Percent Shortage Range	Shortage Response Actions
2	Up to 20%	• Declaration by the Board of Directors upon the determination that (1) the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use of up to 20% due to water supply shortages or an emergency or (2) local conditions impacting the quantity or quality of NCCWD's water supply warrant the need for a reduction in water use of up to 20%. • Includes implementation of mandatory restrictions on end uses (see Table 6-1) as well as agency actions (see Table 6-2).
3	Up to 30%	• Declaration by the Board of Directors upon the determination that (1) the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use of up to 30% due to water supply shortages or an emergency or (2) local conditions impacting the quantity or quality of NCCWD's water supply warrant the need for a reduction in water use of up to 30%. • Includes implementation of mandatory restrictions on end uses (see Table 6-1) as well as agency actions (see Table 6-2).
4	Up to 40%	• Declaration by the Board of Directors upon the determination that (1) the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use of up to 40% due to water supply shortages or an emergency or (2) local conditions impacting the quantity or quality of NCCWD's water supply warrant the need for a reduction in water use of up to 40%. • Includes implementation of mandatory restrictions on end uses (see Table 6-1) as well as agency actions (see Table 6-2).
5	Up to 50%	• Declaration by the Board of Directors upon the determination that (1) the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use of up to 50% due to water supply shortages or an emergency or (2) local conditions impacting the quantity or quality of NCCWD's water supply warrant the need for a reduction in water use of up to 50%. • Includes implementation of mandatory restrictions on end uses (see Table 6-1) as well as agency actions (see Table 6-2).
6	>50%	• Declaration by the Board of Directors upon the determination that (1) the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use of greater than 50% due to water supply shortages or an emergency or (2) local conditions impacting the quantity or quality of NCCWD's water supply warrant the need for a reduction in water use of greater than 50%. • Includes implementation of mandatory restrictions on end uses (see Table 6-1) as well as agency actions (see Table 6-2).

6. SHORTAGE RESPONSE ACTIONS

☑ ***CWC § 10632 (a) (4)***

Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:

(A) Locally appropriate supply augmentation actions.

(B) Locally appropriate demand reduction actions to adequately respond to shortages.

(C) Locally appropriate operational changes.

(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.

(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.

☑ ***CWC § 10632 (b)***

For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

This section describes the response actions the District will take to deal with the shortages associated with each of the six stages, plus a no-drought stage that is in effect at all times, enumerated in Section 5 (Table 5-1).

6.1 Supply Augmentation

The District relies on the SFPUC RWS for its potable supplies. There are currently no supply augmentation actions planned in the District's shortage response actions. However, as discussed in Section 6.7 of the District's 2020 UWMP, potential transfer and exchange opportunities exist within and outside of the SFPUC RWS.

The Water Shortage Allocation Plan (WSAP) adopted by all BAWSCA agencies and the SFPUC provides the basis for voluntary transfers of water among BAWSCA agencies during periods when mandatory rationing is in effect on the SFPUC RWS (see also Section 7.1.1 of the UWMP). Some BAWSCA agencies have the capacity to rely on groundwater or other sources during dry years and thus may be willing to transfer a portion of their wholesale water entitlement to other BAWSCA agencies in need of supply above their allocations. Securing water from willing sellers outside the SFPUC RWS is a more complex process than transfers within the RWS, which requires both a contract with the seller agency and approval by the SFPUC. BAWSCA has the authority to plan for and acquire supplemental water supplies and continues to evaluate the feasibility of water transfers as part of its implementation of its Long-Term Reliable Water Supply Strategy (see Section 7.1.3.5 of the 2020 UWMP).

Additionally, as discussed in Chapter 6 of the 2020 UWMP, NCCWD is evaluating options to expand its water supply portfolio through use of groundwater and surface water and expanded use of recycled

water. The District will likely pursue one or more of these options as a source of supply augmentation in the future, particularly if the potential shortfalls projected by the SFPUC in the 2020 UWMP persist.

6.2 Demand Reduction Methods

As discussed above and shown in in Table 6-1, the WSCP lists the demand reduction methods that NCCWD will implement during each stage of action to reduce NCCWD's own water consumption and encourage reduction in water use by its customers. The monthly and cumulative annual water savings impacts associated with each restriction, prohibition, and consumption reduction method were quantitatively estimated using the DRT for each stage of action (see Attachment B).

A focus of NCCWD's planned consumption reduction measures is to increase public outreach and keep customers informed of the water shortage emergency and actions they can take to reduce consumption. The public outreach efforts that NCCWD will implement to respond to a water shortage are described in Section 8.

6.3 Operational Changes

The WSCP lists the operational changes that the District will implement during each stage of action including measures to: (1) reduce system losses through a reduction in flushing of water distribution mains, (2) increase enforcement and customer service, and (3) implement the demand reduction methods.

Table 6-1 Demand Reduction Actions (DWR Table 8-2)

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement ?
No Drought	Other	--	1. Hoses shall be equipped with a shut-off valve for washing vehicles, sidewalks, walkways, or buildings. 2. Ornamental fountains shall use only re-circulated or recycled water. 3. Potable water shall not be applied in any manner to any driveway, sidewalk, or other hard surface except when necessary to address immediate health or safety concerns. 4. Potable water shall not be used to water outdoor landscapes in a manner that causes more than incidental runoff onto non-irrigated areas, walkways, roadways, parking lots, or other hard surfaces. 5. Potable water shall not be applied to outdoor landscapes during and up to 48 hours after measurable rainfall. 6. Potable water shall not be used to irrigate ornamental turf on public street medians. 7. Hotels and motels shall provide guests an option whether to launder towels and linens daily. Hotels and motels shall prominently display notice of this option in each bathroom using clear and easily understood language. 8. Restaurants and other food service operations shall serve water to customers only upon request. 9. Customers are obligated to fix leaks, breaks, or malfunctions in lines, fixtures, or facilities. Loss or escape of water through breaks, leaks, or malfunctions in the water user's plumbing, distribution, or irrigation system is prohibited for any period time after such water waste should have reasonably been discovered and corrected. Leaks, breaks, or malfunctions shall be corrected in no more than five days of District notification. The District, at its sole discretion, may temporarily shut off service if unable to contact the account holder on record. 10. Recreational water features shall be covered when not in use. 11. Single-pass cooling systems on new construction shall not be allowed. 12. Other measures as may be approved by the State Water Resources Control Board or Board of Directors Resolution.	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement ?
1	Other	5%	1. Continue with "no drought" restrictions and prohibitions except where superseded by more stringent requirements. 2. Restrict landscape irrigation to specific times. 3. Prohibit outdoor watering with potable water more than 15 minutes per day and 2 days per week. 4. Restrict water use for decorative water features such as fountains. 5. Allow filling of recreational water features (e.g., swimming pools and spas) only when an appropriate cover is in place. 6. Use of water through a hose or pressure washer to clean of any building or home is prohibited, except prior to painting or if required for health or safety purposes. 7. Require repair of leaks, breaks, or malfunctions in lines, fixtures, or facilities within 2 days. 8. Hosing down or washing down vehicles is prohibited, unless using a bucket and/or rinsing with an automatic shut-off hose nozzle. 9. Other measures approved by the Board of Directors.	Yes
2	Other	15%	1. Continue with Stage 1 restrictions and prohibitions except where superseded by more stringent requirements. 2. Prohibit outdoor watering with potable water more than 10 minutes per day and 1 day per week. 3. Prohibit use of potable water for construction and dust control. 4. Prohibit vehicle washing except at facilities using recycled or recirculating water. 5. Commercial kitchens required to use pre-rinse spray valves. 6. Prohibit filling of recreational water features (e.g., swimming pools and spas). 7. Require repair of leaks, breaks, or malfunctions in lines, fixtures, or facilities within 1 day. 8. Other measures as may be approved by the Board of Directors.	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement ?
3	Other	25%	1. Continue with Stage 2 restrictions and prohibitions except where superseded by more stringent requirements. 2. Prohibit all landscape irrigation of ornamental and private landscapes with potable water, except as required to keep trees alive. 3. Water use shall not exceed Stage 3 water budgets for each customer. 4. No new water-using landscape may be installed by any customer. 5. No new potable water service shall be provided, including temporary meters or permanent meters 6. Water use shall not exceed water allocations established by NCCWD for each customer. 7. Other measures as may be approved by the Board of Directors.	Yes
4	Other	35%	1. Continue with Stage 3 restrictions and prohibitions except where superseded by more stringent requirements. 2. Water use shall not exceed Stage 4 water budgets for each customer. 3. Other measures approved by the Board of Directors.	Yes
5	Other	45%	1. Continue with Stage 4 restrictions and prohibitions except where superseded by more stringent requirements. 2. Water use shall not exceed Stage 5 water budgets for each customer. 3. Other measures approved by the Board of Directors.	Yes

Shortage Level	Demand Reduction Actions	How much is this going to reduce the shortage gap?	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement ?
6	Other	53%	1. Continue with Stage 5 restrictions and prohibitions except where superseded by more stringent requirements. 2. Water use shall not exceed Stage 6 water budgets for each customer. 3. Other measures approved by the Board of Directors.	Yes
NOTES: (a) The percentages listed in this table are the cumulative savings for each shortage level with implementation of corresponding supply augmentation and other agency actions in Table 6-2. Detailed saving estimates based on end use, response action, and implementation rates can be found Attachment B. (b) Table 6-1 lists each demand reduction action as "other" because they represent a suite of demand reduction actions for each shortage level that include multiple categories of demand reduction actions provided in the DWR drop down menu.				

Table 6-2 Supply Augmentation and Other Actions (DWR Table 8-3)

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 *(optional)*
1	Other	5%	1. Inform customers that there is a water shortage emergency and the list of actions they can take to reduce water use (e.g., via direct mail, media campaign, website, bill inserts, etc.). 2. Offer water use surveys. 3. Promote rebates on high-efficiency plumbing fixtures and devices such as toilets. 4. Promote rebates for Turf Replacement. 5. Audit and reduce water system loss. 6. Promote use of residential recycled water fill station.

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 *(optional)*
			7. Coordination with BAWSCA and SFPUC. 8. Schedule staff for enforcement and customer service.
2	Other	15%	1. Continue with actions and measure from Stage 1. 2. Implement or modify drought rate structure as allowed by adopted Rate and Fee Schedule. 3. Decrease line flushing 4. Increase public outreach, including hosting public events and workshops. 5. Increase public outreach including information regarding fines or penalties for non-compliance. 6. Increase leak detection. 7. Accelerate water conservation program implementation.
3	Other	25%	1. Continue with actions and measures from Stage 2. 2. Increase water waste patrols. 3. Develop mandatory water allocation program for all accounts and notice those accounts appropriately. 4. Impose an excess water use charge with the implementation of water allocations. 5. Require fixture retrofits prior to review of customer hardship exemptions from prohibitions and restrictions. 6. Establish moratorium on new connections and new landscaping.
4	Other	35%	1. Continue with actions and measures from Stage 3. 2. Switch to more frequent (e.g., monthly) billing. 3. Suspend water service to landscape accounts.
5	Other	45%	1. Continue with actions and measures from Stage 4.

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 *(optional)*
6	Other	55%	1. Continue with actions and measures from Stage 5.
NOTES: (a) The percentages listed in this table are the cumulative savings for each shortage level with implementation of corresponding demand reduction measures in Table 6-1. Detailed saving estimates based on end use, response action, and implementation rates can be found in Attachment B. (b) Table 6-2 lists each supply augmentation method or other actions by water supplier action as "other" because they represent a suite of actions by the water supplier for each shortage level that include multiple categories of actions provided in the DWR drop down menu.			

6.4 Defining Water Features

☑ ***CWC § 10632 (b)***

For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

As required by CWC § 10632, NCCWD distinguishes between "decorative water features" such as ponds, lakes, and fountains that are artificially supplied with water and "recreational water features" such as swimming pools and spas. Prohibitions on water use for decorative water features are listed separately from those for recreational water features (see Table 6-1).

6.5 Prohibitions on End Uses

Restrictions and prohibitions associated with each stage of action are presented in Table 6-1, including those water waste prohibitions that will be in effect at all times. As discussed above, these responses focus on the reduction of non-essential water uses such as ornamental landscape irrigation, and preserve water uses that are vital to the health, safety, welfare, and economic vitality of NCCWD's customers. Lower stages of the WSCP focus on guiding customer actions through prohibitions on end uses, while subsequent levels of the WSCP include increasingly restrictive prohibitions and conformance with water allocations that will be assigned to each customer account.

NCCWD anticipates assigning water allocations to each customer account during higher WSCP stages (i.e., Stages 3 through 6). Table 6-3 further describes how the cutbacks will be distributed between water use sectors and end uses, in order to collectively achieve the targeted water savings associated with each stage of action. The measures and prohibitions described for each stage of action in Table 6-1 are designed to assist customers in meeting their target reductions and water budgets.

As discussed in the 2020 UWMP and Section 6.6.1 below, NCCWD serves water primarily to residential customers and has among the lowest residential per capita water use across the State. Therefore, achieving the targeted demand reductions in Stages 5 and 6 would significantly impact the essential water use of the District's residential and CII customers. The level of rationing suggested in Table 6-1 for Stages 5 and 6 are intended to be implemented only during a short-term emergency such as a critical interruption lasting less than a week.

NCCWD currently does not anticipate a long-term shortage condition that would require the District to enact the level of rationing in Stages 5 and 6. As discussed in Section 7.1.1.1 of the 2020 UWMP, there is no current methodology for allocating available water between SFPUC and Wholesale Customers for SFPUC RWS shortages greater than 20 percent. As noted in BAWSCA's memoranda dated February 18, 2021 (included as an appendix to the 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 water needs to support critical institutions such as hospitals, and minimizing economic impacts on individual communities and the region."

In addition, NCCWD will prioritize furnishing water transfers or alternative supplies in the event of a prolonged shortage condition and consult with its customers to identify alternative water saving actions.

Table 6-3 Potential Water Allocations by Customer Sector

Customer Category	Potential Water Allocations					
	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Residential Allocation	--	--	32 GPCD	25 GPCD	25 GPCD	25 GPCD
Commercial Customer	--	--	85%	60%	15%	0%
Irrigation Customer	--	--	25%	25%	0%	0%

NOTES:
(a) Water allocations for a commercial and irrigation customer are presented as the percentage of water use compared to the customer's baseline water use.
(b) Water allocations would not apply to water sales to San Bruno (a portion of CII uses). This volume of water (10 MG per year) is assumed to be held constant in the DRT.

6.6 Shortage Response Action Effectiveness

To evaluate and ensure that effective actions will be implemented with the proper level of intensity, NCCWD employed the DRT, an Excel spreadsheet model developed by EKI Environment and Water, Inc. The DRT model calculates monthly savings anticipated by implementing each stage of action as detailed below.

6.6.1 Baseline Water Use Profile

Using the DRT, NCCWD developed a baseline water use profile that reflects usage patterns within NCCWD's service area by major water use sectors in 2019.[4] The analysis of the baseline water use profile was used to guide development of the WSCP. Key findings from this analysis are presented below.

Residential Per Capita Demand

NCCWD's baseline residential gallons per capita per day (R-GPCD) demand in 2019 was approximately 45 R-GPCD. As shown in Table 6-4 and the associated chart, this R-GPCD is significantly lower than both the statewide average of 85 R-GPCD and the average of all BAWSCA agencies of 61 R-GPCD during the

[4] Water use for 2019 was used as the baseline water year instead of 2020, because 2020 water use was influenced by COVID-19. The District anticipates water use returning to pre-COVID-19 water use patterns.

same period. NCCWD has among the lowest residential per capita water use of the BAWSCA agencies and across the State.

Proportion of Outdoor Water Use

As shown in Table 6-5 and the associated charts, outdoor water use, which can generally be considered as a "discretionary water use", was estimated to be approximately 13 percent of NCCWD's total consumption in 2019. The seasonal variation in baseline water use generally reflects increased irrigation demands during the summer and fall months. Therefore, the greatest potential for reductions in non-essential water use is expected during these months.

Table 6-4 Baseline Residential Per Capita Water Demand

	Baseline Residential Per Capita Water Demand (R-GPCD)
NCCWD (a)	45
BAWSCA Agencies (b)	61
Statewide Average (c)	85

NOTES:
(a) NCCWD R-GPCD calculated using 2019 metering data.
(b) Average BAWSCA R-GPCD calculated from data provided in BAWSCA Annual Survey FY 2018-19 (BAWSCA, 2020).
(c) State-wide R-GPCD for 2019 obtained from data provided at California State Water Resources Control Board Water Conservation Portal - Conservation Reporting, http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/conservation_reporting.shtml, accessed April 2021.

Chart 6-3 Baseline Residential Per Capita Water Demand

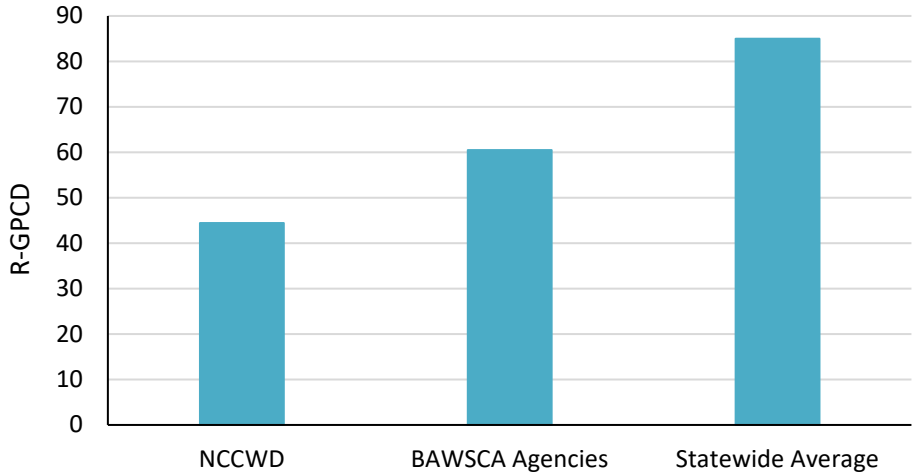


Table 6-5 Baseline Water Use Profile

Sector	End-Use	Baseline (2019) Water Use													Annual % of Total by Sector
		January	February	March	April	May	June	July	August	September	October	November	December	Annual	
Residential	Indoor	48	43	48	46	48	46	48	48	46	48	46	48	565	90%
	Outdoor	0.2	4.5	0.0	2.2	4.0	7.6	8.1	8.4	9.2	7.3	12	2.0	65	10%
	Subtotal Residential	*48*	*48*	*48*	*49*	*52*	*54*	*56*	*56*	*56*	*55*	*58*	*50*	*630*	*75%*
CII	Indoor	8.1	7.3	8.1	7.9	8.1	7.9	8.1	8.1	7.9	8.1	7.9	8.1	96	84%
	Outdoor	0.0	0.7	0.1	0.6	0.9	1.6	2.3	2.5	2.8	2.2	3.7	0.1	18	16%
	Subtotal CII	*8.1*	*8.0*	*8.2*	*8.5*	*9.1*	*9.5*	*10*	*11*	*11*	*10*	*12*	*8.2*	*113*	*14%*
Dedicated Irrigation	Outdoor	0.3	0.2	0.6	1.2	2.1	2.6	3.3	3.4	3.4	3.1	2.1	1.1	23	3%
Non-Revenue	Non-Revenue	4.8	2.9	6.2	8.8	2.4	19	8.6	10	3.1	-5.3	2.4	5.2	69	8%
Total	Indoor	56	51	56	54	56	54	56	56	54	56	54	56	660	79%
	Outdoor	0.5	5.5	0.6	4.0	7.0	12	14	14	15	13	17	3	106	13%
	Non-Revenue	4.8	2.9	6.2	8.8	2.4	19	8.6	10	3.1	-5.3	2.4	5.2	4.8	8%
	Total	**61**	**59**	**63**	**67**	**65**	**85**	**78**	**81**	**73**	**63**	**74**	**64**	**835**	100%

NOTES:
(a) Volumes are in units of MG.
(b) Monthly water use is estimated based on bi-monthly billing.
(c) CII water use includes sales to San Bruno to serve a multi-family residential complex (10 MG).
(d) Totals may not sum due to rounding.

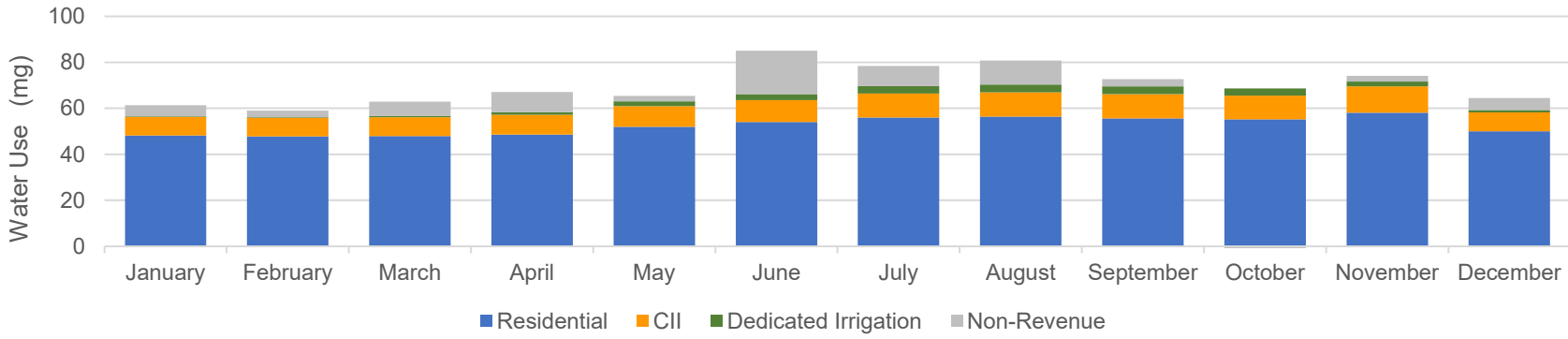


Chart 6-5A Baseline Year (2019) Monthly Total Water Use by Sector
Water Use (mg)
100
80
60
40
20
0
January
February
March
April
May
June
July
August
September
October
November
December
Residential
CII
Dedicated Irrigation
Non-Revenue

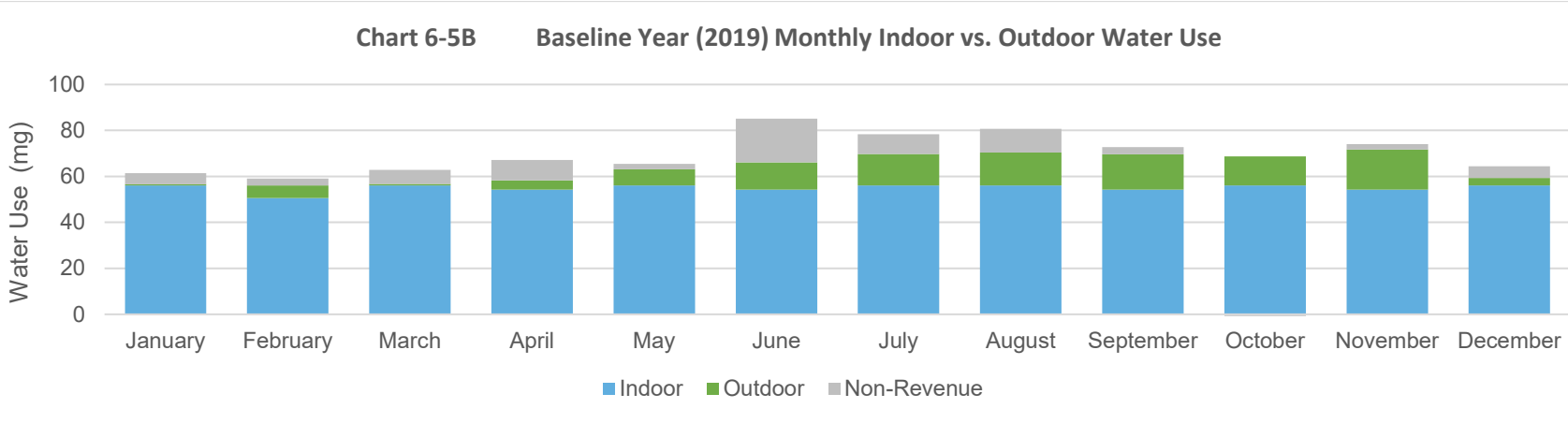


Chart 6-5B Baseline Year (2019) Monthly Indoor vs. Outdoor Water Use
Water Use (mg)
100
80
60
40
20
0
January
February
March
April
May
June
July
August
September
October
November
December
Indoor
Outdoor
Non-Revenue

6.6.2 Shortage Response Action Effectiveness

The DRT provides a quantitative framework that allows NCCWD to systematically estimate the monthly and cumulative annual demand reductions expected to result from particular combinations of drought response actions and associated implementation rates. Data inputs to the DRT include total production, class-specific water use, population, and assumptions regarding the split between indoor and outdoor water use for each customer class.

