MILLBRAE

2020 Urban Water Management Plan

PREPARED FOR THE CITY OF MILLBRAE

MAY 2021

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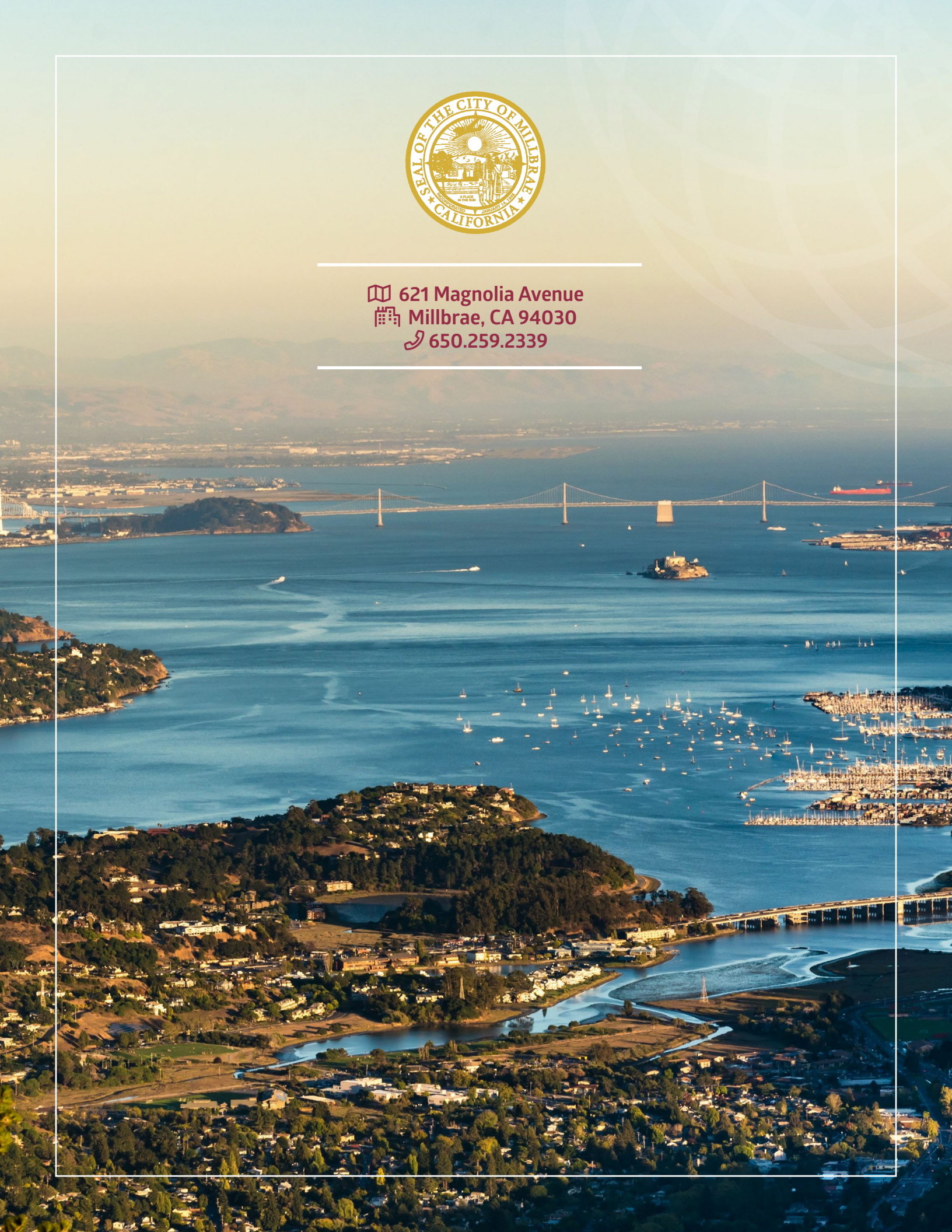

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Key Acronyms and Abbreviations

ABAG	Association of Bay Area Governments		HCD	State Department of Housing and Community Development
AB 1414	Assembly Bill 1414		HET	High efficiency toilet
AB 1668	Assembly Bill 1668		ISA	Interim Supply Allocation
ACDD	Alameda Creek Diversion Dam		ISG	Individual Supply Guarantee
Act	Urban Water Management Plan Act		ISL	Interim Supply Limitation
ACWD	Alameda County Water District		IWSAP	Interim Water Shortage Allocation Plan
AFY	Acre-feet per year		LOS	Level of Service
AWWA	American Water Works Association		MCTV	Millbrae Community Television
AWSP	Alternative Water Supply Planning Program		MFR	Multi-Family Residential
BAIRWMP	Bay Area Integrated Regional Water Management Plan		MID	Modesto Irrigation District
BARR	Bay Area Regional Reliability Partnership		MGD	Million gallons per day
BART	Bay Area Regional Transportation		MG	Million gallons
BAWSCA	Bay Area Water Supply and Conservation Agency		MGY	Million gallons per year
BAWSCA Strategy	Long-Term Reliable Water Supply Strategy		MSASP	Millbrae Station Area Specific Plan Update
Bay-Delta Plan	Bay-Delta Plan Phase 1		MG	Million gallons
BMP	Best Management Practice		MGY	Million gallons per year
CEQA	California Environmental Quality Act		MSASP	Millbrae Station Area Specific Plan Update
CCF	100 Cubic Feet		MOU	Memorandum of Understanding
CCR	Consumer Confidence Reports		NOP	Notice of Preparation
CCWD	Contra Costa Water District		PEIR	Programmatic Environmental Impact Report
CII	Commercial, Industrial and Institutional		PG&E	Pacific Gas and Electric Company
CIP	Capital Improvement Program		RWS	Regional Water System
City	City of Millbrae		RHNA	Regional Housing Needs Allocation
COG	Regional Council of Governments		SB 606	Senate Bill 606
Commission	SFPUC's five member governing commission		SBX7-7	Water Conservation Act of 2009
CUWCC	California Urban Water Conservation Council		SFO	San Francisco International Airport
CWC	California Water Code		SCADA	Supervisory Control and Data Acquisition
Demand Study	Regional Water Demand and Conservation Projections		SFPUC	San Francisco Public Utilities Commission
DMM	Demand Management Measure		SFR	Single Family Residential
DOF	California Department of Finance		SWRCB	State Water Resources Control Board
DPH	California Department of Public Health		TID	Turlock Irrigation District
DRA	Drought Risk Assessment		TOD	Transit-Oriented Development
DSS Model	Demand Side Management Least Cost Planning Decision Support System		UACFG	Upper Alameda Creek Filter Gallery
DWR	Department of Water Resources		UWMP	Urban Water Management Plan
EBMUD	East Bay Municipal Utility District		Valley Water	Santa Clara Valley Water District
EIR	Environmental Impact Report		WCIP	Water Conservation Implementation Plan
ETo	Evapo-transpiration of common turf grass		WPCP	Water Pollution Control Plant
ETWU	Estimated Total Water Use		WSA	Water Supply Assessment
FY	Fiscal Year		WSAP	Water Shortage Allocation Plan
FEMA	Federal Emergency Management Agency		WSCP	Water Shortage Contingency Plan
GPCD	gallons per capita per day		WSIP	Water System Improvement Program
GPF	Gallons per flush		WQD	Water Quality Division
GPM	Gallons per minute			

Executive Summary (Lay Description)

Purpose and Overview and Plan Preparation

In 1983 the Urban Water Management Plan Act (Act) came into existence, which requires all water suppliers designated as urban water suppliers to legally participate in water resources planning. An urban water supplier, as defined in the California Water Code (CWC), is one that supplies water to either 3,000 customers or supplies a total annual volume in excess of 3,000 acre-feet per year. As of the fiscal year 2020, the City of Millbrae supplied water to 6,591 municipal water connections, and therefore the City is required to complete an Urban Water Management Plan (UWMP).

To assist in the development of UWMP's, and to ensure that water suppliers can address all requirements as set forth in the CWC, the California Department of Water Resources (DWR) has developed the *2020 Urban Water Management Plans Guidebook for Urban Water Suppliers*. The guidebook presents a recommended structure for agencies to complete their UWMP, which is the structure used in this report. The outline is shown in Figure ES-1 below.

1. Introduction and Overview
2. Plan Preparation
3. System Description
4. System Water Use
5. Baselines and Targets
6. System Supplies
7. Water System Reliability
8. Water Shortage Contingency Planning
9. Demand Managment Measures
10. Plan Adoption, Submittal, and Implementation

Figure ES-1. 2020 Urban Water Management Plan Outline.

System Description

The City of Millbrae is located on the San Francisco peninsula approximately 15 miles south of downtown San Francisco. The City is located adjacent to the San Francisco International Airport. The City operates a municipal water system, with the boundaries of the service area coterminous with the City limits. The City has a mild Mediterranean climate, with annual average precipitation approximately 20 inches and an annual average temperature of 65 degrees Fahrenheit.

Figure ES-2. City of Millbrae vicinity map.

The City is essentially built out, with the expectation of a handful of development and redevelopment projects that have been planned in the vicinity of the City's Bay Area Regional Transportation (BART) train station (part of the Millbrae Station Area Specific Plan). As a result, the City's population is projected to

increase at a relatively steady pace as shown below (ABAG, 2017).[1]

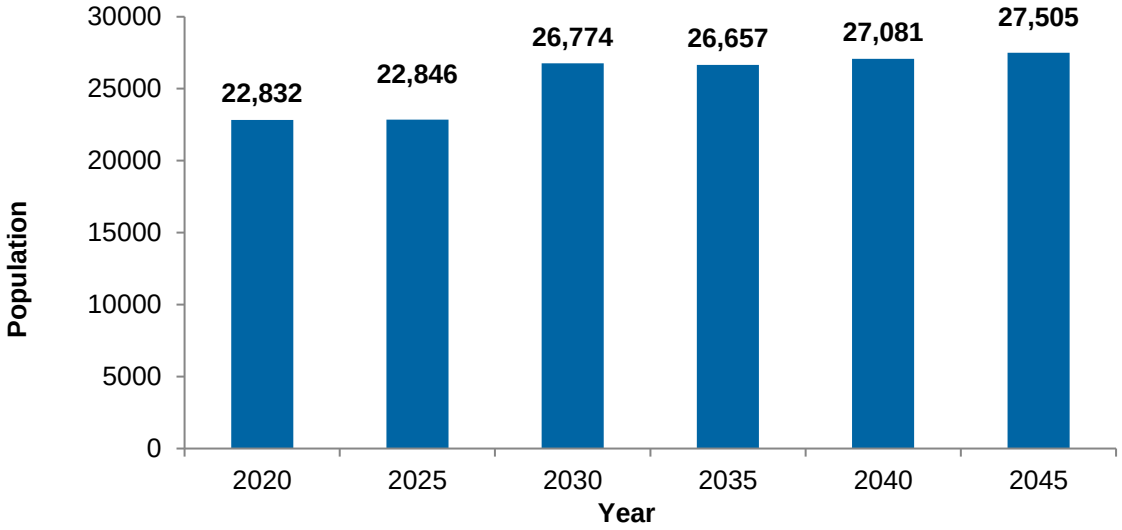
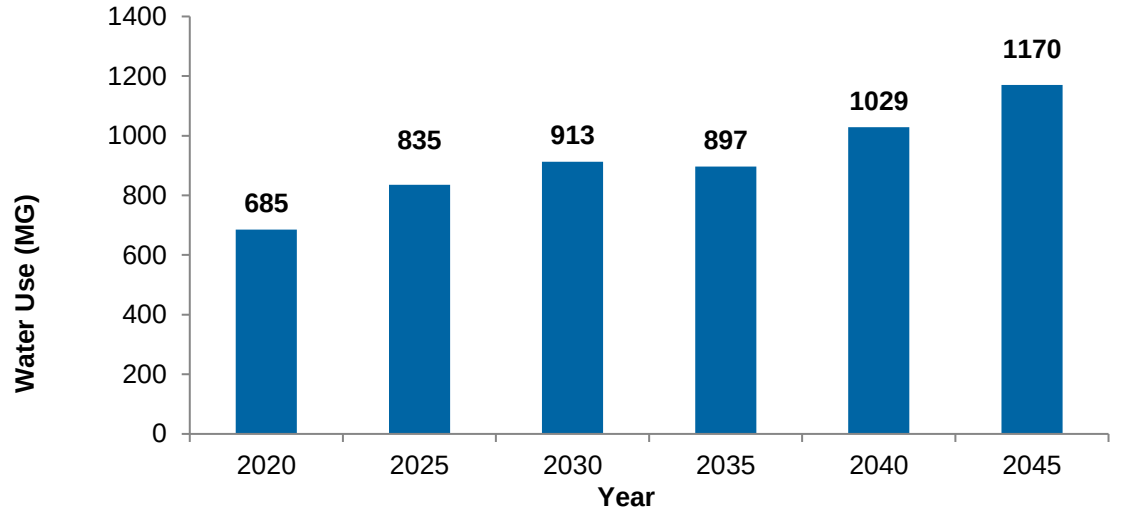


Figure ES-3. City's current and projected population (ABAG, 2017).

System Water Use

In general the City has experienced declining water demands over the past 10 years. This is likely due to a number of factors, including advances in water use efficiency, increased conservation awareness, periodic economic hardship, and drought regulations. Over the past 5 years average annual demand has been approximately 636 million gallons (MG). The lowest demand during this period occurred during fiscal year (FY) 2016, with a total demand of 583 MG. Based on the population projections presented above and the City's planned active and passive conservation measures, the water demand projections for the City through 2045 are shown in Figure ES-4.



[1] Due to the timing of the 2020 UWMP, the City is using ABAG population projections from Plan Bay Area 2017. An update to Plan Bay Area is underway and the City will incorporate the new population projections from the update for future planning.

Figure ES-4. Actual and projected water demands (MG) for the City (BAWSCA, 2020).

The City's water use projections incorporate the effect of passive conservation measures, which include updated building codes and natural fixture replacement, and planned active conservation measures, including the following:

- School education and outreach;
- Water loss control program;
- High efficiency water fixture rebates;
- Landscape water budgets; and
- Water sense fixture giveaways.

Water use in the City is primarily residential, with smaller but sizable demand contributions coming from commercial and landscape uses (Figure ES-5). System water losses have generally declined over the past 5 years, with a low of 52 MG in FY 2020.

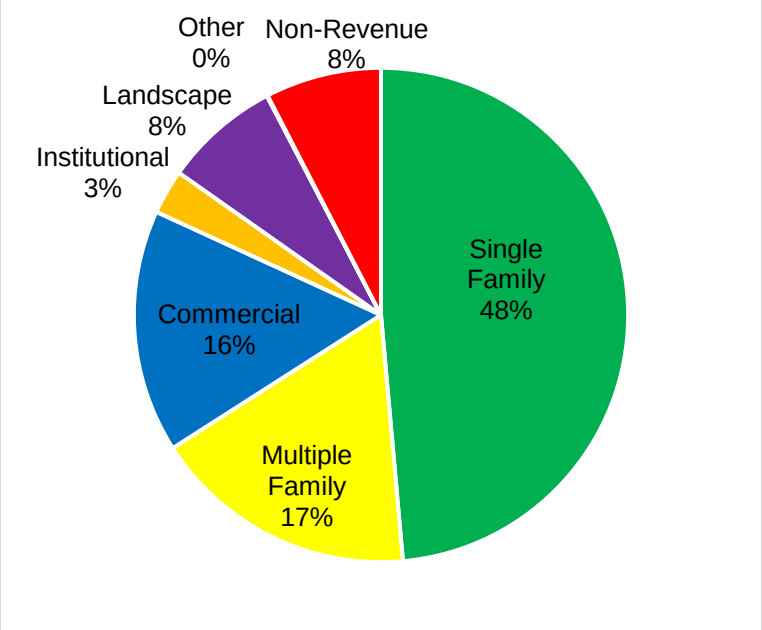


Figure ES-5. Percent water use by meter type.

Baselines and Targets

Pursuant to Senate Bill X7-7, which was passed in 2009, the City was required to reduce its overall water use per person (gross per capita water use) by 20% by the year 2020. The City's baseline water use for setting its 2020 reduction target was calculated using a methodology developed by the Department of Water Resources (DWR). As shown in Figure ES-6, the City achieved and surpassed this target, with a gross per capita water use in FY 2020 fiscal year of 82 GPCD, well below its target of 117 GPCD.

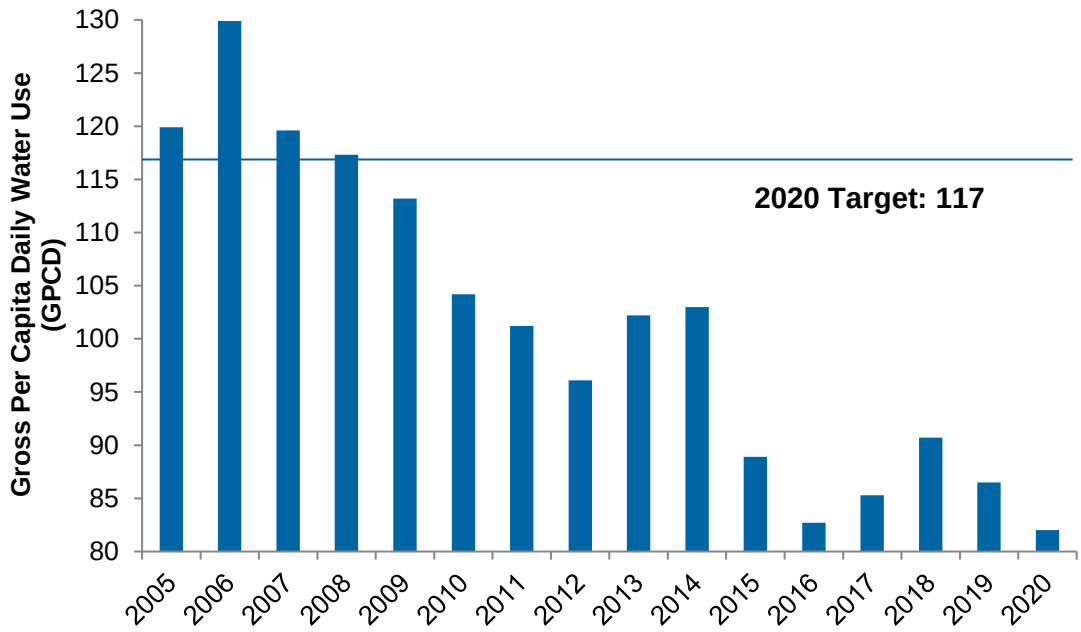


Figure ES-6. Past, and current gross per capita water use (GPCD).

System Supplies

Due to a number of geographical and economic constraints, the City does not produce any potable water from within the City service area. Like many of the cities in the greater San Francisco Bay area, the City purchases its entire potable water supply from the Regional Water System (RWS), operated by the San Francisco Public Utilities Commission (SFPUC).

The City is a member of the Bay Area Water Supply and Conservation Agency (BAWSCA), an agency that represents the interests of the 26 total agencies that purchase water at a wholesale level from the SFPUC RWS. BAWSCA has the authority to represent the agencies on issues pertaining to water supply and conservation throughout the region.

The total annual water supply available to the City is set forth in the Water Supply Agreement and subsequent Water Sales Contract, agreed upon between the City and the SFPUC (among other parties). During normal water years, the City's Individual Supply Guarantee (ISG) is 3.15 million gallons per day (MGD), which corresponds to an annual volume of 1,150 MG.

The City takes advantage of recycled water at the Water Pollution Control Plant (WPCP) operated by the City. Currently, uses are restricted to washing and maintenance activities at the plant, and are not included in reported supplies. The City has identified the opportunity for additional recycled water use; however, at this time these plans do not include a projected volume.

Water System Reliability

The City is solely dependent on drinking water from the RWS operated by the SFPUC. As such, the reliability of the City's water supply is directly related to the reliability of the RWS, which is impacted by multiple factors such as climate change and regulatory changes. In particular, 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. If the Bay-Delta Plan Amendment is implemented, the SFPUC would experience supply shortages of greater than 20% in single dry years or multiple dry years.

The availability of supply to the City during times of drought or other water shortage is outlined in the Water Shortage Allocation Plan (WSAP), which is composed of the following two components:

1. Tier One Plan: Allocates water between SFPUC and the wholesale customers of the RWS; and
2. Tier Two Plan: Allocates the collective wholesale water share between each wholesale customer.

Specifically, the Tier Two Plan allocates water to each wholesale customer based on an allocation factor, or percent of total available supply. Subsequently, the available water supply during a single dry year or multiple year drought are determined.

The Tier One and Tier Two Plans will be used to allocate water from the RWS between retail and wholesale customers during system-wide shortages of 20% or less. For the purposes of the 2020 UWMP, it is assumed that drought cutbacks among SFPUC wholesale customers will be equivalent (e.g. same cutback percentage to each wholesale customer) during RWS shortages in excess of 20%. However, in an actual shortage in excess of 20%, wholesale customers would have the opportunity to develop and agree upon a

more nuanced and equitable approach. Table ES-1 below shows the water supply available to the City in a multi-year shortage compared to the City's projected demands.

Table ES-1. Consecutive dry year supply and demand comparison (MG).

		2025	2030	2035	2040	2045
First year	Supply totals	533	580	569	653	635
	Demand totals	835	913	896	1,029	1,170
	Difference	(302)	(333)	(327)	(376)	(535)
Second year	Supply totals	456	500	489	558	635
	Demand totals	835	913	896	1,029	1,170
	Difference	(379)	(413)	(407)	(471)	(535)
Third year	Supply totals	456	500	489	558	635
	Demand totals	835	913	896	1,029	1,170
	Difference	(379)	(413)	(407)	(471)	(535)
Fourth year	Supply totals	456	500	489	493	540
	Demand totals	835	913	896	1,029	1,170
	Difference	(379)	(413)	(407)	(536)	(630)
Fifth year	Supply totals	456	500	445	493	540
	Demand totals	835	913	896	1,029	1,170
	Difference	(379)	(413)	(451)	(536)	(630)

As shown, implementation of the Bay-Delta Plan Amendment would significantly decrease the available water supplies to the City in dry year beginning as early as 2023, with shortages of up to 630 MG (54%) in years 4 and 5 of a multiple year drought beginning in 2045.

Water Shortage Contingency Planning

The City has a Water Shortage Contingency Plan (WSCP) to help guide the City in policy and decision-making during times of water shortage. The demand reduction strategy outlined by the plan is a six-stage approach, based on the supply deficiencies shown below. The City added an additional shortage level in the 2021 WSCP update to align with DWR standard shortage levels. Figure ES-7 demonstrates how the City's shortage levels align with DWR levels.

