California Water Service

2015 Urban Water Management Plan

South San Francisco District

June 2016

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List of Acronyms

AB	Assembly Bill
AF	Acre-Foot
AMI	Advanced Metering Infrastructure
AMR	Automatic Meter Reading
BCR	Benefit-Cost Ratio
BMP	Best Management Practice
CEHTP	California Environmental Health Tracking Program
CASGEM	California Statewide Groundwater Elevation Monitoring Program
CII	Commercial, Industrial, Institutional, water use sectors
CIMIS	California Irrigation Management Information System
CPUC	California Public Utilities Commission
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CWC	California Water Code
DMMs	Demand Management Measures
DOF	Department of Finance
DWR	Department of Water Resources
eARDWP	Electronic Annual Reports to the Drinking Water Program (SWRCB)
ETo	Reference Evapotranspiration
GIS	Geographic Information System
GPCD	Gallons per Capita per Day
IOU	Investor-Owned Utility
IRWM	Integrated Regional Water Management
LAFCO	Local Agency Formation Commission
MGD	Million Gallons Per Day
MOU	Memorandum of Understanding Regarding Urban Water Conservation
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
PWS	Public Water System
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SB X7-7	Senate Bill Seven of the Senate's Seventh Extraordinary Session of 2009
SGMA	Sustainable Groundwater Management Act
SWP	State Water Project
SWRCB	State Water Resources Control Board
RUWMP	Regional Urban Water Management Plan
USBR	United States Bureau of Reclamation
UWMP	Urban Water Management Plan
WARN	Water/Wastewater Agency Response Network
WDR	Waste Discharge Requirement
WRR	Water Recycling Requirement
WSCP	Water Shortage Contingency Plan

Chapter 1
Introduction and Overview

This chapter discusses the importance and uses of this Urban Water Management Plan (UWMP), the relationship of this plan to the California Water Code (CWC), the relationship of this plan to other local and regional planning efforts, and how this plan is organized.

This chapter contains the following sections:

1.1 Background and Purpose

California Water Service Company (Cal Water) is an investor-owned public utility supplying water service to 1.7 million Californians through 435,000 connections. Its 24 separate water systems serve 63 communities from Chico in the North to the Palos Verdes Peninsula in Southern California. California Water Service Group, Cal Water's parent company, is also serving water to communities in Washington, New Mexico and Hawaii. Rates and operations for districts located in California are regulated by the California Public Utilities Commission (CPUC). Rates are set separately for each of the systems.

Cal Water incorporated in 1926 and has provided water service to communities served by the South San Francisco District since 1931, when it purchased the South San Francisco Water Company.

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

- A long-range planning document by Cal Water for water supply and system planning
- Source data on population, housing, water demands, water supplies, and capital improvement projects used in
    - Regional water resource management plans prepared by wholesale water suppliers and other regional planning authorities,
    - General Plans prepared by cities and counties,

- Statewide and broad regional water resource plans prepared by the California Department of Water Resources (DWR), State Water Resources Control Board (State Board or Board), or other state agencies.

UWMPs are updated every five years. The last update was completed in 2010. This document is an update to the 2010 UWMP and carries forward information from that plan that remains current and is relevant to this plan. Although this plan is an update to the 2010 UWMP, it was developed to be a self-contained, stand-alone document and does not require readers to reference information contained in previous updates.

1.2 Urban Water Management Planning and the California Water Code

The UWMP Act requires urban water suppliers to prepare an UWMP every five years and to file this plan with the DWR, the California State Library, and any city or county within which the supplier provides water supplies. All urban water suppliers, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet annually are required to prepare an UWMP (CWC §10617).

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

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

1.3 Relation to Other Planning Efforts

This plan provides information specific to water management and planning by the South San Francisco District. However, water management does not happen in isolation; there are other planning processes that integrate with the UWMP to accomplish urban planning. Some of these plans include city and county General Plans, Water Master Plans, Recycled Water Master Plans, Integrated Regional Water Management Plans, Groundwater Management Plans and others.

This plan is informed by and helps to inform these other planning efforts. In particular, this plan utilizes information contained in city and county General Plans and local and regional water resource plans to the extent data from these plans is applicable and available.

1.4 Plan Organization

The organization of this Plan follows the same sequence as outlined in 2015 UWMP Guidebook.