For each drought response action, the user specifies:

- The customer class(es) and end use(s) that are affected;
- The percent savings for that end use for each account that implements the action (based on evaluations reported in the literature, or where such studies are not available, on best estimates based on NCCWD's experience); and
- The percentage of accounts assumed to implement the action, which is presumed to be the result of the intensity level of NCCWD's program implementation, including but not limited to, marketing and enforcement activities.[5]

An additional critical DRT user input is a set of constraints on demand reductions to ensure that usage levels do not endanger health and safety or result in unacceptable economic impacts. The DRT will not permit estimated usage reductions to violate these constraints, regardless of the demand reduction actions selected. The constraints are:

- A minimum residential indoor per capita daily usage of 25 gallons,
- A maximum residential outdoor usage reduction of 100 percent,
- A maximum commercial, industrial, and institutional (CII) indoor usage reduction of 40 percent except in the most extreme conditions (e.g., Stage 5 and 6), and
- A maximum CII outdoor usage reduction of 100 percent.

Based on the foregoing constraints, the DRT model calculates the resulting monthly savings. NCCWD adjusted the combination of actions and implementation levels to achieve the targeted savings levels at each of the six stages of action.

For each of the stages of action, the modeling targeted the mid-range of the required demand reduction range, ergo:

- 5 percent for Stage 1,
- 15 percent for Stage 2,
- 25 percent for Stage 3,
- 35 percent for Stage 4,
- 45 percent for Stage 5, and
- 53 percent for Stage 6.

The key DRT inputs and outputs for each of the stages of action are reproduced in Attachment B.

[5] The participation rate for CII actions has been adjusted to maintain a constant volume of sales to San Bruno in each stage.

Table 6-1 and Table 6-2 show the water shortage reduction actions, savings assumptions, and implementation rates that are required for NCCWD to achieve the required annual demand reductions for each of the six stages of action. At each stage, there are two types of demand-reduction actions identified:

- Restrictions on customer water usage; and
- Consumption reduction actions by NCCWD to encourage decreased water usage.

Many actions are implemented across multiple stages, some at increasing implementation levels. Therefore, the actions are listed as a row under the first stage at which they are implemented, and the implementation rate is listed under each stage column heading at the right. The unit savings represent a percentage savings of the end uses indicated in the table.

6.7 Catastrophic Supply Interruption

Catastrophic supply interruptions may be caused by a regional power outage, natural disaster, or national security/terrorism emergencies. Catastrophic interruptions may occur in the SFPUC RWS or in the NCCWD water distribution system. In the event of a catastrophic supply interruption, the response procedures that the District would follow are described in:

- SFPUC Emergency Operations Plan (EOP);
- San Mateo County's Operational Area EOP Potable Water Procurement and Distribution Annex; and
- NCCWD Emergency Response Plan (ERP).

In the event of a catastrophic supply interruption, the response procedures that NCCWD would follow are described in the SFPUC Emergency Operations Plan (EOP) as well as the San Mateo County Operational Area EOP (County of San Mateo, 2004). Actions described in the SFPUC EOP focus on maintaining flow within, and from, the RWS pipelines. SFPUC's emergency preparedness procedures are described in detail in Attachment C. The San Mateo Operational Area EOP addresses San Mateo County's planned response to extraordinary emergency situations associated with natural disasters, man-made technological incidents, and national security emergencies. This EOP is a preparedness document that is designed to be read, understood, and exercised prior to an emergency. Each agency is responsible for ensuring the preparation and maintenance of appropriate and current Standard Operating Procedures, Emergency Operating Procedures, and alert lists that will support the EOP.

Together, these EOPs provide the framework for responding to major emergencies or disasters associated with natural disasters, technological incidents, and national security/terrorism emergencies. Sections of these EOPs outline specific strategies to prepare for, mitigate, respond to, and recover from an emergency or disaster that affects the water utilities that serve the population within San Mateo County.

NCCWD is in the process of updating its Emergency Response Plan to address responding to catastrophic supply interruptions as well as other emergencies. NCCWD's ERP will be in compliance with America's Water Infrastructure Act of 2018 (AWIA).

NCCWD's ERP will include information on key facilities, emergency response roles, communication methods, public notification information, response actions and procedures, mitigation actions, and detection strategies. The ERP will include incident action checklists for the possible water supply

catastrophes including: contamination, cybersecurity, drought, earthquake, flooding, pandemic, power outage, and wildfire.

NCCWD may evaluate and require appropriate WSCP response actions during a catastrophic supply interruption, such as end-use prohibitions and mandatory rationing, as well as implement the operational changes and communication protocols described herein.

When a shortage declaration appears imminent, the General Manager manages related activities and will serve as the Emergency Response Lead. In the absence of the General Manager the Assistant General Manager of Operations or other available supervisory personnel will serve as the Emergency Response Lead. If warranted, the EOP will be activated and information will be provided to Police, Fire, City of Pacifica, and San Mateo County. The General Manager will also provide essential information to the public, including coordinating information with other jurisdictions if necessary, before releasing information to the news media.

NCCWD has sufficient facilities and infrastructure to reroute around most temporary water supply disruptions. The District also has emergency interties with Westborough Water District, the City of Daly City, and the City of San Bruno. NCCWD has onsite backup generators installed at all critical sites that can support facilities an emergency event. NCCWD regularly inspects all existing water supply storage and distribution facilities per a maintenance schedule. NCCWD typically has over 13 MG of emergency water storage in the NCCWD water tanks at all times. This supply of water can meet average daily water demands for approximately 5.8 days.

NCCWD may evaluate and require appropriate WSCP response actions during a catastrophic supply interruption, such as end-use prohibitions and mandatory rationing, as well as implement the operational changes and communication protocols described herein.

7. SEISMIC RISK ASSESSMENT

☑ ***CWC § 10632.5***

(a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

Impacts associated with earthquakes and liquefaction for NCCWD are discussed in the 2016 San Mateo County Hazard Mitigation Plan (County HMP; County of San Mateo, 2016). The County HMP includes a discussion of the probability of a seismic event affecting San Mateo County, citing a United States Geological Survey (USGS) estimate of a 63 percent probability of at least one 6.7 or greater magnitude earthquake before 2036 affecting the greater San Francisco Bay area. The County HMP also includes an assessment of the County's vulnerability in the event of a major seismic event and estimates that an earthquake on the Northern San Andreas Fault of magnitude 7.8 would result in a total building damage of approximately $39.7 billion, or 12.4 percent of the total assessed value for the planning area.

NCCWD also participated in the update to the San Mateo County Multi-Jurisdictional Hazard Mitigation Plan. Section 3: Annexes for Special District Partners, Part 2- Water Districts: Chapter 5. North Coast County Water District of the Final Draft Updated County HMP, provides a specific hazard mitigation plan for NCCWD (NCCWD HMP; Attachment D). The NCCWD HMP identifies earthquakes as a high hazard risk, and also identifies severe weather, landslide, flood, fire, tsunami as medium hazard risks. The NCCWD HMP identifies several hazard mitigations for the NCCWD to implement to reduce the identified hazard risks. NCCWD has implemented in recent years and is continuing to implement several of these actions through its capital improvement program, including storage tank seismic retrofits, expansion of storage capacity, interconnection improvements, pipeline improvements, and exploration of local supply sources.

8. COMMUNICATION PROTOCOLS

☑ ***CWC § 10632 (a) (5)***

Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:

(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.

(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.

(C) Any other relevant communications.

Even before formal declaration of a water shortage by NCCWD, a public information program will be activated to provide customers with as much advance notice as possible. Following declaration of a shortage, NCCWD customers will be provided notice of water shortage rules and regulations via a variety of media and communications methods, including, for example, bill inserts, automated phone system call out with shortage level details, social media posts, website content, advertising on the local TV station, newsletters, and signs and banners posted around the service area.

Coordination between NCCWD and with other public agencies can begin prior to formal declaration of a water shortage and can be accomplished through regular meetings, e-mail group updates, and presentations. In a regional water shortage scenario, NCCWD would use the public outreach resources and materials provided by BAWSCA and SFPUC. In addition to these materials, NCCWD may develop its own materials to communicate with customers, such as a dedicated customer service hotline, and expand its normal public outreach to support its water conservation efforts (see Section 9.2.4 of the 2020 UWMP).

As discussed in Section 9.2.6 of the UWMP, NCCWD currently has three staff members with responsibilities for water conservation. Staff time dedicated to water conservation and enforcement action will increase with the severity of a supply shortage. Additional duties may be assigned to current NCCWD employees or hiring of temporary staff may be considered to meet staffing needs during extreme water shortages.

9. COMPLIANCE AND ENFORCEMENT

☑ ***CWC § 10632 (a) (6)*** *For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.*

Enforcement of the District's water use restrictions and prohibitions is focused on soliciting cooperation from water customers who are unaware of the restrictions or have failed to comply with the provisions of this WSCP. If repeated discussions with the customer are unsuccessful in obtaining compliance, the District is authorized to temporarily terminate water service or install a flow restrictor that violate the restrictions and prohibitions listed in Table 6-1.

The enforcement actions that the District is authorized to take after each violation of the WSCP are described in the District's WSCP Resolution adopted by the Board of Directors and are summarized in Table 9-1. Actions range from education/written notice after the first violation and discontinuance or restriction of water service after the fourth violation. As shown in Table 9-1, customers will incur additional charges for providing on-site notification, installation and removal of flow restricting devices, and disconnection and reconnection of service on a time and material basis if the District deems these actions necessary.

In addition, the District's current conservation pricing is tiered for single family residential accounts such that charges for excess use are effectively included. All other accounts are billed at a higher fixed rate set to dissuade high water use. NCCWD has also imposed mandatory water-rationing programs in the past which include excess use charges. Future mandatory water rationing programs will also carry similar charges and penalties.

As mentioned in Section 8, staff time dedicated to water conservation and enforcement action will increase with the severity of a supply shortage. Additional duties may be assigned to current District employees or hiring of temporary staff may be considered to meet staffing needs during extreme water shortages to enforce compliance.

Table 9-1 Enforcement of Water Use Restrictions and Prohibitions

Violation	Enforcement Action or Penalty
1st	The District will attempt to educate the customers by contacting them and informing the customer about the violation, potential penalties, and compliance requirements.
2nd	The District will send a written notice to the customer specifying the nature of the violation and the date and time of occurrence and request that the customer cease the violation and take prompt remedial action. The District will provide the customer with a copy of the Ordinance and inform the customer that failure to comply may result in termination of water service.
3rd	The District will make reasonable efforts to notify the customer of the violation and post a notice on the front door or other point of entry onto the property requiring the customer to cease the violation and take remedial action within 48 hours of the on-site notification. Failure to comply after the on-site notification may result in the temporary termination of water service.
4th	In the event that a further violation(s) is observed by District personnel 48 or more hours after the on-site notification, it will be deemed a willful violation of the mandatory restrictions on water use and the District may temporarily terminate water service or install a flow restrictor. The customer shall be responsible for paying the District's costs incurred in enforcing this Ordinance, including providing the on-site notification, installing a flow restrictor, and temporarily terminating and restoring water service, on a time and material basis. The customer shall pay all fees and charges above, and the customer's account must be in good standing, in order for the District to proceed with the reconnection of water service after it has been temporarily terminated.

10. LEGAL AUTHORITIES

☑ ***CWC § 10632 (a) (7)***

(A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.

(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.

(C) A statement that an urban water supplier shall coordinate with any District or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

☑ ***CWC § 10632.3***

It is the intent of the Legislature that, upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the board defer to implementation of locally adopted water shortage contingency plans to the extent practicable.

NCCWD WSCP is adopted by Resolution No. 1118, a resolution of the Board of Directors adopting a Water Shortage Contingency Plan.

The provisions of each water shortage stage of action are triggered upon the Board of Director's determination that a Governing Authority has required NCCWD to achieve a voluntary or mandatory reduction in water use because of water shortage conditions or because of a local supply shortage.

The stages of action will become effective after the Board of Directors declares a particular stage of action and NCCWD has published notice of this determination. Once effective, the provisions of a water shortage stage of action will stay in effect until (1) a different stage of action is declared; or (2) the Board of Directors determines that the water shortfall condition no longer exists and NCCWD has published notice of this determination.

NCCWD shall declare a water shortage emergency in accordance with Water Code Chapter 3 (commencing with Section 350) of Division 1. NCCWD shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency. A list of contacts for other cities and counties within the NCCWD service area is provided below:

- City of Pacifica
  City Manager
  170 Santa Maria Avenue
  Pacifica, CA 94044
  (650) 738-7300

- San Mateo County
  County Manager
  400 County Center, 1st Floor
  Redwood City, CA 94063
  (650) 363-4123

NCCWD is a member of BAWSCA and anticipates coordinating with other Member Agencies via BAWSCA during a water shortage or emergency on the SFPUC RWS.

11. FINANCIAL CONSEQUENCES OF WSCP

☑ ***CWC § 10632 (a) (8)***

A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:

(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).

(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.

In the event of a drought, if NCCWD anticipates significant loss in revenue due to decreased water consumption, NCCWD may increase its water rates so that customers are charged for the actual cost of providing water during a shortage. These rates will be specified in NCCWD's water rate schedule in accordance with Proposition 218 requirements.

NCCWD understands the projected ranges of water sales by shortage stage and what the impact would be on projected revenues and expenditures by each shortage stage. Revenues would decrease as consumption decreased. Expenditures would increase as response actions are implemented.

NCCWD is currently completing a water rate study and cost of service analysis, which is anticipated to be complete by the end of 2021. NCCWD is investigating the implementation of drought surcharge rates in conjunction with its water rate study. Drought surcharge rates would be designed to compensate for lost revenue due to the decreased volumetric water sales and additional expenses related to implementation of the WSCP. The District may update this WSCP after the new rates structure is adopted.

In addition, NCCWD manages an emergency reserve fund to address the potential financial impacts of a severe drought. NCCWD may also defer expense on capital improvement projects during a severe drought.

The administration of the WSCP will also have an impact on NCCWD's general and administrative costs. Costs could include funding additional staff focused on high water consumption monitoring, water waste patrols, additional billing requirements, and customer outreach. Other costs could be related to funding additional rebate programs, print and mail costs for additional outreach, and expenses related to creating and enforcing customer water budgets. These costs will be considered whenever NCCWD's budget is next adopted. Revenue from potential excess use charges as result of implementation of the water allocation program can also be applied towards the administration of the WSCP to help offset the revenue shortfalls.

12. MONITORING AND REPORTING

☑ ***CWC § 10632 (a) (9)*** *For an urban retail water supplier, 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.*

NCCWD monitors water use through analysis of wholesale water purchases and customer meter readings. The NCCWD reads meters installed on each of its supply turnouts to monitor wholesale water purchases. In addition, each customer account is metered. Some large landscape sites, including City parks and schools, have irrigation meters to monitor water use for landscape irrigation separately from indoor uses.[6]

The NCCWD reads all meters read on a bi-monthly basis. During a supply shortage, NCCWD will continue to monitor water use on this schedule to determine the effectiveness of the customer response to the implementation of this WSCP. If necessary, NCCWD may increase the frequency of meter readings and increase proactive leak checks and water audits based on customer consumption.

Pursuant to California Code of Regulations (CCR) Title 23 §991, NCCWD reports monthly water use and production to the SWRCB.[7] Effective October 1, 2020, during a governor declared drought emergency or when an urban water supplier invokes a water shortage level to respond to a drought greater than 10 percent, each supplier is required to submit an expanded report that contains the supplier's actions and statistics in achieving planning reductions.

[6] Several schools and parks use recycled water. Shortages of recycled water are not anticipated even during drought.

[7] Water supplier monthly reports can be accessed at https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/conservation_reporting.html

13. WSCP REFINEMENT PROCEDURES

☑ ***CWC § 10632 (a) (10)*** *Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.*

The WSCP is implemented as an adaptive management plan. NCCWD will evaluate the need to revise its WSCP every year after performing its Annual Assessment or commensurate with its UWMP updates. The evaluation will consider the effectiveness of WSCP actions and any anticipated water supply shortages assessed by the Annual Assessment. If the WSCP is revised, the Board of Directors will adopt a new resolution adopting the revised WSCP and, if necessary, declare a water shortage level to implement.

14. PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY

☑ ***CWC § 10632 (c)*** *The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any District or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.*

As described in Section 10 of the 2020 UWMP, NCCWD informed the public and the appropriate agencies of: (1) its intent to prepare a WSCP, (2) where the WSCP was available for public review, and (3) when the public hearing regarding the WSCP would be held. All notifications were completed in compliance with the stipulations of Section 6066 of the Government Code.

A copy of the adopted 2020 WSCP including any amendments will be provided to the Department of Water Resources (DWR), the California State Library, San Mateo County, and SFPUC within 30 days of the adoption. An electronic copy of the adopted 2020 WSCP will be submitted to the DWR using the DWR online submittal tool.

A copy of the adopted 2020 WSCP will be available for public review in the NCCWD District Office during normal business hours and on NCCWD's website within 30 days after filing the plan with DWR.

REFERENCES

BAWSCA, 2020. *Bay Area Water Supply and Conservation Agency Annual Survey FY 2018-19,* March 2020.

County of San Mateo, 2004, *San Mateo County/ Operational Area Emergency Operations Plan, Potable Water Procurement and Distribution Annex,* 3rd Edition, July 2004.

County of San Mateo, 2016. *San Mateo County Hazard Mitigation Plan,* prepared by Tetra Tech, dated July 2016.

ATTACHMENT A
ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

SECTION 1 INTRODUCTION

The San Francisco Public Utilities Commission (SFPUC) is pleased to present this Water Shortage Contingency Plan (WSCP or Plan) for the City and County of San Francisco (City).

The City owns and operates the San Francisco Regional Water System (RWS), a public asset that plays a key role in delivering high-quality drinking water to more than 2.7 million residents and businesses in the San Francisco Bay Area. The system collects water from the Tuolumne River in the Sierra Nevada and from protected local watersheds in the East Bay and Peninsula.

The SFPUC operates the RWS to deliver water to 27 wholesale customers in Alameda, Santa Clara, and San Mateo Counties, as well as the Groveland Community Services District (Groveland CSD) in Tuolumne County. The Bay Area Water Supply and Conservation Agency (BAWSCA) represents the interests of 26 of the wholesale customers in Alameda, Santa Clara, and San Mateo Counties (collectively, Wholesale Customers) and coordinates their water conservation programming. The SFPUC also provides retail water service to customers in San Francisco (generally referred to as in-City retail customers) and a small number of customers outside of San Francisco that are located along the RWS transmission system (generally referred to as suburban retail customers). Additionally, some retail customers are supplied with local groundwater and recycled water supplies. The SFPUC also has a robust retail conservation program, as well as an Onsite Water Reuse program to reduce water demands and use water more efficiently.

This WSCP presents the latest information about the SFPUC's annual water supply and demand assessment (WSDA) procedures and describes the SFPUC's water shortage contingency planning. This WSCP coincides with additional planning efforts conducted by the SFPUC, including its urban water management planning.

This introduction section provides background on the SFPUC's response to past water shortage experiences pre-2010 (Section 1.1, described in more detail in Appendix B) as well as the most recent 2012-2016 drought (Section 1.2, described in more detail in Appendix C).

1.1 EXPERIENCE WITH WATER SHORTAGES PRE-2010

Every water system has vulnerabilities in terms of its ability to provide a safe and reliable supply of water. Water shortages can occur in a number of ways. Very localized shortages can occur due to distribution system problems, and system shortages can occur due to major facility failures. Apart from system facility contingencies, potential drought periods may limit the amount of water that is available over a series of years. Drought contingency planning is not necessarily caused by physical facility limitations. Within the past 30 years, San Francisco has experienced both localized shortages due to earthquakes and system-wide shortages due to drought.

The SFPUC's past experiences with water shortages during drought and following major earthquakes have shaped its current water shortage preparedness plans and response policies:

- In 1987-92 San Francisco experienced a serious drought. During 6-year drought the SFPUC adopted various levels of action in response to the main Hetch Hetchy source of water available to the SFPUC being taxed to the point of running out of water.

- Following the October 17, 1989 Loma Prieta earthquake, the SFPUC worked with the Mayor's Office of Emergency Response to reconnect water service to retail customers impacted by the earthquake. Most of the homes that lost water service were reconnected within 72 hours.

- In April 2007, below normal precipitation and snow pack caused the SFPUC to initiate a 10% voluntary reduction in water use in the service area. The call for a voluntary reduction continued through 2009.

The 1987-92 drought illustrated the deficit between the SFPUC's supplies and its customers' demands. Other than the 1976-77 drought, drought sequences in the past did not seriously affect the ability of the SFPUC to maintain full deliveries to its customers. As the SFPUC progressed into the 1987-92 drought and reservoir storage continued to decline, it became evident that full deliveries could not be sustained without the risk of running out of water before the drought ended. This circumstance became a reality in early 1991 when the Hetch Hetchy Reservoir became so depleted (less than 25,000 AF of storage in a reservoir with over 360,000 AF of capacity) that minimum instream flow releases and anticipated demands required the SFPUC to initiate programs to achieve a 45% reduction in system-wide water deliveries to balance water supplies with deliveries. Fortunately, unexpected runoff in March 1991 provided relief from the severity of that instance of water shortage; however, the drought was far from over.

Appendix B provides a more detailed summary of San Francisco's 1987-92 drought experience and the actions taken at the time.