Stage	Water Shortage Magnitude	Stage Title
1	0-5%	Water Shortage Alert
2	6-15%	Water Shortage Warning
3	16-25%	Water Shortage Emergency
4	26-35%	Severe Water Shortage Emergency
5	36-50%	Critical Water Shortage Emergency
6	>50%	Water Shortage Disaster

2020 WSCP Level	Shortage Level
1	<10%
2	10-20%
3	20-30%
4	30-40%
5	40-50%
6	>50%

Figure ES-7. City's shortage level alignment with DWR standard levels

Contained within each of the City's water shortage stages is the following information:

- An overview of the response;
- A discussion of the key issues involved in that stage;
- A prepared public message; and
- A list of recommended restrictions and prohibitions on end uses, communication strategies, and operating actions to reduce municipal demand.

As noted above, each stage contains a number of mandatory prohibitions on water end use, including:

- Prohibiting water use to wash hard surfaces, including sidewalks, driveways, and patios;
- Limit irrigation times and days;
- Restaurants may only serve water upon request;
- Accelerated leak repair scheduling;
- Prohibit turf installation in new development; and
- Prohibit onsite vehicle washing.

An often-overlooked consequence of implementing demand reduction measures is the subsequent loss in water sales revenue. To estimate the possible effect of reduced water sales on the City's water system revenue, the following chart has been developed.

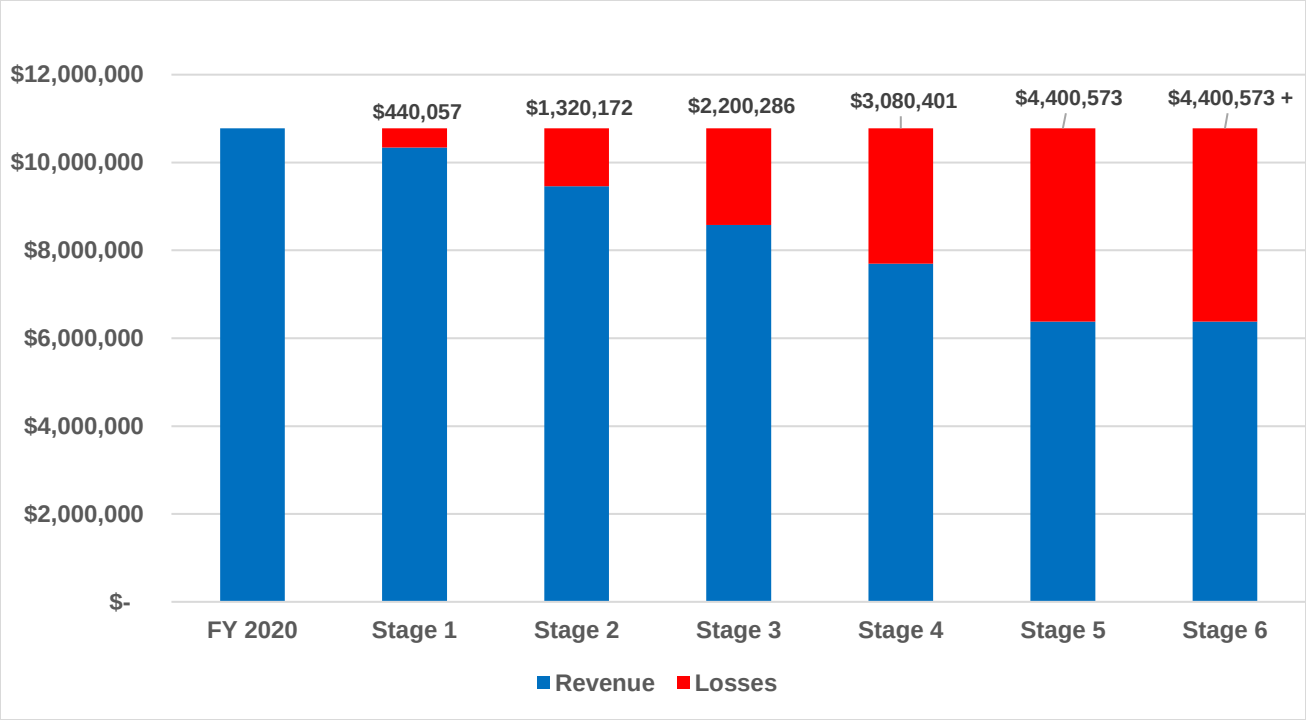


Figure ES-8. Estimated revenue losses associated with each water shortage stage.

The chart above is based solely on water sales; there are other factors that could act to increase revenue, such as penalty fees, and some factors that could further reduce revenue, such as an increased need for staffing.

Demand Management Measures

The City maintains a comprehensive water conservation program, which includes a host of Demand Management Measures (DMMs) implemented by the City to improve water use efficiency. A listing of these DMMs is shown below.

Table ES-2. Summary of City Demand Management Measures.

Demand Management Measure	Description/Components
Water Waste Prevention Ordinances	• City's Water Conservation Ordinance Title 8, Chapter 45 and CALGreen building codes
Metering	• All City water customers are currently metered • City has a meter testing, repair, and replacement program
Conservation Pricing	• City currently uses uniform rates for water usage • The City has a tiered excess use water rate structure outlined in the Water Shortage Contingency Plan during times of extreme shortage
Public Education and Outreach	• Displays at Millbrae Public Library and City Hall

	• Articles in City Chamber of Commerce e-newsletter • Postings on City's website and Facebook page • Messages on customer utility bills • New resident packets about water conservation • Annual consumer confidence reports (CCR) • Classroom education outreach and programs
Programs to Assess and Manage Distribution System Losses	• City Monitors water system losses by comparing metered usage to total SFPUC purchases • The City promptly repairs leaks upon detection
Water Conservation Program and Staffing Support	• City employs an Environmental Programs Manager who oversees the water conservation program, and other support staff assist from the Public Works Department
Other Demand Management Measures	• Residential landscape education • Water-Wise landscape award program • City Facility Water Conservation Program
Residential Conservation Program	• Water efficient toilet/washer and rain barrel rebates • Indoor water use surveys • Sprinkler nozzle head program • Free water efficient devices
Commercial, Industrial, and Institutional (CII) Conservation Programs	• Water audits and free water efficient devices • Water efficient toilet and rain barrel rebates • Conservation materials for hotels and restaurants • Participation in BAWSCA's Large Landscape Conservation Program

Over the past five years, the City has implemented DMMs to remain consistent with the goal of water use efficiency and statewide demand reduction targets.

Green Building Standards	•City adopted the CALGreen Building Code in 2019
Drought Emergency Regulations	•City implemented drought emergency regulations from 2014-2017
Water Shortage Contingency Plan	•City implemented Stage 2 from 2015-2017
Municipal Operations	•From 2015-2017, the City implemented operational and maintanance changes to reduce City water use
Education and Outreach	•Over the past five years, the City has implemented the Eduction and Outreach components listed in Table ES-2
Water Savings Devices and Rebates	•Since 2015, the City has issued 7,282 water efficient devices, 121 high efficiency washer rebates, 228 high efficiency toilet rebates, and 33 rain barrel rebates

Figure ES-9. DMMs implemented over the past five years.

Plan Adoption, Submittal, and Implementation

An UWMP requires proper notification of the public and stakeholder agencies during the process. The following table summarizes the notices that were sent during the preparation of the City's 2020 UWMP.

Table ES-3. Summary of stakeholder outreach and notification.

Stakeholder	Notification Type	Date(s)
San Mateo County Daily Journal (Public)	Notice of UWMP preparation, time and location of public hearing	February 6, 2021, May 13th and 20th 2021
San Mateo County Public Works Dept.	Notice of UWMP preparation, time and location of public hearing	February 4, 2021, May 13, 2021
Tuolumne River Trust	Notice of UWMP preparation, time and location of public hearing	February 4, 2021, May 13, 2021
BAWSCA	Notice of UWMP preparation, time and location of public hearing	February 1, 2021, May 13, 2021
City Website/Facebook (Public)	Notice of UWMP preparation, time and location of public hearing	April 13, 2021

The City is holding a public hearing to discuss and adopt the UWMP on May 25, 2021. Subsequently, the UWMP and associated data in the DWR standard tables will be submitted to the DWR via the WUEData submittal tool prior to July 1, 2021.

1. Introduction and Overview

This section provides context and purpose to this report with a discussion of the Urban Water Management Plan Act, an overview of this document, and a presentation of relevant changes to the California Water Code since the last update of the City of Millbrae's (City) Urban Water Management Plan (UWMP) in 2015.

1.1 Purpose

Water resource planning is an essential component in managing successful and sustainable communities and developments now and in the future. The Urban Water Management Plan Act (Act) of 1983, and all subsequent amendments to the California Water Code, have been enacted to help ensure that all urban water delivery agencies, both wholesale and retail, are conducting the long-term planning that is necessary for successful development and resource management. In general, the Act was established so that water suppliers report, describe, and evaluate:

- Water demand and uses for a 20-year planning period;
- How the identified demand will be met over the same planning period, during normal, single dry, and multiple dry year types;
- Water planning coordination with fellow stakeholder agencies and the public;
- Efficient water uses, demand management measures, and water system losses; and
- Water shortage contingency planning.

In addition to the Act, a subsequent bill was passed in 2009, the Water Conservation Act (SB X7-7), with the goal of reducing water consumption in California by 20% by the year 2020. This legislation introduced new requirements for UWMPs beginning in the year 2010, including:

- Calculating baseline gross water demand in units of gallons per capita per day (GPCD) using a 10- or 15-year base usage period;
- Calculating a target reduction from the baseline demands using one of four methodologies;
- Verifying reduction target goal using a five-year baseline usage period, calculated in GPCD; and
- Setting the reduction gross per capita water use target for 2020.

This 2020 UWMP update addresses the necessary issues of water management as noted above, as well as others required in the California Water Code (CWC). The subsections below outline how the requirements are presented in this document.

1.2 2020 UWMP Overview

To ensure consistency with the requirements of the CWC, this document uses the suggested format of the *2020 Urban Water Management Plans Guidebook for Urban Water Suppliers* from the Department of Water Resources (DWR), with some additional inclusions that are specifically relevant to the City. As a component of this outline, many of the tables used in this report are the same as the standardized tables as part of the 2020 UWMP requirements; these same tables are also submitted separately to the DWR through the WUEdata online submission tool. The outline of this report is presented in Table 1-1 below.

Table 1-1. 2020 UWMP document outline.

Section Number	Section Title	Description
1	Introduction and Overview	A brief discussion of the UWMP process and requirements, a document outline, and presentation of changes to the CWC since 2015.
2	Plan Preparation	Provides information on the UWMP process used for the City of Millbrae's 2020 UWMP update.
3	System Description	Describes water suppliers' water system and service area, including service boundary maps, population projections, and local climate.
4	System Water Use	A description and quantification of the City's current and projected water use.
5	Baseline and Targets	A description of the method used to comply with the water use reduction targets mandated by SB X7-7, and a discussion on meeting the 2020 target water use goal.
6	System Supplies	Describes and quantifies the current and projected water supply available to the City.
7	Water Supply Reliability	Describes the reliability of the water supply for the 20-year projection period. Reliability is assessed for normal, single-dry, and five consecutive dry water years.
8	Water Shortage Contingency Planning	Provides and describes the City's current Water Shortage Contingency Plan.
9	Demand Management Measures	Communicates the past, present, and current efforts to promote water conservation and meet the demand reduction goals of SB X7-7.
10	Plan Adoption, Submittal, and Implementation	A description of the steps taken to adopt and submit the final UWMP to the DWR. Also includes information on public availability and the City's plan to implement the UWMP.

In addition to the general outline shown above, the DWR has developed a checklist for each section to ensure that all components of the CWC are covered in the report. This checklist, with the location each item is addressed in this report, can be found in Appendix A.

1.3 Recent Changes to Water Code

Changes to the CWC over the past five years have resulted in additional requirements for the preparation of the 2020 UWMP. These additional requirements are listed below.

Table 1-2. Changes to water code since 2015 UWMP reporting (DWR, 2020).

Topic	CWC Section	Legislative Bill	Summary
Water Supply and Demand Assessment	10635.(a)	SB 606, 2018	Requires water supply and demand assessment to project for a normal water year, a single dry water year, and a drought lasting five consecutive water years.
Annual Water Supply and Demand Assessment	10632.1	AB 1414, 2019	Requires water suppliers conduct an annual water supply and demand assessment on or before July 1 of each year, starting 2022.
Drought Risk Assessment	10635.(b)	SB 606, 2018	Requires that water suppliers must include as part of its UWMP, a drought risk assessment. The drought risk assessment shall include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period and 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.
Seismic Risk Assessment	10632.5.(a)	SB 606, 2018	Requires that the Water Shortage Contingency Plan (WSCP) include a seismic risk assessment and mitigation plan.
Water Shortage Contingency Plan	10632.(a)(1), (a)(2), (a)(3)(A), (a)(4), (a)(5), (a)(9), and (a)(10)	SB 606, 2018	Require that the WSCP include the following elements: Six standard shortage levels, locally appropriate “shortage response actions”, procedures for conducting an annual water supply and demand assessment, communication protocols and procedures, monitoring and reporting procedures, and a re-evaluation and improvement process for the WSCP.

Coordination with Local or Regional Use Authorities	10631.(a)	AB 1414, 2019	Requires that water suppliers coordinate with local or regional land use authorities to determine the most appropriate land use information for projecting water use.
Energy Intensity	10631.2.(a)	SB 606, 2018	Water suppliers must include information that can be used to calculate the energy intensity of their water service, based on information readily available.
Lay Description	10630.5	SB 606, 2018	Water suppliers shall provide a simple lay description of their projected water use for the foreseeable future.

1.4 Other Planning Efforts

This UWMP was prepared in coordination with the City's update to its WSCP The two documents have been updated in parallel to maximize the utility and relevancy of the information and projections contained in each report. Further information on the City's WSCP can be found in Section 8 of this report.

2. Plan Preparation

This section demonstrates the applicability of the Act to the City. Specific items of interest in this section include the City's selection of an individual UWMP and how the City has and plans to coordinate with both fellow stakeholder agencies and the public.

2.1 Basis for Preparing a Plan

In California, if a municipal water agency is categorized as an urban water supplier, then the agency must prepare an UWMP every five years in accordance with the Act. The CWC Section 10617, defines an urban water supplier as any supplier, whether publicly or privately owned, that provides water for municipal purposes to more than 3,000 customers or supplies an annual volume at or in excess of 3,000 acre-feet (AF) (978 million gallons [MG]). The number of municipal connections and the volume of water supplied by the City at the end of the fiscal year 2020 are shown in Table 2-1 below.

Table 2-1. Public water system information.

Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Purchased 2020 (MG)	Volume of Water Purchased 2020 (CCF)
4110018	City of Millbrae	6,591	685	915,448
TOTAL		6,591	685	915,448
NOTES: UWMP Guidebook Table 2-1.				

As shown in Table 2-1, the City supplies water to more than 3,000 total municipal connections; therefore, the City is an urban water supplier. The City shall in accordance with the CWC complete an update to their UWMP.

2.2 Regional Planning

Similar to many other planning documents, an UWMP can be addressed on a regional level as opposed to an individual agency level as long as all requirements of the CWC are satisfied. Agencies that choose to engage in regional reporting can either participate in a Regional Urban Water Management Plan (RUWMP) or a Regional Alliance. In a RUWMP, agencies combine to produce an UWMP that contains data for each individual agency. As part of a RUWMP, the agencies may choose to report on the water use reduction targets of SB X7-7 on an individual level, or form a Regional Alliance wherein a group of agencies sets a common water use reduction target for the region. It should be noted that a regional alliance can exist whether or not an agency chooses to take place in a RUWMP.

2.3 Individual or Regional Planning Compliance

The City of Millbrae has completed an individual UWMP to fulfill the requirements of the CWC (Table 2-2). Additionally, the City will report on the requirements of SB X7-7 on an individual agency level.

Table 2-2. UWMP preparation type.

Plan Identification		
☑	Individual UWMP	
☐	Regional UWMP (RUWMP)	
	Select One:	
	☐	RUWMP includes a Regional Alliance
	☐	RUWMP does not include a Regional Alliance
NOTES: UWMP Guidebook Table 2-2.		

2.4 Fiscal or Calendar Year and Units of Measure

For consistency with DWR requirements, the primary unit of measure for water volumes is million gallons (MG). However, some select tables throughout the plan include the units of 100-cubic feet (CCF), which are the billing units the City uses. The reporting years align with the City's fiscal year, which begins on July 1st. See

Table 2-3 below for a summary of this information.

Table 2-3. Agency identification.

Type of Agency	
☐	Agency is a wholesaler
☑	Agency is a retailer
Fiscal or Calendar Year	
☐	UWMP Tables Are in Calendar Years
☑	UWMP Tables Are in Fiscal Years
If Using Fiscal Years Provide Month and Day that the Fiscal Year Begins (mm/dd)	
07/01	
Units of Measure Used in UWMP	
Unit	MG
NOTES: UWMP Guidebook Table 2-3	

2.5 Coordination and Outreach

2.5.1 Agency Coordination

The 2020 UWMP has been prepared under the supervision of the Public Works Department. The Department has also coordinated with other agencies throughout the process, including the Bay Area Water Supply and Conservation Agency (BAWSCA) and San Francisco Public Utilities Commission (SFPUC). Public participation has been encouraged throughout the process, with efforts including making draft and final versions of the report available for public review. The following table summarizes the agency and public coordination efforts that have been undertaken by the City during this process.

Table 2-4. Summary of UWMP preparation outreach coordination.

Agency	Participated in UWMP Development	Received Copy of Draft	Comment on Draft	Attended Public Meetings	Contacted for Assistance	Sent Notice of Intent to Adopt
BAWSCA	X	X			X	X
Millbrae City Council	X	X		X		X
City of Millbrae Public Works Dept.	X	X		X		X
Public Library		X				X
SFPUC		X			X	X
San Mateo County		X				X

2.5.2 Public Participation and Outreach

The CWC recommends that water agencies encourage active participation from a diverse social, cultural, and economic representation of the service area. During the 2020 UWMP update process, the City actively conducted public outreach through a variety of methods, and provided information on the preparation of the Plan and Public Hearing.

Notifications regarding the preparation of the UWMP and the call for participation were also made targeting the public. Publications and print media outreach occurred through the following:

1. San Mateo Daily Journal (notice posted 2/6/2021)
2. Utility Bill Messages, May 2021
3. Millbrae Library E-Newsletter, May 2021
4. City Hall Display Windows, May 2021

The City also used electronic publications for the notice of preparation for the UWMP. This included an ad on the local cable TV station, MCTV Channel 27, and the posting of all information on the City's website (www.ci.millbrae.ca.us).

The San Mateo County Daily Journal (local newspaper) published a UWMP preparation notice dated February 6, 2021. Public plan preparation notices will also be published in the newspaper on May 13th and May 20th, 2021. As required, Plan preparation notices, public hearing notices, and draft UWMP notices were also sent to BAWSCA, the Tuolumne River Trust, and the San Mateo County Public Works Director.

Coordination between the City and other stakeholders has occurred throughout the UWMP update process. Notifications regarding the preparation of the UWMP were sent to the following agencies/stakeholders:

1. Millbrae Public Library
2. School District Superintendent
3. Peninsula Chinese Business Association
4. Tuolumne River Trust
5. City Committees and Commissions including
    I. Community Preservation Commission
    II. Planning Commission
    III. Cultural Arts Commission
    IV. Parks and Recreation Commission
    V. Senior Advisory Commission
    VI. Downtown Process Committee
    VII. Mayor's Civic Coordinating Council
    VIII. Youth Advisory Committee

Table 2-5 below presents a brief summary of the outreach and timeline that has occurred in order to comply with the CWC. Copies of all public hearing notices can be found in Appendix B, and further information on this topic can be found in Section 10.

Table 2-5. Summary of public participation timeline.

Date	Event	Description
April 13, 2021	Public notification of plan preparation	Describe UWMP requirements and process
May 13, 2021	Public review and comment	Release Draft UWMP and solicit input
May 25, 2021	City Council Meeting	Presentation of Final Draft UWMP
May 25, 2021	Public Hearing	UWMP considered for adoption by the City Council

2.5.3 Coordination with Water Wholesaler

In addition to coordination with stakeholder agencies, governmental organizations, and citizens, the City has coordinated with its water wholesaler, the SFPUC (Table 2-6). Pursuant to CWC 10631, the City has informed the wholesaler of its projected demands over the next 25 years, reported in five-year increments.

Table 2-6. Water supplier and wholesaler information exchange.

Wholesale Water Supplier Name*:*
San Francisco Public Utilities Commission
NOTES: UWMP Guidebook Table 2-4.

2.5.4 Notice to Cities and Counties

Consistent with CWC section 10621(b), the City notified the County of San Mateo about the 2020 UWMP update process. A copy of the notification can be found in Section 10.

3. System Description

This section provides an overview of the City's service area and municipal water system. To provide a clear picture of the circumstances that are unique to the City, the discussion includes a description of the City's water and wastewater system, service area boundary, local climate, and an overview of population, demographic factors, and land uses.

3.1 General Description

3.1.1 Location

The City is located on the San Francisco peninsula, approximately 15 miles south of San Francisco and directly west of San Francisco Airport (SFO). See Figure 1 for a vicinity map showing the City's location. The City is located in San Mateo County.

The City covers an area of approximately 3.25 square miles and is bordered to the west by Highway 280, the east by Highway 101. The city limits are coterminous with the City of San Bruno to the north and the City of Burlingame to the south.

The eastern portion of the City is located on relatively flat terrain with an average elevation of approximately 40 feet. Moving west through the City towards the Highway 280 boundary, the slope of the terrain increases significantly to an elevation of approximately 500 feet at the north city limits and 600 feet to the south city limits.

3.1.2 Potable Water System

The City purchases its water from the SFPUC's Regional Water System (RWS). The source water for SFPUC is primarily from the Hetch Hetchy water system, with some additional surface water contributions coming from Alameda County and San Francisco Peninsula. Further information on the SFPUC's RWS can be found in Section 6.

The City receives water through 5 connections to the RWS and distributes it to customers through approximately 76.1 miles of domestic water mains. The water distribution system boundary is coterminous within the City limits and consists of the following components:

- 450 fire hydrants;
- 1,500 valves (including hydrant and line valves);
- 11 pressure reducing stations;
- 6 water storage tanks (total storage capacity of approximately 2.1 MG);
- 2 water pump stations; and
- 6,611 service connections.