1.2 EXPERIENCE WITH THE 2012-2016 DROUGHT

From 2012-2016, California experienced a severe drought which included the driest four consecutive water years based on statewide precipitation (2012-2015) and the lowest April 1 statewide snowpack water equivalent (5 percent in 2015). The unprecedented dry weather conditions prompted then-Governor Jerry Brown to declare a drought State of Emergency in January 2014, which remained in effect for most of California until 2017. The SFPUC took the following actions in response to the drought:

- **Voluntary call for water use reduction:** Spurred by the declaration of a State of Emergency in January 2014, the SFPUC requested that all customers of the RWS voluntarily reduce water use by at least 10 percent. Soon after, the San Francisco Mayor's Office issued a formal executive directive requiring all City departments to develop individual water conservation plans and take immediate steps to achieve a mandatory 10 percent reduction in water consumption. Ultimately, no water shortage emergency was declared, and no subsequent mandatory system-wide demand reductions and shortage allocations were imposed because customers exceeded the 10 percent voluntary system-wide reduction in conjunction with the Statewide mandatory reductions assigned by the State Water Resources Control Board (SWRCB) (see below). The SFPUC lifted the call for a voluntary 10 percent reduction in April 2017.
- **Statewide mandatory reductions:** In July 2014, new emergency conservation regulations issued by the SWRCB prompted the SFPUC to implement outdoor water waste restrictions and require a mandatory 10 percent reduction in outdoor water use. Additional emergency conservation regulations issued by the SWRCB in the spring of 2015 established more Statewide water use restrictions, a mandatory Statewide water reduction of 25 percent compared to 2013 water use, and conservation standards for individual urban water suppliers to meet the Statewide 25 percent reduction. These emergency conservation regulations were the first of their kind, indicative of the State's desire for swift and substantial action to cope with the drought. The State's these regulations assigned the SFPUC retail service area a conservation standard of 8 percent in recognition of its low residential per capita water use. In the SFPUC wholesale service area, conservation standards assigned to the Wholesale Customers ranged from 8 percent to 36 percent. The conservation standards took effect in June 2015 and remained in effect through April 2017.
- **Mandatory reduction of outdoor water use:** In addition to the State mandates, the SFPUC imposed a mandatory 10% reduction on outdoor irrigation along with water use allocations and excess use charges for all retail irrigation customers starting in August 2014. Following the additional SWRCB regulations in the spring of 2015, the SFPUC increased the mandatory reduction on retail outdoor irrigation from 10 percent to 25 percent starting in July 2015. The SFPUC lifted the mandatory reduction on outdoor irrigation in July 2016.

Appendix C provides a more detailed overview of San Francisco's response to the 2012-2016 drought.

SECTION 2 ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

Each year the SFPUC evaluates the amount of total water storage expected to occur throughout the RWS and compares it to expected demands. This annual Water Supply and Demand Assessment (WSDA) is described in the subsections below, which are organized by the sequential steps the SFPUC takes to conduct the assessment each year and reference the relevant California Water Code requirements for a WSDA.[1]

The SFPUC's annual WSDA is a robust planning system that considers a range of input factors unique to the SFPUC's water supplies and system configuration while also providing the flexibility to consider new factors. Traditional surface water supplies from the SFPUC's up country, East Bay, and Peninsula reservoirs are the backbone of the water supply, but the SFPUC extends and protects those supplies in many additional ways by: (1) partnering with the community to help save water through robust conservation programs; (2) minimizing the need for additional water to serve new developments through an onsite water reuse program; (3) recycling wastewater resources to deliver water for large non-potable uses; (4) utilizing local groundwater supplies to supplement surface water supplies; (5) investigating new, alternative water supply options such as purified water and desalination; and (6) investing in innovations that allow for creative solutions to meet diverse needs. These efforts help the SFPUC conserve water and diversify supplies to reduce likelihood of a water shortage condition.

2.1 DEMAND ASSESSMENT [WATER CODE SECTION 10632(A)(2)(B)(I)]

To calculate unconstrained customer demand for the purpose of an annual WSDA, the SFPUC collects information on both the retail and wholesale system demands. Retail customer demand is estimated based on the best available information to date, and typically includes the previous year's demands as well as consideration of current demand use patterns or other conditions impacting demands, such as weather and growth. Each year, in February, the SFPUC receives from BAWSCA a report of estimated Wholesale Customer demand for the upcoming year. Estimates of projected demands are provided to BAWSCA by each Wholesale Customer. Relatively small demands from the two additional wholesale customers not part of the WSA are estimated based on the best available information to date, and typically includes the previous year's demands as well as consideration of current demand use patterns or other conditions impacting demands, such as weather and growth.

2.2 SUPPLY ASSESSMENT [WATER CODE SECTIONS 10632(A)(2)(B)(II) AND 10632(A)(2)(B)(V)]

The RWS collects water from the Tuolumne River watershed in the Sierra Nevada and from local reservoirs in the Alameda and Peninsula watersheds. The RWS draws an average of 85 percent of its supply from the Tuolumne River watershed. This water feeds into an aqueduct system delivering water 167 miles by gravity to Bay Area reservoirs and customers. The remaining RWS supply is drawn from local surface waters in the Alameda and Peninsula watersheds. The split between these resources varies from year to year depending on the water year hydrology and operational circumstances.

To project and evaluate water supply conditions, the SFPUC uses measurements of precipitation and snowpack in the watersheds above Hetch Hetchy, Cherry, and Eleanor Reservoirs. Snowpack conditions are evaluated regularly by the Cooperative Snow Survey (conducted by the SFPUC in partnership with state and federal agencies) beginning in late January of each year. The SFPUC also estimates snowpack conditions using information from airborne snow observatory (ASO) and other sources. The SFPUC maintains a hydrologic model of the watersheds that uses this information to

[1] California Water Code section 10632(a)(1) requires "*the analysis of water supply reliability conducted pursuant to Section 10635.*" Additional information about the SFPUC's water supply reliability analysis can be found in Chapter 7 of the SFPUC's 2020 UWMP.

project expected runoff for the coming year. This process also includes a statistical analysis of additional expected precipitation. In addition to projected runoff, the determination of projected available water supply also takes into account stored water throughout the RWS, water acquired by the SFPUC from non-SFPUC sources, inactive storage, reservoir losses, and allowances for carryover storage.

Additionally, the SFPUC accounts for groundwater provided by the San Francisco Groundwater Supply Project for the in-City retail system and recycled water provided for irrigation at Harding Park, Fleming and Sharp Park Golf Courses.

The RWS relies on precipitation and snowmelt captured and stored in its reservoirs. During droughts, water supply deliveries can exceed inflows, such that water stored in previous years is relied upon to meet demands. Because of the importance of carry-over storage, the SFPUC constantly monitors and evaluates water supply conditions in the RWS. Look-ahead forecasts are updated as a year's hydrology and operations change. Generally, in early winter of any year, SFPUC staff can begin providing a forecast of water supply conditions for the upcoming year based on known and anticipated winter and spring precipitation and snowpack. The predictive power of this forecast improves greatly through the spring. The annual precipitation, snowmelt, and carry-over storage together constitute the SFPUC's reservoir storage condition. Using data for each of these factors, the SFPUC can determine whether the reservoir system will be capable of serving full deliveries to its customers. Section 2.3 describes the system modeling SFPUC conducts.

Table 2-1 shows the availability of RWS supplies for retail customers and Wholesale Customers in normal years. Table 2-2 shows the current and projected RWS supply needs to meet retail and wholesale demands based on information and projections presented in the SFPUC's 2020 UWMP.

The SFPUC sells water to 26 of its 28 wholesale customers under the terms of the 25-year contract known as the Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County (WSA) and associated individual water sales contracts with each Wholesale Customer. The WSA carries forward the SFPUC's "Supply Assurance" of 184 million gallons per day (mgd) to the Wholesale Customers. The SFPUC has agreed to deliver water to the Wholesale Customers up to the amount of the Supply Assurance, and this agreement is perpetual and survives the expiration of the WSA. The Supply Assurance is, however, subject to reduction due to water shortage, drought, scheduled RWS maintenance activities, and emergencies. As part of the Phased Water System Improvement Plan (WSIP) in 2008, the SFPUC established a temporary 265 mgd annual average limitation on water deliveries from RWS watersheds, the "Interim Supply Limitation" (ISL). The SFPUC has allocated the ISL between the retail customers and Wholesale Customers as follows:

- Wholesale supply allocation: 184 mgd
- Retail supply allocation: 81 mgd[2]

[2] Groveland CSD is considered a retail customer of the SFPUC. Thus, RWS supplies to Groveland CSD are accounted for in the retail supply allocation of 81 mgd.

Table 2-1. Regional Water System Supply Availability in Normal Years (mgd)

RWS Supply Allocation	Actual	Projected				
	2020	2025	2030	2035	2040	2045
Retail Customers[a, b]	81	81	81	81	81	81
Wholesale Customers[c, d]	184	184	184	184	184	184
Total RWS Supplies	265	265	265	265	265	265

a Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if these alternative supplies are not available, up to 81 mgd of RWS supply could be used in normal years.

b Groveland CSD is reported as a wholesale customer for the purposes of this 2020 UWMP, but it is considered a retail customer of the SFPUC solely for purposes of allocating RWS supplies between retail and Wholesale Customers. Its demands would be met by the retail supply allocation of 81 mgd.

c Projected Wholesale Customer deliveries are limited to 184 mgd, including the demands of the Cities of San Jose and Santa Clara, which are supplied on a temporary and interruptible basis, with their total supply not exceeding 9 mgd assuming supply is available (decision to be made by end of 2028).

d Cordilleras MWC is not a party to the WSA, and it is not included in the wholesale supply allocation of 184 mgd. The demands of Cordilleras MWC are minor (projected to be less than 0.01 mgd) and are anticipated to be met with RWS supplies through 2045.

Table 2-2. Regional Water System Supply Utilized in Normal Years (mgd)

RWS Supply Allocation	Actual	Projected				
	2020	2025	2030	2035	2040	2045
Retail Customers[a, b]	66.5	67.2	67.5	68.6	70.5	73.7
Wholesale Customers[c, d]	132.1	146.0	147.9	151.9	156.3	162.8
Total RWS Supplies	198.6	213.2	215.4	220.5	226.8	236.5

a Groundwater and recycled water are assumed to be used before RWS supplies to meet retail demand. However, if these alternative supplies are not available, up to 81 mgd of RWS supply could be used in normal years.

b Groveland CSD is reported as a wholesale customer for the purposes of this 2020 UWMP, but it is considered a retail customer of the SFPUC solely for purposes of allocating RWS supplies between retail and Wholesale Customers. Its demands would be met by the retail supply allocation of 81 mgd.

c Projected Wholesale Customer deliveries are limited to 184 mgd, including the demands of the Cities of San Jose and Santa Clara, which are supplied on a temporary and interruptible basis, with their total supply not exceeding 9 mgd assuming supply is available (decision to be made by end of 2028).

d Cordilleras MWC is not a party to the WSA, and it is not included in the wholesale supply allocation of 184 mgd. The demands of Cordilleras MWC are minor (projected to be less than 0.01 mgd) and are anticipated to be met with RWS supplies through 2045.

2.3 INFRASTRUCTURE CONSIDERATIONS [WATER CODE SECTION 10632(A)(2)(B)(III)]

On an ongoing basis, the SFPUC's Hetch Hetchy Water and Power, Water Supply and Treatment Division, and Hydrology and Water Systems group conduct analyses of the RWS that incorporate planned facility outages and multiple levels of projected system demands to evaluate and plan for potential water delivery constraints. These groups meet quarterly to share plans and coordinate how facility outages, changes in service area demand, wet or dry weather, and other variables shape the operating plans each year. Facility outages due to maintenance or upgrades are coordinated in an adaptive manner to respond to changes as they occur. For new water supplies or new capital projects related to supply distribution, impacts on the system are evaluated extensively prior to initiation of any changes. Results from these modeling efforts are considered in the annual WSDA.

2.4 SYSTEM MODELING [WATER CODE SECTION 10632(A)(2)(B)(IV)]

To proactively plan for conditions that would result in a shortage of water supplies, the SFPUC models conditions using a hypothetical drought that is more severe than what the RWS has historically experienced. This drought sequence is referred to as the "design drought" and serves as the basis for planning and modeling of future scenarios. The design drought consists of an 8.5-year sequence of dry conditions.

In applying its water supply planning methodology, the SFPUC performs an initial model simulation of the system for the design drought sequence and then reviews the ability of the system to deliver water to the service area through the entire design drought sequence. If the projected water supply runs out before the end of the design drought sequence in the initial model run, system-wide water use reduction is added and the scenario is re-run. This process continues iteratively until a model simulation of the system is achieved in which the water supply in storage at the end of the design drought sequence is brought to the system "dead pool," where no additional storage is available for delivery (currently simulated as 96,775 acre-feet). Drawing system storage down to the dead pool without going below it indicates that water supply delivery, including the adjusted amount of water use, is maintained through the design drought sequence.

Estimated reduced water use levels and corresponding storage threshold values can then be used to simulate the operation of the system through the historical record of hydrology, or to evaluate system water supply conditions during an ongoing drought. While the design drought sequence does not occur in the historical hydrology, the reduced water use and storage threshold values that are adjusted to allow a system configuration to maintain water delivery through the design drought sequence can be used to evaluate system performance in the historical record, or as a comparison for real-time system conditions. Through use of this planning method, the SFPUC can simulate a response to declining water supply in storage that is appropriate for the system conditions being evaluated.

The SFPUC plans its water deliveries using indicators for water use reduction that are developed through analysis with the design drought sequence. As a result, the SFPUC system operations are designed to provide sufficient carry-over water in SFPUC reservoirs to continue delivering water, although at reduced levels, during multiple-year droughts.

2.5 DECISION-MAKING PROCESS [WATER CODE SECTION 10632(A)(2)(A)]

Regardless of the expectation of shortage conditions, as part of the normal course of business, the SFPUC provides a water supply condition update to its executive team every two weeks throughout the year. The SFPUC also provides water supply estimates to its Wholesale Customers on a monthly basis beginning February 1. A Wholesale Customer Annual Meeting is held in the latter portion of February at which the SFPUC makes a presentation on current water supply conditions and forecasts. The last snow survey of the season typically occurs within the first week of April, followed by a runoff forecast to determine total system storage expected as of July 1. By the middle of April, the SFPUC sends a formal letter to the Wholesale Customers summarizing the water supply availability for the coming year.

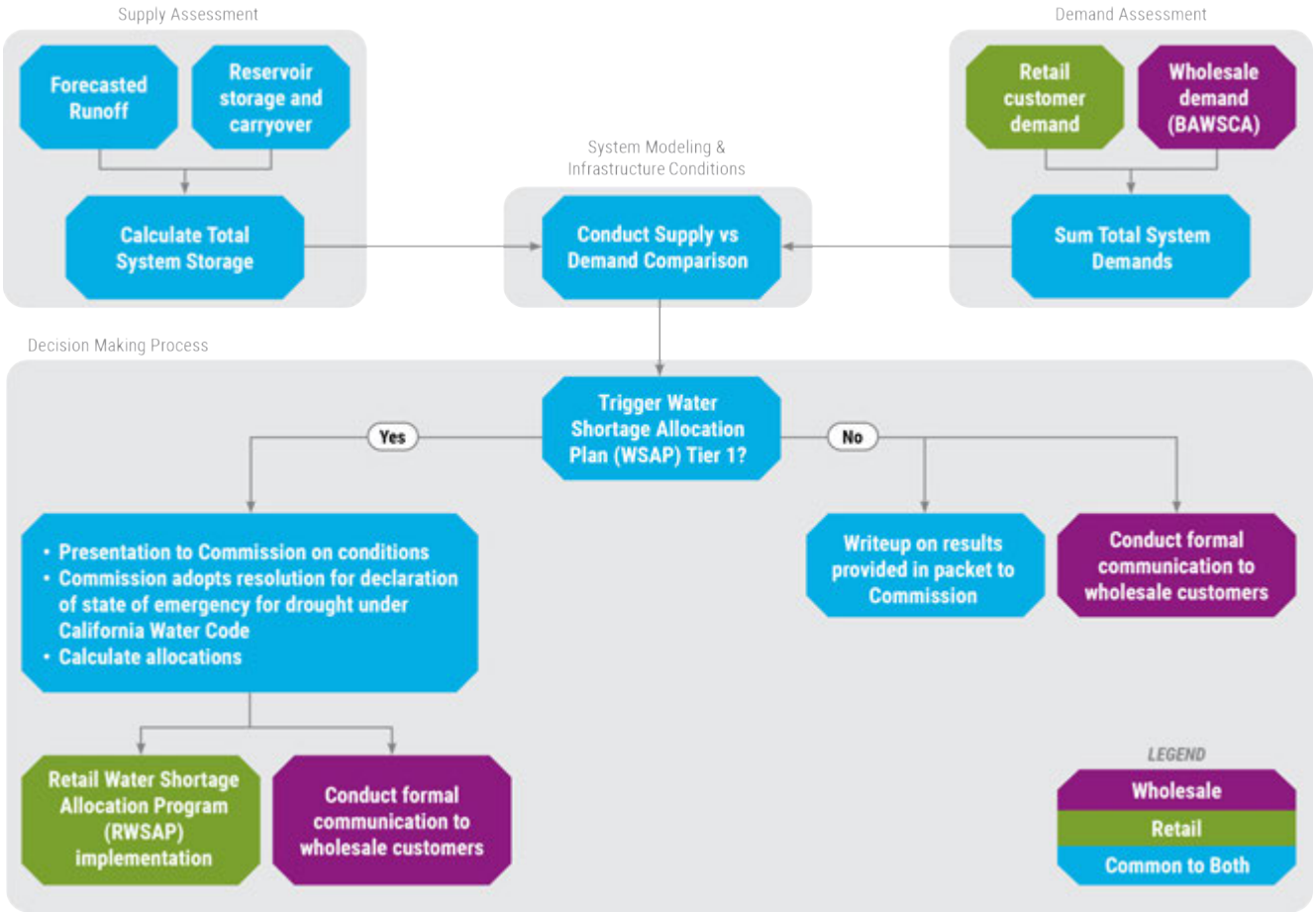
If the RWS appears incapable of meeting system-wide demand due to drought, the SFPUC is expected to declare a water shortage by March 31 of that drought year. The General Manager, or designee, is responsible for declaring such a shortage. A presentation would be made to the Commission as part of the General Manager's report, showing conditions of precipitation to date, snowpack, and storage levels with more information as necessary depending on the particulars of the supply forecast. Depending on the level of shortage, the Commission may adopt a resolution declaring a water shortage emergency under the California Water Code, or lesser actions such as a call for voluntary conservation efforts.

Prior to the initiation of any water delivery reductions to its retail customers, whether it be initial implementation of delivery reductions or implementing a different water shortage level, the SFPUC will outline a drought response plan to address the following: the water supply situation; proposed water use reduction objectives; alternatives to water use reductions;

methods to calculate water use allocations and adjustments; compliance methodology and enforcement measures; and budget considerations. Details on the expected allocation program are described further in Section 4.1. This drought response plan will be presented at a regularly scheduled SFPUC Commission meeting and advertised in accordance with the requirements of Section 6066 of the California Government Code.

The overall WSDA process is described visually in the flowchart presented in Figure 2-1.

Figure 2-1: Water Supply and Demand Assessment Process



ATTACHMENT B
DROUGHT RESPONSE TOOL QUANTITATIVE ASSESSMENT

Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

1 - Home

Example Water District

Enter Agency Information	
Agency Name	North Coast County Water District
Total Population Served	38,665
Number of Residential Accounts	11,451
Number of Commercial, Industrial, and Institutional (CII) Accounts	988
Number of Dedicated Irrigation Accounts	91
Baseline Year(s)	2019
Percentage of Residential Indoor Use During Minimum Month (%)	100%
Percentage of CII Indoor Use During Minimum Month (%)	100%
Comments	

Navigation	
USER'S GUIDE	Download and read the guide before using this Tool
1 - HOME	Enter agency information
2 - INPUT BASELINE YEAR WATER USE	Enter Baseline Year production and use
3 - BASELINE YEAR WATER USE	Review and confirm entered information
4 - DROUGHT RESPONSE ACTIONS	Select Drought Response Actions and input estimated water savings and implementation rates.
5 - ESTIMATED WATER SAVINGS	Review estimated water production and compare estimated savings to conservation target.
6 - DROUGHT RESPONSE TRACKING	Track production and water savings against the conservation target.

1 - Home

Example Water District

For questions about this tool or for additional information, contact:

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(650) 292-9100

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2 - Input Baseline Year (2019) Water Use

North Coast County Water District

Input Baseline Year (2019) Production and Water Use

Units: (mg)

Select the units to input monthly production and use data. Enter the total monthly potable water production for the Baseline Year. Next, enter monthly water use data by sector for the Baseline Year. If you bill on a bi-monthly basis, divide your billing data between the months that the billing cycle includes. If your single-family and multi-family accounts are tracked separately, enter the combined water use for both sectors in the Residential Water Use column. If your commercial, industrial, and institutional (CII) accounts are tracked separately, enter the combined water use for each sector in the CII Water Use column. Your non-revenue water use is calculated by subtracting your monthly residential, CII, and dedicated irrigation water uses from your monthly production. Your monthly residential gallons per capita per day (R-GPCD) is calculated by dividing your monthly residential water use by your population entered in Worksheet 1 - Home.

Date	Total Production (mg)	Residential Water Use (mg)	CII Water Use (mg)	Dedicated Irrigation Water Use (mg)	Non-Revenue Water Use (mg)	Total R-GPCD	Comments
January	61	48	8	0	5	40	
February	59	48	8	0	3	44	
March	63	48	8	1	6	40	
April	67	49	8	1	9	42	
May	65	52	9	2	2	43	
June	85	54	9	3	19	47	
July	78	56	10	3	9	47	
August	81	56	11	3	10	47	
September	73	56	11	3	3	48	
October	63	55	10	3	-5	46	
November	74	58	12	2	2	50	
December	64	50	8	1	5	42	

3 - Baseline Year (2019) Water Use Profile

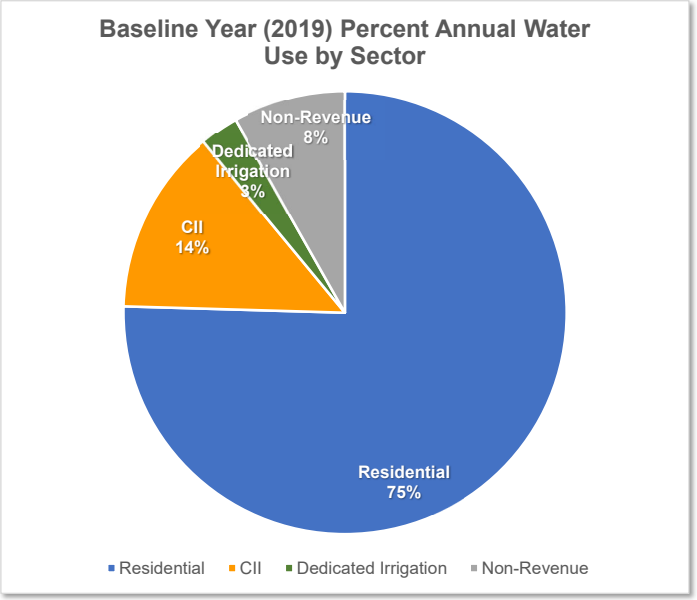
North Coast County Water District

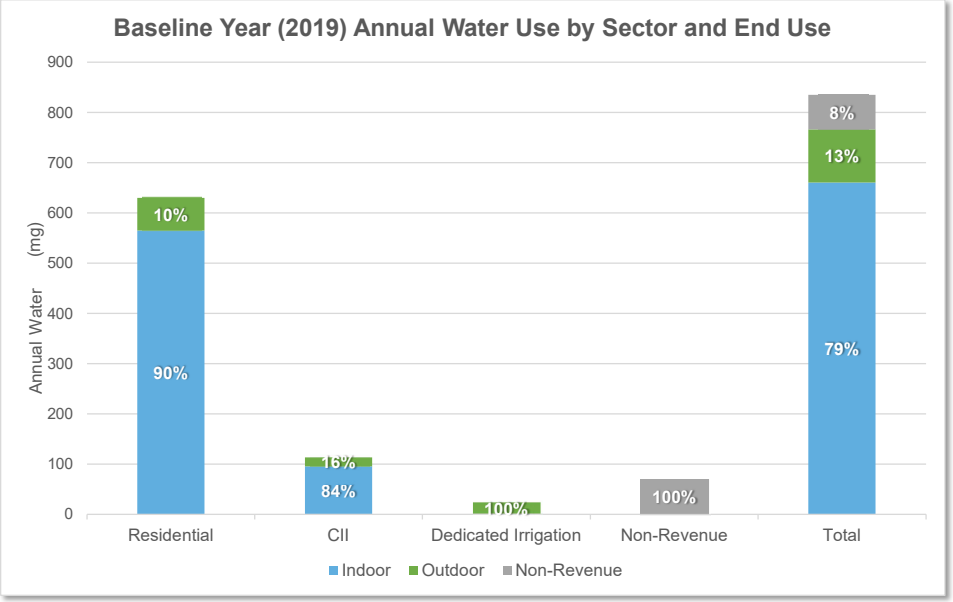
Baseline Year (2019) Annual Water Use Summary

Units: (mg)

A summary of your Baseline Year water use by sector and major end use category is shown below. Select the units in which your production and use data are displayed.

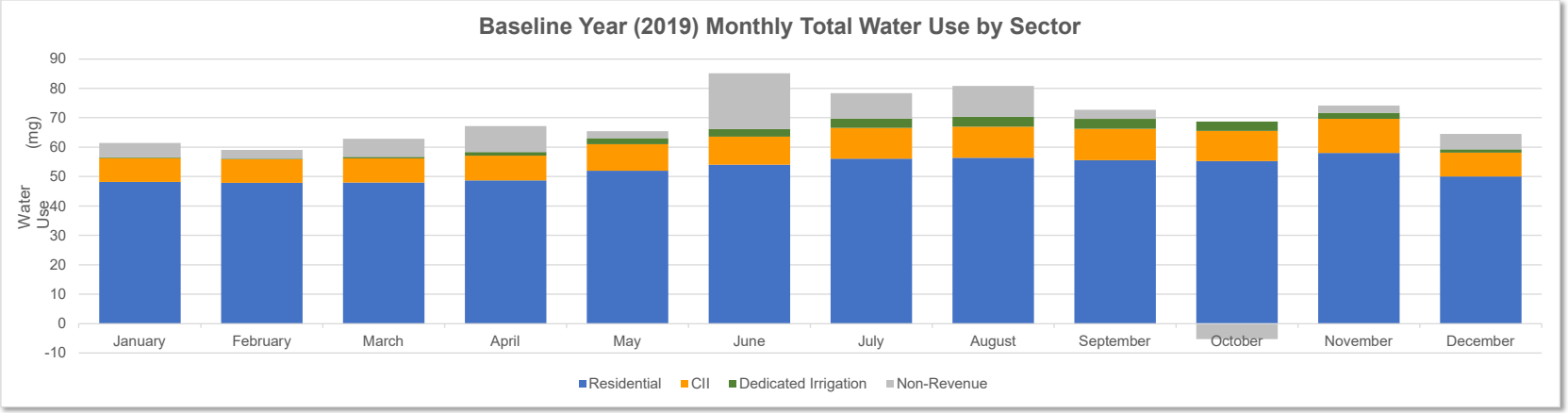
Water Use	Total Production (mg)	Water Use (mg)				Comments
		Residential	CII	Dedicated Irrigation	Non-Revenue	
Total	835	630	113	23	69	
Total Indoor	660	565	96	--	--	
Total Outdoor	106	65	18	23	--	
Total Non-Revenue	69	--	--	--	69	
Total Indoor %	79%	90%	84%	0%	--	
Total Outdoor %	13%	10%	16%	100%	--	
Total Non-Revenue %	8%	--	--	--	100%	

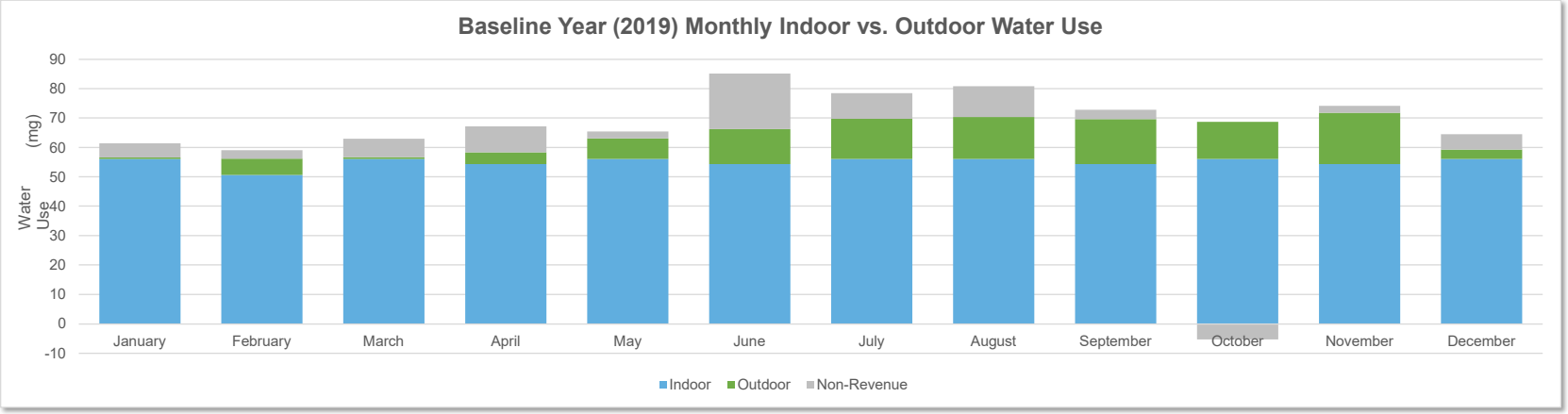




3 - Baseline Year (2019) Water Use Profile

North Coast County Water District

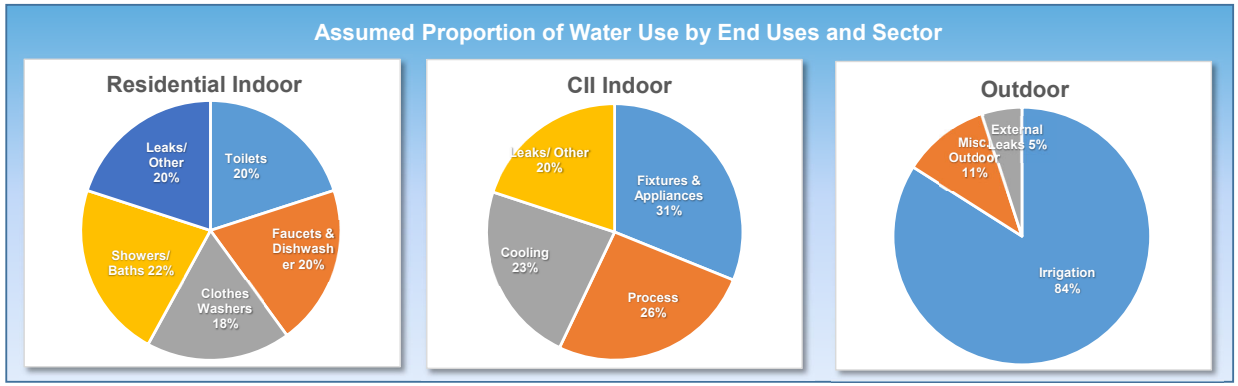




4 - Drought Response Actions - Stage 1

North Coast County Water District

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	35	R-GPCD
Maximum Residential Outdoor Savings	75%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	30%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	75%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	75%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	**26%**	of Total Baseline Production



4 - Drought Response Actions - Stage 1

North Coast County Water District

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**75%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☐	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☐	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☐	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☐	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☐			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☐			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☐	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☐	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☐	0.5%	50%	EBMUD, 2011	--

4 - Drought Response Actions - Stage 1

North Coast County Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	0.5%	50%	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☑		50%	--	--
Water Efficiency Workshops, Public Events	All	☑	0.5%	25%	EBMUD, 2011	--
Water Bill Inserts	All	☑	0.5%	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☑	100%	**1%**	--	--
Home or Mobile Water Use Reports	All	☑	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☐	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☑	45%	50%	DWR, 2015	Target 50% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☐	5%	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☐			--	--
Move to Monthly Metering / Billing	All	☐	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☑			--	--
Establish Drought Hotline	All	☐			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☑	30%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	38%	50%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Require Repair of all Leaks within 24 hours	External Leaks	☐	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☐	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☐	**25%**	**90%**	--	--

4 - Drought Response Actions - Stage 1

North Coast County Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Agency Drought Actions / Restrictions**						
▶ **Residential**						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☑	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	38%	**75%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☐	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☐	100%	5%	--	--
Require Pool Covers	Misc. Outdoor	☑	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☐	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All Residential Uses	☐	**20%**	**90%**	--	--
Establish Water Budget - 20% Reduction	All Residential Uses	☐	20%	50%	--	--
▶ **CII**						
Conduct CII Surveys Targeting High Water Users	All CII uses	☑	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	38%	**75%**	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☐		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☐	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☐	100%	5%	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☐	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☐	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All CII uses	☐	10%	**90%**	--	--
Establish Water Budget - 20% Reduction	All CII uses	☐	20%	50%	--	--
Establish Water Budget - 30% Reduction	All CII uses	☐	30%	50%	--	--

4 - Drought Response Actions - Stage 1

North Coast County Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

5 - Estimated Water Savings - Stage 1

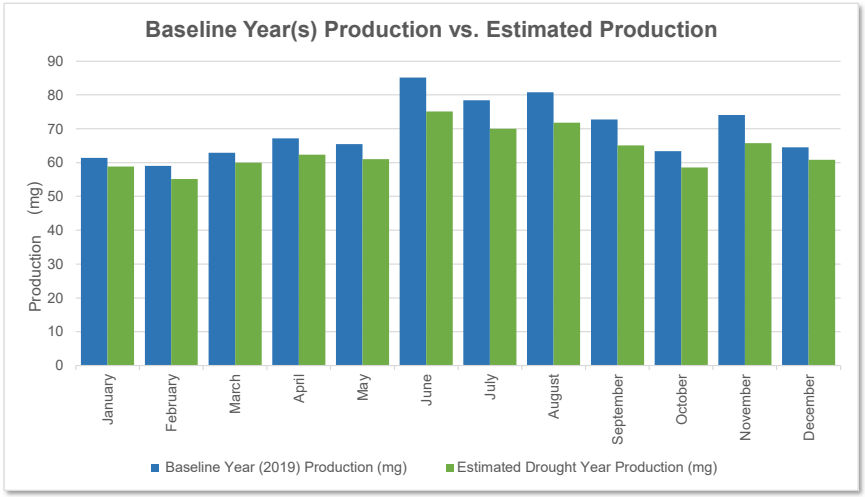
North Coast County Water District

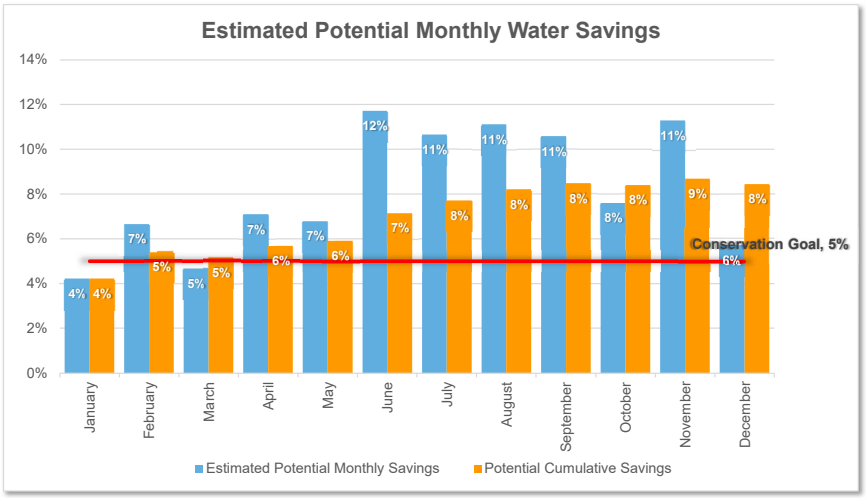
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
January	61	59	4%	4%	5%	
February	59	55	7%	5%	5%	
March	63	60	5%	5%	5%	
April	67	62	7%	6%	5%	
May	65	61	7%	6%	5%	
June	85	75	12%	7%	5%	
July	78	70	11%	8%	5%	
August	81	72	11%	8%	5%	
September	73	65	11%	8%	5%	
October	63	59	8%	8%	5%	
November	74	66	11%	9%	5%	
December	64	61	6%	8%	5%	

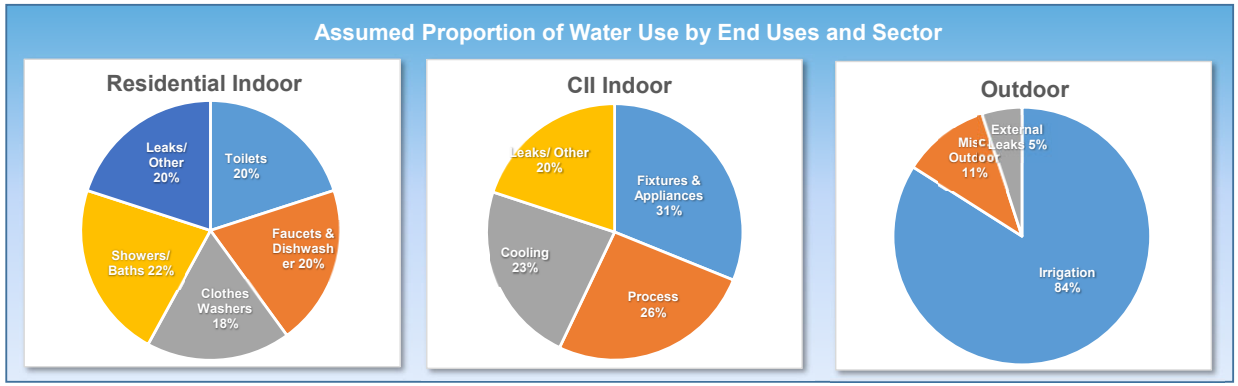




4 - Drought Response Actions - Stage 2

North Coast County Water District

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	25	R-GPCD
Maximum Residential Outdoor Savings	100%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	30%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	75%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	75%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	**44%**	of Total Baseline Production



4 - Drought Response Actions - Stage 2

North Coast County Water District

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**75%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☐	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☐	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☐	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☐	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☐			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☐			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☐	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☐	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☐	0.5%	50%	EBMUD, 2011	--

4 - Drought Response Actions - Stage 2

North Coast County Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	0.5%	**75%**	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☑		**75%**	--	--
Water Efficiency Workshops, Public Events	All	☑	0.5%	25%	EBMUD, 2011	--
Water Bill Inserts	All	☑	0.5%	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☑	100%	**5%**	--	--
Home or Mobile Water Use Reports	All	☑	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☑	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☑	45%	50%	DWR, 2015	Target 50% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☐	5%	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☐			--	--
Move to Monthly Metering / Billing	All	☐	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☑			--	--
Establish Drought Hotline	All	☐			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☑	30%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	50%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	**90%**		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Require Repair of all Leaks within 24 hours	External Leaks	☐	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☐	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☐	**25%**	**90%**	--	--

4 - Drought Response Actions - Stage 2

North Coast County Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Residential**						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☑	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	75%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	**90%**		
Prohibit use of Potable Water for Irrigation	Irrigation	☐	100%	50%		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☐	100%	5%	--	--
Require Pool Covers	Misc. Outdoor	☑	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☑	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All Residential Uses	☐	**20%**	**95%**	--	--
Establish Water Budget - 20% Reduction	All Residential Uses	☐	20%	50%	--	--
► **CII**						
Conduct CII Surveys Targeting High Water Users	All CII uses	☑	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	75%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	**90%**		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☑		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☐	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☐	100%	5%	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☑	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All CII uses	☐	10%	**90%**	--	--
Establish Water Budget - 20% Reduction	All CII uses	☐	20%	50%	--	--
Establish Water Budget - 30% Reduction	All CII uses	☐	30%	50%	--	--

4 - Drought Response Actions - Stage 2

North Coast County Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

5 - Estimated Water Savings - Stage 2

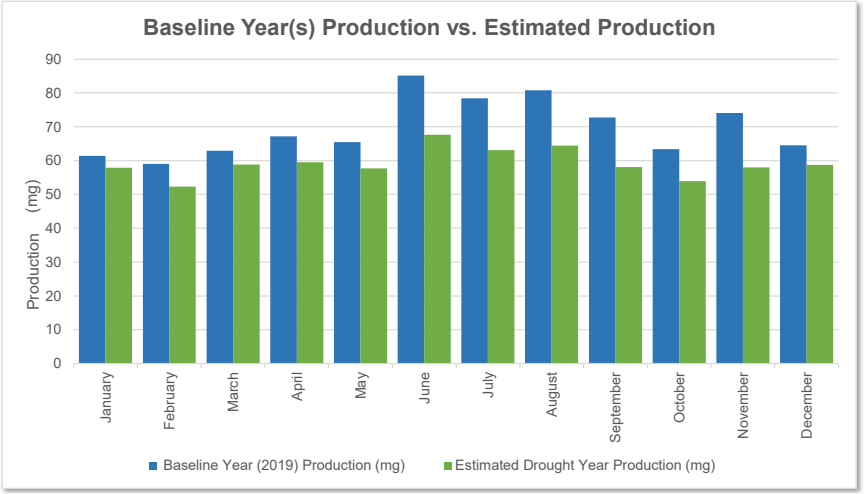
North Coast County Water District

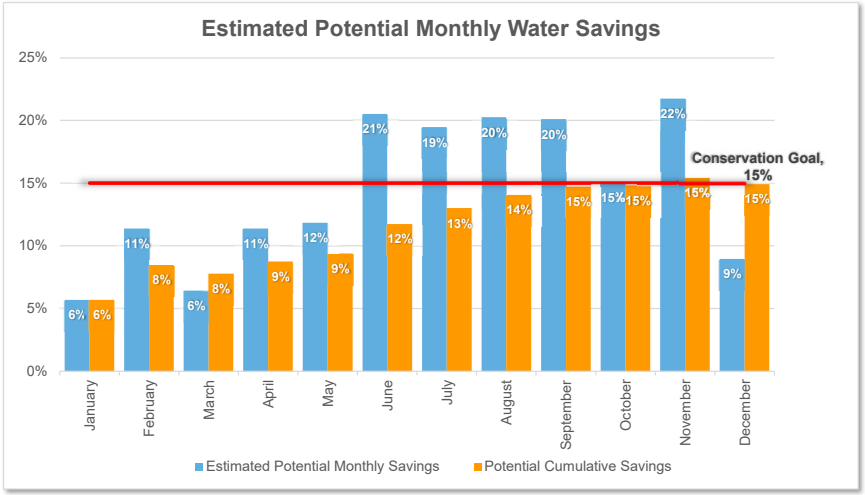
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
January	61	58	6%	6%	15%	
February	59	52	11%	8%	15%	
March	63	59	6%	8%	15%	
April	67	59	11%	9%	15%	
May	65	58	12%	9%	15%	
June	85	68	21%	12%	15%	
July	78	63	19%	13%	15%	
August	81	64	20%	14%	15%	
September	73	58	20%	15%	15%	
October	63	54	15%	15%	15%	
November	74	58	22%	15%	15%	
December	64	59	9%	15%	15%	

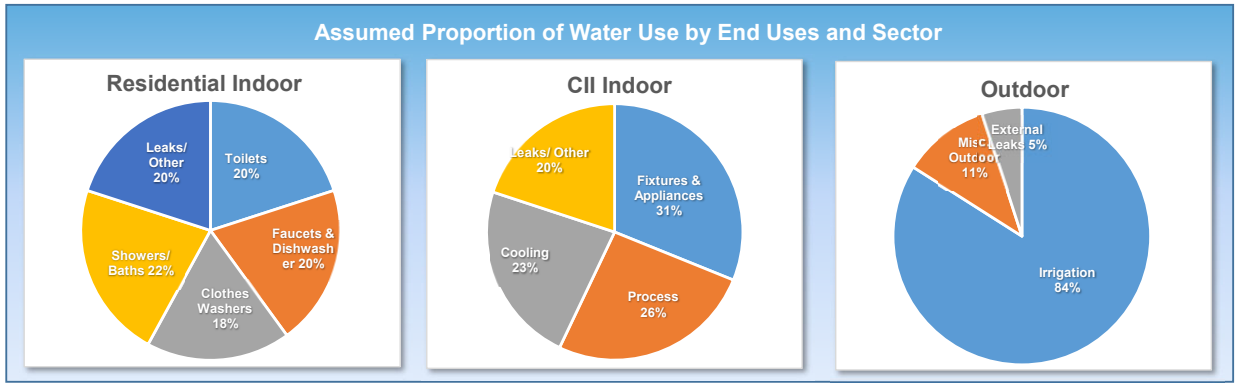




4 - Drought Response Actions - Stage 3

North Coast County Water District

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	25	R-GPCD
Maximum Residential Outdoor Savings	75%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	30%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	75%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	75%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	**42%**	of Total Baseline Production



4 - Drought Response Actions - Stage 3

North Coast County Water District

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**75%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☐	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☐	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☐	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☐	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☐			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☐			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☐	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☐	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☐	0.5%	50%	EBMUD, 2011	--

4 - Drought Response Actions - Stage 3

North Coast County Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	0.5%	50%	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☑		50%	--	--
Water Efficiency Workshops, Public Events	All	☑	0.5%	25%	EBMUD, 2011	--
Water Bill Inserts	All	☑	0.5%	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☑	100%		--	--
Home or Mobile Water Use Reports	All	☑	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☑	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☑	45%	50%	DWR, 2015	Target 50% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☐	5%	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☑			--	--
Move to Monthly Metering / Billing	All	☐	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☑			--	--
Establish Drought Hotline	All	☐			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☑	30%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	50%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☑	100%	50%		
Require Repair of all Leaks within 24 hours	External Leaks	☐	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☐	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☑	**50%**	**90%**	--	--

4 - Drought Response Actions - Stage 3

North Coast County Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Residential**						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☑	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	75%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☑	100%	50%		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☐	100%	5%	--	--
Require Pool Covers	Misc. Outdoor	☑	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☑	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All Residential Uses	☑	**30%**	**90%**	--	--
Establish Water Budget - 20% Reduction	All Residential Uses	☐	20%	50%	--	--
► **CII**						
Conduct CII Surveys Targeting High Water Users	All CII uses	☑	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	75%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	50%		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☑		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☐	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☐	100%	5%	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☑	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All CII uses	☑	**15%**	**80%**	--	--
Establish Water Budget - 20% Reduction	All CII uses	☐	20%	50%	--	--
Establish Water Budget - 30% Reduction	All CII uses	☐	30%	50%	--	--