3.1.3 Wastewater System

The City operates a Water Pollution Control Plant (WPCP), which treats wastewater generated within the service area boundary. The plant is located on the eastern edge of the City limits, adjacent to Highway 101 and near San Francisco Bay (Figure 1). Wastewater reaches the WPCP through a network of approximately 57 miles of sanitary sewer lines, which are primarily under gravity flow conditions. The City also operates

three sanitary sewer pumping stations. The WPCP is designed for a dry-weather operation of 3 million gallons per day (MGD), with a wet-weather peak capacity of 9 MGD. The City disposes of its treated effluent through a force main into San Francisco Bay.

3.2 Service Area Boundary Maps

The municipal water service area for the City of Millbrae water system is shown in Figure 1. The boundaries of the City's water system service area are coterminous with the City limits.

Figure 1. City of Millbrae Vicinity Map.

3.3 Service Area Climate

The City is located on the Central Pacific west coast of California, which is generally characterized by a Mediterranean climate. The wet season typically occurs between October and May, with little-to-no precipitation occurring during the summer months. Annual average precipitation is approximately 20 inches and the annual average maximum temperature is 65.2 degrees Fahrenheit, as shown in Table 3-1.

Table 3-1. Average climate data for Millbrae area.

Month	Monthly Average Reference ETo (inches)[1]	Average Monthly Rainfall (inches)[2]	Average Maximum Temperature (Fahrenheit)[2]
January	1.86	4.31	55.8
February	2.24	3.58	59.1
March	3.41	2.88	61.2
April	4.80	1.38	63.8
May	5.27	0.39	66.7
June	5.70	0.13	70.0
July	5.58	0.02	71.4
August	5.27	0.04	72.0
September	4.20	0.17	73.4
October	3.41	1.00	70.2
November	2.40	2.31	62.9
December	1.86	3.73	56.4
Total	46.3	19.94	65.2

[1]ETo data from Reference ETO Zone 3 retrieved on September 17th, 2020 from http://www.cimis.water.ca.gov/App_Themes/images/etozonemap.jpg

[2]Temperature and precipitation data from the Western Regional Climate Center, reported from the SFO station for the period of record 07/1945 – 06/2016. Retrieved on September 17th, 2020 from <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7769>

3.4 Climate Change

Climate change is an issue of growing concern and awareness for water agencies around the world. In California, which recently experienced a historic drought, agencies have experienced first-hand how large a role climate plays in all facets of water management.

Some potential climate change effects that have been identified in California include increased average temperatures, decreased snowpack, earlier snow melts, sea level rise, and more intense precipitation events. To characterize some of the potential impacts and vulnerabilities that may be of issue to the City, the *Climate Change Vulnerability Assessment,* which is included in Appendix I of the DWR 2020 UWMP Guidebook Document, was performed for the City. Some of the specific vulnerabilities relevant to the City include:

- Water source vulnerability (snowmelt from the Sierra Nevada supply the SFPUC RWS);
- Water availability for outdoor use due to decreased supplies;
- Coastal structures and infrastructure vulnerable to sea level rise;
- Flooding (portions of the City are in the FEMA 100- and 500-year floodplain); and
- Increased fire risk.

The potential effects of climate change will have an impact on water supply, demand, and source reliability as time moves forward. Further discussions on these topics can be found in Section 7 of this report.

3.5 Service Area Population and Demographics

The population projections for the City are from the Association of Bay Area Governments (ABAG), which is a regional planning organization that was created to help meet the City's planning needs. These population estimates were obtained from ABAG's *Plan Bay Area 2040* data, released in 2017. [2]These estimates are also used in a recent study performed by BAWSCA, *Regional Water Demand and Conservation Projections Report (*June, 2020), discussed in further detail in subsequent sections. The current estimated population of the City is 22,832 residents. The population projections for the years 2020 through 2045, reported in five-year increments, are shown in Table 3-2 below.

Table 3-2. City population, current and projected.

	2020	2025	2030	2035	2040	2045
Population Served	22,832	22,846	26,774	26,657	27,081	27,505

NOTES: UWMP Guidebook Table 3-1. 2020 population is from DOF E-5 consistent with SBX7-7 calculation requirements.

3.5.1 Socioeconomic Factors

Socioeconomic information for the City was obtained from the 2010 US Census and ABAG *Plan Bay Area 2040*. The City's population consists of approximately 43% people aged 18-64, 19% under 18, and 19% 65 or older. Of the population aged 16 or older, 64% is in the labor force. According to ABAG's projections, jobs should increase over time in Millbrae from 5,920 to 11,595. The median household income in the City is $120,565. Approximately 64% of the residents own the house they occupy with a median home value of $1,230,900. Median rent in the City is $2,320. Over 93% of residents that are 25

[2] Due to the timing of the 2020 UWMP, the City is using ABAG population projections from Plan Bay Area 2017. An update to Plan Bay Area is underway and the City will incorporate the new population projections from the update for future planning.

or older are high school graduates and approximately 52% have a bachelor's degree or higher. The most recent poverty statistics show that there is a 4.7% rate of residents in poverty.

3.5.2 Service Area Land Use

Due to the highways and cities bordering Millbrae, the City at present is essentially built out. A large portion of the population growth projected is a result of urban redevelopment, in particular the Millbrae Station Transportation Oriented Development (TOD) projects outlined in the Millbrae Station Area Specific Plan (MSASP). As part of this plan, several sites located in the vicinity of the Bay Area Rapid Transit (BART) station would be redeveloped into mixed-use areas, including an increase in residential units and hotel rooms. A summary of the three redevelopment projects as reported in the MSASP Update Final Environmental Impact Report (EIR) is shown below:

- **TOD #1:** The proposed development is comprised of 267,000 SF of office space, 32,000 SF of retail space, and 500 high- to medium-density residential units. The estimated population growth as a result of this project is 1,325 permanent residents.
- **TOD #2:** The proposed development is comprised of approximately 164,535 SF of office space, 46,935 SF of retail space, 321 high- to medium-density residential units, and 116 hotel rooms. The estimated population growth as a result of this project is 851 permanent residents.
- **Other Allocations:** Includes all of the remaining buildout potential not included in TOD 1 and 2. This includes a net increase in approximately 1,213,300 SF of office space, 101,700 SF of retail space, 617 high- to medium-density residential units, and 124 hotel rooms. The project also includes the removal of approximately 335,240 SF of industrial space, which will be redeveloped. The estimated population growth as a result of this project is 1,635 permanent residents.

These developments will result in water use implications moving forward, with a net increase in permanent population and population density. The completion of these projects would increase the total population by an estimated 3,808 permanent residents. These projected land uses are incorporated in the ABAG population projections and the associated water use requirements are incorporated in the water demand forecasts in presented Section 4.

4. System Water Use

This section presents the projected water demands that have been developed for the City by BAWSCA, presented through the year 2045 in five-year increments, as well as related information on projected demand by sector, water system losses, and projected water savings.

4.1 Regional Water Demand and Conservation Projections

In June 2020, BAWSCA completed the *Regional Water Demand and Conservation Projections Report* (Demand Study).[3] The goal of the Demand Study was to develop transparent, defensible, and uniform demand and conservation savings projections for each BAWSCA member agency (SFPUC 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.

The demand projections developed for the City of Millbrae through the Demand Study modeling study are presented in this section and incorporated throughout the report.

4.2 Historical Water Use

To provide context to the current water demand, the City's historic water purchases and metered usage were obtained for the ten years prior to 2020. Figure 2 below shows the purchases from SFPUC and the corresponding gross daily per capita water usage for the City from FY 2010 through FY 2019.

[3] BAWSCA Regional Water Demand and Conservation Projections Final Report: http://bawsca.org/uploads/pdf/BAWSCA_Regional_Water_Demand_and_Conservation%20Projections%20Report_Final.pdf

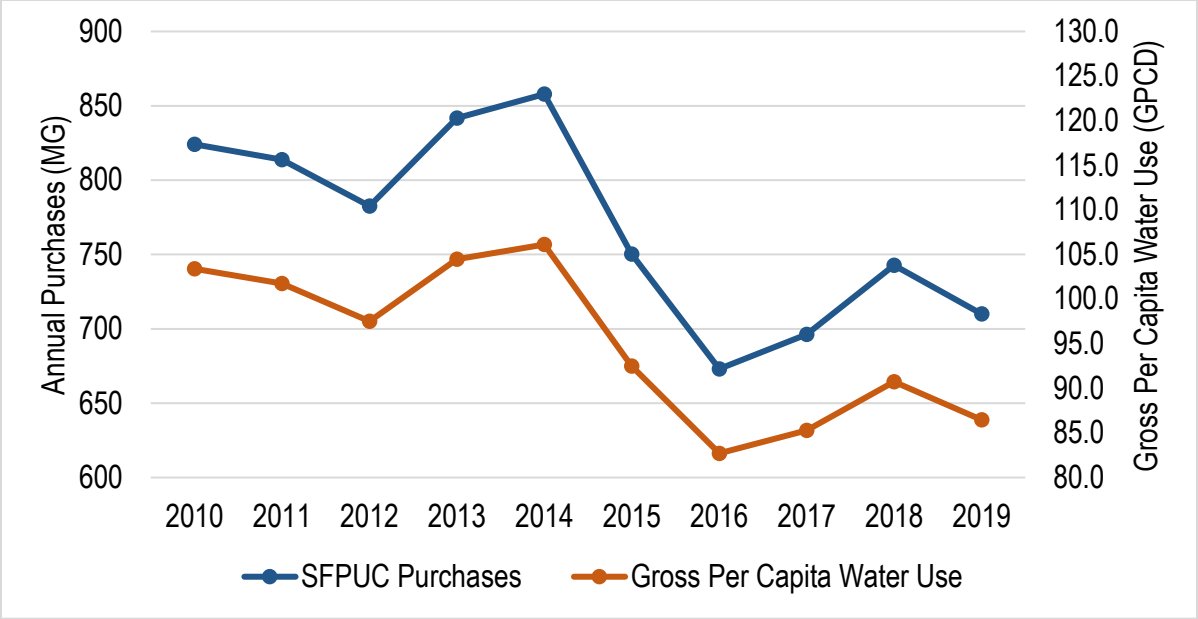


Figure 2. Water purchases from SFPUC from the years 2010-2019 (MGY).

The general trend over the past ten-years of water purchases and gross per capita water use shows a decline in average daily consumption. It is important to note that during this time period there was an economic recession (through 2012) and a major drought (2014-2016), both of which likely played an important role in decreasing demands. It should also be noted that the City's population grew by an estimated 663 residents during this time, making the decrease in total water purchases even more significant. From 2017 to 2019, increases in water use are largely associated with the end of the drought and the removal of associated water use restrictions.

4.3 Water Uses by Sector

The City collects metered water usage for a variety of use categories, including single- and multi-family, commercial, institutional, landscape, fire use, and temporary metered use. Based on the meter data from FY 2019-2020, Table 4-1 shows the total annual water demand (MG) for each measured use type.

Table 4-1. Retail demands for potable water by meter type (MG).

Use Type	2020 Actual Water Usage			
	Additional Description	Level of Treatment When Delivered	Volume (MG)	Volume (CCF)
Single Family	-	Drinking Water	333	444,659
Multi-Family	Multifamily and duplex units	Drinking Water	119	159,081
Commercial	Includes commercial, restaurants, and bars	Drinking Water	109	146,136
Industrial	-	Drinking Water	0	0
Institutional/Governmental	Includes schools, churches, and the City	Drinking Water	20	26,579
Landscape	-	Drinking Water	52	69,292
Losses	System losses from water audit	Drinking Water	52	69,184
Other	Includes temporary metered uses and fire service	Drinking Water	0.4	517
		TOTAL	685	915,448

NOTES: UWMP Guidebook Table 4-1. System losses are from the CY 2019 audit, all other usage is reported from FY 2019-20.

It should be noted that the value for system losses reported in the table above were calculated based on the American Water Works Association (AWWA) methodology discussed in Section 4.6. The total annual volume purchased from SFPUC was 685 MG, which corresponds to a daily average delivery of 1.88 MGD, approximately 60% of the City's Individual Supply Guarantee (ISG) from the SFPUC of 3.15 MGD. Comparing the 2020 water purchases to those made in the past 10-years (Figure 2), the overall trend of water use decline appears to be continuing. Consistent with the past two years, water use is anticipated to gradually increase over the next 5 years as demand continues to rebound from the drought. However, long-term trends of declining per capita water use are anticipated to continue.

One of the requirements of the CWC is to project total water demand over a 20-year period for each of the City's identified use types (i.e., Residential, Commercial, etc.). As noted previously, the demand projections used in the report were generated from the BAWSCA Demand Study (described in Section 4.1).

Table 4-2 below shows the resulting demands that were calculated for the City through this effort.

Table 4-2. BAWSCA projected demands (MG) for Millbrae using DSS model.

Year	2025	2030	2035	2040	2045
Total Demand[1]	835	913	897	1,029	1,169

[1]Demand projections include passive and active conservation measures identified by the City.

The total system demands shown above include both passive and active conservation measures, which are discussed in further detail in Section 4.6. Total water demand is defined as total water consumption plus non-revenue water. These demands are further defined based upon projected growth for each customer type. Demand projections do not include recycled water use for internal processes. Table 4-3 shows the demand by use type for the period 2025 through 2045, in five-year increments.

Table 4-3. Projected demands (MG) for potable and raw water.

Use Type	Additional Description	Projected Water Use				
		2025	2030	2035	2040	2045
Single Family	-	377	430	422	422	423
Multi-Family	Multifamily and duplex units	128	143	138	137	137
Commercial	Includes meters designated commercial, restaurants, and bars	136	133	132	213	293
Industrial	-	0	0	0	0	0
Institutional/ Governmental	Includes meters designated as schools, City of Millbrae, and churches	32	38	38	38	39
Landscape	Irrigation Uses	55	52	52	90	130
Losses	Calculated as water purchases less metered usage	106	117	114	127	145
Other	Includes temporary metered usage and fire service	1	1	1	1	2
	Total (MG)	835	913	896	1,029	1,170
	Total (CCF)	1,116,671	1,222,0695	1,198,508	1,375,505	1,563,599
NOTES: UWMP Guidebook Table 4-2.						

The total projected demands for the years 2025 to 2045 are projected to increase from 835 MG to 1,170 MG. The losses projected for each reporting year are modeled based upon historical losses as a percent of total water use, as shown in Table 4-6. Because the demands above include system losses, the totals shown above are the required volumes that would need to be purchased from SFPUC. It is important to

note that there will be some variability in usage percentages projecting into the future. As noted earlier, the largest potential developments that could occur are the Millbrae Station TOD projects, which are composed almost entirely of Commercial and Multifamily residential usage. When these projects are completed, usage percentages in the two categories would be expected to increase.

4.4 Total Retail Water Demands

The total retail water demands are equal to the potable water purchases from SFPUC. The total retail water demands for the City of Millbrae are listed in Table 4-4 below.

Table 4-4. Total water demands (MG).

	2020	2025	2030	2035	2040	2045
Potable and Raw Water	685	835	913	896	1,029	1,170
Total Demand (MG)	685	835	913	896	1,029	1,170
Total Demand (CCF)	915,775	1,116,210	1,221,166	1,198,637	1,375,975	1,562,963
NOTES: UWMP Guidebook Table 4-3.						

The City uses a constant annual volume of 9 MG of recycled water at the WPCP for washing and other maintenance activities. However, this recycled water use has not been included in the total retail water demands as the water is used for internal purposes only.

4.5 Distribution System Water Losses

Water losses were evaluated using the American Water Works Association (AWWA) methodology consistent with Water Code Section 10608.34. This method takes into account the water purchases from SFPUC versus the total metered water volumes and includes additional considerations such as unbilled metered usage and unauthorized consumption estimates. Water losses were calculated on a calendar year basis, rather than a fiscal year basis, for compliance with reporting deadlines. The total annual water loss for the City for calendar years 2015 through 2019 is presented in Table 4-5.

Table 4-5. 12-month water loss audit reporting

Reporting Period Start Date	Volume of Water Loss (MG)	Volume of Water Loss (CCF)
01/2015	85	114,491
01/2016	95	127,025
01/2017	88	117,502
01/2018	76	101,604
01/2019	52	69,184
NOTES: UWMP Guidebook Table 4-4. 2019 and 2018 value from AWWA Water Loss Audit on a calendar year basis. 2015-2017 calculated from subtracting consumption from SFPUC purchases for each year.		

4.6 Projected Water Use 2021 to 2025

Consistent with Water Code Section 10635(B), the City's characteristic five-year unconstrained water use for fiscal years 2021 through 2025 is presented in Table 4-6. These projections represent expected gross water use for the next five years without drought conditions. The projections incorporate planned active conservation and passive conservation savings for the City consistent with the Demand Study.

Table 4-6. Projected 5-year water demands.

	2021	2022	2023	2024	2025
Total Demand (MG)	715	745	775	805	835
Total Demand (CCF)	955,862	995,949	1,036,036	1,076,123	1,116,210

4.7 Estimating Future Water Savings

As noted above, the demands generated by BAWSCA that were subsequently used in this report include both active and passive water conservation measures. Passive water conservation measures are those that result in water use savings without direct financial contributions from water agencies. Most commonly, passive conservation measures result from building codes or ordinances. The passive water conservation measures included in the projected demands for the City are presented below:

1. The natural replacement of existing older plumbing fixtures and replacement with fixtures meeting new/updated plumbing codes; and
2. Installation of water-efficient fixtures in new buildings and retrofits as required under the CALGreen Building Code Standards (CCR Title 24, Part 11).
3. The Model Water Efficient Landscape Ordinance.

Active conservation measures are those that require direct financial or educational contribution from the water agency. For inclusion into the BAWSCA projected demands, each city indicated which of 25 active conservation measures they currently are or will be using in the future. The active conservation measures and anticipated water use savings used in the City's demands presented above are listed below.

Table 4-7. Active conservation measures used for City's water use projections.

Conservation Measure	Description	Anticipated Savings
CII Water Survey	Program provides free water surveys to CII customers to evaluate ways for the business to save water and money. The surveys may target large accounts (e.g., accounts that use more than 5,000 gallons of water per day) only such as hotels, restaurants, stores and schools. Emphasis may be on supporting the top 25 users for each individual water agency.	Savings of 15% per site for 0.5% of accounts annually.
Large Landscape Outdoor Water Surveys	Outdoor water audits offered for existing large landscape customers. Normally those with high water use are targeted and provided a customized report on how to save water. All large multifamily residential, CII, and public irrigators of large landscapes would be eligible for free landscape water audits upon request. Tied to the Water Budget Program.	Savings of 15% for 0.8% of accounts annually.
Large Landscape (Waterfluence) Program	Website provides feedback on irrigation water use (budget vs. actual). Current Waterfluence Program.	Savings of 30% for 5% of accounts.
Lawn Be Gone! And Rainwater Capture Rebates	Provide a per square foot incentive for to remove turf and replace with low water use plants or permeable hardscape. Landscape conversion includes conversion of turf to lower-water-using turf varieties. Rebate based on dollars per square foot removed, and capped at an upper limit for single family residence, multifamily residence and/or commercial account.	Savings of 18% over 5 years for 0.13% of accounts annually.
Residential Water-Savings Devices Giveaway	Utility provides free high efficiency showerheads, shower timers, toilet leak detection tablets, and aerators in bulk and	Savings of 6.9% for 1.25% of user accounts annually.

Conservation Measure	Description	Anticipated Savings
	gives them away at Utility office and community events.	
Flowmeter Rebate	Program provides rebates for flow measuring devices which inform customers of their water use and provide leak detection and remote shutoff with a smart phone interface. Devices are targeted to residential users and can monitor indoor only, whole site meter use, and/or irrigation only use.	Savings of 7% of total use for 0.5% of user accounts annually.
New Development Submetering	This is an existing code that, as of January 1, 2018, requires the metering of individual units in new multifamily, condos, townhouses, mobile-home parks and business centers (less than four stories and with water heater in the units).	Savings of 22% per account on indoor uses only for 50% of new multifamily accounts.
New Development Hot Water On Demand	Existing code which requires new residential development to include efficient hot water on demand systems. Systems reduce hot water waiting times. Coordination with building department and tracking.	Savings of 4.3 gpd for 100% of new residential accounts.
Public & School Education	Program includes in-person and online outreach to residential customers, schools and all CII customers, landscapers and contractors. Outreach includes tools and resources specific to outdoor water use efficiency (e.g. WaterWise gardening tool and landscape watering calculator) as well as general information on water conservation through community events, websites, and social media.	Savings of 1% on common indoor water uses for 5% of user accounts.

[1]See BAWSCA *Regional Water Demand and Conservation Projection Report* for full list of uses.

Many of the conservation measures in the table above are components of the demand management measures used by the City. Further discussion on demand management measures can be found in Section 9.

4.8 Water Use for Lower Income Households

Senate Bill 1087 requires that all urban water suppliers project the water demand for low-income households planned within their service area. The following section presents the demand projections for low-income housing based on the method outlined in Section 4.5 of the UWMP Guidebook.

In this method, projected low-income housing units are to be identified from a city's housing element or a county general plan. Housing elements are based on the Regional Housing Needs Allocation (RHNA), which are produced by the State Department of Housing and Community Development (HCD). The RHNA is then used to allocate the regional need for housing to the regional council of governments (COG) or the HCD for incorporation into their respective housing elements. If a City is part of a COG, it then falls upon the COG to allocate each individual City's "fair share" of the total regional housing needs. These fair shares are separated into income categories; extremely low, very low, low, moderate, and above moderate, and subsequently included in the City's housing element.

The COG for the City is the ABAG; the same organization noted above that produces information for the region including the population projections used in this report. ABAG and HCD used these population estimates, in conjunction with job growth estimates, available land, and proximity to transportation to develop the needs for the region. ABAG subsequently allocated the needs to each city. The ABAG allocated needs for Millbrae are found in Table 4-8 below. These needs are those found in the City's housing element for the planning period 2015-2023.[4]

Table 4-8. City housing element housing needs allocation ("fair share").

	Extremely Low	Very Low	Low	Moderate	Above Moderate	Total
Units	96	97	101	112	257	663
Percent	14.5%	14.5%	15%	17%	39%	100%

The total number of units needed for all three low-income categories is 294. To project the demand required for these units, the total unit occupancy is estimated by multiplying the number of units by the average population per household (2.67) as reported in the 2010 census. The total projected low-income population is then multiplied by the average per capita residential water use for fiscal year 2020 to determine the total annual projected water use for the planned low-income developments. A summary of these demands is shown in Table 4-9 below.

[4] The RHNA reporting data includes only units that have had a building permit for construction issued before January 1, 2021 and in the Above Moderate income level category, the City can only report 257 units per HCD, even though 310 total units have been issued building permits as of December 31, 2020. Surplus in an individual income category cannot count towards the RHNA reporting data based on current HCD rules. As a result, the State undercounts the actual number of housing units constructed. The City will need to issue 367 building permits allocated across income levels (186 very low, 95 low, and 86 moderate income units) between 2021-2023 to meet the City's RHNA allocation by the end of the housing element cycle.

Table 4-9. Future low-income housing development demands.

Income Category	Housing Units Allocated	Projected Annual Demand (MG)
Extremely Low	96	5.1
Very Low	97	5.2
Low	101	5.4
Total	**294**	**15.7**

The total projected demand for future low-income housing developments in the City is 15.7 MG, split relatively evenly between extremely-, very, and low-income housing. The projected housing needs allocation and subsequent low-income demands presented above are based on the ABAG population estimates. These population estimates are the same that were used by BAWSCA in the DSS model, which were used to determine the City's projected potable water demands. Therefore, the projected water demands presented in Section 4.3 include the anticipated demand for low-income housing. Table 4-10 below confirms this requirement as part of the CWC.

Table 4-10. Inclusion of specific data in water use projections.

Are Future Water Savings Included in Projections	Yes
Section found in UWMP	Section 4.7
Are Lower Income Residential Demands Included In Projections?	Yes
NOTES: UWMP Guidebook Table 4-5.	

4.9 Climate Change

The potential effects of climate change could have an impact on future water demand within the City service area. As noted above, possible climate outcomes such as decreased snowpack in the Sierra Nevada Mountains and increased temperatures could result in customer demand modifications. According to *California's Fourth Climate Change Assessment San Francisco Bay Area Summary Report*, the Bay Area's historical temperature increased 1.7 degrees Fahrenheit from 1950 to 2005. It is predicted that annual mean maximum temperatures will increase by 1 to 2 degrees Fahrenheit in the early 21st century from the years 2006 to 2039, then will increase by an additional 3.3 degrees Fahrenheit in the mid-21st century from 2040 to 2069. This increment for the mid-21st century rises to 4.4 degrees Fahrenheit if the Bay Area remains under the high emissions scenario of "business-as-usual." For the BAWSCA Demand Study, the annual mean temperature increase in the early 21st century of 1.7 degrees Fahrenheit was incorporated into the City's demand forecast for the time period of 2019 to 2045.

A decreased supply from the SFPUC RWS could lead to lower water usages as a necessary byproduct of available supply. Increased temperatures, which can lead to dryer soil conditions, could lead to increased water demand for irrigation accounts and at home outdoor water use. There is some uncertainty with exactly

what will happen as the climate continues to change. Due to this uncertainty, it is difficult to truly assess or predict how water demand will change in any area, including the City.

5. Baselines and Targets

With the adoption of the Water Conservation Act of 2009, also known as the SB X7-7, the State of California is required to reduce urban per capita water use by 20 percent by the year 2020. In order to achieve this statewide objective, each urban retail water supplier was required to develop an urban water use target to help the state collectively achieve a 20-percent reduction. This section outlines City's process for setting and complying with the SB X7-7 water use target .

5.1 Baseline Periods

The baseline gross per capita water usage is determined using the 10- or 15- year baseline period. The 10-year baseline period is used for urban water suppliers that do not deliver recycled water as more than 10% of their overall water supply. The City uses recycled water amounting to less than 10% of overall demand; therefore, a 10-year continuous baseline period is used to determine baseline gross demand. The 10-year baseline period used in the subsequent analysis occurs between 1999 and 2008.

A second baseline period is also determined using a 5-year continuous period, regardless of the volume of recycled water delivered. The 5-year baseline period is used as the water reduction target confirmation and establishes the minimum value that any water use reduction method must achieve. The 5-year baseline period used is from 2004-2008.

5.2 Service Area Population

The populations used to update the water use reduction targets in the 2020 UWMP were obtained from the DOF's Reports and Research page. Updating the population estimates using this data was selected based on the DWR UWMP Guidance and Methodologies document, which suggests that cities whose service boundary largely overlaps (e.g., greater than 95%) their city boundary use DOF data as their first choice. In addition to the populations for the baseline years, the population estimate for the compliance year 2020 was obtained from the DOF. The updated population estimates can be found in Table 5-1 presented below.

Table 5-1. Service area population during baseline years.

Year		Population	Year		Population
10 to 15 Year Baseline Population			**5 Year Baseline Population**		
Year 1	1999	20,888	Year 1	2004	20,427
Year 2	2000	20,718	Year 2	2005	20,359
Year 3	2001	20,696	Year 3	2006	20,375
Year 4	2002	20,583	Year 4	2007	20,468
Year 5	2003	20,481	Year 5	2008	20,947
Year 6	2004	20,427	2020 Compliance Year Population		
Year 7	2005	20,359	**2020**		22,832
Year 8	2006	20,375	NOTES:		
Year 9	2007	20,468	1. Population estimates from the DOF (http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-5/)		
Year 10	2008	20,947	2. SB X7-7 Table 3		

5.3 Gross Water Use

The City's entire water supply comes through SFPUC purchases, which are metered upon delivery to any of the City's connections to the SFPUC RWS. The SFPUC bills the City based on these metered volumes, which are reported in Table 5-2 below. The years reported in the table correspond to the baseline years used as part of the SB X7-7 analysis.

Table 5-2. Water purchase volumes (MG) from SFPUC from 1999-2008.

Baseline Year	Purchase Volumes from SFPUC (MG)
1999	960
2000	949
2001	1000
2002	905
2003	840
2004	942
2005	891
2006	967
2007	894
2008	898

Because these volumes are a result of metering before final delivery, storage, or loss in the City's distribution system, these volumes represent the total gross water use.

5.4 Baseline Daily per Capita Water Use

The gross water use and estimated population values presented in Sections 5.3-5.4 above are used to calculate the baseline daily per capita water use. Baselines are calculated for each of the target years in both the 5- and 10-year calculation ranges; they are determined by taking the total gross annual usage and averaging it over the entire population per day. Table 5-3 below shows the baseline water use for each of the target years.

Table 5-3. Daily per capita usage (GPCD) during baseline years 1999-2008.

Baseline Year		Service Area Population	Annual Gross Water Use (MG)	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	1999	20,888	960	126
Year 2	2000	20,718	949	125
Year 3	2001	20,696	1,000	132
Year 4	2002	20,583	905	120
Year 5	2003	20,481	840	112
Year 6	2004	20,427	942	126
Year 7	2005	20,359	891	120
Year 8	2006	20,375	967	130
Year 9	2007	20,468	894	120
Year 10	2008	20,947	898	117
10-15 Year Average Baseline GPCD				**123**
5 Year Baseline GPCD				
Baseline Year		**Service Area Population**	**Gross Water Use (MG)**	**Daily Per Capita Water Use (GPCD)**
Year 1	2004	20,427	942	126
Year 2	2005	20,359	891	120
Year 3	2006	20,375	967	130
Year 4	2007	20,468	894	120
Year 5	2008	20,947	898	117
5 Year Average Baseline GPCD				**123**
2020 Compliance Year GPCD				
2020		22,832	685	**82**
NOTES: SB X7-7 Table 5.				

Also shown in the table are the final baseline usages for each target (5- and 10-year). These final baselines are the average of the annual baselines in their respective reporting ranges. The baseline daily per capita water uses for the 5- and 10-year baseline periods are both 123 GPCD.

Also shown in the table is the baseline water usage for the compliance year 2020, which is 76 GPCD. This usage is significantly below the baselines determined using data from the years 1999-2008. It is important in this case to recognize the context of the 2015 value in comparison to the baseline periods, where there are two significant impacts that have occurred since 2008. First, the prolonged economic downturn occurred around 2008 and has likely played a role in lower demands, as noted in the 2020 UWMP. Second, the drought which the entire State faced from 2014 through 2016 forced many cities, including Millbrae, to enact

water shortage measures to lower water usage. These factors do play some role in the lower magnitude of usage as compared to the baseline periods.

5.5 2020 Target

The DWR has provided four methods with which to determine the 2020 urban water use target. As noted in Section 5.1, the City has chosen to use Method 3 which is the same method used in the 2010 UWMP. Method 3 is based on reducing demand to 95% of the Hydrologic Regional Target determined in the 20 x 2020 Water Conservation Plan. The City is located in the San Francisco Bay Hydrologic region, which has a total 2020 Plan baseline target of 131 GPCD. To determine the target usage using this method, the City must meet 95% of the target value, or 124 GPCD.

However, CWC 10608.22 states that regardless of the method used to determine the 2020 target, an urban retail water supplier's per capita daily water use reduction target shall be no less than 95% of the 5-year baseline daily per capita water use. The 5-year baseline water use, as shown in Table 5-3 above, is 123 GPCD. Therefore, the City's 2020 water use reduction target is 117 GPCD, as shown in the table below. In addition to the 2020 water use target, SB X7-7 requires the development of an interim target water use goal for the year 2015. The interim water use target is the average of the baseline water demand and the target water demand, which for the City is 120 GPCD (Table 5-4). As part of the bill, the City's 2020 per capita water use will need to be below this value in order to be in compliance.

Table 5-4. Baseline year reduction targets summary.

Baseline Period	Start Year	End Year	Average Baseline GPCD*	Confirmed 2020 Target*
10-15 year	1999	2008	123	-
5 Year	2004	2008	123	117
*All values are in Gallons per Capita per Day (GPCD)				
NOTES: UWMP Guidebook Table 5-1.				

5.6 2020 Compliance Daily per Capita Water Use

As noted above, a component of the 2020 UWMP is to assess whether the City has achieved compliance with the water use targets established as part of SB X7-7. Using the City's 2020 fiscal year water purchases and the population estimates obtained from the DOF, the City's gross per capita water use for 2020 was 82 GPCD, which is 35 GPCD below their water use target. This information is summarized in Table 5-5.

Table 5-5. 2020 SB X7-7 compliance summary.

Actual 2020 GPCD*	Optional Adjustments to 2020 GPCD Enter "0" if no adjustment is made *From Methodology 8*					2020 GPCD* *(Adjusted if applicable)*	Did Supplier Achieve Targeted Reduction for 2020? Y/N
	Extraordinary Events*	Economic Adjustment*	Weather Normalization*	TOTAL Adjustments*	Adjusted 2020 GPCD*		
82	0	0	0	0	82	82	Y
**All values are in Gallons per Capita per Day (GPCD)*							
NOTES: UWMP Guidebook Table 5-2							

The City of Millbrae is in compliance with SB X7-7. As noted in the 2010 UWMP, the City has been experiencing a decline in water use as a result of many factors, some of which may be overall changes in water use patterns, and some that may be short term. The City has promoted water conservation programs (detailed in Section 4.6) and has been active in promoting many other demand management measures (see Section 9) which will continue to reduce typical water use trends moving forward.

6. System Supplies

This section provides an overview of the City's present and future water sources. To remain consistent with the demands presented in Section 4, water supply availability projections are reported until the year 2045, in five-year increments. Discussions for both potable water use and recycled water use are included. In addition to anticipated supply volumes, this section also presents a discussion of current and future capital improvements that will help increase water supply (Section 6.8). A summary table of all anticipated water supplies is presented in Section 6.9

6.1 SFPUC Water Purchases

As noted previously, the City purchases its potable water from the SFPUC, delivered through the RWS. This section presents a physical overview of the SFPUC RWS, and then subsequently discusses some of the key components of the relationship between the City and its sole water wholesaler, the SFPUC.

6.1.1 SFPUC Regional Water System

The RWS operated by the SFPUC is the third largest municipal system in California, servicing more than 2.6 million commercial, residential, and industrial customers. These customers are split between two major categories; the retail customers in the City of San Francisco (approximately 1/3 of the delivered water), and the wholesale customers (receiving the remaining 2/3 of water supplied). The wholesale customers are composed of 26 member agencies located around the San Francisco Bay Area, including the City of Millbrae. (Figure 3 below), which captures snowmelt and runoff from California's Sierra Nevada Mountains. This source provides approximately 85% of the RWS's municipal demand. From the Hetch Hetchy reservoir system, diverted surface water travels through a system of approximately 280 miles of pipelines and intermediate reservoirs before being delivered to the customers of the RWS.

In addition to the Hetch Hetchy supply, the SFPUC operates several other water sources which contribute the remaining 15% of municipal demand. These sources are split into two major areas, those located in Alameda County and those located in the Peninsula area of San Mateo County. The Alameda County supplies include the Calaveras and San Antonio reservoirs and the Sunol Filter Galleries (groundwater); the Peninsula supplies include the Crystal Springs, San Andreas, Pilarcitos and Stone Dam reservoirs. As noted from the source description presented above, the RWS is almost entirely dependent on surface water runoff and snow pack.

6.1.2 Bay Area Water Supply and Conservation Agency

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 RWS.

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

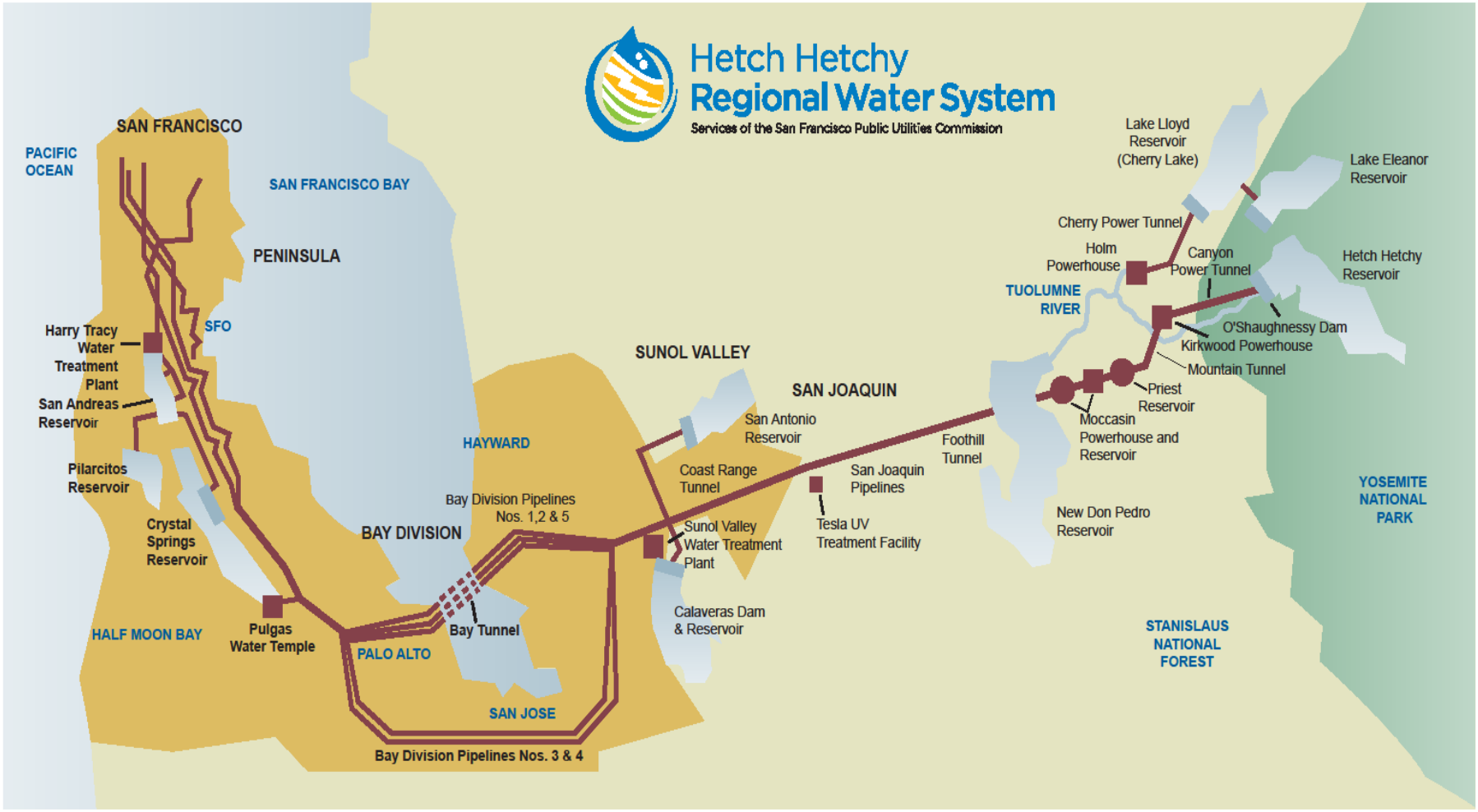


Figure 3. SFPUC Regional Water System (RWS) schematic (SFPUC, 2020)

6.1.3 Water Supply Agreement

The terms of the relationship between the City and County of San Francisco and the wholesale customers of the RWS are largely defined in the Water Supply Agreement (WSA), which came into effect in July of 2009. Among other issues, the WSA covers the Supply Assurance and Allocation during normal years, and the Water Shortage Allocation Plan. The Supply Assurance to the wholesale customers of the RWS is 184 MGD, expressed as an annual delivery average. The term of the current WSA is 25 years; however, the Supply Assurance established as part of the WSA survives the expiration of the contract. A full copy of the WSA can be found in Appendix D.

6.1.4 City of Millbrae Water Sales Contract

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 City of Millbrae's ISG is 3.15 MGD, which corresponds to 1150 MG annually.

The City records its water supply volumes through billing from the SFPUC. The volumes for SFPUC billing are metered at the five municipal connections to the RWS.

6.1.5 SFPUC's Efforts to 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.

6.2 Groundwater

The City does not use any groundwater to supplement its water supply purchases from SFPUC. As reported in the 2015 UWMP, in the mid 1990's City staff investigated the potential to install its own wells to produce groundwater; however, no source was found within the City's boundaries. Presently, the City does not have plans to reinvestigate the development of groundwater.

6.3 Surface Water

The City does not supplement its water purchases from SFPUC with surface water diversion. It should be noted that the water supply source for the water purchased from SFPUC comes from surface water. This source is discussed in further detail in Section 6.1.

6.4 Stormwater

The City does not currently divert or treat stormwater for beneficial reuse on a municipal level. The City has participated in a workshop series, in conjunction with BAWSCA and the Millbrae Library, to teach and demonstrate rainwater harvesting and greywater reuse techniques, and currently offers rainwater harvesting rebates (further described in Section 9). However, these efforts are targeted for implementation by the end user.

6.5 Wastewater and Recycled Water

This section outlines the existing and planned recycled water use and coordination involving the City and surrounding area. Also presented in this section is the projected recycled water supply through 2045.

6.5.1 Recycled Water Coordination

The City's only municipal facility capable of producing recycled water is the Water Pollution Control Facility, which is located on the eastern boundary of the City's service area (see Figure 1). This facility, operated by the City, is responsible for collecting, treating, and discharging all effluent produced within the City limits. This facility is discussed in further detail in subsequent sections.

6.5.2 Wastewater Collection, Treatment, and Disposal

The City is responsible for the collection, treatment, and disposal of wastewater within the City's service area boundary. The City's cumulative wastewater system consists of a dedicated sanitary sewer system, a Waste Pollution Control Plant (WPCP), and a force main discharge outlet to San Francisco Bay.

Existing Facilities

The wastewater collection system consists of approximately 55 miles of underground sanitary sewer pipe of various sizes. The sewer system is predominantly gravity drained; however, the system does have three sewage pumping stations.

The City's WPCP is a secondary treatment facility with a design flow capacity of 3 MGD. The peak wet weather flow for the plant is approximately 9 MGD. Table 6-1 below shows the volume of wastewater entering the plant during the 2020 fiscal year.

Table 6-1. Wastewater collected within service area in FY 2020.

Retail: Wastewater Collected Within Service Area in 2020						
☐	There is no wastewater collection system. The supplier will not complete the table below.					
100%	Percentage of 2020 service area covered by wastewater collection system					
100%	Percentage of 2020 service area population covered by wastewater collection system					
Wastewater Collection			**Recipient of Collected Wastewater**			
Name of Wastewater Collection Agency	**Wastewater Volume Metered or Estimated?**	**Volume of Wastewater Collected in 2020 (MG)**	**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?**
City of Millbrae	Metered	529	City of Millbrae	City of Millbrae WPCP	Yes	No
Total Wastewater Collected from Service Area in 2020 (MG):		529				
NOTES: UWMP Guidebook Table 6-2.						

In 2020 the facility metered a total inflow volume of 529 MG, which is an annual average inflow of approximately 1.45 MGD. The facility's treatment processes include headworks with bar screens and grit removal, primary sedimentation, biological activated sludge treatment, secondary clarification, disinfection, and effluent skimming. Solids generated from the sedimentation processes are treated through mechanical thickening, mesophilic anaerobic digestion, and belt filter press dewatering. The finished solids are off-hauled from the site. During the anaerobic digestion process, methane gas is collected and used for energy generation onsite.

The WPCP produces restricted use disinfected secondary effluent. This effluent is used as recycled water for onsite activities and stored onsite in a 5,000 gallon storage tank. This is not included as a water supply source within the context of the UWMP.

Treated effluent is discharged though a force main into San Francisco Bay. The force main is also used for effluent disposal by the cities of Burlingame, South San Francisco, San Bruno, and the San Francisco International Airport. The force main outfall is located approximately 5,300 feet offshore and 20 feet below the mean low ocean level.

Table 6-2 shows the volume of wastewater treated and discharged from the City's WPCP during fiscal year 2020. The City is allowed to discharge up to an annual average of 3 MGD under the discharge requirements outlined by the Regional Water Quality Control Board's Order No. R2-2019-0009 and NPDES Permit No. CA0037532. This order was adopted by the Regional Board in March of 2019 and will expire on April 30, 2024. The total treated wastewater, as noted above, is 529 MG for the fiscal year 2020. The total effluent being discharged through the force main into San Francisco Bay is 548 MG, which is an annual average of 1.50 MGD.

Table 6-2. Wastewater treatment and discharge within service area in FY 2020.

Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2020 volumes				
						Wastewater Treated (MG)	Discharged Treated Wastewater (MG)	Recycled Within Service Area (MG)	Recycled Outside of Service Area (MG)	Instream Flow Permit Requirement
City of Millbrae WPCP	2	Lower San Francisco Bay Marine Outfall	Ocean outfall	No	Secondary, Disinfected - 23	529	548	9	0	0
					Total	529	548	9	0	0

NOTES: UWMP Guidebook Table 6-3.
Records show slight discrepancy of 3.6% between influent and effluent flows.