4 - Drought Response Actions - Stage 3

North Coast County Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

5 - Estimated Water Savings - Stage 3

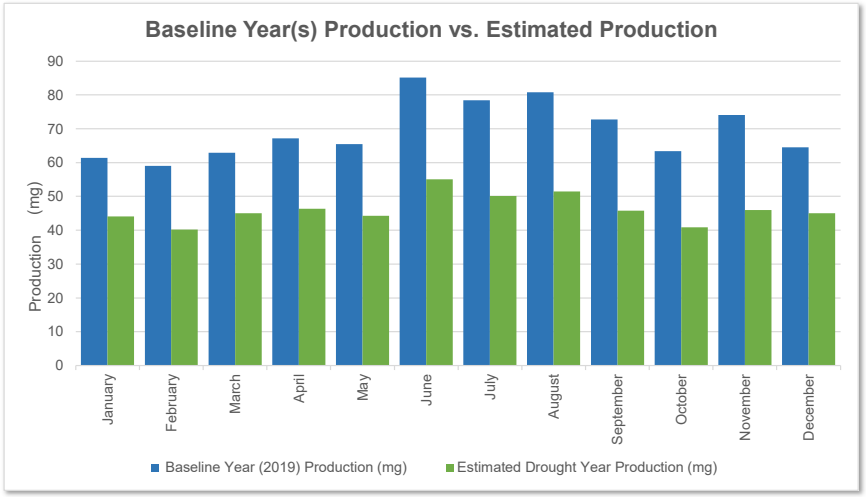
North Coast County Water District

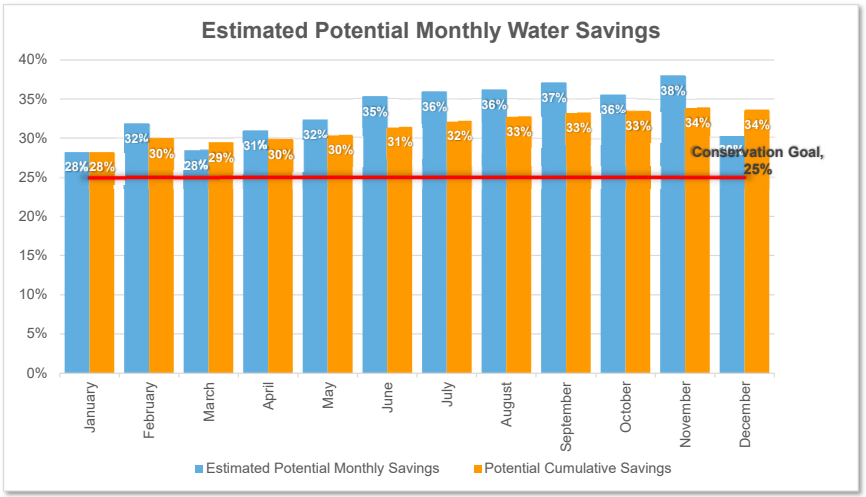
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
January	61	44	28%	28%	25%	
February	59	40	32%	30%	25%	
March	63	45	28%	29%	25%	
April	67	46	31%	30%	25%	
May	65	44	32%	30%	25%	
June	85	55	35%	31%	25%	
July	78	50	36%	32%	25%	
August	81	52	36%	33%	25%	
September	73	46	37%	33%	25%	
October	63	41	36%	33%	25%	
November	74	46	38%	34%	25%	
December	64	45	30%	34%	25%	

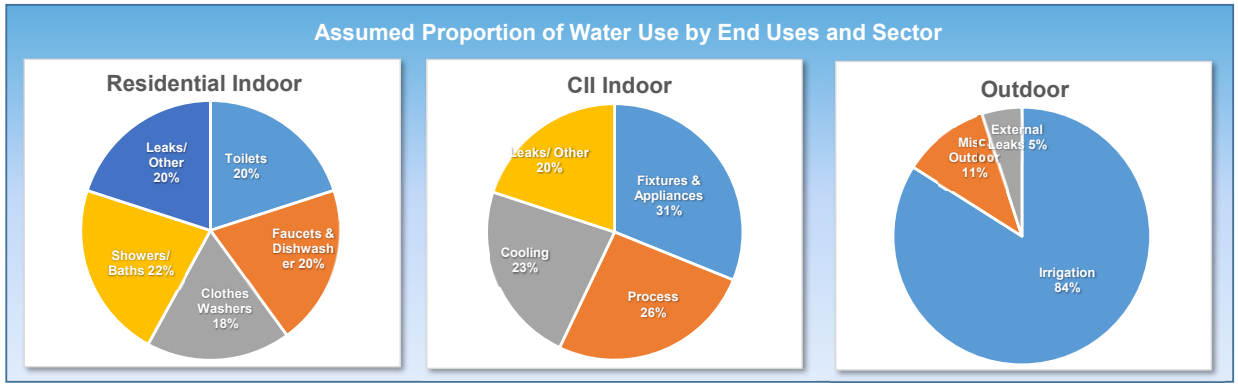




4 - Drought Response Actions - Stage 4

North Coast County Water District

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	25	R-GPCD
Maximum Residential Outdoor Savings	75%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	50%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	75%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	100%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	**45%**	of Total Baseline Production



4 - Drought Response Actions - Stage 4

North Coast County Water District

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**75%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☐	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☐	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☐	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☐	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☐			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☐			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☐	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☐	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☐	0.5%	50%	EBMUD, 2011	--

4 - Drought Response Actions - Stage 4

North Coast County Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	0.5%	50%	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☑		50%	--	--
Water Efficiency Workshops, Public Events	All	☑	0.5%	25%	EBMUD, 2011	--
Water Bill Inserts	All	☑	0.5%	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☑	100%		--	--
Home or Mobile Water Use Reports	All	☑	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☑	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☑	45%	50%	DWR, 2015	Target 50% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☐	5%	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☑			--	--
Move to Monthly Metering / Billing	All	☑	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☑			--	--
Establish Drought Hotline	All	☐			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☑	30%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	50%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☑	100%	50%		
Require Repair of all Leaks within 24 hours	External Leaks	☐	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☐	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☑	75%	**90%**	--	--

4 - Drought Response Actions - Stage 4

North Coast County Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Residential**						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☑	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	75%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☑	100%	50%		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☐	100%	5%	--	--
Require Pool Covers	Misc. Outdoor	☑	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☑	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All Residential Uses	☑	**40%**	**90%**	--	--
Establish Water Budget - 20% Reduction	All Residential Uses	☐	20%	50%	--	--
► **CII**						
Conduct CII Surveys Targeting High Water Users	All CII uses	☑	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	75%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	50%		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☑		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☐	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☐	100%	5%	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☑	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All CII uses	☑	**40%**	**80%**	--	--
Establish Water Budget - 20% Reduction	All CII uses	☐	20%	50%	--	--
Establish Water Budget - 30% Reduction	All CII uses	☐	30%	50%	--	--

4 - Drought Response Actions - Stage 4

North Coast County Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

5 - Estimated Water Savings - Stage 4

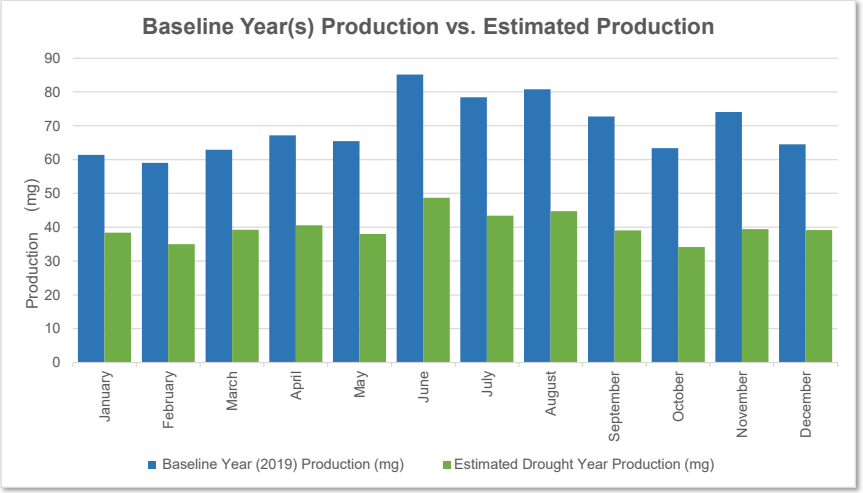
North Coast County Water District

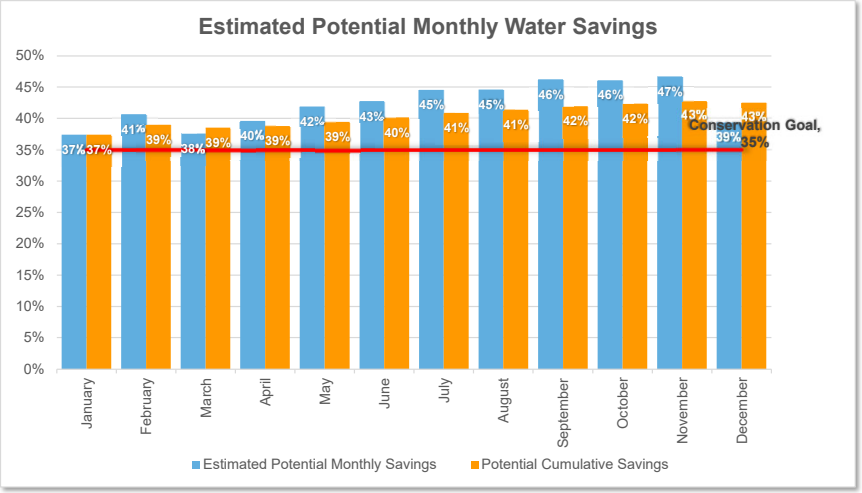
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
January	61	38	37%	37%	35%	
February	59	35	41%	39%	35%	
March	63	39	38%	39%	35%	
April	67	41	40%	39%	35%	
May	65	38	42%	39%	35%	
June	85	49	43%	40%	35%	
July	78	43	45%	41%	35%	
August	81	45	45%	41%	35%	
September	73	39	46%	42%	35%	
October	63	34	46%	42%	35%	
November	74	39	47%	43%	35%	
December	64	39	39%	43%	35%	

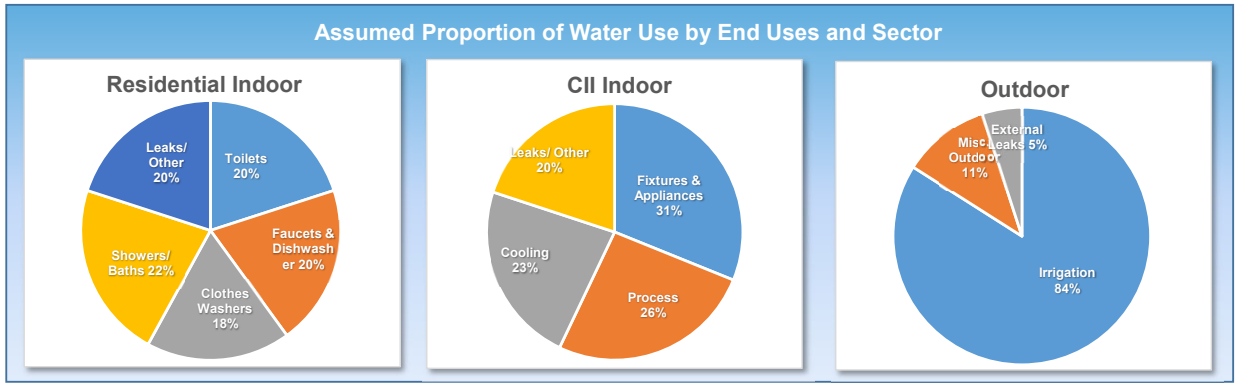




4 - Drought Response Actions - Stage 5

North Coast County Water District

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	24	R-GPCD
Maximum Residential Outdoor Savings	100%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	100%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	100%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	100%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	**55%**	of Total Baseline Production



4 - Drought Response Actions - Stage 5

North Coast County Water District

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**75%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☐	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☐	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☐	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☐	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☐			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☐			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☐	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☐	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☐	0.5%	50%	EBMUD, 2011	--

4 - Drought Response Actions - Stage 5

North Coast County Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	0.5%	50%	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☑		50%	--	--
Water Efficiency Workshops, Public Events	All	☑	0.5%	25%	EBMUD, 2011	--
Water Bill Inserts	All	☑	0.5%	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☑	100%		--	--
Home or Mobile Water Use Reports	All	☑	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☑	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☑	45%	50%	DWR, 2015	Target 50% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☐	5%	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☑			--	--
Move to Monthly Metering / Billing	All	☑	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☑			--	--
Establish Drought Hotline	All	☐			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☑	30%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	50%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	100%	100%		
Prohibit use of Potable Water for Irrigation	Irrigation	☑	100%	50%		
Require Repair of all Leaks within 24 hours	External Leaks	☐	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☐	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☑	**100%**	**100%**	--	--

4 - Drought Response Actions - Stage 5

North Coast County Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Agency Drought Actions / Restrictions**						
▶ **Residential**						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☑	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	75%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☑	100%	50%		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☐	100%	5%	--	--
Require Pool Covers	Misc. Outdoor	☑	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☑	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All Residential Uses	☑	**40%**	**95%**	--	--
Establish Water Budget - 20% Reduction	All Residential Uses	☐	20%	50%	--	--
▶ **CII**						
Conduct CII Surveys Targeting High Water Users	All CII uses	☑	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	75%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	50%		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☑		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☐	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☐	100%	5%	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☑	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All CII uses	☑	**85%**	**90%**	--	--
Establish Water Budget - 20% Reduction	All CII uses	☐	20%	50%	--	--
Establish Water Budget - 30% Reduction	All CII uses	☐	30%	50%	--	--

4 - Drought Response Actions - Stage 5

North Coast County Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

5 - Estimated Water Savings - Stage 5

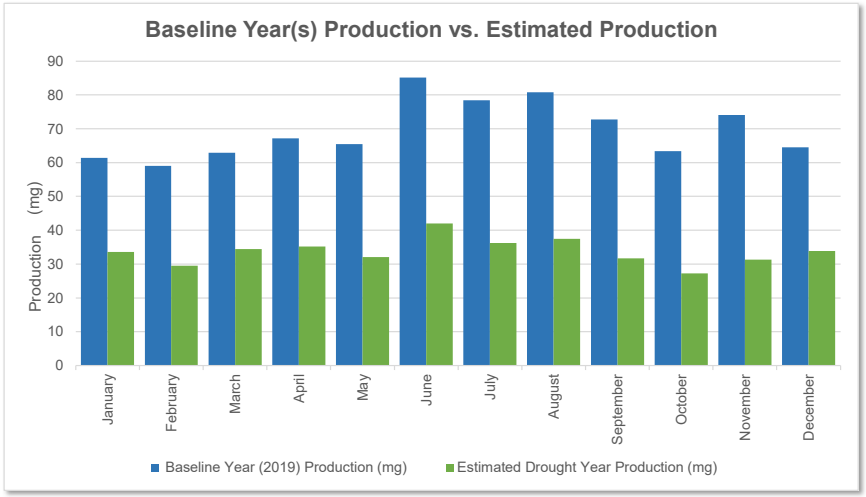
North Coast County Water District

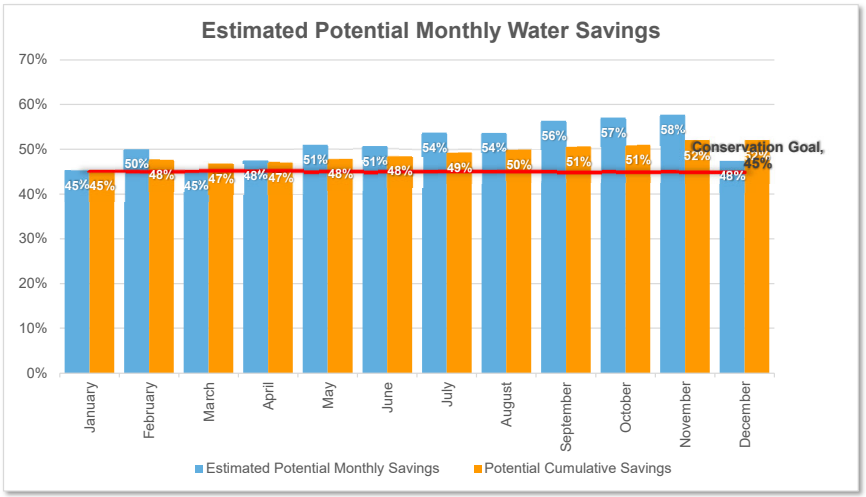
Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
January	61	34	45%	45%	45%	
February	59	30	50%	48%	45%	
March	63	34	45%	47%	45%	
April	67	35	48%	47%	45%	
May	65	32	51%	48%	45%	
June	85	42	51%	48%	45%	
July	78	36	54%	49%	45%	
August	81	37	54%	50%	45%	
September	73	32	56%	51%	45%	
October	63	27	57%	51%	45%	
November	74	31	58%	52%	45%	
December	64	34	48%	52%	45%	

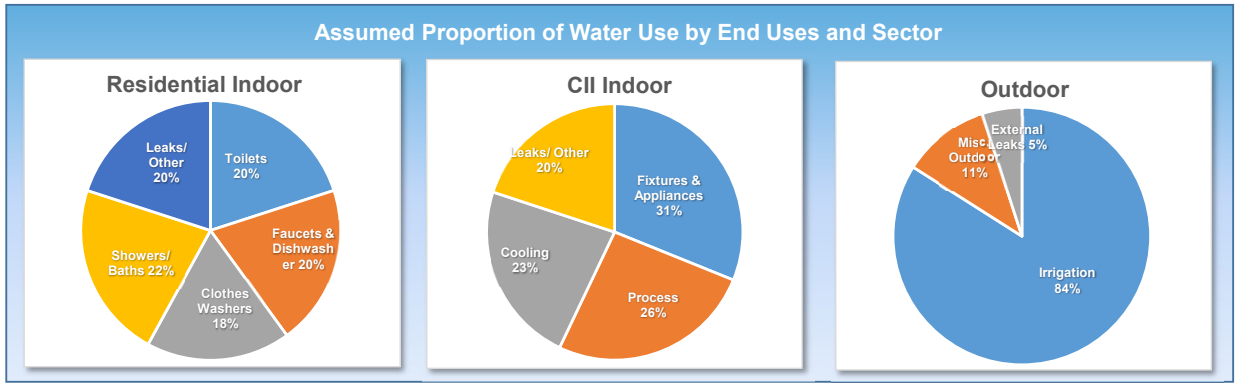




4 - Drought Response Actions - Stage 6

North Coast County Water District

Maximum Savings Potential		
Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.		
Minimum Residential Indoor GPCD	22	R-GPCD
Maximum Residential Outdoor Savings	100%	of Baseline Residential Outdoor Water Use
Maximum CII Indoor Savings	100%	of Baseline CII Indoor Water Use
Maximum CII Outdoor Savings	100%	of Baseline CII Outdoor Water Use
Maximum Dedicated Irrigation Account Savings	100%	of Baseline Dedicated Irrigation Water Use
Maximum Non-Revenue Water Savings	50%	of Baseline Non-Revenue Water Use
Resulting Total Maximum Annual Savings Potential	**59%**	of Total Baseline Production



4 - Drought Response Actions - Stage 6

North Coast County Water District

Drought Response Actions

Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.

Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Possible Mandatory Prohibitions**	All Outdoor	☑	14%	**75%**	--	--
Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems	Irrigation	☐			--	--
Require Shut-Off Nozzles on Hoses for Vehicle Washing	Misc. Outdoor	☐	17%	50%	See Appendix D of the DRP	--
Prohibit Use of Potable Water to Wash Sidewalks and Driveways	Misc. Outdoor	☐	17%	50%		--
Prohibit the Use of Potable Water for Street Washing	Misc. Outdoor	☐	17%	50%		--
Prohibit Irrigation with Potable Water in a Manner that causes Runoff	Irrigation	☐	3%	50%	DeOreo et al., 2011	--
Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall	Irrigation	☐			--	--
Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians	Irrigation	☐			--	--
Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water	Misc. Outdoor	☐	50%	50%	EBMUD, 2008	--
Provide Linen Service Opt Out Options	Fixtures & Appliances	☐	0.5%	50%	EBMUD, 2011	--
Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments	Fixtures & Appliances	☐	0.5%	50%	EBMUD, 2011	--

4 - Drought Response Actions - Stage 6

North Coast County Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
► **Agency Drought Actions / Restrictions**						
► **Agency Actions**						
Media Campaign, Newspaper Articles, Website	All	☑	0.5%	50%	EBMUD, 2011	--
Promote Water Conservation / Rebate Programs	All	☑		50%	--	--
Water Efficiency Workshops, Public Events	All	☑	0.5%	25%	EBMUD, 2011	--
Water Bill Inserts	All	☑	0.5%	100%	EBMUD, 2011	--
Promote / Expand Use of Recycled Water	Irrigation	☑	100%		--	--
Home or Mobile Water Use Reports	All	☑	5%	10%	WaterSmart Software, 2015	--
Decrease Frequency and Length of Line Flushing	Non Revenue Water	☑	25%	50%	See Appendix D of the DRP	Reduced flushing by 50%.
Audit and Reduce System Water Loss	Non Revenue Water	☑	45%	50%	DWR, 2015	Target 50% of leakage.
Implement Drought Rate Structure / Water Budgets	All	☐	5%	100%	CUWCC, 2015	--
Establish Retrofit on Resale Ordinance	All Residential Indoor	☐	21%	6%	SFPUC, 2004	First Tuesday, 2015
Require Net Zero Demand Increase on New Connections	All	☐			--	--
Moratorium on New Connections	All	☑			--	--
Move to Monthly Metering / Billing	All	☑	5%	10%	See Appendix D of the DRP	--
Increase Water Waste Patrols / Enforcement	All	☑			--	--
Establish Drought Hotline	All	☐			--	--
Reduce Distribution System Pressures	Non Revenue Water	☐	4.5%	100%	CUWCC, 2010; DWR, 2015	--
► **Dedicated Irrigation**						
Conduct Irrigation Account Surveys	Irrigation	☑	30%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	50%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☑	100%	50%		
Require Repair of all Leaks within 24 hours	External Leaks	☐	100%	5%	--	--
Customer Water Budgets						
Establish Water Budget - 25% Reduction	Irrigation	☐	25%	50%	--	--
Establish Water Budget - 50% Reduction	Irrigation	☐	50%	50%	--	--
Establish Water Budget - 75% Reduction	Irrigation	☑	**100%**	**100%**	--	--

4 - Drought Response Actions - Stage 6

North Coast County Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Agency Drought Actions / Restrictions**						
▶ **Residential**						
Conduct Water Use Surveys Targeting High Water Users	All Residential Uses	☑	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	75%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	79%	50%		
Prohibit use of Potable Water for Irrigation	Irrigation	☑	100%	50%		
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☐	50%	50%	EBMUD, 2008	--
Require Repair of all Leaks within 24 hours	Leaks	☐	100%	5%	--	--
Require Pool Covers	Misc. Outdoor	☑	28%	25%	Maddaus & Mayer, 2001	--
Prohibit Filling of Pools	Misc. Outdoor	☑	55%	25%	DeOreo et al., 2011	--
Customer Water Budgets						
Establish Water Budget - 50% Reduction	All Residential Uses	☑	**45%**	**100%**	--	--
Establish Water Budget - 20% Reduction	All Residential Uses	☐	20%	50%	--	--
▶ **CII**						
Conduct CII Surveys Targeting High Water Users	All CII uses	☑	10%	10%	EBMUD, 2011	--
Limit Irrigation Days, Time and Duration (Select One)						
Limit Irrigation to 2 Days/Week, 15 Minutes/Day, Between 9PM and 6AM	Irrigation	☐	38%	75%	UC IPM, 2014	--
Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM	Irrigation	☑	79%	50%		
Prohibit Use of Potable Water for Construction and Dust Control	Misc. Outdoor	☑		100%	--	--
Prohibit Single-Pass Cooling Systems	Cooling	☐	80%	1%	Vickers, 2001	--
Require Repair of all Leaks within 24 hours	Leaks	☐	100%	5%	--	--
Prohibit Vehicle Washing Except with Recycled Water	Misc. Outdoor	☑	50%	50%	EBMUD, 2008	--
Require Water-Efficient Pre-Rinse Spray Valves	Fixtures & Appliances	☑	0.8%	50%	EPA, 2015; Pacific Institute, 2003	--
Customer Water Budgets						
Establish Water Budget - 10% Reduction	All CII uses	☑	**100%**	**90%**	--	--
Establish Water Budget - 20% Reduction	All CII uses	☐	20%	50%	--	--
Establish Water Budget - 30% Reduction	All CII uses	☐	30%	50%	--	--

4 - Drought Response Actions - Stage 6

North Coast County Water District

Drought Response Actions						
Action Description	End Use(s)	Implement Program	End Use Savings (%)	Implementation Rate	Source of Default Savings Estimate	Source of Default Implementation Rate
▶ **Residential Customer Actions to Encourage**						
Install Bathroom Faucet Aerators	Faucets and Dishwashers	☐			--	--
Install a Water-Efficient Showerhead	Showers/Baths	☐			--	--
Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking	Faucets and Dishwashers	☐			--	--
Fill the Bathtub Halfway	Showers/Baths	☐			--	--
Wash Only Full Loads of Clothes	Clothes Washers	☐			--	--
Install a High-Efficiency Toilet	Toilets	☐			--	--
Take Shorter Showers	Showers/Baths	☐			--	--
Run Dishwasher Only When Full	Faucets and Dishwashers	☐			--	--
Reduce Outdoor Irrigation	Irrigation	☐			--	--
Install Drip-Irrigation	Irrigation	☐			--	--
Use Mulch	Irrigation	☐			--	--
Plant Drought Resistant Trees and Plants	Irrigation	☐			--	--
Use a Broom to Clean Outdoor Areas	Misc. Outdoor	☐			--	--
Flush Less Frequently	Toilets	☐			--	--
Re-Use Shower or Bath Water for Irrigation	Irrigation	☐			--	--
Wash Car at Facility that Recycles the Water	Misc. Outdoor	☐			--	--

5 - Estimated Water Savings - Stage 6

North Coast County Water District

Estimated Monthly Water Use and Savings Summary

Units: (mg)

This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.

Month	Baseline Year (2019) Production (mg)	Estimated Drought Year Production (mg)	Estimated Potential Monthly Savings	Potential Cumulative Savings	Conservation Goal	Comments
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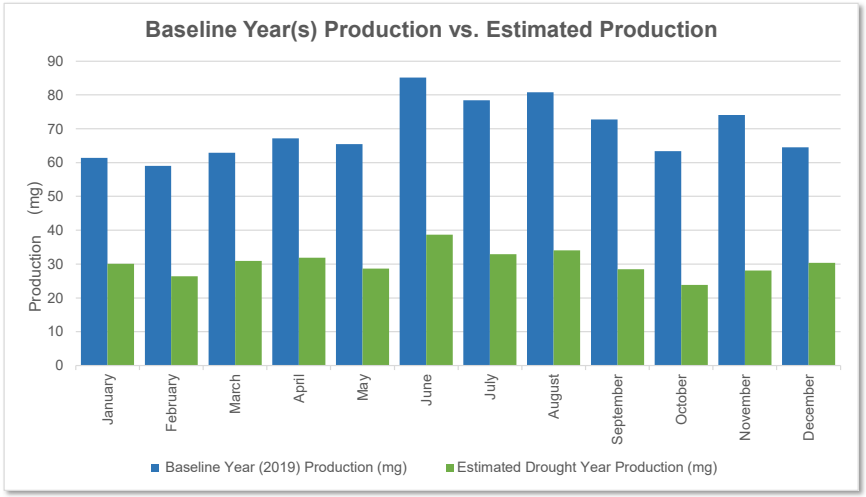
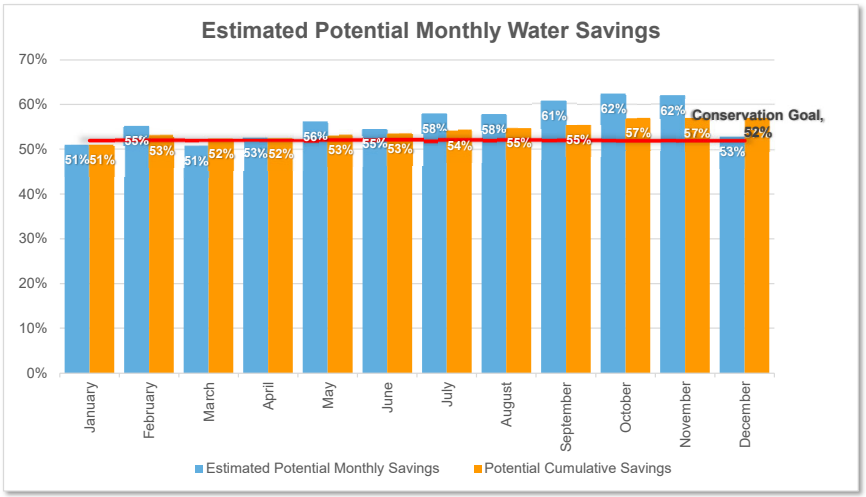
February	59	26	55%	53%	52%	
March	63	31	51%	52%	52%	
April	67	32	53%	52%	52%	
May	65	29	56%	53%	52%	
June	85	39	55%	53%	52%	
July	78	33	58%	54%	52%	
August	81	34	58%	55%	52%	
September	73	28	61%	55%	52%	
October	63	24	62%	57%	52%	
November	74	28	62%	57%	52%	
December	64	30	53%	57%	52%	





ATTACHMENT C
SFPUC EMERGENCY PREPAREDNESS PROCEDURES

PREPARATION FOR CATASTROPHIC SUPPLY INTERRUPTION

The SFPUC maintains various planning documents which collectively address its emergency preparedness and planned response in the event of a catastrophic interruption of water supplies due to power outages, earthquakes, or other disasters. These plans are described in sections 1.1 (Emergency Preparedness Plans), 1.2 (Emergency Drinking Water Planning), and 1.3 (Power Outage Preparedness and Response) below. Section 1.4 addresses the seismic risk assessment and mitigation plan required by California Water Code Section 10632.5.(a). Should a catastrophic interruption occur, the SFPUC will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency (California Government Code, California Emergency Services Act Article 2, Section 8558).

1.1 EMERGENCY PREPAREDNESS PLANS

Following the 1989 Loma Prieta Earthquake, the SFPUC created a departmental Emergency Operations Plan (EOP). The SFPUC EOP was originally released in 1992 and has been updated as necessary ever since. Most recently, the SFPUC developed a Water System Emergency Response Plan (Water ERP) to comply with the America's Water Infrastructure Act (AWIA) passed in 2018. The Water ERP acts as a unifying document, integrating and referencing common components of SFPUC plans and programs that have been developed to date. The Water ERP is intended to address water transmission and distribution systems and identify the Enterprises, Divisions, and Bureaus with direct roles and responsibilities. The Water ERP integrates directly into, and functions as an annex to, the SFPUC Emergency Operations Plan (EOP). The SFPUC EOP addresses a broad range of potential emergency situations that may affect the SFPUC and supplements the City's Emergency Response Plan, which was prepared by the Department of Emergency Management and most recently updated in 2017. Specifically, the purpose of the SFPUC EOP is to describe its emergency management organization, roles and responsibilities, and emergency policies and procedures.

In addition, SFPUC divisions and bureaus each have their own Division Emergency Operations Plans (DEOP) (in alignment with the SFPUC EOP), which detail that entity's specific emergency management organization, roles and responsibilities, and emergency policies and procedures. The SFPUC tests its DEOPs on a regular basis by conducting emergency exercises. Through these exercises, the SFPUC learns how well the plans and procedures will or will not work in response to an emergency. DEOP improvements are based on the results of these exercises and real-world event response and evaluation. The SFPUC also has an emergency response training plan that is based on federal, State, and local standards and exercise and incident improvement plans. SFPUC employees have emergency training requirements that are based on their emergency response roles.

The SFPUC EOP functions as a front end for the SFPUC's DEOPs, covering emergency response at the Department level; while each DEOP covers Division-specific information on the Division's emergency organization and response procedures specific to Division responsibilities, assets, technical scope, and operations. The types of events affecting SFPUC that may require emergency plans include but are not limited to:

- Major earthquake
- Loss of power
- Loss of water supply
- Major fire
- Hazardous material release that threatens water supply or environment
- Major pipeline breaks
- Dam break
- Significant outage of SFPUC services
- Man-made or intentional acts of terrorism resulting in damage to the system or interruption in service

In addition to the documents described above, the SFPUC also maintains various plans and procedures that deal with the possibility of alternate supply schemes and options. These include:

- Emergency Disinfection and Recovery Plan (EDRP)
- Emergency Response Action Plan (ERAP)
- Emergency Drinking Water Equipment and Alternatives Report
- Disinfection of SFPUC Water Trailers Procedure
- City Distribution Division Hydrant Manifold Standard Operating Procedure
- Pilot plant trailer (Mobile Pilot Plan O&M Plan)

1.2 EMERGENCY DRINKING WATER PLANNING

In February 2005, the SFPUC published the City Emergency Drinking Water Alternatives report. The purpose of this report was to outline a plan for supplying emergency drinking water in the City after damage and/or contamination of the SFPUC raw and/or treated water systems resulting from a major disaster. Since the publication of this report, the SFPUC has implemented a number of projects to increase its capability to support the provision of emergency drinking water during an emergency. These projects include:

- Completion of many Water System Improvement Program (WSIP) projects and other capital upgrades to improve security, detection, and communication (see Section 1.4);

- Public Information and materials for home and business;

- Construction of a disinfection and fill station at the existing San Francisco Zoo well, and obtaining a permit to utilize this well as a standby emergency drinking water source;

- Constructed six wells as part of the San Francisco Groundwater Supply Project, two of which also serve as emergency drinking water supplies, including a distribution system to fill emergency water tankers;

- Purchase and engineering of emergency-related equipment, including water tanker trucks and water distribution manifolds, to help with distribution post-disaster; and

- Coordination of planning with other City departments, neighboring jurisdictions, and other public and private partners to maximize resources and supplies for emergency response.

The SFPUC has also prepared the RWS Water Quality Notifications and Communications Plan. This plan, which was first prepared in 1996 and was most recently updated in 2017, provides contact information, procedures, and guidelines to be implemented by several SFPUC divisions, wholesale customers, and BAWSCA in the event of water quality impacts. The plan treats water quality issues as potential or actual supply problems, which fall under the emergency response structure of the SFPUC ERP.

1.3 POWER OUTAGE PREPAREDNESS AND RESPONSE

The SFPUC's water transmission system is primarily gravity fed from Hetch Hetchy Reservoir to the City. Within the in-City distribution system, key pump stations have generators on site and all others have connections in place that would allow portable generators to be used.

Although water conveyance throughout the RWS would not be greatly impacted by power outages because it is gravity fed, the SFPUC has prepared for potential regional power outages as follows:

- The Tesla Treatment Facility, the Sunol Valley Water Treatment Plant (SVWTP), and the San Antonio Pump Station have back-up power on site in the form of generators or diesel-powered pumps. Additionally, both the SVWTP and San Antonio Pump Station would not be impacted by a failure of the regional power grid because these facilities are powered by hydropower generated by the Hetch Hetchy Water and Power System.

- Both the Harry Tracy Water Treatment Plant (HTWTP) and the Baden Pump Station (part of the Peninsula System) have back-up generators in place.

- Administrative facilities that will act as emergency operation centers also have back-up power.

- The SFPUC has an emergency water supply connection with the Santa Clara Valley Water District (SCVWD), the SCVWD intertie, which also has back-up generators in place.

- Additionally, as described in the next section, the WSIP includes projects that expand the SFPUC's ability to remain in operation during power outages and other emergency situations.

1.4 SEISMIC RISK ASSESSMENT AND MITIGATION PLAN

As part of the Facilities Reliability Program and the Water System Improvement Program (WSIP), the SFPUC performed an extensive multi-year evaluation of seismic risks to its water system that resulted in major capital improvements to increase seismic reliability. The goals of WSIP include enhancing the ability of the SFPUC water system to meet identified service goals for water quality, seismic reliability, delivery reliability, and water supply. One of the original goals of WSIP was to limit rationing to no more than 20 percent on a system-wide basis; the WSIP was developed to reduce the likelihood of shortages, thereby reducing the likelihood of needing to implement the WSCP.

The WSIP projects include several projects located in San Francisco to improve the seismic reliability of the in-City distribution system, including more wells that can be used as emergency drinking water sources. The WSIP also incorporates many projects related to the RWS to address both seismic reliability and overall system reliability. As of August 2018, the WSIP is over 96 percent complete. Local San Francisco projects are 100 percent complete as of June 2020. The current forecasted date to complete the overall WSIP is December 2021.

WSIP seismic levels of service (LOS) informed development of capital projects and guided program implementation. The LOS established post-earthquake delivery and recovery objectives under the following seismic scenarios:

- Magnitude 7.9 event on the San Andreas fault
- Magnitude 7.3 event on the Hayward fault
- Magnitude 6.9 event on the Calaveras fault

An assessment of seismic risk and resilience is contained in the body of analysis performed to support the WSIP. The risks associated with the seismic scenarios considered are reflected in the delivery objectives established in the LOS, specifically:

- Delivery of winter month demand 24 hours after a major earthquake, and
- Delivery of average day demand 30 days after a major earthquake

In addition to the improvements that have or will come from the WSIP, the City has already constructed system interties for use during catastrophic emergencies, short-term facility maintenance and upgrade activities, and times of water shortages. These are listed below:

- A 35 mgd intertie with the EBMUD allowing EBMUD to serve the City of Hayward's demand and/or supply the SFPUC directly (and vice versa);
-
- A 40-mgd system intertie between the SFPUC and SCVWD; and,
-
- One permanent and one temporary intertie to the South Bay Aqueduct, which would enable the SFPUC to receive State Water Project water.

The WSIP also includes projects related to standby power facilities at various locations. These projects provide for standby electrical power at six critical facilities to keep them in operation during power outages and other emergency situations. Permanent engine generators are located at four locations (San Pedro Valve Lot, Millbrae Facility, Alameda West, and HTWTP), while hookups for portable engine generators are at two locations (San Antonio Reservoir and Calaveras Reservoir).The City of San Francisco also has a Hazard Mitigation Plan which was last updated in June 2014 and includes sections describing earthquakes hazards and mitigation for assets within the City's boundary, including state-regulated reservoirs (Sutro, Sunset North and South, and University Mound North and South).

ATTACHMENT D
NORTH COAST COUNTY WATER DISTRICT HAZARD MITITGATION PLAN

Chapter 5.
North Coast County Water District

5.1 Hazard Mitigation Plan Point of Contact

Primary Point of Contact
Cari Lemke, General Manager
P.O. Box 1039 (2400 Francisco Blvd.)
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Alternate Point of Contact
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Pacifica CA 94044
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5.2 Jurisdiction Profile

5.2.1 Overview

The North Coast County Water District is a special district created in 1944 to provide potable water service to the coastal area south of the City of Daly City, west of the City of South San Francisco and City of San Bruno, and north of the City of Montara. The District began with the acceptance, from the County of San Mateo, of the assets and operation of Salada Beach Public Utility District; the District's designated service area expanded throughout the years with the acquisition of Vallemar County Water District, San Pedro Water System and the Sharp Park Sanitary District. The District also acquired land by purchase or otherwise acquiring the land from private landowners. Later, in 1957, the City of Pacifica incorporated 9 unincorporated communities which coincided primarily with the North Coast County Water District's service area.

Presently, the District is one of the San Francisco Public Utilities Commission's twenty-six wholesale customers and receives approximately 3,300 acre-feet of water deliveries annually, or 2.9 million gallons per day. This water is conveyed through a distribution system containing approximately 132 miles of pipelines ranging from 2-inches – 24-inches in diameter. The District operates 5 pump stations, 14 storage tanks, and 61 pressure regulating stations separating, but linking together, the 30 pressure zones. Pursuant to 22 CCR 64413.3 and the Water Supply Permit, the District is classified as a D4 distribution system.

The North Coast County Water District also operates a small recycled water system with 1 pump station, 1 tank and 4 service connections (e.g. City of Pacifica, Jefferson Union High School District, Pacifica School District). The District has opened a Residential Recycled Water Fill Station for residents to fill up to a 55-gallon container with recycled water for watering their gardens.

A five-member elected Board of Directors governs the District. The Board assumes responsibility for the adoption of this plan; the General Manager will oversee its implementation.

As of 2015, the District serves approximately 11,350 water connections and 4 recycled water service connections with a current staff of 20.

Funding comes primarily from water sales.

5.2.2 Service Area and Trends

The District serves a population of 38,551. Its service area covers 8,019 acres in City of Pacifica plus 606 acres of unincorporated land south of the City, extending up the slope of San Pedro Mountain.

Five of the ten common trends among water utility leaders that have had the most negative impact in the past five years include: (a) uncertain economy/financial instability, (b) availability/adequacy of water resources, (c) aging water infrastructure/capital needs, (d) shifting water demands, and (e) climate uncertainty. Some trends have been positive for some utilities while quite detrimental for others (such as the availability/adequacy of water resources). Although these extremes are largely a product of system characteristics and geographic differences, human nature seeks strategies to mitigate and master the challenges dealt in an effort to turn a negative trend positive.

The other five trends projected in "Forecasting the Future" are (f) increasing/expanding regulations, (g) changing workforce, (h) efficiency drivers/resource optimization, (i) mass/social media explosion, and (j) expanding technology application.

The North Coast County Water District's annual average precipitation is 22.0 inches, virtually all of which is rainfall, with about 87 percent falling between November and April.

5.2.3 Assets

Table 5-1 summarizes the critical assets of the district and their value.

These numbers indicate the estimated replacement value at the present date that this report was issued.

TABLE 5-1. SPECIAL PURPOSE DISTRICT ASSETS

Asset		Value
Property		
San Pedro Valley Park (Watershed)	513+/- Acres	$26,500,000
2400 Francisco Blvd: APN: 016-322-230	.79 Acres	$316,000
Milagra Site: APN: 016-460-0030	17.83 Acres	$7,132,000
Sharp Park Tank Site: APN: 017-470120	.30 Acres	$120,000
Gypsy Hill Tank Site: APN: 016-442-03	3.10 Acres	$1,240,000
Royce Tank Site: APN: 022-150-370	3.09 Acres	$1,236,000
Vallemar Tank Site: APN: 018-160-020	.24 Acres	$96,000
Christen Hill Tank Site: APN: 009-610-060	1.00 Acres	$400,000
Hickey Tank Site: APN: 009-570-440	.25 Acres	$100,000
Park Pacifica Site: APN: 023-622-440	.82 Acres	$328,000
Sheila Tank Site APN: 023-110-010	1.00 Acres	$400,000
Tapis Tank Site: APN: 023-110-050	.40 Acres	$160,000

TABLE 5-1. SPECIAL PURPOSE DISTRICT ASSETS

Asset		Value
Fassler Tank Site APN: 022-330-070	.50 Acres	$200,000
Skyline Intertie: APN: 009-320-170	.25 Acres	$100,000
Total:		**$38,328,000**
Critical Infrastructure and Equipment		
Milagra Tank (5MG)		$5,000,000
Sharp Park Tank (.5MG)		$600,000
Gypsy Hill Tank Site (3MG)		$2,500,000
Royce Tank Site (3MG, 5MG, .75MG)		$8,750,000
Vallemar Tank Site (.2MG)		$400,000
Christen Hill Tank Site (3.8MG)		$3,000,000
Hickey Tank Site (.6MG)		$750,000
Park Pacifica Tank Site (1MG)		$1,200,000
Sheila Tank (.1MG)		$350,000
Tapis Tank (.4MG)		$500,000
Fassler Tank (.5MG)		$600,000
Total:		**$23,650,000**
Critical Facilities		
Main Pump Station located at the Harry Tracy Treatment Plant		$1,250,000
Milagra Pump Station		$650,000
Royce Pump Station		$500,000
Park Pacifica Pump Station		$450,000
District Office		$2,500,000
Total:		**$5,350,000**

5.3 Planning and Regulatory Capabilities

There are no applicable North Coast County Water District (NCCWD) plans and regulatory capabilities for this Hazard Mitigation Plan Update. In August 2013, NCCWD selected a contractor to develop a 20-Year Long-Term Master Plan which will evaluate the District's existing water distribution system, identify any deficiencies in the distribution system, analyze for flow capacity and review regulatory compliance, and develop prioritized list of capital improvement projects to address any deficiencies. The 20-Year Long-Term Master Plan was approved at the March 16, 2016 Board Meeting. See Opportunities for Future Integration for more details on linkages to hazard mitigation.

5.4 Fiscal, ADMINISTRATIVE and TECHNICAL Capabilities

An assessment of fiscal capabilities is presented in Table 4.1. An assessment of administrative and technical capabilities is presented in Table 5.2.

TABLE 5.1. FISCAL CAPABILITY

Financial Resources	Accessible or Eligible to Use?
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	No
User Fees for Water, Sewer, Gas or Electric Service	Yes
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	No
Incur Debt through Private Activity Bonds	No
State-Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	Yes
Other	No

TABLE 5.2. ADMINISTRATIVE AND TECHNICAL CAPABILITY

Staff/Personnel Resources	Available?	Department/Agency/Position
Planners or engineers with knowledge of land development and land management practices	Yes	Outsource/Brezack and Associates
Engineers or professionals trained in building or infrastructure construction practices	Yes	Outsource/Stetson Engineers
Planners or engineers with an understanding of natural hazards	Yes	Outsource/Stetson Engineers
Staff with training in benefit/cost analysis	Yes	Accountant
Surveyors	Yes	Outsource/Professional Land Services
Personnel skilled or trained in GIS applications	Yes	Outsource/Stetson Engineers
Scientist familiar with natural hazards in local area	No	-
Emergency manager	Yes	General Manager
Grant writers	Yes	Outsource/Stetson Engineers
Other	No	-

5.5 Education and Outreach Capabilities

An assessment of education and outreach capabilities is presented in Table 5.3.

TABLE 5.3. EDUCATION AND OUTREACH

Criteria	Response
Do you have a Public Information Officer or Communications Office?	Yes - Assistant to General Manager
Do you have personnel skilled or trained in website development?	Yes - Assistant to General Manager
Do you have hazard mitigation information available on your website?	No
Do you utilize social media for hazard mitigation education and outreach?	No
Do you have any citizen boards or commissions that address issues related to hazard mitigation?	No
Do you have any other programs already in place that could be used to communicate hazard-related information?	No

Criteria	Response
Do you have any established warning systems for hazard events?	Yes
• If yes, please briefly describe.	Rapid Notify - Rapid Notify is a mass notification system that enables the District to send emergency and non-emergency communications by telephone, email and SMS text messaging. The system can be activated by District management from anywhere, alerting customers within minutes.

5.6 Integration with Other Planning Initiatives

The following describe the jurisdiction's process for integrating the hazard mitigation plan into existing plans and programs.

5.6.1 Existing Integration

The following plans and programs currently integrate the goals, risk assessment and/or recommendations of the hazard mitigation plan:

- Not applicable.