6.5.3 Recycled Water System

Recycled Water History

Since 1994, the City has actively engaged in the investigation or use of recycled water for various purposes within the City service area. The City's first recycled water project occurred through an agreement with the California Department of Transportation (CalTrans), where disinfected effluent was used for landscape irrigation at a CalTrans property and in Highway 101 landscape medians.

In 1996, recycled water was trucked offsite and used for dust control and soil compaction during the construction of the BART station.

The City is undertaking a process to update the Millbrae Station Area Specific Plan (MSASP), which was initially developed and adopted in 1998. The MSASP guides future public improvements and private development in the Plan Area surrounding the BART Station over the next 25 years. The project area is in close proximity to the City's WPCP; therefore, as a component of the plan the City had investigated using recycled water onsite during development and potentially reused water onsite post-development. To provide post-development reuse water onsite, a new tertiary treatment unit would need to be installed at the WPCP. Currently, no recycled water facilities exist within the Plan area; however, the MSASP requires all development projects to use recycled urban water for the irrigation of landscapes, plazas, and playgrounds to reduce demand for potable water. All new projects are required to provide purple pipes in the street adjacent to their property for future hook-up to the citywide purple pipe network.

Current Recycled Water Use

The City's current recycled water use is limited to applications onsite at the WPCP. The recycled water is used to wash down and clean equipment, including the bar screens and clarifiers, and for dust control at

the facility. The total monthly volume of recycled water used onsite is 9 MG. Recycled water for this purpose is planned to continue indefinitely. This on-site recycled water use is not included in calculations of water supply.

6.5.4 Recycled Water Beneficial Uses

The City has in the past and will continue to explore recycled water as a means of offsetting potable water use within the service area. There are several potential beneficial use applications for recycled water in the City, including use for irrigation, construction, dust control, and commercial uses. A brief discussion of potential recycled water use is presented below.

- As noted previously, the MSASP includes using recycled water for future development projects.
- The City participated in a feasibility study to evaluate using the WPCP's effluent for a recycled water program. The study concluded that the WPCP has sufficient developable space for the estimated maximum footprint of 3.0 MGD recycled water treatment facilities. The City will continue planning efforts and pursue grant funding to support the project.
- The City is looking into participating in a joint project with the cities of South San Francisco and San Bruno. This project would recycle effluent from the cities of Millbrae, San Bruno, South San Francisco, and SFO, and use it for various applications in the South San Francisco area.

Although the City will continue to evaluate the benefit and financial feasibility of expanding recycled water use, at present there are no firm plans to expand beyond the existing uses at the WPCP. The City will continue to evaluate the feasibility of expanding the use of recycled water. It is anticipated that for the purpose of this planning projection that recycled water use will be restricted to onsite activities at the WPCP. Table 6-3 below presents the current and projected recycled water usage in the service area through 2045.

Table 6-3. Current and projected recycled water for direct beneficial uses within the service area (MG).

Beneficial Use Type	Potential Beneficial Uses of Recycled Water	Amount of Potential Uses of Recycled Water	General Description of 2020 Uses	Level of Treatment	2020	2025	2030	2035	2040	2045
Agricultural irrigation			-							
Landscape irrigation (excludes golf courses)			-							
Golf course irrigation			-							
Commercial use			-							
Industrial use			-							
Geothermal and other energy production			-							
Seawater intrusion barrier			-							
Recreational impoundment			-							
Wetlands or wildlife habitat			-							
Groundwater recharge (IPR)			-							
Surface water augmentation (IPR)			-							
Direct potable reuse			-							
Other			-							
				Total:	0	0	0	0	0	0
NOTES: UWMP Guidebook Table 6-4. Internal Reuse not included in totals based upon DWR guidance.										

6.5.5 Recycled Water Comparison

Projections for recycled water use were included in the City's 2015 UWMP. At the time, the City projected 28 AFY (9 MG) for use at the WPCP that is not included in the UWMP projections. There were no additional projected uses for recycled water. As noted in Section 6.5.4, the City currently uses 9 million gallons per year at the WPCP for cleaning activities. A summary of the comparison can be found in the Table below.

Table 6-4. 2015 UWMP recycled water use projection compared to 2020 (MG).

Use Type	2015 Projection for 2020	2020 Actual use
Agricultural irrigation	-	-
Landscape irrigation (excludes golf courses)	-	-
Golf course irrigation	-	-
Commercial use	-	-
Industrial use	-	-
Geothermal and other energy production	-	-
Seawater intrusion barrier	-	-
Recreational impoundment	-	-
Wetlands or wildlife habitat	-	-
Groundwater recharge (IPR)	-	-
Surface water augmentation (IPR)	-	-
Direct potable reuse	-	-
Other	-	-
Total	0	0
NOTES: UWMP Guidebook Table 6-5. Does not include recycled water used for cleaning activities at WPCP.		

6.5.6 Methods to Encourage Recycled Water Use

The City has made efforts to promote recycled water use in the service area and explore opportunities for expanding recycled water use beyond the WPCP.

As noted previously, the City has explored using recycled water at the MSASP development projects, and has also investigated implementing a water reuse system at the site that would be supplied with tertiary effluent from the WPCP. To successfully implement this type of project, a new tertiary treatment unit, storage, and dedicated distribution system would need to be installed.

The City actively promotes water conservation and efficiency measures through various public outreach efforts. A component of the outreach efforts has been for greywater reuse on the residential level. Specific greywater outreach methods have included workshops at the Millbrae public library and links to resources on greywater technology on the City's website and in newsletters and other water conservation brochures the City provides.

In 2010, the City passed the Indoor Water Conservation Ordinance, which amended chapter 9.6 of the Millbrae Municipal Code. This section of code applies to new developments and remodels of a specified size, and outlines the water conservation measures and water fixture requirements for these developments. Some of the standards set forth in the code have implications on recycled water use, including the following:

1. Section 9.60.040. Automatic vehicle wash facilities are required to use 50% or more recycled water from onsite.

2. Section 9.60.040. Separate meters to be installed for outdoor landscaping areas greater than 5,000 square feet in area.

Although the City actively promotes recycled water use, both on the residential and municipal level, at this time the only planned recycled water projects will be what is included in the MSASP, and other than that the only recycled water use is the 9 MG currently used at the WPCP. Through various work in the past, the City has found that implementing municipal level recycled water projects is currently cost prohibitive, and would require grant funding to make financial sense. As such, the City plans to continue using recycled water at the WPCP, and will continue to evaluate possibilities to expand recycled water use. Projects of this type will be implemented when the need for such a product is identified and the project can be made financially feasible, either through grant funding or other financial incentives.

6.6 Desalinated Water Opportunities

For many water agencies around California, the development of desalination facilities has become a potential solution worth exploring to help diversify or replace existing water supplies. However, due to traditionally high capital and operating costs and plant siting constraints, many smaller water agencies find desalination projects infeasible. For these same reasons the City has found desalination of either sea water or brackish groundwater not applicable to their near term water supply plans.

As noted in the 2015 UWMP, the Bay Area's larger wholesale water agencies have partnered to begin developing a desalination project in the Bay Area. As the City could benefit if such a project were to take place, Section 6.6.1 below summarizes the program.

Similar to the feasibility analyses mentioned above, BAWSCA has also conducted feasibility studies on developing desalination projects that would serve the member agencies. These efforts have been documented in the BAWSCA report titled *Long-Term Reliable Water Supply Strategy,* and are discussed in Section 6.6.2 below.

6.6.1 Bay Area Brackish Water Desalination

The Bay Area's five largest water agencies including Contra Costa Water District (CCWD), the East Bay Municipal Utility District (EBMUD), the SFPUC, the Santa Clara Valley Water District (Valley Water), and the Zone 7 Water Agency partnered together on the Bay Area Regional Brackish Water Desalination (Regional Desalination) Project. The Alameda County Water District (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. Further details on the Regional Desalination Project can be found in Section 7.6.3.

6.6.2 BAWSCA Desalination Projects

As part of the Long-Term Reliable Water System Strategy, BAWSCA led the investigation of two specific desalination project scenarios. These included two intake methods and two potential project areas. The intake methods investigated were an open intake in San Francisco Bay and a shallow brackish well either near or under the bay. The two greater regions identified as feasible siting locations were termed the Central Focus Area and the Southern Focus Area.

Upon completion of an analysis which included among other criterion effective cost, facility reliability, and permitting requirements, it was concluded that desalination could potentially provide substantial yield; however, at a cost and permitting requirement that make the option less attractive than other supply augmentation methods. However, even with the costs and permitting associated with this alternative, desalination does provide one of the most intriguing alternatives to produce water within the BAWSCA service area, and continuing this feasibility analysis warrants further investigation.

6.7 Exchanges or Transfers

Currently, the City has no firm plans to engage in direct water transfers or exchanges with other water agencies. There is however the possibility of either the SFPUC or BAWSCA securing transferred water to be used by the wholesale customers of the RWS. The discussion below summarizes these opportunities.

The current WSIP provides the ability for the SFPUC to engage in water purchases for its wholesale or retail customers. The discussion in the WSIP includes the potential of purchasing additional water from Modesto Irrigation District (MID). In 2012, negotiations were taking place between the two agencies on a dry-year water transfer averaging 2 MGD. Negotiations were not successful and the talks have since been terminated. Subsequently, the SFPUC has begun engaging in ongoing conversations with Oakdale Irrigation District for a one-year water transfer agreement for an annual average of 2 MGD. 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 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), a partnership among eight Bay Area water utilities (including the SFPUC, Alameda County Water District, BAWSCA, Contra Costa Water District, Valley Water) to identify opportunities to move water across the region as efficiently as possible, particularly during times of drought and emergencies.

BAWSCA facilitated two transfers of portions of 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. The City may consider an ISG transfer from another BAWSCA agencies in the future to meet increasing demands.

6.8 Future Water Projects

The City maintains a thorough Capital Improvement Program (CIP) to ensure that all components of the water system can be maintained as needed, in a timely fashion. A sample of current projects in the City's CIP include:

- Fire hydrant upgrades/replacements;
- Water main replacements;
- Water tank replacement;
- Water Wise landscaping; and
- Valve replacements and refurbishments.

Currently, there are no projects planned outside of the CIP projects that would have an appreciable outcome on water supply. Projects relevant to supply increases for the RWS are discussed in Section 6.1.3.

6.9 Summary of Existing and Planned Sources of Water

As developed in the previous sections, the City's total current and anticipated water supply come from the City's purchases from the SFPUC and from recycled water at the WPCP. For the year 2020, the total water purchases and recycled water use is shown in Table 6-5 below.

Table 6-5. 2020 actual water supplies (MG).

Water Supply	Additional Detail on Water Supply	FY 2020		
		Actual Volume (MG)	Actual Volume (CCF)	Water Quality
Purchased or Imported Water	From SFPUC	685	915,775	Drinking Water
Recycled Water		0	0	Recycled Water
Total		685	915,775	
NOTES: UWMP Guidebook Table 6-8.				

The total drinking water purchased by the City in 2020 was 685 MG. The total supply available to the City from the SFPUC is 1,150 MG annually; therefore, the 2020 water usage represents approximately 60% of total available supply. Recycled water was used solely at the WPCP for cleaning purposes and was not included in the water supply totals for the UWMP. The total projected potable water supply between 2025 and 2045 is based on the City's current ISG of 3.15 MGD (1,150 MGY). The individual and total projections to the year 2040 are shown in Table 6-6 below.

Table 6-6. Projected water supplies 2025-2045 (MG).

Water Supply	Additional Detail on Water Supply	Projected Water Supply *Report To the Extent Practicable*				
		2025	2030	2035	2040	2045
		Reasonably Available Volume (MG)	Reasonably Available Volume (MG)	Reasonably Available Volume (MG)	Reasonably Available Volume (MG)	Reasonably Available Volume (MG)
Purchased/ Imported Water	SFPUC Purchases	1,150	1,150	1,150	1,150	1,150
Total		1,150	1,150	1,150	1,150	1,150
NOTES: UWMP Guidebook Table 6-9.						

6.10 Energy Intensity

A new requirement for the 2020 UWMP, the City investigated the energy intensity of its water supply. Using the Total Utility Approach, The City used its energy meter data from its water supply system over a one-year period (June 17, 2019 to June 15, 2020) and the volume of water produced during the same time span to calculate the energy intensity of its water supply. The data used and the resulting calculation are presented below in Table 6-7. The calculation showed that the City's water supply system energy intensity was 0.3 kWh/AF.

Table 6-7. Energy Intensity of Water Supply

	Urban Water Supplier Operational Control		
	Sum of All Water Management Processes	Non-Consequential Hydropower	
	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process (AF)	845,437	0	845,437
Energy Consumed (kWh)	212,984	0	212,984
Energy Intensity (kWh/AF)	0.3	0	0.3
NOTES: UWMP Guidebook Table O1-B. Data is from June 17, 2019 to June 15, 2020.			

6.11 Climate Change Impacts to Supply

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 2019 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 was established as 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. Though the BAIRWMP was updated in 2019 to align with DWR standards for Proposition 1 implementation funding, the Climate Change chapter and contents remained largely unchanged.

Table 6-8. 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 armouring (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 cold water 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.

7. Water System Reliability

This section discusses the reliability of the water supply for the City. Topics covered include the City's relationship with BAWSCA, the reliability of the RWS operated by the SFPUC, and the water delivery volumes made available to the City during drought years.

7.1 Constraints on Water Sources

The City purchases its entire potable water supply from the SFPUC regional water system. Therefore, any constraints on the wholesale water supply are directly relevant to the reliability of the potable water supply for the City. Constraints that are applicable to the SFPUC water supply are discussed in detail below and include water quality and climactic effects to the water source.

7.1.1 Water Quality

Water quality is one of the most common constraints imposed on a water supply, in particular when surface water is the primary source. The SFPUC supply is composed of several sources, including snowmelt/rainfall from the Sierra Nevada, surface water from the Alameda and San Mateo watersheds. As part of the SFPUC operations, water quality monitoring and reporting is an important and regular task.

SFPUC performs annual Watershed Sanitary Surveys to evaluate the sanitary conditions, water quality, and potential contamination sources. Additionally, these surveys provide the results of watershed management activities with partner agencies, which include the National Parks Service and United States Forest Service.

The SFPUC water sources deliver excellent quality water for use in the RWS. The majority of the water, approximately 85%, originates from the upper Tuolumne River watershed, which is outside the influence from urban development and pollution. This source has been deemed as pristine as to not require filtration prior to delivery to the customer; only primary disinfection and pH adjustment is required. The remaining 15% of the SFPUC supply comes from the Alameda and San Mateo watersheds. These watersheds do require treatment, including filtration, to meet water quality standards before being blended with water from the Hetch Hetchy. During all stages of treatment, the water quality at the treatment plant is monitored closely.

To ensure that water treatment facilities are capable of producing high-quality drinking water, the Harry Tracy Water Treatment Plant, which treats water from the San Mateo watersheds, has recently been upgraded. The $280 million upgrade project included significant upgrades to the ozonation system (used for primary disinfection), the construction of five new filters, and a new 11-million gallon treated water reservoir. These upgrades will help to increase the reliability of the RWS to deliver high-quality water to the RWS retail and wholesale customers.

The SFPUC Water Quality Division (WQD) regularly takes water samples from a variety of sampling points throughout the RWS. These samples are taken to ensure that water quality meets or exceeds federal and state drinking water standards. In 2019, the WQD staff conducted in excess of 53,000 drinking water tests in the RWS transmission and distribution system. This sampling is in addition to monitoring that occurs at the RWS water treatment plants, which treat water collected in the San Mateo and Alameda watersheds.

The SFPUC does not anticipate that water quality impacts will have an effect on the available water supply in the future. The Hetch Hetchy source is quite pristine, and with no planned urban development within the upper Tuolumne watershed there is no anticipated impact that could greatly reduce water quality. The Alameda and San Mateo sources are more vulnerable to reductions in water quality, due primarily to their proximity to human development. However, all of these sources are treated prior to entrance into the RWS delivery mains, and any reductions in water quality should be taken care of at the treatment plants.

If water quality should be affected for any reason, the City has formulated an emergency plan to protect the health and safety of the City's residents. In addition to the emergency plan, the City also uses the "Suburban Customer Water Supply Emergency Operations and Notifications Plan", which is supplied by the SFPUC. The plan advises the City to isolate the City's water system by closing turnouts connected to the RWS, and temporarily rely on City storage as the primary water source. While the system is isolated from the RWS, notices would go out to the public to require demand reductions.

In addition to the City's emergency plans, the City also conducts various activities to ensure that water moving through their distribution system meets water quality standards. The City conducts water quality sampling throughout the water system, which includes over 40 samples per month. In 2019, the City reported no violations of coliform or any other drinking water related Maximum Contaminant Level (MCL). Other periodic sampling efforts by the City include sampling for lead and copper, disinfection byproducts, and general physical components required by state and federal regulations. A copy of the City's Consumer Confidence Report (CCR) can be found in Appendix G.

The City regularly monitors the five connection points between the City water system and the RWS and key components of the City water system such as storage tanks with a computerized SCADA system. The system continuously monitors incoming water for water quality information.

The City also performs regular operational and maintenance activities to ensure high water quality. These activities include regular water system flushing, water line/main replacement, and water line dead-end removal (to reduce stagnant water).

7.1.2 Climatic Effects

Several climatic conditions could have an effect on the availability of the water supply moving forward. These effects include decreased snowpack in the Sierras and increased drought frequency and duration.

Snow in the Sierras acts as water storage, which during the melt periods slowly meters flow into the Tuolumne River watershed and Hetch Hetchy system. Decreased snowpack would result in less water entering the watershed late in the water year, and more water moving through the system in large-flow or runoff events.

Some climate science has suggested that droughts on the magnitude that California recently experienced may become more common. During these droughts, surface water supplies can significantly decrease, which could significantly affect available water for the RWS.

7.1.3 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" 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 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.

7.1.4 Plans to Increase Supply Reliability

To address the potential impacts on the water supply from climate change, both the SFPUC and BAWSCA have set in place projects or studies to help address these vulnerabilities.

The SFPUC has been completing the WSIP, which has the stated goal of increasing supply reliability for the wholesale and retail customers of the RWS. Many of the projects included in the WSIP involve increasing storage capacity or otherwise improving storage function and reliability. Improved storage in particular will help normalize water supply availability if snow storage in the Sierras decreases, or if melt times and runoff

rates change. Additionally, this plan has explored acquiring additional supply sources, which could include water transfers or desalination. Further information on the SFPUC WSIP can be found in Sections 6.1.3 and 7.6. The SFPUC is also looking into acquiring additional water supplies and exploring other projects that would increase overall water supply resilience through the Alternative Water Supply Planning Program, discussed further in Section 7.6.3.

BAWSCA has been completing the *Long-Term Reliable Water Supply Strategy*. One goal of this effort has been to identify projects that can increase water supply reliability, and address water supply shortages during drought years when the SFPUC decreases available water supply to the wholesale customers. Further information on this project can be found in Section 7.4.

7.2 2028 SFPUC Decisions

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.

7.3 Environmental Enhancement Surcharge

As an incentive to keep Regional Water System (RWS) deliveries below the ISL of 265 MGD, the SFPUC adopted an Environmental Enhancement Surcharge for collective deliveries in excess of the ISL effective at the beginning of fiscal year 2011-12. This volume-based surcharge would be unilaterally imposed by the SFPUC on individual wholesale customers and San Francisco retail customers, when an agency's use exceeds their ISA and when sales of water to the wholesale customers and San Francisco retail customers, collectively, exceeds the ISL of 265 MGD. Actual charges would be determined based on each agency's respective amount(s) of excess use over their ISA. To date, no Environmental Enhancement Surcharges have been levied.

7.4 BAWSCA's 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 SFPUC's wholesale customers 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 [5](BARR), a partnership among eight Bay Area water utilities (including the SFPUC, Alameda County Water District, BAWSCA, Contra Costa Water District, Valley Water) 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 re-evaluate 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.

7.5 Tier One and Tier Two Drought Allocations

This section describes the Tier One and Tier Two drought allocations, which distribute the available supply from the SFPUC RWS amongst the wholesale and retail customers of the RWS during system-wide shortages. The Tier One drought allocations outline how water is distributed amongst the SFPUC's wholesale and retail customers; the Tier Two drought allocations outline how the wholesale supply is split among the wholesale customers.

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

7.5.1 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 Regional Water System (RWS) between retail and wholesale customers during system-wide shortages of 20% 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% less than projected system-wide water purchases. The following table shows the SFPUC 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.

Table 7-1. Tier One drought allocation percentages based on system wide supply shortfalls.

Level of System-Wide Reduction in Water Use Required	Share of Available Water	
	SFPUC Share	Wholesale Customers Share
5% or less	35.50%	64.50%
6% through 10%	36.00%	64.00%
11% through 15%	37.00%	63.00%
16% through 20%	37.50%	62.50%

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[6]) 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 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.

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

7.5.2 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 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. BAWSCA recognizes that this is not an ideal method and that in the event of actual RWS shortages greater than 20 percent, the wholesale customers would have the opportunity to develop and agree upon a more nuanced and equitable approach. Such an approach would likely consider basic health and safety needs such as a per capita minimum, critical institutions such as hospitals, and minimizing economic impacts on individual communities and the region.

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.

7.6 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:

Table 7-2. WSIP goals and objectives.

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.

The adopted WSIP had several water supply elements to address the WSIP water supply goals and objectives. The following provides the water supply elements for all year types and the dry-year projects of the adopted WSIP to augment all year type water supplies during drought.

7.6.1 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
- 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, Stone Dam, and San Andreas Reservoirs. The adopted WSIP retains this mix of water supply for all year types.

7.6.2 Water Supply – Dry-Year Types

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.

7.6.3 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[7], 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.

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.

[7] 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.

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.

7.6.4 Projected SFPUC Regional Water System Supply Reliability

The SFPUC has provided the following table (**Table 7-3**) presenting the projected RWS supply reliability. This table assumes that the wholesale customers purchase 184 MGD from the RWS through 2045 and the implementation of the dry-year water supply projects included in the WSIP. The numbers represent the wholesale share of available supply during historical year types per the Tier One Water Shortage Allocation Plan and the additional cutbacks under the current plans for Bay-Delta Plan implementation beginning in 2023. This table does not reflect any potential impact to RWS yield from the additional fishery flows required as part of Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements Project.

Table 7-3. Projected deliveries for consecutive dry years. (2020-2025)

	Base year 2020 (Non-Dry)	Single Dry Year	Deliveries During Consecutive Dry Years				
			Year 1	Year 2	Year 3	Year 4	Year 5
System Wide-Shortage	0%	10%	10%	20%	55%	55%	55%
Annual Wholesale Allocation (MG)	67,160	57,488	57,488	48,363	27,193	27,193	27,193
Annual Wholesale Allocation (CCF)	89,786,100	76,855,615	76,855,615	64,656,417	36,354,278	36,354,278	36,354,278

Notes: Values from SFPUC memo dated January 22, 2021. Assumes Bay-Delta Plan takes effect in 2023.

Compared to the projected shortages from the 2015 UWMP, no extra shortfall is anticipated in the system during single dry years between 2020 and 2022. However, the SFPUC has projected a significant increase in shortfall in single dry year or multiple dry year conditions beginning in 2023, increasing the shortfall from 20% to 55%.

The volumes shown in Table 7-3 are the total deliveries to the wholesale customers from the RWS during dry year types. For the volume of the total allocation made available to the City during these same year types, see Section 7.7.

7.6.5 Impact of Recent SFPUC Actions on Dry-Year Reliability

As noted earlier, in adopting the Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements Project, the SFPUC committed to providing fishery flows below Calaveras Dam and Lower Crystal Springs Dam, as well as bypass flows below Alameda Creek Diversion Dam. The fishery flow schedules for Alameda Creek and San Mateo Creek represent a potential decrease in available water supply of an average annual 9.3 MGD and 3.5 MGD, respectively with a total of 12.8 MGD average annually. The Alameda Creek Recapture Project, described above, will replace the 9.3 MGD of supply lost to Alameda Creek fishery flows. Therefore, the remaining 3.5 MGD of fishery flows for San Mateo Creek will potentially create a shortfall in meeting the SFPUC demands of 265 MGD and slightly increase the SFPUC's dry-year water supply needs.

The adopted WSIP water supply objectives include (1) meeting a target delivery of 265 MGD through 2018 and (2) rationing at no greater than 20 percent system-wide in any one year of a drought. Participation in projects outlined in the Alternative Water Supply Planning Program may help manage the water supply loss associated with the fishery flows.

As a result of the Individual Supply Guarantees described above, the SFPUC has a responsibility to provide 184 MGD to its wholesale customers in perpetuity, regardless of demand. Therefore, the current projections for purchase requests through 2018 remain at 265 MGD, which includes wholesale and retail demand. The implementation of the Bay Delta Plan in 2023 will severely limit the wholesale volume available, cutting down to 74.5 MGD starting in the third consecutive dry year. The implications of this shortfall for the City are discussed in Section 7.8.

7.7 Reliability by Type of Year

The City relies on water purchases from the SFPUC RWS for the entirety of its demand during all water year types. Therefore, the projected availability of water, and subsequent annual supply shortfalls, are a result of the water supply available from SFPUC. Given the uncertainty surrounding implementation of the Bay Delta Plan, the reliability analysis and supply and demand assessment by water year type is provided for two scenarios:

- Implementation of the Bay-Delta Plan Amendment beginning in 2023
- No Implementation of the Bay-Delta Plan Amendment

The Tier One and Tier Two drought allocation plans, described in Section 7.5.2, provide the basis for allocating water between SFPUC and the wholesale customers for systemwide shortages up to 20%. However, there is currently no adopted methodology for allocating water among the wholesale customers for shortages greater than 20%. For scenarios in which projected systemwide shortages would exceed 20%, BAWSCA has provided recommended numbers for each member agency to use for available water supply in each type of year through the 25-year planning horizon.

7.7.1 Reliability Assessment with Bay-Delta Plan Amendment

The Bay-Delta Plan Amendment, if implemented as adopted by the SWRCB, would have significant impacts on the City's water supply availability in dry years. Table 7-4 below shows the City's expected annual water supply during average, single dry, and consecutive dry years under 2020 infrastructure conditions for 2021-2025, assuming implementation of the Bay-Delta Plan Amendment beginning in 2023.

Table 7-4. Basis of water supply data (MG) 2020 infrastructure conditions with Bay-Delta Plan

Year Type	Base Year	Available Supplies if Year Type Repeats	
		Volume Available (MG)	% of Average Supply
Average Year		1150	100%
Single-Dry Year	1967-1977	712	62%
Consecutive Dry Years 1st Year	1987-1988	712	62%
Consecutive Dry Years 2nd Year	1988-1989	785	68%
Consecutive Dry Years 3rd Year	1989-1990	416	36%
Consecutive Dry Years 4th Year	1990-1991	416	36%
Consecutive Dry Years 5th Year	1991-1992	416	36%
NOTES: UWMP Guidebook Table 7-1.			

Through 2023, the City anticipates during single dry years to receive 62% of normal annual supply. During the third through fifth dry year, when it is assumed that the Bay-Delta Plan will go into effect, the total available supply reduces to as low as 36% of normal. Drought cutbacks for single-year and multiple-year drought sequences are projected to increase through 2045 as overall demands on the SF RWS increase for Millbrae and other wholesale customers.

The available supplies during normal, single-, and multiple-dry are compared to the projected demands presented in Section 4.4. As shown in Table 7-5 below, the City is projected to meet its normal year retail demands between 2025 and 2040. In the year ending 2045, the projected supply deficit is 20 MG, which is approximately a 1.7% exceedance. During normal years, it is anticipated that is small exceedance could be met through additional SFPUC purchases, as the SFPUC wholesale customers overall are not projected to reach the overall 184 MGD supply guarantee by 2045. Alternately, this demand could be met through additional conservation or purchase of an ISG transfer, as discussed in Section 6.7.

Table 7-5. Normal year supply and demand comparison (MG).

	2025	2030	2035	2040	2045
Supply total (MG)	1,150	1,150	1,150	1,150	1,150
Demand total (MG)	835	913	896	1,029	1,170
Difference (MG)	315	237	254	121	(20)
NOTES: UWMP Guidebook Table 7-2.					

With implementation of the Bay-Delta Plan Amendment, the City is projected to experience supply shortfalls of up to 46% in 2045 in a single dry year, based on the reliability analysis provided by SFPUC and BAWSCA. The single dry year supply and demand comparison is shown in Table 7-6 below.

Table 7-6. Single dry year supply and demand comparison (MG).

	2025	2030	2035	2040	2045
Supply totals (MG)	533	580	569	653	635
Demand totals (MG)	835	913	896	1,029	1,170
Difference (MG)	(302)	(333)	(327)	(376)	(535)
NOTES: UWMP Guidebook Table 7-3					

Similar to the single dry year scenario, the City is also projected to experience significant supply shortfalls in multiple dry years scenarios with implementation of the Bay-Delta Plan Amendment, shown in Table 7-7 below. In years 2 through 5 of a multiple dry year event, the City is projected to experience shortages of up to 54% in 2045 based on projected demands and the reliability analysis provided by SFPUC and BAWSCA.

Table 7-7. Consecutive dry year supply and demand comparison (MG).

		2025	2030	2035	2040	2045
First year	Supply totals	533	580	569	653	635
	Demand totals	835	913	896	1,029	1,170
	Difference	(302)	(333)	(327)	(376)	(535)
Second year	Supply totals	456	500	489	558	635
	Demand totals	835	913	896	1,029	1,170
	Difference	(379)	(413)	(407)	(471)	(535)
Third year	Supply totals	456	500	489	558	635
	Demand totals	835	913	896	1,029	1,170
	Difference	(379)	(413)	(407)	(471)	(535)
Fourth year	Supply totals	456	500	489	493	540
	Demand totals	835	913	896	1,029	1,170
	Difference	(379)	(413)	(407)	(536)	(630)
Fifth year	Supply totals	456	500	445	493	540
	Demand totals	835	913	896	1,029	1,170
	Difference	(379)	(413)	(451)	(536)	(630)
NOTES: UWMP Guidebook Table 7-4.						

The supply cutbacks presented in the single dry year and multiple dry year analysis represent equal cutbacks to projected SFFUC purchases across all wholesale customers to stay within available supply. The supply cutbacks also assume that the Bay Delta Plan takes effect in 2023 and that no alternative water supply sources to address the projected deficit are implemented before 2045.

The City WSCP, discussed in Section 8, identifies the shortage response actions that would be taken to provide the necessary demand reductions in response to single year and multiple year shortages.

7.7.2 Reliability Assessment without Bay-Delta Plan Amendment

If the Bay-Delta Plan Amendment is not implemented, the City's projected available water supply in dry years would increase significantly. Table 7-8 shows the City's expected annual water supply during average, single dry, and consecutive dry years under 2020 infrastructure conditions for 2021-2025, without implementation of the Bay-Delta Plan Amendment.

Table 7-8. Basis of water supply data (MG) 2020 infrastructure conditions w/o Bay-Delta Plan

Year Type	Base Year	Available Supplies if Year Type Repeats	
		Volume Available (MG)	% of Average Supply
Average Year		1150	100%
Single-Dry Year	1967-1977	712	62%
Consecutive Dry Years 1st Year	1987-1988	712	62%
Consecutive Dry Years 2nd Year	1988-1989	738	64%
Consecutive Dry Years 3rd Year	1989-1990	738	64%
Consecutive Dry Years 4th Year	1990-1991	743	65%
Consecutive Dry Years 5th Year	1991-1992	751	65%
NOTES: UWMP Guidebook Table 7-1.			

The City would generally be able to receive over 62% of its normal annual supply throughout consecutive dry years without implementation of the Bay-Delta Plan Amendment. In a single dry year, the City would face at most a 3% shortfall in 2045. **Table 7-9** shows the single dry year supply and demand comparison.

Table 7-9. Single dry year supply and demand comparison w/o Bay-Delta Plan (MG)

	2025	2030	2035	2040	2045
Supply totals (MG)	836	913	894	1029	1132
Demand totals (MG)	835	913	896	1,029	1,170
Difference (MG)	1	0	(2)	0	(38)
NOTES: UWMP Guidebook Table 7-3					

In a multiple year drought, supply availability in the the first and second consecutive dry years would mirror the single dry year availability. Years 3-5 of consecutive dry years would see additional cutbacks and result in minor shortfalls ranging from 9% in 2025 to 24% in 2045. Table 7-10 below shows the supply and demand comparison in consecutive dry years.

Table 7-10. Consecutive dry year supply and demand comparison w/o Bay-Delta Plan (MG)

		2025	2030	2035	2040	2045
First year	Supply totals	836	913	894	1029	1132
	Demand totals	835	913	896	1,029	1,170
	Difference	1	0	(2)	0	(38)
Second year	Supply totals	836	913	894	1029	1132
	Demand totals	835	913	896	1,029	1,170
	Difference	1	0	(2)	0	(38)
Third year	Supply totals	836	913	894	1029	1132
	Demand totals	835	913	896	1,029	1,170
	Difference	1	0	(2)	0	(38)
Fourth year	Supply totals	756	818	788	847	894
	Demand totals	835	913	896	1,029	1,170
	Difference	(79)	(95)	(108)	(182)	(276)
Fifth year	Supply totals	756	818	788	847	894
	Demand totals	835	913	896	1,029	1,170
	Difference	(79)	(95)	(108)	(182)	(276)

NOTES: UWMP Guidebook Table 7-4.

7.8 Drought Risk Assessment

The City completed a Drought Risk Assessment (DRA) to determine the reliability of water service under a severe drought period lasting for the next five consecutive years. The DRA provides an opportunity to evaluate the functionality of the City's Water Shortage Contingency Plan (WSCP), discussed in Section 8. Results of this evaluation can be used to help identify undesired risks and allow for proactive steps to be taken prior to the next actual long-term drought. The DRA can be modified or updated on an interim cycle, as needed, to allow for the incorporation of new information as it becomes available or in the event of unforeseen circumstances.

7.8.1 Data and Methodology

Per UWMP requirements, the DRA is based on the five driest consecutive years on record. To align with SFPUC's DRA, the historical period used in this analysis is the period from 1988-1992. This represents the

five-year period determined by the SFPUC to have the lowest available water supply. Demands are escalated annual to reflect projected growth in demands anticipated to occur from 2021 through 2025. WSCP use reduction benefits are based upon the WSCP shortage response actions described in Section 8. The DRA assumes that the Bay-Delta Plan Amendment will go into effect beginning in 2023. Table 7-11 below shows the City's DRA.

Table 7-11. Five-Year Drought Risk Assessment Table (MG)

	2021	2022	2023	2024	2025
Gross Water Use	712	785	785	785	785
Total Supplies	712	785	416	422	426
Surplus/Shortfall w/o WSCP Action	0	0	(369)	(363)	(359)
Planned WSCP Actions					
WSCP Supply Augmentation Benefit	0	0	0	0	0
WSCP Use Reduction Savings Benefit	42	42	415	415	415
Revised Surplus/Shortfall	42	42	46	52	56
Resulting % Use Reduction from WSCP	6%	5%	53%	53%	53%
NOTES: UWMP Guidebook Table 7-5					

7.9 Regional Supply Reliability

The water code requires all water suppliers to describe methods, tools, or options that are being implemented or planned for implementation that will maximize the use of local water resources. The City receives its entire potable water supply from the Hetch Hetchy system through the SFPUC RWS, and therefore is dependent upon imported water from other regions to meet municipal potable demand. Any local water projects, or methods to reduce demand, would therefore increase the regional supply reliability.

The City has explored means of obtaining water within its service area, including through desalination and groundwater development; however, neither of these options has presented a feasible opportunity for supplementing the SFPUC supply.

As mentioned in Section 7.4, BAWSCA has also led efforts to increase the supply reliability for the member agencies, and has found that regional desalination may provide a local means to increase local water supply reliability. The costs of such a facility may be less prohibitive if spread across multiple member agencies.

The City has implemented several demand management measures, further discussed in Section 9, which have actively reduced municipal demand and therefore increased supply reliability. In addition, the City's continued exploration of recycled water is a work in progress towards increasing local supply reliability.

The City will continue to explore and implement measures to increase water supply reliability through demand reduction, which essentially reduces the City's reliance on imported water. However, due to the infrastructure in place with the RWS, and the existing demand regionally, it is unlikely that there would be a shift away from imported supplies moving forward.

8. Water Shortage Contingency Planning

8.1 Overview

The City has a Water Shortage Contingency Plan (WSCP), which was updated in parallel with the 2020 UWMP. The Plan is available in its entirety in Appendix K of this report. The descriptions of the Plan described in this section are summaries of the information available in the full Plan; for further detail on any of the topics in this section please refer to the full WSCP.

The goals that have been identified in the City's WSCP are as follows:

- To conserve the water supply of the City for the greatest public benefit;
- To mitigate the effects of a water supply shortage on public health and safety, economic activity, and customer lifestyle; and
- To budget water use so that supply will be available for the most essential purposes for the entire duration of the water shortage.

8.2 Coordinated Drought Planning

The City is a member of BAWSCA, an association of 26 member agencies that purchase water from the SFPUC RWS for resale to municipal customers. The City is dependent on these purchases for the entirety of their potable water supply. As noted previously, opportunity to augment the water supply from sources within the City, including from desalination, groundwater, surface water, or other system interties, has limited or no feasibility. The dependence on purchases from SFPUC places added importance on the agreements in place between the BAWSCA member agencies and the SFPUC, in particular the Tier One Plan (Section 7.5.1).

Under the Tier One Plan, the SFPUC will determine whether voluntary or mandatory actions will be required to reduce the purchases of SFPUC water to necessary levels to meet water supply availability during times of water shortage. If SFPUC determines that only voluntary reductions are necessary to meet reduced supply levels, the wholesale customers (including the City), will make good-faith efforts to reduce their water purchases to stay within water use targets. The SFPUC will not impose excess use charges during periods of voluntary rationing, but may suspend the prospective accumulation of water bank credits. If the SFPUC determines that mandatory demand management actions are necessary, the SFPUC may implement excess use charges.

As shown in the Tier One allocations plan summary table (Table 7-1), the allocation plan only covers system wide shortages up to 20%. The SFPUC and BAWSCA member agencies recognize that during times of drought, and as a component of drought planning, preparing for shortages larger than 20% is necessary. If a reduction of supply of this magnitude or greater occurs, the SFPUC and the wholesale customers would agree to meet within 10 days and discuss whether a change in the allocations set forth in Table 7-1 would be necessary. These changes could be made to ensure that there is no undue hardship to any individual agency and their retail customers.

Following the meeting mentioned above, the water allocation established by the Tier One Plan or a modified version may be adopted by mutual written consent of the SFPUC and the wholesale customers. If the SFPUC and wholesale customers cannot agree on an appropriate allocation within 30 days of the SFPUC's determination of water shortage greater than 20 percent, then the provisions of the Master Contract will apply unless all the wholesale customers direct in writing that an allocation methodology agreed to by them

be used to apportion the water to be made available to the wholesale customers collectively, in lieu of the provisions of the Master Contract.

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. BAWSCA recognizes that this is not an ideal method and that in the event of actual RWS shortages greater than 20 percent, the wholesale customers would have the opportunity to develop and agree upon a more nuanced and equitable approach. Such an approach would likely consider basic health and safety needs such as a per capita minimum, critical institutions such as hospitals, and minimizing economic impacts on individual communities and the region.

8.3 Annual Supply and Demand Assessment

A new requirement for the 2020 UWMP, urban water suppliers are required to submit an annual water shortage assessment report to DWR by July 1st of each year following the adoption of the 2020 UWMP. The procedures for conducting this annual supply and demand assessment are described further in the City's WSCP.

8.4 Stages of Action

The City has a six-stage WSCP, recently updated to align with the new Water Code requirements, which has triggering levels based on percent reductions in normal supply. These stages range in magnitude from less than 5% to over 50%, and include measures to help reduce water use, prohibit non-essential uses, and allocate available supplies to the uses deemed most critical. The six stages, as outlined in Section 3 of the City's WSCP, are shown in Table 8-1 below. Figure 4 demonstrates how the City's six stages align with DWR standard shortage levels.

Table 8-1. Stages of water shortage contingency plan.

Stage	Percent Supply Reduction[1]	Water Supply Condition
1	0-5%	Water shortage alert
2	6-15%	Water shortage warning
3	16-25%	Water shortage emergency
4	26-35%	Severe water shortage emergency
5	36-50%	Critical water shortage emergency
6	>50%	Water shortage disaster
NOTES: UWMP Guidebook Table 8-1.		

Stage	Water Shortage Magnitude	Stage Title
1	0-5%	Water Shortage Alert
2	6-15%	Water Shortage Warning
3	16-25%	Water Shortage Emergency
4	26-35%	Severe Water Shortage Emergency
5	36-50%	Critical Water Shortage Emergency
6	>50%	Water Shortage Disaster

2020 WSCP Level	Shortage Level
1	<10%
2	10-20%
3	20-30%
4	30-40%
5	40-50%
6	>50%

Figure 4. DWR shortage level alignment.

The City's strategy for approaching water shortages in each of the six stages above is uniform. Each stage includes the following four major components:

1. An allocation system to establish reduction goals for different customer groups;
2. Demand reduction measures;
3. Publicity and communications (outreach); and
4. Operating actions.

Also included in each demand stage is a prepared public message to be used in the event the City enacts the corresponding stage of the plan. The allocation system mentioned above is established in detail in Section 3.3 of the WSCP. The backbone of the allocation plan is the understanding that certain uses are higher priority than others when a water supply shortage occurs. The priorities used in the City's allocation system are as follows:

1. **Indoor Use:** This is the highest priority use, which includes residential and non-residential interior domestic and sanitary uses for health and safety purposes.
2. **Business:** This category is the second highest priority and includes all non-sanitary usage related to commercial and industrial activity.
3. **Outdoor/Irrigation:** This is the lowest priority and includes all irrigation and outdoor usage in the single family, multiple family, and irrigation categories.

Based on these priorities, the City has developed the following allocations based on normal deliveries during each stage of the WSCP.

Table 8-2. Water delivery allocation by priority (based on normal deliveries).

Stage	System Shortfall	Indoor	Business	Outdoor/Irrigation
2	15%	95%	95%	63%
3	25%	95%	90%	33%
4	35%	90%	85%	12%
5	50%	75%	60%	0%
6	>50%	<75%	<60%	0%

The goal of this allocation system is to balance available supplies in times of water shortage as much as feasible. This is achieved primarily through reductions in outdoor water use, as shown in the table above. At each level of supply reduction, health and safety and business are given the highest priority. In all system shortfalls, however, each usage suffers greater reductions in available allocation, which is necessary to balance available supplies with demand.

As noted above, the primary concern for the allocations in each stage of the water shortage contingency plan is to maintain sufficient water for public health, safety, and sanitation use. Table 8-3 below shows the residential indoor water use allocation in terms of available daily water on a per capita basis for each stage of the WSCP.

Table 8-3. Health and safety indoor water use allocations.

Deficiency Condition	Health/Safety Allocation	Combined Residential Use (GPCD)
No deficiency	100%	55
15%, 25%	95%	49
35%	90%	41
50%	75%	33
>50%	<75%	30

Essential indoor health and safety water use is commonly estimated at 45-50 GPCD. As shown in the table above, in all but the most extreme cases of water supply listed, the plan above meets this standard. Further explanation as to how the estimates in the table above were developed can be found in Section 3.3 of the City's WSCP.

The water shortage strategy developed by any water agency can only be as effective as the process in place to implement the plan. The following section describes the process in place for moving through the water shortage process.

8.4.1 Implementation Strategy

The City can implement the water shortage stages in two ways. First, as the City is solely dependent on the SFPUC supply, movement through these stages could occur based on the supply as reported available for purchase from SFPUC. Second, the City could implement and move through these stages based on drought or emergency declarations from the City or State. Although actual shortages may occur at any point in the year, a typical drought shortage is usually forecasted by the SFPUC between March and April.

In addition to drought emergencies, the staged water shortage contingency plan can also be used to manage demand during shortages caused by other phenomena, such as water quality issues. During such an event, the same supply reduction triggering levels would be used.

The process in place for the City to declare a water shortage is summarized below:

- The City Council holds a public hearing on the matter;
- The public hearing be properly noticed (minimum of publishing once in newspaper at least seven days prior to the date of the hearing);
- Upon determining and declaring the existence of a water shortage or drought, City Council may then adopt regulations and restrictions governing the use and delivery of water.

The stages outlined above include various prohibitions, regulations, and other associated polices. These components are discussed in further detail in subsequent sections.