5.6.2 Opportunities for Future Integration

The following plans and programs do not currently integrate the goals, risk assessment and/or recommendations of the hazard mitigation plan, but provide an opportunity for future integration:

- 20-Year Long-Term Master Plan – Plan can be integrated through an amendment to the Master Plan to address new information (risks/hazards) that necessitate changing the scope or schedule of future Capital Improvement Program (CIP) projects.

5.7 Jurisdiction-Specific Natural Hazard Event History

Table 5-5 lists all past occurrences of natural hazards within the jurisdiction.

TABLE 5-5. NATURAL HAZARD EVENTS

Type of Event	FEMA Disaster # (if applicable)	Date	Preliminary Damage Assessment
Tsunami (Warning)	N/A	2011	Not Available. The 8.9 earthquake in Japan set off a Tsunami warning for the West Coast of California. Staff was called in to move vehicles and equipment to higher ground since the corporation yard is at sea level. No damage to facilities or infrastructure.

TABLE 5-5. NATURAL HAZARD EVENTS

Type of Event	FEMA Disaster # (if applicable)	Date	Preliminary Damage Assessment
Landslide	N/A	1997	Not Available. Mudslide in the Pedro Point Area of Pacifica washed out a road leading to a water tank site.
Landslide	N/A	1993	Not Available. Landslide in the Vallemar Area of Pacifica caused water piping to separate. Piping was repaired and a flexible expansion joint fitting installed.
Severe Weather	N/A	1991	Not Available. Freezing caused service lines to fail.
Loma Prieta Earthquake	DR 845	1989	Not Available. Damage occurred to one water tank's piping connection. Pipe cracked, a repair clamp was installed.

5.8 Jurisdiction-Specific Vulnerabilities

Earthquakes. The North Coast County Water District's service area is located in the vicinity of the San Andreas Fault. The District has water mains that run parallel with the San Andreas Fault as well as water mains that cross the fault.

Severe Weather: The coastal climate of Pacifica has kept system failures due to severe weather at a minimum. Although historically Pacifica has had relatively mild weather when comparing to other parts of the United States, the future weather patterns are unknown. North Coast County Water District Standards reflect the mild climate that we are located in. If there was a long period of severe weather (freezing), service lines and pipeline appurtenances above any "frost line" would be subject to failure.

Flooding. The lower Linda Mar area in Pacifica is subject to flooding during times of extreme weather. Although the District has not been directly affected to date, the flooding has the potential of transporting objects that can strike hydrants and other above-ground appurtenances. Additionally, contamination may occur to potable water in the event of a flood in an area where there is a water main break and positive pressure is lost.

Drought. The State of California is currently in a drought. Drought can impact existing landscaping including large trees; trees can fall and uproot themselves pulling water piping out of the ground. In areas where pump stations are located, trees can sever power lines that feed pump station buildings. The indirect impacts of the drought include customers conserving water which results in less funding for capital improvements.

Fire. Pacifica is a coastal community surrounded in part by undeveloped land. Due to the lack of rain in recent years, these areas are more susceptible to fire. Although there have not been any natural occurring wildfires from the result of lightening strikes, there are many local, county, state, and federally owned trails that people can visit. There are also locations in the hills that attract homeless people. Fires can impact the North Coast County Water District if power was lost. The heat from fires may also impact tanks if the tank coatings fail. Although all of the tanks are closed tops, smoke and ash debris may be able to enter into the water via the tank vents and cause taste and odor problems.

Landslides and Accessibility. Highway One (California State Route 1) is the major road that connects the city's neighborhoods and allows for traffic in and out of the city. In the very south, Pacifica is connected to the next community via a bridge and a tunnel. In the very north, Pacifica is connected to the City of San Francisco by Interstate 280 (I-280). The other access into or out of Pacifica is Sharp Park Road (that connects with California State Route 35 (C35).

There are areas of Highway One which may be susceptible to landslides due to the steep grade. There have been some minor rock slides in the area. If areas of Highway One were blocked due to a landslide, the District may be severely limited to access equipment, parts, and materials to fix infrastructure.

Unknown condition of neighboring infrastructure. In recent years, water pipe failures have happened in near proximity to existing culvert piping. During repairs on failed water lines, staff has noticed that some existing culverts are in relatively poor condition. It is unknown if the culvert piping have indirectly caused the water pipes to fail, or if the failed water pipelines have caused the culvert piping to fail.

5.9 Hazard Risk Ranking

Table 5-6 presents the ranking of the hazards of concern.

TABLE 5-6. HAZARD RISK RANKING

Rank	Hazard Type	Risk Rating Score (Probability x Impact)	Category
1	Earthquake	48	High
2	Severe Weather	33	Medium
3	Landslide	24	Medium
4	Flood	18	Medium
5	Fire	18	Medium
6	Tsunami	18	Medium
7	Drought	3	Low
8	Dam Failure	0	Low

5.10 Hazard Mitigation Action Plan and Evaluation of Recommended Actions

Table 5-7 lists the actions that make up the North Coast County Water District's hazard mitigation action plan. Table 5-8 identifies the priority for each action. Table 5-9 summarizes the mitigation actions by hazard of concern and the six mitigation types.

TABLE 5-7. HAZARD MITIGATION ACTION PLAN MATRIX

Applies to new or existing assets	Hazards Mitigated	Objectives Met	Lead Agency	Estimated Cost	Sources of Funding	Timeline
NCCWD-1 Seismically Retrofit Water Storage Tanks and storage tank piping connections, including anchoring to foundation and flexible expansion joints to allow for movement.						

Applies to new or existing assets	Hazards Mitigated	Objectives Met	Lead Agency	Estimated Cost	Sources of Funding	Timeline
Existing	Earthquake	1, 4, 7, 11	NCCWD	Medium	Staff Time, General Funds	On-going
NCCWD-2 Increase existing storage capacity.						
New	Earthquake, Landslide, Fire	1, 4, 7,	NCCWD	High	Staff Time, General Funds	Long Term
NCCWD-3 Improve and add additional interconnections with neighboring agencies.						
New & Existing	Earthquake, Landslide, Fire, Dam Failure	1, 2, 7, 8, 10	NCCWD	High	Staff Time, General Funds between Neighboring Agencies	Long Term
NCCWD-4 Piping upgrades to include strengthening vulnerable piping crossing and running in the close vicinity to known faults as well as improving piping to increase flow capacities.						
Existing	Earthquake, Fire	1, 4, 7, 11	NCCWD	High	Staff Time, General Funds	On-going
NCCWD-5 Develop and implement a program to capture perishable data after significant events within the District's GIS program to support future mitigation efforts including the implementation and maintenance of the hazard mitigation plan.						
New	All Hazards	1, 3, 4, 8, 10,	NCCWD	Low	Staff Time, General Funds	Short Term
NCCWD-6 Integrate the hazard mitigation plan into other plans and programs that support infrastructure investment choices, such as the capital improvement program and the 20 Year Master Plan.						
New	All Hazards	1, 3, 4, 5, 6, 7, 8	NCCWD	Low	Staff Time, General Funds	Short Term
NCCWD-7 Develop a long term plan and execute the plan for the District's Corporation Yard and offices.						
Existing	Earthquake, Flood, Tsunami, Severe Weather	1, 4, 5, 7, 9, 11	NCCWD	High	Staff Time, General Funds	Long Term
NCCWD-8 Re-establishing existing and/or establishing new sources for supplemental potable water.						
New & Existing	Earthquake, Landslide, Drought, Fire, Dam Failure	2, 4, 5, 7, 8	NCCWD	High	Staff Time, General Funds	Long Term
Action G-1— Support the County-wide initiatives identified in Volume I of the hazard mitigation plan.						
New and existing	All	All	Jurisdictions	Low	General Fund	Short- and long-term
Action G-2— Actively participate in the plan maintenance protocols outlined in Volume I of the hazard mitigation plan.						
New and Existing	All	1, 4	Jurisdictions	Low	Staff Time, General Funds	Short-term

TABLE 5-8. MITIGATION STRATEGY PRIORITY SCHEDULE

Action #	# of Objectives Met	Benefits	Costs	Do Benefits Equal or Exceed Costs?	Is Project Grant-Eligible?	Can Project Be Funded Under Existing Programs/ Budgets?	Implementation Priority[a]	Grant Priority[a]
NCCWD-1	4	Medium	Medium	Yes	Yes	Yes	Medium	Medium

Action #	# of Objectives Met	Benefits	Costs	Do Benefits Equal or Exceed Costs?	Is Project Grant-Eligible?	Can Project Be Funded Under Existing Programs/ Budgets?	Implementation Priority[a]	Grant Priority[a]
NCCWD -2	3	High	High	Yes	No	No	Low	Low
NCCWD -3	5	High	High	Yes	No	No	Low	Low
NCCWD -4	4	High	High	Yes	Yes	Yes	Medium	Medium
NCCWD -5	5	Low	Low	Yes	No	Yes	Medium	Low
NCCWD -6	7	Medium	Low	Yes	No	Yes	Medium	Low
NCCWD -7	6	High	High	Yes	Yes	No	Medium	Medium
NCCWD -8	5	High	High	Yes	No	No	Low	Low
G-1	11	Low	Low	Yes	No	Yes	High	Low
G-2	2	Low	Low	Yes	No	Yes	High	Low

a. See the introduction to this volume for explanation of priorities.

TABLE 5-9. ANALYSIS OF MITIGATION ACTIONS

Hazard Type	Action Addressing Hazard, by Mitigation Type[a]					
	1. Prevention	2. Property Protection	3. Public Education and Awareness	4. Natural Resource Protection	5. Emergency Services	6. Structural Projects
Dam Failure	-	-	-	-	3, 8	-
Drought	8	-	3	-	3, 5, 8	-
Earthquake	1,2, 3, 4, 7, 8	1, 2, 4, 5, 6, 7	5	8	1,2, 3, 4, 5, 7, 8	1, 2, 3, 4 7, 8
Flood	5, 6, 8	7	5	-	5, 7	7
Landslide	5, 6	-	5	-	2, 3, 8	-
Severe Weather	5, 6, 7	7	5	-	-	7
Tsunami	7	7	5	-	7	7
Wildfire	2, 3, 8	5	5	3, 8	2, 3, 4, 8	2, 3, 8

a. See the introduction to this volume for explanation of mitigation types.

5.11 Future Needs to Better Understand Risk/Vulnerability

Classes available for Public Agencies from FEMA designed to help the Agencies better understand risk/vulnerability in their specific location. Perhaps these classes can also help agencies who are interested in mitigation planning to apply for grants.

APPENDIX J
LETTERS TO SWRCB, BAWSCA, AND SFPUC

2400 Francisco Blvd.
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www.nccwd.com

Phone (650) 355-3462
Fax (650 355-0735

December 28, 2016

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

Re: Comment Letter – 2016 Bay-Delta Plan Amendment & SED

Dear Ms. Townsend:

The North Coast County Water District (NCCWD) submits the following comments regarding 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). In addition, NCCWD would like to incorporate by reference separate comments submitted by the Bay Area Water Supply and Conservation Agency (BAWSCA) and the San Francisco Public Utilities Commission (SFPUC) that provide more detail of the SED proposal's impact on NCCWD service area and the region.

Under the SED, the State Water Resources Control Board (SWRCB) proposes substantial changes to flow objectives for the Tuolumne River. These changes are anticipated to result in significantly reduced surface water available for diversions, thereby causing significant, potentially unavoidable impacts to water supply and the environment. Below we provide relevant information that the SWRCB must consider in conducting its analysis of the SED's impacts:

- As a wholesale customer of SFPUC that purchases 100% of its potable water supply from the San Francisco Regional Water System, water supply available to NCCWD under the SED proposal could be reduced more than 50% under drought conditions for multiple consecutive years.

- NCCWD has made significant strides in water conservation since 2000. Residential per capita water use decreased 32% from 85.35 gallons per capita per day (gpcd) to 57.9 gpcd.

  Based on NCCWD's 2015 Urban Water Management Plan, this significant cut to water supply would force NCCWD to take a number of significant actions including, instituting

Stage 4 rationing that would limit per capita water use to approximately 30 gallons per person per day. At this usage level, NCCWD customers would face extreme hardship. At 30 gallons per person per day, all NCCWD customers would need to install rainwater cisterns and graywater systems to simply water any plants, flush toilets, or wash pets. This is unacceptable when alternatives exist to prevent such hardship.

- Since outdoor use represents a relatively small proportion of NCCWD's commercial, industrial, and institutional account water demand, commercial, industrial, and institutional customers generally have fewer opportunities to reduce water use without changing their operations or incurring significant economic impacts.

In the light of these aforementioned impacts as well as those articulated in the BAWSCA and SFPUC comment letters incorporated here by reference, NCCWD strongly requests that environmental and economic impacts of any shortage on the San Francisco Regional Water System, and the associated lost jobs and delayed development, be fully and adequately analyzed as part of the SWRCB's proposed flow alternatives. Such full and adequate analysis should be given at least equal weight with all other elements of the SWRCB's subsequent deliberations and decision making.

Last, the Governor has indicated his strong support for negotiated voluntary agreements to resolve these issues. NCCWD requests that the SWRCB provide adequate time for a voluntary agreements to be reached amongst the stakeholders prior to any action on the SED. Please give this settlement process a chance for success instead of expediting implementation of the current proposal. NCCWD shares BAWSCA's commitment to continue working closely with the diverse interests and stakeholders to develop that shared solution.

Sincerely,

Joshua Cosgrove
President

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North Coast County Water District
SINCE 1944

Phone (650) 355-3462
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May 21, 2021

Steven Ritchie
Assistant General Manager of Water Enterprise
San Francisco Public Utilities Commission
525 Golden Gate Ave, 13th Floor
San Francisco, CA 94102

Re: NCCWD Urban Water Management Plan

Dear Mr. Ritchie,

The North Coast County Water District (NCCWD) is one of the San Francisco Public Utilities Commission (SFPUC) wholesale customers under the November 2018 Amended and Restated Water Supply Agreement with the City and County of San Francisco. NCCWD relies solely on water provided by the SFPUC to meet the potable water needs of its customers.

NCCWD is preparing its 2020 Urban Water Management Plan (UWMP). NCCWD appreciates all the information the SFPUC has provided to NCCWD regarding the regional water supply, both with and without the implementation of the Bay Delta Plan. NCCWD was shocked when it saw the huge cutbacks that would be imposed on NCCWD in drought years with the implementation of the Bay-Delta Plan. The SFPUC modeling shows system-wide water supply reductions of up to 49%, which results in reductions to NCCWD of up to 54% in multiple year droughts. This potential cutback far exceeds the level of service goal included in the Water Supply Agreement of not more than 20% shortage during drought years. NCCWD urges the SFPUC to expedite water supply projects to meet its supply assurance obligations of 184 million gallons per day (MGD) to its wholesale customers and NCCWD's Individual Supply Guarantee of 3.84 MGD. We note that the supply reliability letter you provided on January 21, 2021 does not reflect amounts that meet these obligations.

SFPUC has initiated litigation in connection with the Bay-Delta Plan and has been advocating for a voluntary agreement in that proceeding to prevent these drastic water supply cutbacks. It is essential that SFPUC pursue the voluntary agreement aggressively in order to assure adequate water supply for the health and safety of the customers of NCCWD in times of drought. NCCWD customers have done a remarkable job of using water efficiently and conserving water over the years. In 2020, our water usage was 60 gallons per capita per day overall with a residential use of 48 gallons per capita per day. NCCWD will not be able to reduce its water consumption by 54% in a drought given these past and sustained conservation efforts without significant risks to the health and safety of its customers.

NCCWD understands that the SFPUC is in a difficult situation too. However, NCCWD expects SFPUC will take the steps necessary to ensure that it meets its "goal of not more than 20 percent system-wide shortage in any year of the design drought."

NCCWD appreciates the SFPUC's efforts toward these important matters and that the SFPUC takes seriously its obligations to all its wholesale customers, including NCCWD.

Sincerely,

Thomas J. Piccolotti
President, Board of Directors
North Coast County Water District

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North Coast County Water District
SINCE 1944

Phone (650) 355-3462
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May 21, 2021

Ms. Nicole Sandkulla
Chief Executive Officer & General Manager
Bay Area Water Supply & Conservation Agency
155 Bovet Road, Suite 650
San Mateo CA 94402

Re: NCCWD Urban Water Management Plan

Dear Nicole:

While the North Coast County Water District (NCCWD) appreciates all the time and effort that the Bay Area Water Supply and Conservation Agency (BAWSCA) has put into assisting its member agencies prepare the 2020 Urban Water Management Plan (UWMP), NCCWD disagrees with the use of "equal allocation cutbacks" for allocating regional water supplies among the BAWSCA member agencies. For planning purposes under the 2020 UWMPs, BAWSCA recommends that the Wholesale Customers adopt an "equal allocation cutback," in which each agency will have its supply reduced equally for regional water supply shortages greater than 20%, in lieu of the adopted Tier 2 Plan. This results in water supply reductions to NCCWD of up to 54% in multiple year droughts.

This equal allocation cutback methodology has inequitable results, particularly when considering past water conservation efforts and existing per capita water usage. NCCWD customers have done a remarkable job of using water efficiently and implementing long term water conservation measures that have lasting results. In 2020 NCCWD's overall water usage was 60 gallons per capita per day, with a residential usage at 48 gallons per capita per day. The equal allocation cutback approach penalizes NCCWD's investment in these water conservation efforts and threatens the health and safety of NCCWD's water customers.

Given the many concerns that NCCWD and others have expressed about this "equal allocation of cutbacks" methodology, NCCWD must go on record to say that while we are using this method merely for planning purposes for the 2020 UWMP at your suggestion, NCCWD is not in agreement with this methodology. We believe that BAWSCA understands how problematic inequities would arise if the equal allocation cutback methodology were used, so NCCWD requests that BAWSCA proactively lead the effort to develop an equitable methodology among the BAWSCA member agencies for regional water supply shortages that exceed 20%.

NCCWD relies solely on water provided by the SFPUC to meet the needs of its customers. NCCWD was shocked by the huge cutbacks that will be imposed in drought years with the implementation of the Bay-

Delta Plan. The projected system-wide water supply reductions of up to 49% in multiple year droughts far exceeds the level of service goal included in the November 2018 Amended and Restated Water Supply Agreement with the City and County of San Francisco, which BAWSCA was instrumental in negotiating. The Water Supply Agreement provides that the SFPUC has a "goal of not more than 20 percent system-wide shortage in any year of a design drought." Because BAWSCA administers the Water Supply Agreement on behalf of all the wholesale customers, NCCWD requests that BAWSCA work with the SFPUC to ensure that SFPUC meets this level of service goal. We expect that BAWSCA will urge the SFPUC to expedite water supply projects to meet its supply assurance obligations of 184 million gallons per day (MGD) to its wholesale customers and NCCWD's Individual Supply Guarantee of 3.84 MGD.

We also want to acknowledge and support the efforts that BAWSCA has made to advocate on behalf of the Wholesale Customers of the Hetch Hetchy water system for a voluntary settlement agreement in the Bay-Delta proceeding in order to avoid the very severe water supply cutbacks that would occur with the implementation of the Bay-Delta Plan that was adopted by the State Water Resources Control Board in December of 2018.

Again, NCCWD appreciates all that BAWSCA does for its member agencies, and we look forward to working with you to ensure that SFPUC provides adequate water supply to all Wholesale Customers during drought years.

Sincerely,

Thomas J. Piccolotti
President, Board of Directors
North Coast County Water District

APPENDIX K
NCCWD WATER WASTE PREVENTION ORDINANCES (2014-56, 2015-57, 2017-58)

ORDINANCE NO. 2014-56

IMPLEMENTING STAGE 2 WATER SHORTAGE RESPONSE OF WATER SHORTAGE CONTINGENCY PLAN REGARDING MANDATORY RESTRICTIONS ON OUTDOOR WATER USE

NORTH COAST COUNTY WATER DISTRICT

WHEREAS, California is experiencing one of the most severe droughts on record; and

WHEREAS, on January 17, 2014, Governor Brown declared a drought state of emergency and called on all Californians to do their part to reduce their water use; and

WHEREAS, on January 31, 2014, the wholesale water provider for the District's water supply, the San Francisco Public Utilities Commission, requested 10 percent voluntary water use reduction system-wide; and

WHEREAS, on April 25, 2014, Governor Brown issued a proclamation of a continued state of emergency to mitigate the effects of drought conditions upon the people and property of California, and called on residents to refrain from wasting water; and

WHEREAS, on July 15, 2014, the State Water Resources Control Board (SWRCB) adopted drought emergency regulations (Resolution No. 2014-0038) that impose mandatory actions by urban water suppliers, which became effective July 28, 2014; and

WHEREAS, the North Coast County Water District (District) is an urban water supplier, as defined in the SWRCB emergency regulations, that has an adopted Water Shortage Contingency Plan considered sufficient by the California Department of Water Resources by review of the District's Urban Water Management Plan; and

WHEREAS, the District is required to comply with the SWRCB drought emergency regulations that apply to an urban water supplier, and one of the mandatory actions requires the District to implement all requirements and actions of the stage of its Water Shortage Contingency Plan that impose mandatory restrictions on outdoor irrigation of ornamental landscapes or turf with potable water; and

WHEREAS, since January, 2014, the District has undertaken a substantial public outreach effort to encourage its customers to reduce water use and conserve water during this state-wide water shortage emergency; and

WHEREAS, Stage 2 of the District's Water Shortage Contingency Plan provides for mandatory water rationing programs that include prohibitions on the wasteful use of water such as any use that results in run off to gutters or streets, the use of water to clean hard surfaces such as sidewalks and streets, and restrictions on certain outdoor irrigation; and

WHEREAS, as required by the SWRCB emergency regulations, the District will implement Stage 2 of its Water Shortage Contingency Plan; and

WHEREAS, the actions taken hereinafter are exempt from the provisions of Section 21000 *et seq*. of the Public Resources Code as a project undertaken as immediate action necessary to prevent or mitigate an emergency pursuant to Title 14, California Code of Regulations Section 15269 and as a project undertaken to assure the maintenance, restoration or enhancement of a natural resource pursuant to Title 14, California Code of Regulations Section 15307.

NOW, THEREFORE, BE IT ORDAINED that the Board of Directors of the North Coast County Water District hereby takes the following actions:

1. The District, based on the directive in the SWRCB emergency regulations, implements Stage 2 of its Water Shortage Contingency Plan.

2. The District, to promote water conservation, prohibits each of the following actions, except where necessary to address an immediate health and safety need or to comply with a term or condition in a permit issued by a state or federal agency:

   A. The application of potable water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures.

   B. The use of a hose that dispenses potable water to wash a motor vehicle, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water when immediately not in use.

C. The application of potable water to driveways and sidewalks.

D. The use of potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system.

E. The use of water to clean hard surfaces, such as sidewalks, driveways, and patios.

F. The service of water in restaurants, except on request.

G. The use of potable water on new outdoor ornamental landscaping or turf installed on or after September 1, 2014, unless the landscaping consists of low water use drought tolerant plants.

H. The irrigation of outdoor ornamental landscapes or turf with potable water between the hours of 10 a.m. and 6 p.m.

I. The irrigation of outdoor ornamental landscapes or turf with potable water more than 2 days per week.

3. The mandatory restrictions on the irrigation of outdoor ornamental landscapes or turf does not apply to the following categories of use:

A. Watering or irrigating by use of a hand-held bucket or similar container.

B. Watering or irrigating by a hand-held hose with a positive shut-off valve or similar device.

C. Properly functioning low volume irrigation system.

D. Watering for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

E. Graywater system.

F. Recycled water.

4. Enforcement

A. Education/Written Notice. If the District believes that water has been or is being used in violation of the above restrictions, the District will try to educate the customers by contacting them and informing the customer about the violation.