8.5 Demand Reduction Actions

Mandatory prohibitions on water use are vital measures to outline in an agency's WSCP. These measures, combined with a proactive public information campaign, give the City the ability to implement and enforce measures that can play a large role in reducing demand during times of water shortage emergency. Table 8-4 below summarizes the demand reduction actions relevant to each stage of water shortage emergency outlined in the City's WSCP. The actions in this table are a summary of the material contained throughout Section 3 of the WSCP. For full explanation on all of these measures, or for any other restrictions and prohibitions not listed here, refer to the WSCP included in Appendix K. The stages listed in the table represent the water shortage stage when each specific measure becomes active. Note that most measures remain active through the stages beyond which the measure is implemented.

Table 8-4. Demand Reduction Actions

Stage	Demand Reduction Actions	Volume Reduction of Shortage Gap	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
1	Expand Public Information Campaign	2.4%	Implement Media Campaign including newspaper and web announcements	Yes
1	Increase Water Waste Patrols	1.4%	Enforce existing water waste ordinances	Yes
1	Other	0.8%	Non-essential uses banned	Yes

Stage	Demand Reduction Actions	Volume Reduction of Shortage Gap	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
1	Landscape - Other landscape restriction or prohibition	0.4%	Graywater and Customer Conservation to Drip, Low-Volume Irrigation	Yes
2	Expand Public Information Campaign	4.3%	Expand campaign to include regular media briefings; publish weekly consumption reports	Yes
2	Other	3.8%	Accelerate System leak detection and repair	Yes
2	Landscape - Other landscape restriction or prohibition	0.2%	Conduct workshops on Large Landscape Requirements	Yes
2	Landscape - Limit landscape irrigation to specific times	0.7%	Landscape irrigation restricted to designated watering days	Yes
2	Landscape - Other landscape restriction or prohibition	0.7%	Require large landscapes to adhere to water budgets	Yes
2	Other - Prohibit use of potable water for washing hard surfaces	0.6%	Prohibit exterior washing of structures	Yes
2	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	0.6%	Require large users to audit premises and repair leaks	Yes
2	Water Features - Restrict water use for decorative water features, such as fountains	0.6%	Use re-circulated water to operate decorative fountains, ponds, and lakes	Yes
2	Other	0.6%	Use a bucket and a hand-held hose with a positive shut-off nozzle, mobile high-pressure/low-volume wash system, or at a commercial site to wash vehicles	Yes
3	Expand Public Information Campaign	6.5%	Expand campaign to include regular media briefings; publish weekly consumption reports	Yes
3	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	1.4%	Leak repair within 72 hours	Yes
3	Landscape - Other landscape restriction or prohibition	4.6%	Reduce water budgets for large landscapes	Yes
3	CII - Other CII restriction or prohibition	3.0%	Require all commercial customers to prominently display "save water" signage and develop conservation plans	Yes
3	Other water feature or swimming pool restriction	0.3%	No operation of ornamental fountains	Yes

Stage	Demand Reduction Actions	Volume Reduction of Shortage Gap	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
4	Increase Water Waste Patrols	0.7%	Expand water waste enforcement to 24/7	Yes
4	Other	7.2%	Institute water rationing for residential customers	Yes
4	CII - Other CII restriction or prohibition	1.6%	Institute water rationing for commercial customers	Yes
4	Landscape - Other landscape restriction or prohibition	5.3%	Minimal water budgets for large landscape customers	Yes
4	Landscape - Other landscape restriction or prohibition	0.4%	Prohibit turf irrigation installation in new development	Yes
4	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water	0.2%	Prohibit car washing everywhere except commercial facilities	Yes
4	Other	0.1%	Rescind hydrant and bulk water permits	Yes
4	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	1.6%	Leaks must be fixed within 48 hours	Yes
5	Other	10.6%	Reduce residential water allocations	Yes
5	CII - Other CII restriction or prohibition	3.3%	Reduce commercial water allocations	Yes
5	Landscape - Prohibit all landscape irrigation	16.3%	Prohibit outdoor irrigation with 24/7 enforcement	Yes
5	Other water feature or swimming pool restriction	0.0%	No water for recreation, close pools	Yes
5	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	0.0%	Leaks must be fixed within 24 hours	Yes
6	Other	13.6%	Reduce residential water allocations to health and safety minimums	Yes
6	CII - Other CII restriction or prohibition	4.9%	No water for non-essential commercial uses	Yes

NOTES: See the City's Water Shortage Contingency Plan for further detail.
UWMP Guidebook Table 8-2

Enforcement methods for violating mandatory prohibitions and excess water use charges that complement Table 8-4 are presented in the subsequent section.

8.6 Penalties, Charges, Other Enforcement Prohibitions

The City has methods in place to communicate, warn, enforce, and penalize customers that violate mandatory water restriction measures outlined in the previous section. In addition, the City has developed monthly excess use fees for customers that exceed allocated water use levels when they are in force resulting from a Water Shortage Stage. Table 8-5 below presents the excess use charge for customers exceeding their allocations during times of enforced drought.

Table 8-5. Excessive use charge schedule.

% Over Allocation	Excess Use Charge Per CCF
0-10%	$5.00
10.1-20%	$13.00
20.1% or greater	$25.00

The table above can be found in Section 3.5.1 of the WSCP. This excess use fee would be added in addition to the customer's regular water use rates (found in Appendix E), and is designed to act as a deterrent to excess water use during times of shortages. If a customer's water use exceeds the allocation by a large amount, penalties would be greater and may include the following:

- **Flow Restriction:** Some customers will continue to exceed their allotment regardless of the water bill amount. In such cases, the Public Works Department is authorized to install a flow restriction device to reduce flow to the customer, to an amount just enough for health and safety purposes. In these cases, the customer is charged a fee to cover the staff time needed to install the flow restrictor and another fee for its removal. Staff would not use this method where fire suppression sprinklers are on the same supply line as domestic water.
- **Disconnection/reconnection fees:** Water suppliers have the legal authority to enforce water shortage regulations by terminating service for egregious violations. In such cases, the customer would be charged for both disconnection and reconnection.
- **Citations:** The City's water conservation ordinance authorizes staff to issue citations that would have to be paid or challenged in court.

The City also has in place methods to engage, warn, and enforce violations of the mandatory end use prohibitions listed in Table 8-4 above. Initially in cases of end use violation, the violator is contacted via phone, letter, door tag, or in person and City staff will educate them as to why the prohibitions are in place. If this step does not modify the customer's behavior, and further violations were reported, City staff could then issue a written notice of violation. If violations continue to occur, the City could elect to assess a penalty fee, which would be added in addition to the customer's existing utility bill. The City's penalty fee schedule is shown below:

- 1st Violation: $100;
- 2nd Violation: $200; and
- 3rd Violation: $500 (and for each additional violation).

The City could consider higher penalty fees for large users that wilfully violate water restrictions. There are exceptions to the enforcements summarized above, and a process for appeals. Both of these topics can be found in the City's WSCP found in Appendix K.

8.7 Consumption Reduction Methods

Supply augmentation is a strategy some water suppliers use to help offset the effects of drought scenarios on their customers. Since the City receives its supply from SFPUC, there is no real opportunity for supply augmentation in concert with WSCP shortage levels. The City may explore options for supply augmentation as the need arises, but do not have any plans at present.

8.8 Determining Water Shortage Reductions

As noted previously, the City and its water system is fully metered. Additionally, each connection between the City and the RWS is metered. Metered water consumption is reported on a bi-monthly basis, which is generated from the utility billing system. During a water shortage, large water consumers would be monitored on a more frequent basis. During severe water shortages, consumption would be monitored on a daily basis and daily status reports would be given to the Public Works Director.

8.9 Revenue and Expenditure Impacts

An often overlooked consequence of implementing demand reduction to address water shortages is the corresponding reduction in revenue that occurs to the City's Water Enterprise Fund as a result of reduced water sales. To better understand the magnitude of revenue losses that the Water Enterprise Fund might experience, a table was developed based on 2020 fiscal year revenues. The table assumes the "ready-to-serve" or fixed monthly service charge that is based on meter size would remain unaffected. The volumetric portion of the Water Fund's revenue is based on water sales and would vary by customer class in accordance with the allocation presented in Table 8-2 over the seven month period in which water shortage regulations are likely to be in effect. Results are summarized in Table 8-6 below.

Table 8-6. Estimated revenue losses associated with each water shortage stage.

Customer Category	FY 2020 Revenue			Revenue Losses Due to Reduced Water Sales					
	From Water Service Charges	From Water Sales	Total	Stage 1 (5%)	Stage 2 (15%)	Stage 3 (25%)	Stage 4 (35%)	Stage 5 (50%)	Stage 6 (>50%)
Single Family Residential	$1,734,000	$4,624,454	$6,358,454	$231,223	$693,668	$1,156,113	$1,618,559	$2,312,227	$2,312,227+
Multi-Family Residential	$84,000	$1,654,442	$1,738,442	$82,722	$248,166	$413,611	$579,055	$827,221	$827,221+
Business	$88,200	$1,519,814	$1,608,014	$75,991	$227,972	$379,954	$531,935	$759,907	$759,907+
Municipal	$13,500	$276,422	$289,922	$13,821	$41,463	$69,105	$96,748	$138,211	$138,211+
Irrigation	$28,200	$720,637	$748,837	$36,032	$108,096	$180,159	$252,223	$360,318	$360,318+
Other	$29,400	$5,377	$34,777	$269	$807	$1,344	$1,882	$2,688	$2,688+
Totals	$1,977,300	$8,801,146	$10,778,446	$440,057	$1,320,172	$2,200,286	$3,080,401	$4,400,573	$4,400,573+
Estimated Net Revenue				$10,338,389	$9,458,274	$8,578,160	$7,698,045	$6,377,873	>$6,377,873

Table 8-6 shows revenue losses ranging from just over $440,000 in a 5% water shortage situation to over $4.4 million in a water shortage disaster of over 50%. Compared to the 2020 revenues of just approximately $10.8 million, the City's net revenue would be reduced to approximately $10.3 million in Stage 1 and to under $6.4 million in Stage 6. These revenue loss projections are the best estimates at this time and may underestimate the problem. There are other factors that could affect revenue during times of mandatory demand reduction that are more difficult to quantify, which include the following reasons:

- It is unlikely that system water use would immediately recover to normal levels in the months following a period of curtailment as modelled, thereby further depressing income;
- The table above does not include added operating costs of staff, equipment, and materials related to the water shortage response;
- The table above does not include potential penalties or excess use charges; and
- There would be relatively minor cost savings associated with reduced power and chemical usage at the WPCP.

Whatever the situation, one element of implementing this WSCP involves examining the Water Enterprise Fund budget for the coming year and recommending action(s) to reduce expenditures to lessen or overcome the revenue shortfall. Options include the following:

- Deferring planned capital improvements
- Considering possible rate adjustments or surcharges

Another implementation issue associated with pricing is the Proposition 218 procedure for increasing water rates, fees, and charges. It is assumed that the proposed changes to both penalty fees and excess use fees discussed in Section 8.5 would require written notice to all customers, a public hearing, and consideration of written protests and comments before implementing the new fees. Given the minimum 45 day protest period, the entire Proposition 218 process can take several months to complete.

8.10 Resolution or Ordinance

The City's water shortage contingency plan resolution can be found in Appendix C.

8.11 Plan Refinement/Re-Evaluation Process

The Water Shortage Contingency Plan is a living document and will need to be responsive to the effectiveness of conservation measures in the midst of a water shortage. The City will analyze monthly monitoring data, consult with all City Departments, and convene the Water Appeals Board to determine if adaptive measures need to be taken to achieve the necessary shortage reduction levels. In the case that the measures are not working as desired, the City will add new actions or refine current actions to achieve greater savings. Measures from a higher stage can be adopted into the current stage, such as requiring leak repairs within 24 hours rather than 72 hours in Stage 3. When updates are needed, the City will coordinate amongst all City Departments to refine the plan and provide updated information and measures to the City Council for approval.

8.12 Catastrophic Supply Interruption

The CWC grants the authority for the governing body of a water agency to declare a water shortage emergency, in particular under a catastrophic interruption event. After having done so, the agency is given

the authority to enact measures to regulate demand during the shortage. In these situations, water needed for domestic, sanitary, health, and fire protection purposes is given ultimate priority. Discrimination between customers using water for the same purposes is not permitted.

Catastrophic water supply interruptions or shortages can result from a variety of causes, including earthquake, vandalism, flood, pipeline break, or other large scale natural disaster. The WSCP is meant to address short and long term water supply shortages as a result of drought or other dry year conditions; however, many provisions in Stage 6 of the WSCP are directly relevant to a catastrophic supply interruption. Stage 6 is a situation where there is an imminent and extraordinary crisis threatening health, safety, and security of the entire community. During Stage 6, water use is reserved for health, sanitation, and safety needs, and the measures to achieve the required reductions are extreme. Measures in Stage 6 include water rationing for all customers, irrigation prohibitions, vehicle and building washing prohibitions, and required leak repair within 48 hours. For further explanation of Stage 6, and how it may be relevant to a catastrophic supply interruption, see the WSCP attached in Appendix K.

During shorter, high intensity emergency incidents or disasters, the City maintains a separate Emergency Operations Plan. As a component of this plan, the City has developed an emergency water shortage event chart, which can be found in Appendix D of the WSCP. As shown in the chart, City response actions are planned for based on a hierarchy of severity, beginning with the loss of individual City interties to the RWS, and moving up to loss of function of the Sunol and Harry Tracy Water Treatment Plan Supply lines. In addition to where the loss of service occurs, the chart takes into account the duration of the interruption, with durations of less than or greater than 24 hours. For each potential scenario, the corresponding City pressure zones are identified, possible scenarios/reasons are formulated, and City response measures are outlined. As there is a host of information in the emergency water shortage event chart, please refer to Appendix D of the WSCP for further explanation.

8.12.1 Seismic Risk Assessment and Mitigation Plan

The City also has a Hazard Mitigation Plan that is contained within the County of San Mateo Hazard Mitigation Plan (Section 2, Chapter 12). The City and portions of the RWS are located in seismically active areas, making catastrophic supply interruption due to a natural disaster such as an earthquake a tangible threat and the natural hazard that poses the highest risk to the City. Past natural hazard events within the City have included landslides and earthquakes.

The County Hazard Mitigation Plan identifies several specific vulnerabilities for the City, including:

- City water storage tanks are not up to current seismic codes. Tanks have been in service since 1970 and have passed their useful life. The City of Millbrae recently completed the Water Storage Tanks Master Plan and is actively seeking funding to implement the projects recommended in the Master Plan.
- Aging water distribution system. The majority of the 75 miles of water distribution system are also over 60 years old and in urgent need of replacement and retrofit.

The County Hazard Mitigation Plan also includes an action plan for mitigation of the identified vulnerabilities. Specific actions for the water system include:

- Water system intertie with the San Francisco Airport
- Water storage tanks seismic upgrades, retrofits and replacement
- Actively participate in the plan maintenance protocols

Relevant sections of the County Hazard Mitigation Plan are included in the Appendix K.

8.12.2 SFPUC Preparations

Because the City relies on the RWS, it is important to note the procedures in place for the SFPUC given a catastrophic water supply interruption. For emergency response, the SFPUC has prepared the Regional Water System Emergency Response and Recovery Plan (ERRP). The purpose of this document is to describe the SFPUC RWS emergency management organizations, along with their roles and responsibilities, and other emergency management procedures. These procedures outline how to respond to and recover from a major seismic event, or other type of natural disaster.

The SFPUC has also prepared the Regional Water System Notification and Communications Plan. This plan provides contact information, procedures, and guidelines to follow when a potential or actual water quality issue occurs.

Increasing the reliability of the RWS has been prepared for through the WSIP that has been undertaken by the SFPUC. Several of these projects have been focused on increasing the seismic reliability of several key water system features.

8.13 Minimum Supply Next Three Years

The minimum anticipated potable water supply for the next three years would occur during a multiple dry year water scenario as presented in Section 7. During this type of event, the City would receive its full average base year water deliveries from SFPUC for the first year and second consecutive dry years, then roughly 60% of normal for the third year. The total volumes available during these years are shown in Table 8-7 below.

Table 8-7. Minimum water supply for the next three years.

Year	2021	2022	2023
Available Water Supply (MG)	712	785	416
NOTES: UWMP Guidebook Table 8-4			

9. Demand Management Measures

This section provides an overview of the City's efforts to promote water conservation and reduce demands on water supplies.

9.1 Water Conservation Background

In compliance with applicable State and local laws, the City has an ongoing Water Conservation Program. Chapter 9 of Title 8 of the Millbrae Municipal Code establishes the City's program. Ordinance No. 593, found in Appendix L amended the Code to update the City's program in 1993. Local and regional water conservation programs are being implemented. The drought regulations adopted in 2014 and 2015 and extended drought regulations helped to reduce water use in the City. In addition, the implementation and continuing programs with BAWSCA have continued to contribute towards water conservation. In addition, the CALGreen Building Codes, which the City began adopting in 2011 (Appendix L) will continue to reduce water consumption in the City through increased plumbing code requirements.

9.2 Regional Coordination on Demand Management

The City participates in a number of regional programs in coordination with BAWSCA and its other member agencies. The City also looks for opportunities to work with other water agencies, including the SFPUC, to leverage available resources to implement water use efficiency projects. Cooperative programs with BAWSCA include school education; landscape budgets; rain barrel, smart irrigation controller, and lawn replacement rebates; water loss management; and medium- and long-term planning efforts.

BAWSCA and its participating member agencies are part of the Bay Area Integrated Regional Water Management Plan (see Section 6.10). Together with other major Bay Area water utilities, BAWSCA has submitted a Proposition 1 Implementation Grant proposal to support regional water conservation efforts that offer long-term water savings. The project includes a package of water conservation programs to improve water use efficiency throughout the San Francisco Bay Area. The project provides direct funding, financial incentives (rebates), and/or subsidies for the implementation of programs that achieve reduced water demand by all classes of users (residential, commercial, industrial, institutional, and system water loss). Five specific programs were selected for the project because they were determined to provide the most quantifiable and sustainable water savings and support compliance with the upcoming statewide urban water use objectives. These programs include:

- Qualified Water Efficient Landscaper training program
- Smart irrigation controller rebates
- Lawn replacement rebates
- Flowmeter rebates
- Component analysis to support system water loss management

The City will continue participation in the rebate programs for the near term as described in the Section 9.3.8.

Since the 2015 UWMP, the BAWSCA Demand Study was implemented in coordination with BAWSCA and its member agencies to identify additional measures for the City to meet ever increasing goals for additional water conservation and water allocations. The Demand Study included water conservation savings for

programs planned for future implementation. Specific measures identified for implementation by the City and associated water savings are presented in Table 9-1.

Table 9-1. Water conservation measures.

Conservation Measure	Description	Anticipated Savings
CII Water Survey	Program provides free water surveys to CII customers to evaluate ways for the business to save water and money. The surveys may target large accounts (e.g., accounts that use more than 5,000 gallons of water per day) only such as hotels, restaurants, stores and schools. Emphasis may be on supporting the top 25 users for each individual water agency.	Savings of 15% per site for 0.5% of accounts annually.
Large Landscape Outdoor Water Surveys	Outdoor water audits offered for existing large landscape customers. Normally those with high water use are targeted and provided a customized report on how to save water. All large multifamily residential, CII, and public irrigators of large landscapes would be eligible for free landscape water audits upon request. Tied to the Water Budget Program.	Savings of 15% for 0.8% of accounts annually.
Large Landscape (Waterfluence) Program	Website provides feedback on irrigation water use (budget vs. actual). Current Waterfluence Program.	Savings of 30% for 5% of accounts.
Lawn Be Gone! And Rainwater Capture Rebates	Provide a per square foot incentive for to remove turf and replace with low water use plants or permeable hardscape. Landscape conversion includes conversion of turf to lower-water-using turf varieties. Rebate based on dollars per square foot removed, and capped at an upper limit for single family residence, multifamily residence and/or commercial account.	Savings of 18% over 5 years for 0.13% of accounts annually.
Residential Water-Savings Devices Giveaway	Utility provides free high efficiency showerheads, shower timers, toilet leak detection tablets, and aerators in bulk and gives them away at Utility office and community events.	Savings of 6.9% for 1.25% of user accounts annually.

Conservation Measure	Description	Anticipated Savings
Flowmeter Rebate	Program provides rebates for flow measuring devices which inform customers of their water use and provide leak detection and remote shutoff with a smart phone interface. Devices are targeted to residential users and can monitor indoor only, whole site meter use, and/or irrigation only use.	Savings of 7% of total use for 0.5% of user accounts annually.
New Development Submetering	This is an existing code that, as of January 1, 2018, requires the metering of individual units in new multifamily, condos, townhouses, mobile-home parks and business centers (less than four stories and with water heater in the units).	Savings of 22% per account on indoor uses only for 50% of new multifamily accounts.
New Development Hot Water On Demand	Existing code which requires new development to include efficient hot water on demand systems. Systems reduce hot water waiting times. Coordination with building department and tracking.	Savings of 4.3 gpd for 100% of new residential accounts.
Public & School Education	Program includes in-person and online outreach to residential customers, schools and all CII customers, landscapers and contractors. Outreach includes tools and resources specific to outdoor water use efficiency (e.g. WaterWise gardening tool and landscape watering calculator) as well as general information on water conservation through community events, websites, and social media.	Savings of 1% on common indoor water uses for 5% of user accounts.

9.2.1 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.
- [8]
- 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*.

9.3 Demand Management Measures for Retail Agencies

The following sections describe the individual demand management measures used by the City.

9.3.1 Water Waste Prevention Ordinance

The City's Water Conservation Ordinance, Title 8, Chapter 8.45, has been in place since 1976 and prohibits water waste. The ordinance includes a number of restrictions including the following:

- The prompt repair of broken or leaky plumbing, sprinklers, or irrigation systems;
- Positive shutoff valves for hoses;
- Disallowing flooding or runoff in gutters, driveways, or streets;
- Use of recycled water for all cooling purposes and for car washes; and
- All connections to the City water system must be metered with City-approved meters.

These are just a sampling of the restrictions included in the ordinance; see Appendix L for a full listing of restrictions. In addition to the restrictions listed above, the ordinance includes other water use conservation measures that are encouraged, which include:

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

- Watering/irrigation time is recommended between 6 pm and 10 am;
- Sidewalks, driveways, and other hard surfaces should not be cleaned from hoses or faucets;
- Restaurants and similar facilities should only serve water upon customer request; and
- Water used to maintain decorative fountains should be recycled.

The City also follows the CALGreen Building Code for indoor water use conservation.

In addition to the Water Conservation Ordinance, the City in 2014 and 2015 adopted and implemented drought regulations per the State's imposed regulations. Additionally, the City declared Stage 2 of its Water Shortage Contingency Plan. These regulations were lifted in June 2017.