If the violation occurs again, the District will send a written notice to the customer specifying the nature of the violation and the date and time of occurrence and request that the customer cease the violation and take prompt remedial action. The District will provide the customer with a copy of this Ordinance and inform the customer that failure to comply may result in termination of water service.

B. On-Site Notification. In the event that a further violation(s) is observed by the District, after the original written notice, the District will make reasonable efforts to notify the customer of the violation and post a notice on the front door or other point of entry onto the property requiring the customer to cease the violation and take remedial action within 48 hours of the on-site notification. Failure to comply after the on-site notification may result in the temporary termination of water service.

C. Termination of Water Service/Flow Restrictors

1. In the event that a further violation(s) is observed by District personnel 48 or more hours after the on-site notification, it will be deemed a willful violation of the mandatory restrictions on water use and the District may temporarily terminate water service or install a flow restrictor.

2. The customer shall be responsible for paying the District's costs incurred in enforcing this Ordinance, including providing the on-site notification, installing a flow restrictor, and temporarily terminating and restoring water service, on a time and material basis.

3. The customer shall pay all fees and charges above, and the customer's account must be in good standing, in order for the District to proceed with the reconnection of water service after it has been temporarily terminated.

5. Appeal. Any customer who disputes a staff determination of a violation(s) of the above restrictions may appeal the termination of water service or installation of a flow restrictor in writing to the General Manager. The written appeal must be addressed to the General Manager and include (1) the customer's name; (2) address; (3) account number; (4) a description of the violation(s); (5) the enforcement action taken; and (6) a detailed explanation of the basis of the appeal. The General Manager will evaluate each written appeal based on the following criteria: (1) public health; (2) public safety; and (3) regulatory requirements of a state, federal, or local agency. The General Manager's decision may be appealed to the Board of Directors. The decision of the Board of Directors shall be final.

6. Effective Date. All provision of this Ordinance shall become effective after the publication of this Ordinance and remain in effect until the District cancels implementation of Stage 2 of the District's Water Shortage Contingency Plan.

7. Publication. District staff is hereby directed to arrange for this Ordinance to be published in a newspaper of general circulation in the District and to be posted on the District's website.

PASSED AND ADOPTED this 20th day of August, 2014, by the following vote:

AYES: Directors Piccolotti, Cosgrove, Ash, Burgett and DeJarnatt

NOES: None

ABSENT: None

_____
President, Board of Directors
North Coast County Water District

ATTEST:

_____
Secretary of the District

ORDINANCE NO. 2015-57

AMENDING AND RESTATING ORDINANCE NO. 2014-56 IMPLEMENTING STAGE 2 WATER SHORTAGE RESPONSE OF WATER SHORTAGE CONTINGENCY PLAN REGARDING MANDATORY RESTRICTIONS ON OUTDOOR WATER USE

NORTH COAST COUNTY WATER DISTRICT

WHEREAS, California is experiencing one of the most severe droughts on record; and

WHEREAS, on January 17, 2014, Governor Brown declared a drought state of emergency and called on all Californians to do their part to reduce their water use; and

WHEREAS, on January 31, 2014, the wholesale water provider for the District's water supply, the San Francisco Public Utilities Commission, requested 10 percent voluntary water use reduction system-wide; and

WHEREAS, on April 25, 2014, Governor Brown issued a proclamation of a continued state of emergency to mitigate the effects of drought conditions upon the people and property of California, and called on residents to refrain from wasting water; and

WHEREAS, on July 15, 2014, the State Water Resources Control Board (SWRCB) adopted drought emergency regulations (Resolution No. 2014-0038) that impose mandatory actions by urban water suppliers, which became effective July 28, 2014; and

WHEREAS, the North Coast County Water District (District) is an urban water supplier, as defined in the SWRCB emergency regulations, that has an adopted Water Shortage Contingency Plan considered sufficient by the California Department of Water Resources by review of the District's Urban Water Management Plan; and

WHEREAS, the District is required to comply with the SWRCB drought emergency regulations that apply to an urban water supplier, and one of the mandatory actions requires the District to implement all requirements and actions of the stage of its Water Shortage Contingency Plan that impose mandatory restrictions on outdoor irrigation of ornamental landscapes or turf with potable water; and

WHEREAS, since January, 2014, the District has undertaken a substantial public outreach effort to encourage its customers to reduce water use and conserve water during this state-wide water shortage emergency; and

WHEREAS, Stage 2 of the District's Water Shortage Contingency Plan provides for mandatory water rationing programs that include prohibitions on the wasteful use of water such as any use that results in run off to gutters or streets, the use of water to clean hard surfaces such as sidewalks and streets, and restrictions on certain outdoor irrigation; and

WHEREAS, on August 20, 2014, the District adopted Ordinance No. 2014-56 Implementing Stage 2 Water Shortage Response of Water Shortage Contingency Plan Regarding Mandatory Restrictions on Outdoor Water Use; and

WHEREAS, on March 17, 2015, the SWRCB extended and expanded the drought emergency regulations to support water conservation (Resolution No. 2015-0013), which became effective March 27, 2015; and

WHEREAS, on April 1, 2015, Governor Brown issued an Executive Order that, in part, directs the SWRCB to impose restrictions on water suppliers to achieve a statewide 25 percent reduction in potable urban usage through February, 2016; and

WHEREAS, on May 5, 2015, the SWRCB expanded and modified its drought emergency regulations (Resolution No. 2015-0032) to achieve the 25 percent reduction in overall potable urban water use statewide in accordance with Governor Brown's April 1, 2015 Executive Order and the emergency regulations went into effect on May 18, 2015; and

WHEREAS, the SWRCB determined that the District had an average July – September 2014 R-GPCD of less than 65, and that the District must reduce its total potable water production by 8 percent for each month as compared to the amount used in the same month in 2013; and

WHEREAS, the actions taken hereinafter are exempt from the provisions of Section 21000 *et seq.* of the Public Resources Code as a project undertaken as immediate action necessary to prevent or mitigate an emergency pursuant to Title 14, California Code of Regulations Section 15269 and as a project undertaken to assure the maintenance, restoration or enhancement of a natural resource pursuant to Title 14, California Code of Regulations Section 15307.

NOW, THEREFORE, BE IT ORDAINED that the Board of Directors of the North Coast County Water District hereby takes the following actions:

1. The District, based on the directive in the SWRCB emergency regulations, implements Stage 2 of its Water Shortage Contingency Plan.

2. The District, to promote water conservation, prohibits each of the following actions, except where necessary to address an immediate health and safety need or to comply with a term or condition in a permit issued by a state or federal agency:

A. The application of potable water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures.

B. The use of a hose that dispenses potable water to wash a motor vehicle, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water when immediately not in use.

C. The application of potable water to driveways and sidewalks.

D. The use of potable water in a fountain or other decorative water feature, except where the water is part of a recirculating system.

E. The application of potable water to outdoor landscapes during and within 48 hours after rainfall measuring one tenth of one inch in a 24-hour period. Measurement to be taken at District Office located at 2400 Francisco Blvd, Pacifica.

F. The use of water to clean hard surfaces, such as sidewalks, driveways, and patios.

G. The serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and or purchased.

H. The irrigation with potable water of landscapes outside of newly constructed homes and buildings in a manner inconsistent with regulations or other requirements established by the California Building Standards Commission and the Department of Housing and Community Development.

I. The use of potable water on new outdoor ornamental landscaping or turf installed on or after September 1, 2014, unless the landscaping consists of low water use drought tolerant plants.

J. The irrigation of outdoor ornamental landscapes or turf with potable water between the hours of 10 a.m. and 6 p.m.

K. The irrigation of outdoor ornamental landscapes or turf with potable water more than 2 days per week.

L. The irrigation with potable water of ornamental turf on public street medians.

3. The mandatory restrictions on the irrigation of outdoor ornamental landscapes or turf does not apply to the following categories of use:

A. Watering or irrigating by use of a hand-held bucket or similar container.

B. Watering or irrigating by a hand-held hose with a positive shut-off valve or similar device.

C. Properly functioning low volume irrigation system.

D. Watering for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

E. Graywater system.

F. Recycled water.

4. To further promote water conservation, operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily, and the hotel or motel shall prominently display notice of this option in each guest room using clear and easily understood language.

5. In furtherance of the promotion of water conservation, the District will:

A. Provide prompt notice to a customer whenever it obtains information that indicates that a leak may exist within the customer's exclusive control.

B. Prepare and submit to the SWRCB by the 15th of each month a monitoring report on forms provided by the Board.

6. Enforcement

A. Education/Written Notice. If the District believes that water has been or is being used in violation of the above restrictions, the District will try to educate the customers by contacting them and informing the customer about the violation.

If the violation occurs again, the District will send a written notice to the customer specifying the nature of the violation and the date and time of occurrence and request that the customer cease the violation and take prompt remedial action. The District will provide the customer with a copy of this Ordinance and inform the customer that failure to comply may result in termination of water service.

B. On-Site Notification. In the event that a further violation(s) is observed by the District, after the original written notice, the District will make reasonable efforts to notify the customer of the violation and post a notice on the front door or other point of entry onto the property requiring the customer to cease the violation and take remedial action within 48 hours of the on-site notification. Failure to comply after the on-site notification may result in the temporary termination of water service.

C. Termination of Water Service

1. In the event that a further violation(s) is observed by District personnel 48 or more hours after the on-site notification, it will be deemed a willful violation of the mandatory restrictions on water use and the District may temporarily terminate water service or install a flow restrictor.

2. The customer shall be responsible for paying the District's costs incurred in enforcing this Ordinance, including providing the on-site notification, installing a flow restrictor, and temporarily terminating and restoring water service, on a time and material basis.

3. The customer shall pay all fees and charges above, and the customer's account must be in good standing, in order for the District to proceed with the reconnection of water service after it has been temporarily terminated.

7. Appeal. Any customer who disputes a staff determination of a violation(s) of the above restrictions may appeal the termination of water service or installation of a flow restrictor in writing to the General Manager. The written appeal must be addressed to the General Manager and include (1) the customer's name; (2) address; (3) account number; (4) a description of the violation(s); (5) the enforcement action taken; and (6) a detailed explanation of the basis of the appeal. The General Manager will evaluate each written appeal based on the following criteria: (1) public health; (2) public safety; and (3) regulatory requirements of a state, federal, or local agency. The General Manager's decision may be appealed to the Board of Directors. The decision of the Board of Directors shall be final.

8. Effective Date. All provisions of this Ordinance shall become effective after the publication of this Ordinance and remain in effect until the District cancels implementation of Stage 2 of the District's Water Shortage Contingency Plan.

9. Publication. District staff is hereby directed to arrange for this Ordinance to be published in a newspaper of general circulation in the District and to be posted on the District's website.

PASSED AND ADOPTED this 23rd day of June, 2015, by the following vote:

AYES: Directors Ash, Burgett, Cosgrove, De Jarnatt and Piccolotti

NOES: None

ABSENT: None

President, Board of Directors
North Coast County Water District

ATTEST:

Secretary of the District

ORDINANCE NO. 2017-58

AN ORDINANCE OF THE BOARD OF DIRECTORS OF THE NORTH COAST COUNTY WATER DISTRICT

An Ordinance Rescinding Ordinance No. 2014-56, which Implemented Stage 2 of the Water Shortage Contingency Plan and Rescinding Ordinance No. 2015-57 Which Amended Mandatory Water Use Restrictions and Prohibitions in the District's Service Area

Be it ordained by the Board of Directors of the North Coast County Water District (District) as follows:

Section 1: Findings and Determinations

This ordinance is adopted in light of the following facts and circumstances, which are hereby found and declared by the Board of Directors.

WHEREAS, California is recovering from one of the most severe droughts on record; and

WHEREAS, Governor Brown declared a drought state of emergency on January 17, 2014, and called on all Californians to do their part to reduce their water use; and

WHEREAS, the wholesale water provider for a significant portion of the District's water supply, the San Francisco Public Utilities Commission (SFPUC), requested 10 percent voluntary water use reduction system-wide on January 31, 2014; and

WHEREAS, Governor Brown issued a proclamation of a continued state of emergency on April 25, 2014 to mitigate the effects of drought conditions upon the people and property of California, and called on residents to refrain from wasting water; and

WHEREAS, the State Water Resources Control Board (SWRCB) adopted drought emergency regulations on July 15, 2014 (Resolution No. 2014-0038) that imposed mandatory actions by urban water suppliers that became effective July 28, 2014; and

WHEREAS, the District was required to comply with the 2014 SWRCB drought emergency regulations as an urban water supplier, and one of the mandatory actions required the District to implement all requirements and actions of the stage of its Water Shortage Contingency Plan that impose mandatory restrictions on outdoor irrigation of ornamental landscapes or turf with potable water; and

WHEREAS, Stage 2 – Water Shortage Emergency Warning of the District's Water Shortage Contingency Plan describes a menu of options including mandatory restrictions on outdoor water use, irrigation and prohibiting cleaning of exterior surfaces with potable water; and

WHEREAS, by Ordinance No. 2014-56, adopted on August 20, 2014, the District implemented Stage 2 – Water Shortage Emergency Warning of its Water Shortage Contingency Plan; and

WHEREAS, by Ordinance No. 2014-56, adopted on August 20, 2014, the District established mandatory water use prohibitions and restrictions under Stage 2-Water Shortage Emergency Warning of its Water Shortage Contingency Plan; and

WHEREAS, the SWRCB extended and expanded the drought emergency regulations on March 17, 2015 that imposes mandatory actions by urban water suppliers that became effective March 27, 2015; and

WHEREAS, Governor Brown issued Executive Order B-29-15 on April 1, 2015, that, in part, directed the SWRCB to impose restrictions to achieve a statewide 25 percent reduction in potable urban water usage, to increase enforcement against water waste, and to implement additional restrictions on the outdoor use of potable water; and

WHEREAS, the SWRCB expanded and modified its drought emergency regulations on May 5, 2015 to achieve a statewide 25 percent reduction in potable urban water usage and the emergency regulations went into effect on May 18, 2015; and

WHEREAS, by Ordinance No. 2015-57, adopted on June 23, 2015, the District amended and expanded the mandatory water use prohibitions and restrictions under Stage 2 – Water Shortage Emergency Warning of its Water Shortage Contingency Plan; and

WHEREAS, the SWRCB modified its drought emergency regulations on May 18, 2016 to include a water supply reliability self–certification method of compliance, provided for in CCR, Title 23 § 864.5; and

WHEREAS, the District completed an on-line submittal for the water supply reliability self-certification to qualify for a zero percent conservation standard; and

WHEREAS, on February 1, 2017, the SFPUC cancelled its request for a 10 percent voluntary reduction in water consumption system wide; and

WHEREAS, on March 30, 2017, the California Department of Water Resources manual April snow survey found above average precipitation and water content of the snowpack in the Sierra Nevada Mountains; and

WHEREAS, as of April 17, 2017, Governor Brown issued Executive Order B-40-17 that lifts the drought emergency in all California counties except Fresno, Kings, Tulare and Tuolumne; and

WHEREAS, based on all of the above, conditions no longer exist for the District to remain in a Stage 2 – Water Shortage Emergency Warning of its Water Shortage Contingency Plan.

NOW, THEREFORE, BE IT ORDAINED, that the Board of Directors of the North Coast County Water District recognizes that imported water supply conditions have significantly improved in water year 2017 and that mandatory water use restrictions and prohibitions under Stage 2 are no longer needed; and

BE IT FURTHER ORDAINED, that the Board of Directors rescinds Resolution No. 2014-56 and that the District is no longer implementing any stage of the District's Water Shortage contingency Plan; and

BE IT FURTHER ORDAINED, that the Board of Directors rescinds Ordinance No. 2015-57; and

BE IT FURTHER ORDAINED, that the Board of Directors appreciates its customers for their ongoing water use efficiency efforts and for exceeding the District's mandated emergency water conservation standard in response to the drought.

PASSED AND ADOPTED this 19th day of April 2017 by the following vote:

AYES: Directors De Jarnatt, Ash, Cosgrove, Piccolotti and Burgett

NOES: None

ABSENT: None

Jack J Burgett
President, Board of Directors
North Coast County Water District

ATTEST:

Secretary of the District

APPENDIX L
RESOLUTION 1119, URBAN WATER MANAGEMENT PLAN, 2020 UPDATE

RESOLUTION NO. 1119

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE NORTH COAST COUNTY WATER DISTRICT ADOPTING THE NORTH COAST COUNTY WATER DISTRICT 2020 URBAN WATER MANAGEMENT PLAN

WHEREAS, the Urban Water Management Planning Act (California Water Code § 10610 et seq.) requires urban water suppliers to prepare and adopt an Urban Water Management Plan to, among other things, report, describe, and evaluate water deliveries, water supply sources, efficient water use, and demand management measures; and

WHEREAS, the Urban Water Management Planning Act requires that Urban Water Management Plans are to be prepared every five years by urban water suppliers with 3,000 or more service connections or supplying 3,000 or more acre-feet of water per year; and

WHEREAS, North Coast County Water District ("District") has prepared its Urban Water Management Plan ("UWMP"), which includes an updated Water Shortage Contingency Plan, as required by the Urban Water Management Planning Act; and

WHEREAS, the District has met its 2020 urban water use target under the Water Conservation Act of 2009 and is described in Chapter 5; and

WHEREAS, the 2012 to 2017 drought led to further revisions of the Urban Water Management Planning Act under the 2018 Water Conservation Legislation to improve water supply planning for long-term reliability and resilience to drought and climate change; and

WHEREAS, the District included a lay description of the District's 2020 UWMP, as required by Section 10630.5 of the California Water Code; and

WHEREAS, the impacts of the Bay-Delta Plan Amendment on the SFPUC Regional Water System are described in Chapter 7; and

WHEREAS, the District coordinated the preparation of the UWMP with other appropriate agencies in the area; notified the County of San Mateo and City of Pacifica that the District will be reviewing the UWMP and considering its adoption at least 60 days prior to the public hearing; a copy of the UWMP was available on the District's website; published a notice of the public hearing in the local newspaper once a week for two successive weeks beginning at least fourteen days prior to the public hearing and posted that notice on the District's website; held a public hearing inviting public input regarding the draft UWMP; and considered all comments received during the public hearing.

NOW THEREFORE, BE IT RESOLVED that the Board of Directors of the North Coast County Water District hereby approves and adopts the 2020 Urban Water Management Plan, as presented to the Board.

BE IT FURTHER RESOLVED that the Board authorizes the General Manager to incorporate comments from the public hearing as approved by the Board after the close of the public hearing.

BE IT FURTHER RESOLVED that the General Manager is authorized and directed to submit a copy of the adopted UWMP to the Department of Water Resources by July 1, 2021, as required by

Section 10621 of the California Water Code, and to the California State Library, the County of San Mateo, and the City of Pacifica within 30 days of its adoption, as required by Section 10644 of the California Water Code.

PASSED AND ADOPTED this 16th day of June 2021, by the following vote:

AYES: Directors Ash, Burgett, Cosgrove, De Jarnatt and Piccolotti

NOES: None

ABSTAIN: None

ABSENT: None

President Board of Directors
North Coast County Water District

ATTEST:

Secretary of the Board
North Coast County Water District

APPENDIX M
RESOLUTION 1118, WATER SHORTAGE CONTINGENCY PLAN, 2020 UPDATE

RESOLUTION NO. 1118
A RESOLUTION OF THE BOARD OF DIRECTORS OF THE NORTH COAST COUNTY WATER DISTRICT ADOPTING THE UPDATED WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, Section 10632 of the California Water Code requires the North Coast County Water District ("District") to prepare and adopt a Water Shortage Contingency Plan, as part of its 2020 Urban Water Management Plan; and

WHEREAS, Section 350-359 and 31026-31029 of the California Water Code provides authority for the District to declare a water shortage emergency and implement regulations to manage the water shortage emergency; and

WHEREAS, the District maintains a Water Shortage Contingency Plan that is a guidance document for management of water shortages within the District's jurisdiction; and

WHEREAS, Section 10632 (b) of the California Water Code requires that, starting with the 2015 Urban Water Management Plan, water suppliers shall define water features that are artificially supplied with water; and

WHEREAS, the Board of Directors, after a notified public hearing, adopted Resolution 1070 on June 15, 2016, approving an updated Water Shortage Contingency Plan, and including it in the 2015 Urban Water Management Plan; and after notified public hearing, the Board adopted Resolution 1087 on January 17, 2018, adopting the Amended 2015 Urban Water Management Plan that included an updated Water Shortage Contingency Plan; and

WHEREAS, the Water Shortage Contingency Plan was revised to include Section 10632(a)(3)(A) of the California Water Code that requires water suppliers to define six progressive water shortage levels; and

WHEREAS, the Water Shortage Contingency Plan was revised to include Section 10632(a)(1) of the California Water Code that requires key attributes of a Water Supply Reliability Analysis; and

WHEREAS, the Water Shortage Contingency Plan was revised to include Section 10632(a)(4) of the California Water Code that requires locally appropriate response actions for each shortage level; and

WHEREAS, the Water Shortage Contingency Plan was revised to include Section 10632(a)(2) of the California Water Code that requires that requires procedures for conducting an annual water supply and demand assessment; and

WHEREAS, the Water Shortage Contingency Plan was revised to include Section 10632(a)(5) of the California Water Code that requires that requires communication protocols and procedures to inform the public, and government entities of current or predicted water shortages; and

WHEREAS, the Water Shortage Contingency Plan was revised to include Section 10632(a)(9) of the California Water Code that requires monitoring and reporting procedures to assure

appropriate data is collected to monitor customer compliance and to respond to any state reporting requirements; and

WHEREAS, the Water Shortage Contingency Plan was revised to include Section 10632(a)(10) of the California Water Code that requires a reevaluation and improvement process to assess the functionality of its Water Shortage Contingency Plan and to make appropriate adjustments as may be warranted; and

WHEREAS, the District coordinated the preparation of the Water Shortage Contingency Plan with other appropriate agencies in the area; notified the County of San Mateo and City of Pacifica that the District will be reviewing the Water Shortage Contingency Plan and considering its adoption at least 60 days prior to the public hearing; a copy of the Water Shortage Contingency Plan was available on the District's website; published a notice of the public hearing in the local newspaper once a week for two successive weeks beginning at least fourteen days prior to the public hearing and posted that notice on the District's website; held a public hearing inviting public input regarding the draft Water Shortage Contingency Plan; and considered all comments received during the public hearing.

NOW THEREFORE, BE IT RESOLVED that the Board of Directors of the North Coast County Water District hereby approves and adopts the updated Water Shortage Contingency Plan, as presented to the Board.

BE IT FURTHER RESOLVED that the Board authorizes the General Manager to incorporate comments from the public hearing as approved by the Board after the close of the public hearing.

BE IT FURTHER RESOLVED that the General Manager is authorized and directed to submit a copy of the adopted Water Shortage Contingency Plan, as part of the 2020 Urban Water Management Plan in appendix I, to the Department of Water Resources by July 1, 2021, as required by Section 10621 of the California Water Code, and to the California State Library, the County of San Mateo, and the City of Pacifica within 30 days of its adoption, as required by Section 10644 of the California Water Code.

PASSED AND ADOPTED this 16th day of June 2021 by the following votes of the North Coast County Water District's Board of Directors:

AYES: Directors Ash, Burgett, Cosgrove, De Jarnatt and Piccolotti

NOES: None

ABSENT: None

ABSTAIN: None

President, Board of Directors

Attest:

Secretary of the Board

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