9.3.2 Metering

The City meters water use for all customers. The water rates, found in Appendix E, are uniform and include a service charge based on the meter size. The City has a program to test, repair, and replace meters.

9.3.3 Conservation Pricing

As noted previously, the City's current water rates are uniform and based on per unit (100 cubic feet) usage. As such, regardless of the volume used the City's metered customers pay for what they use. As shown in the water rates attached in Appendix E, the water rates have increased over five-year period ending in 2019. Due to COVID-19, the rate increase that was supposed to take effect on July 1, 2020 was deferred. At present, the City's water rates are in line with average County-wide water rates. With the rate increases, the City has noticed increased conservation from City water users.

True conservation pricing would include tiers of water usage, where per volume charges would increase as more water was used by a customer. These types of rate structures can be very effective for water conservation and can also be incorporated into a City's Drought Contingency Plan to provide a mechanism for increased conservation during supply shortages. The City has in the past and is currently evaluating tiered water rates.

9.3.4 Public Education and Outreach

Public outreach, information, and educational programs are the backbone of the City's Water Resources & Conservation Program. Water conservation, and the City's available resources to encourage conservation, is promoted to residential and commercial customers through a variety of outreach efforts and media types. These types include displays, printed media, presentations, staffing events, and electronic and social media.

Visitors to City Hall receive an information and resources packet that includes various printed brochures on water conservation topics and free water savings devices including low-flow kitchen and bathroom aerators, low-flow showerheads, shower timers, toilet leak detection tablets, moisture meters, and a flow meter displacement bag. Outreach is conducted at a number of City-wide annual events including the Art and Wine Festival, the Health and Wellness Fair, the Lunar New Year Festival, Beats & Brews Concerts, and the Japanese Culture Festival. Educational tables are also staffed in the Downtown during seasonal events such as Earth Week and Pollution Prevention Week. The direct contact between City conservation employees and volunteers provides a great opportunity to have interactive conversations with the community while providing educational handouts in person.

Electronic media outreach promotes available conservation resources and other timely information. The media postings include the City's Facebook, Twitter and NextDoor pages, airing public service announcements, and showing environmental movies on the local cable channel MCTV Channel 27. General information topics include workshops, water savings devices and fixtures, available rebates, and other water savings tips will be promoted. The City also has a dedicated water conservation hotline and an information water conservation webpage to assist customers. A number of resources, including an online water-wise gardening tool, free guides and brochures, tips, and links to other agencies water conservation resources have been made available.

Printed media outreach includes placing regular messages on residential and commercial utility bills and brochure distribution. The City develops and distributes a variety of brochures and literature to the community on water conservation topics, resources, and water efficient landscaping. A water-wise street banner is placed Downtown on a regular basis. Water conservation tips are also included in the annual Consumer Confidence Report. (Appendix G) that is mailed to each household, and in informational packets that are sent to new residents and businesses in the City.

Presentations are also conducted with community groups to highlight the many programs and resources available. Attendees receive program handouts and other printed media mentioned above.

The City provides also provides school assemblies which are conducted by local performers, EarthCapades. These assemblies combine age-appropriate state science standards to teach environmental awareness, water science, and conservation, while engaging the audience with music, juggling, and humor. At these presentations program handouts are given to students and their families.

Educational outreach is also performed through the Library. Students are reached through a cooperative education program which includes providing water savings handouts at their after-school programs and showing environmental movies. Periodically, the City has staffed a booth at the Library entrance to further engage students and the community.

9.3.5 Programs to Assess and Manage Distribution System Water Loss

As noted in Section 4.5, the City's water losses for the year 2019 were approximately 52 MG, which is 7.6% of the total water purchased from SFPUC during the same time period.

The City monitors the water losses regularly, and repairs system leaks promptly upon detection. The City is also continuing several projects that will work to reduce system water losses. The City prepares annual water audits, which are conducted using the AWWA water audit methodology and validated by a third party. In addition, the City participates in BAWSCA's Loss Evaluation and Knowledge work group to support water loss management efforts.

During Fiscal Year 2015-2016, the City implemented a water main replacement program and replaced 8,000 feet of piping at a cost of $2,495,000. When funding is available, there is a five-year plan to continue with this program. This program reduces or eliminate leaks from many older pipes. The intent of this program is to replace water main pipes before a major break occurs.

In addition to the water main replacement program, the City is actively testing and replacing commercial water meters each year (three-quarter, one-inch meters, and other size meters as well). These new meters will increase the accuracy of water used by customers and help close the gap between real and apparent water system losses.

9.3.6 Water Conservation Program Coordination and Staffing Support

The City employs a water conservation coordinator, and has since 1991. Currently, the Environmental Programs Manager serves in this position and oversees the water conservation efforts. There is also one part-time assistant who periodically works on water conservation but mostly works on other environmental programs, and there is one administration staff member who assists with the rebate program and answers the hotline as a part of their many duties in the City Public Works Department. The Environmental Programs Manager oversees the Water Resources & Conservation Program, which includes implementing the many programs for water conservation, and complying with conservation reporting requirements. The City will continue to employ staff for these purposes in the future.

In 2020-2021, the budget for these operations was $120,214. The budget includes costs for personnel, services, and necessary supplies.

9.3.7 Other Demand Management Measures

In addition to the active conservation DMMs described above, the City implements additional programs, which are described in this section.

Residential Landscape Education

In coordination with BAWSCA, water-wise workshops are held for the community in the spring and fall on native and low-water use plants, landscape design, sustainable gardening, efficient irrigation systems, rainwater harvesting, and graywater reuse. The workshops are widely advertised and well attended. Participants are provided with water conservation handouts and water saving devices. In addition, water-wise landscaping brochures are distributed to the public at various locations and at events, which are also posted on the City's website.

Water-Wise Landscape Award Program

The City's Community Enhancement Advisory Committee has a Water-Wise Landscape Award Program which provides a quarterly award to a homeowner that has a water-wise landscape. The award winners receive recognition at a City Council meeting and a plaque to put in their yard.

City Facility Water Conservation Program

The City leads by example with their environmental programs, including for water conservation. An example of this is that City Hall and the Library are certified Green Businesses. A water audit was done previously for City facilities to assess water use and the flow of various fixtures. Water saving devices were installed, including showerheads and faucet aerators, at all City facilities. City facilities will continue to be monitored. In addition, the parks and all of the sports fields use efficient weather-based irrigation systems, and some of these locations are a part of the Large Landscape Water Budget Program.

9.3.8 Residential Conservation Programs

The largest customer class in the City service area is residential, which includes single family, duplex, and multi-family meter accounts. The City has approximately 5,780 single family (SF) and 280 multi-family (MF) residential accounts. Residential accounts make up approximately 92% of total water system connections and 65% of total gross water demand, based on data for the fiscal year 2019-2020. Because residential water use is such a large portion of the total demand, the City has focused the majority of its conservation efforts on residential use. Summaries of the residential programs are found below.

Residential Assistance Program and Water Surveys

The City distributes a variety of residential plumbing retrofit devices and materials to help conserve water. These devices are available as a package at the Public Works Department counter, and they are also distributed at various community events and fairs throughout the year. The contents of these packages include:

- Water efficient showerheads;
- Kitchen and bathroom sink aerators;
- Flow meter displacement bags;
- Shower timers;
- Moisture meters;
- Toilet leak detection tablets; and
- Literature on water conservation and workshops.

The City distributes some of the lowest-flow devices (faucet aerators and showerheads) available. Toilet tank leak detection tablets are widely distributed and test for leaks that are neither seen nor heard, which often time are the most problematic for homeowners. Shower timers encouraging five minute or less showers and moisture meters are also distributed.

The City distributes surveys upon request to residential customers. Customized water usage reports are provided upon request to customers that show the trend over the last four years on their water use. The water survey addresses indoor and outdoor water use and includes information on the free water saving devices and rebate programs. For indoor water use, the survey asks about the:

- Gallons per flush (GPF) of the household's toilets;
- Gallons per minute (GPM) of the kitchen and bathroom faucets; and
- GPM of the showerheads.

For outdoor water use, the survey inquires about:

- How lawns and landscapes are watered (irrigation or hose);
- How often and how long landscaping is watered, and the type of plants; and
- Lawn and landscaping areas and if pools are on-site.

The survey also provides information on how to read water meters and refers to another document for how to find leaks.

The Water-Wise newsletter is distributed to the community through different means and includes information on the rebate programs, water saving tips, water efficient landscaping, and local regulations. In addition, water audits are performed for businesses as a part of the Green Business Certification process, and also when providing assistance on conserving water.

Rebate Programs

The City has had rebate programs in place for a number of years. In the last few years, rebate programs for high-efficiency clothes washers and high efficiency toilets were discontinued. These programs ended regionally due to Pacific Gas & Electric (PG&E) ending the program for washers and saturation for HETs,

as well as due to the market having efficient toilets due to building codes. The City also had a nozzle head replacement program in place from 2015-2018 where residents could obtain free nozzle heads.

Rainwater Harvesting Rain Barrel and Cistern Rebate Program

The City has provided rebates for the purchase and installation of rain barrels and cisterns since 2012. In 2014, the City joined the regional rebate program with BAWSCA and San Mateo County's Water Pollution Prevention Program to offer rain barrel rebates. In 2020, this program expanded to include larger rainwater harvesting barrels and cisterns.

Lawn Be Gone! Rebate Program

The City started participating in the Lawn Be Gone! Rebate Program in 2020 in coordination with BAWSCA to provide rebates tor residents for converting lawn into water-wise landscaping by planting native and drought tolerant plants. This program also includes providing rebates for installing rain gardens.

Smart Irrigation Controller Rebate Program

The City started participating in the Smart Irrigation Controller Rebate Program in 2020 in coordination with BAWSCA by providing an instant rebate for residents to purchase the Rachio 3 smart controller.

New Residential Development

The City adopted a California Green Building Standard in 2011. The City previously adopted an Indoor Water Use Efficiency Ordinance in 2010. Both of these policies reduced water consumption through the increased plumbing code requirements.

The 2010 California Green Building Standards Code (CALGreen Code) went into effect in January 2011 and included a 20% reduction in indoor water use, as well as dedicated meter requirements and regulations addressing landscape irrigation and design. Local jurisdictions, at a minimum, had to adopt the mandatory measures. CALGreen Code also identified voluntary measures that set a higher standard of efficiency, which could also be adopted.

The City's adopted Green Building Standard set forth minimum green building requirements within the City of Millbrae for all construction projects requiring a building permit. This ordinance incorporated all of the Mandatory Measures of the 2010 California Green Building Code and added additional requirements for additions and remodel projects. The Green Building Standard also included green building compliance for non-residential projects. In 2019, the City adopted the new CALGreen Code Green Building requirements and since then has followed that for all affected projects/developments and the respective water conservation measures.

9.3.9 Commercial, Industrial, and Institutional (CII) Conservation Programs

Based on the 2019-2020 fiscal year water delivery data, the number of CII customers in the City service area is 339, accounting for approximately 5.1% of connections and 20% percent of total gross demand. There is no large industry in the City service area, thus the number of industrial customers is reported as zero. Commercial accounts mainly include commercial, restaurants, and bars. Institutional accounts include the City, schools, and churches.

Similar to the residential programs noted above, the City provides water audits, water saving devices and other resources for commercial accounts. City staff continues to work with larger water account users, which primarily includes the local hotels/motels. Hotels/motels have also been provided with Project

Planet linen reuse and towel reuse cards for guest rooms. These cards are helpful in encouraging guests to reuse these items, which help to save water attributed to washing machine use.

Large Landscape Conservation Program

In the 2020 fiscal year, the City delivered approximately 52 MG of potable water to irrigation accounts. Currently, there are 94 irrigation customers (parks, golf courses, and other irrigation accounts), accounting for approximately 1.4% of connections and 7.6% of total demand.

The City participates in a regional large landscape water budget program which is administered by BAWSCA. This includes providing customers with customized water budgets each billing period based on weather conditions and site characteristics. The program also provides site surveys in which an irrigation expert visits selected sites to collect information and provide advice to improve irrigation efficiency and scheduling. Participants receive regular reports showing actual water use in comparison to provided water budgets and the lost dollar amount for going over budget.

The City has promoted regional landscape irrigation auditor workshops for landscape professionals and irrigation workshops for the community.

9.4 Implementation over the Past Five Years

This section presents and discusses how DMMs have been implemented over the past five years. This discussion includes many of the DMM's presented in the previous sections.

Pursuant to CWC section 10631, the DMMs implemented over this time frame will be discussed in the context of the nature and extent to which they have been implemented. For the purpose of this section, the nature of a DMM refers to specifics about how the program works, and the extent refers to the scale of the implementation.

9.4.1 Green Building Codes

The City adopted the most recent CALGreen Building Codes in 2019, which became effective on January 1, 2020.

9.4.2 Drought Emergency Regulations

The City implemented many measures and programs to help reduce municipal water demand during the recent drought. Listed below are the measures that were implemented from 2014 through 2017, when drought emergency regulations were lifted.

1. Watering of grass and ornamental landscapes is limited to two days per week as follows:
    a. Odd numbered addresses: Monday and Thursday
    b. Even numbered addresses: Tuesday and Friday
    c. No addresses, such as medians and parks: Monday and Thursday
        i. Water accounts that use an irrigation meter and 250 units of water or more per year may apply for the Alternate Irrigation Plan program to achieve a 25% water use reduction.
2. Watering of grass and ornamental landscapes is only allowed between 6 p.m. and 10 a.m.
3. Watering of grass and ornamental landscapes is prohibited during and 48 hours following rain.

4. Hoses used for any purpose must be fitted with shut-off nozzles.
5. Use of water is not allowed which results in flooding or runoff in gutters, driveways or streets.
6. Washing of hard surfaces is prohibited, including but not limited to driveways, patios, parking lots or other paved surfaces, and buildings.
7. Fountains or decorative water features are prohibited, unless the water is recirculated.
8. Restaurants and anywhere food or drink are served can only serve drinking water upon request.
9. Hotels and motels must offer guests the option of not washing towels and linens daily.

As noted above, the City has worked with larger irrigation accounts more closely to achieve water use reductions. The approach for achieving these reductions was through the voluntary Alternate Irrigation Plan (AIP). Four large irrigation accounts participated in the AIP program during the drought, and all four participants achieved the required 25% water use reduction goals through their proposed actions.

9.4.3 Stage 2 Water Shortage Contingency Plan Regulations

In addition to the drought regulations that have been implemented, the City enacted Stage 2 of their Water Shortage Contingency Plan on May 26, 2015. The resolution to enact Stage 2 of the WSCP can be found in Appendix M. These measures remained in place into 2017 and included:

- All water use restrictions for Stage 1;
- Draining and refilling of swimming pools prohibited;
- Water efficient indoor fixtures should be used, including, but not limited to, faucet aerators and showerheads (available for free at City Hall's Public Works Counter);
- Use of drip and other low volume irrigation systems encouraged;
- Appropriate use of graywater encouraged;
- Large water users must audit premises and repair leaks; and
- All customers encouraged to read meters and regularly check for leaks.

9.4.4 Municipal Operations

The City recognizes their responsibility to set an example for conservation. During the drought years, several measures were put in place in order to reduce municipal water demand. The City:

- Eliminated unidirectional hydrant flushing;
- Started using water from dead-end hydrants where possible to water the parks (using a water tanker truck);
- Reduced dead-end water main flushing from quarterly to twice a year and reduced the flushing time;
- Had the street sweeper start filling up at dead end hydrants when possible;
- Used the water discharged from the Helen Tank for watering the medians;
- Minimized water use for cleaning vehicles;
- Adjusted the City's irrigation controllers to reduce watering by 25%;

- Updated the remaining irrigation controllers with CalSense weather based controllers and switched older nozzle heads with more water efficient rotating nozzle heads;
- Stopped power washing of sidewalks;
- Used recycled water in the Water Pollution Control Plant (WPCP) operations for cleaning belts and the facility;
- Installed water saving fixtures, including low flow aerators and showerheads, inside City facilities;
- Re-certified City Hall and the Library as Green Businesses in 2013 and an Environmental Policy was also approved that includes implementing water conserving measures for City operations;
- Conducted outreach and education for employees on the drought regulations and conserving water;
- Enacted a program where water meters are evaluated for accuracy;
- Installed smart/weather based irrigation control systems in most of the parks and sports fields. Staff checks irrigation nozzle heads on a regular basis for missing parts or broken fixtures to reduce water waste. Staff review water budget allocations at identified sites to ensure compliance with water budgets; and
- Used drought tolerant plants in landscaped areas.

9.4.5 Education and Outreach

The education and outreach discussed in Section 9.3.4 above has been implemented throughout the past five years. To demonstrate the nature and extent of the outreach the City has performed, the City generated materials on water conservation and held workshops.

As part of the recent drought, the City had performed extensive outreach to inform and alert customers of regulations being implemented and other pertinent information. Specific actions were taken for outreach on the drought including the related material and regulations listed below:

- Mailed two postcard mailers to all water account customers;
- Created a drought regulation fact sheet/flyer;
- Included messages on utility bills;
- Aired ads and announcements on the local cable station, MCTV Channel 27;
- Posted information on the City's website and Facebook page;
- Wrote newsletter articles, press releases, and ads;
- Put in displays in City Hall and the Library;
- Installed a sign near City Hall's fountain that stated: "This fountain is turned off due to the drought. Thank you for conserving water!";
- Placed a roadside solar digital sign stating: "We're in a serious drought. Use water wisely.";
- Made announcements at various workshops, events, meetings;
- Provided restaurants with table tent cards with the message for customers to ask for water upon request;

- Conducted outreach and provided hotels/motels with free linen and towel reuse cards for guests; and
- Included articles in the City's, Chamber of Commerce's, and Garbage/Recycling Hauler's newsletters.

9.4.6 Water Saving Devices and Rebates

For many years free water savings devices and rebates have been provided to the residents of the City through a variety of mechanisms. Fixtures are available at the City Public Works Office counter, and they have been available at City events and other gatherings. Rebates have been available through joint programs with BAWSCA and PG&E for water efficient items including toilets, clothes washers, and rain barrels/cisterns. Current rebate values for each item are shown below:

- Rain barrels: $100 , 50-99 gallons and $150 for larger rain barrels, 100-199 gallons for a maximum of two rain barrels; and
- Cisterns: $200 for one cistern, 200 plus gallons.
- Smart irrigation controllers: $82.13 instant rebate for one controller
- Turf removal rebates: $1 per square foot of turf replaced with water-efficient landscaping
- Rain Garden Rebate: $300 rebate is available for those that also participate in the turf removal program.

In fiscal years 2015 through 2020, the City has provided 7,282 water efficient devices and has issued 121 high efficiency washer rebates, 228 high efficiency toilet rebates, and 33 rain barrel rebates.

9.5 Implementation to Achieve Water Use Targets

As discussed in Section 5.6, the City is in compliance with the water use targets established as part of SB X7-7. The City's gross per capita water use for 2020 was 82 GPCD, which is 35 GPCD below its water use target. The individual DMMs employed by the City to support water use compliance with its targets are described above in Section 1.3.

Beginning in 2023, the City will be required to calculate and report on new urban water use objectives per Water Code requirements. These water use objectives will be based on specific standards for certain water use sectors. The City, in coordination with BAWSCA, has initiated efforts to prepare for these new requirements and to align its water conservation efforts with changing water use patterns and future obligations. As part of the BAWSCA Demand Study, the City evaluated conservation savings potential for a range of water conservation programs based upon the City's current and projected future water use profile. Programs identified for future implementation are described above in Table 9-1.

10. Plan Adoption, Submittal, and Implementation

This section summarizes notifications to Cities, Counties, Agencies, and the Public that have been identified as stakeholders throughout the preparation of the 2020 UWMP. All notices were made in accordance with the requirements set forth in the relevant sections of the CWC.

10.1 Inclusion of all 2020 data

This UWMP used reporting data ending in the Fiscal Year 2020, which ended in June 2020. All data included in this report is reflective of this time period, and all drafts of this document were completed with complete 2020 data.

10.2 Notice of Public Hearing

10.2.1 Notice to Cities and Counties

To remain consistent with CWC sections 10621 and 10642, the City has been timely in 2020 UWMP preparation notification. Notices of UWMP preparation were posted in the San Mateo County Daily Journal on February 6, 2021. Notices were sent to BAWSCA on February 1, 2021, to the San Mateo County Public Works Department on February 4, 2021, and the Tuolumne River Trust on February 4, 2021. These postings are well before the 60 day limit prior to the public hearing, which occurred on May 25, 2021. Postings of UWMP preparation were posted on the City's website and Facebook page on April 13, 2021. The Millbrae City Council was also presented with an informational report on the 2020 UWMP at the April 13, 2021 Council Meeting.

Notices stating the time and location of the public hearing were sent to BAWSCA, the San Mateo County Public Works Director, and the Tuolumne River Trust on May 13, 2021. Table 10-1 below summarizes the City and County that were notified during this UWMP preparation process.

Table 10-1. Cities and counties notified during plan preparation.

City Name	60 Day Notice	Notice of Public Hearing
City of Millbrae (Public)	☑	☑
County Name	**60 Day Notice**	**Notice of Public Hearing**
San Mateo County	☑	☑
NOTES: UWMP Guidebook Table 10-1		

10.2.2 Notice to the Public

As noted in Section 2.5.2, the City published Plan preparation in the local newspaper on February 6, 2021 and Public Hearing notices in the local newspaper for two consecutive weeks. The notices were published in the San Mateo County Daily Journal on the dates May 13th and 20th (2021). A copy of the public hearing notice published in the newspaper can be found in Appendix B. A notice was posted on the City's Facebook page and website in May 2021.

10.3 Public Hearing and Adoption

The 2020 Draft UWMP was posted on the City's website by May 13, 2021 for public review. The City council adopted the 2020 UWMP in a session immediately following the public review hearing on May 25, 2021. The Resolution that was adopted by the City Council on the date of the hearing can be found in Appendix C.

10.4 Plan Submittal

Pursuant to CWC 10621, this UWMP has been submitted to DWR through the WUEdata submittal tool by July 1, 2021. Submittal at this time is consistent with CWC 10644, as adoption of the Plan occurred on May 25, 2021, which is within 30 days of the deadline submittal date to DWR.

To remain consistent with CWC 10644, a hard copy of the Plan was sent to the California State Library within 30 days after Plan adoption.

To remain consistent with CWC 10635, the Plan will be made available to the public and San Mateo County within 60 days of the submittal date to DWR.

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