Chapter 1 - Introduction and Overview

Chapter 2- Plan Preparation

Chapter 3 - System Description

Chapter 4 - System Water Use

Chapter 5- Baselines and Targets

Chapter 6 - System Supplies

Chapter 7— Water Supply Reliability

Chapter 8 – Water Shortage Contingency Planning

Chapter 9 — Demand Management Measures

Chapter 10 — Plan Adoption, Submittal, and Implementation

In addition to these ten chapters, this plan includes a number of appendices providing supporting documentation and supplemental information. Pursuant to CWC §10644(a)(2), this plan utilizes the standardized forms, tables, and displays developed by DWR for the reporting of water use and supply information required by the UWMP Act. This plan also includes other tables, figures, and maps, to augment the set developed by DWR. The plan notes if a table, figure, or map is part of DWR's standardized set or supplemental to it.

Chapter 2
Plan Preparation

This chapter discusses the type of UWMP South San Francisco District is preparing and includes information that will apply throughout the plan. Coordination and outreach during the development of the plan is also discussed.

This chapter includes the following sections:

2.1 Basis for Preparing a Plan

2.2 Regional Planning and Reporting

2.3 Units of Measure

2.4 Coordination and Outreach

2.1 Basis for Preparing a Plan

Per CWC §10617, South San Francisco District is an urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. It is therefore obligated under CWC §10621(d) to update and submit its 2015 UWMP to DWR by July 1, 2016.

South San Francisco District is an urban retail water supplier, as defined by CWC §10608.12. South San Francisco District does not provide water at wholesale.

South San Francisco District operates the Public Water Systems (PWS) listed in Table 2-1. Public Water Systems are the systems that provide drinking water for human consumption and these systems are regulated by the State Water Resources Control Board (Board), Division of Drinking Water. The Board requires that water agencies report water usage and other information via the electronic Annual Reports to the Drinking Water Program (eARDWP). The information provided in this UWMP is consistent with the data reported in the eARDWP. PWS data reported to the Board is used by the state to determine whether or not a retail supplier has reached the threshold (3,000 or more connections or 3,000 acre-feet of water supplied) for submitting an UWMP.

Table 2-1: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2015	Volume of Water Supplied 2015 (AF)
4110009	South San Francisco	16,302	7,064
	Total	**16,302**	**7,064**

2.2 Regional Planning

Regional planning can deliver mutually beneficial solutions to all agencies involved by reducing costs for the individual agency, assessing water resources at the appropriate geographic scale, and allowing for solutions that cross jurisdictional boundaries. Cal Water participates in regional water resources planning initiatives throughout California in the regions in which its 25 water districts are located. In the South San Francisco District, Cal Water participates in regional planning through the Bay Area Water Supply and Conservation Agency (BAWSCA). As a BAWSCA member, Cal Water assisted with development of the San Francisco Bay Area Integrated Regional Water Management Plan and BAWSCA's Long-Term Reliable Water Supply Strategy.

2.3 Individual or Regional Planning and Compliance

Urban water suppliers may elect to prepare individual or regional UWMPs (CWC §10620(d)(1)). South San Francisco District is preparing an individual UWMP.

Urban retail water suppliers may report on the requirements of SB X7-7 (2009 California Conservation Act) individually or as a member of a "Regional Alliance." As described in Chapter 5, South San Francisco District is a member of a Regional Alliance and this UWMP provides information on the District's progress towards meeting its SB X7-7 water conservation targets both as an individual urban retail water supplier and as a member of a Regional Alliance.

Table 2-2: Plan Identification	
☑	Individual UWMP
☐	Regional UWMP
Notes: South San Francisco District is a member of a Regional Alliance. Chapter 5 provides information on the District's progress towards meeting its water conservation targets under SB X7-7 both as an individual urban retail water supplier and as a member of its Regional Alliance.	

2.4 Fiscal or Calendar Year and Units of Measure

Annual volumes of water reported in this UWMP are measured in acre-feet (AF) and are reported on a calendar year basis. Water use and planning data reported in this UWMP for calendar year 2015 cover the full twelve months of the year, as required by the UWMP Guidelines. Table 2-3 summarizes the units of measure used throughout this UWMP.

Table 2-3: Agency Identification	
Name of Agency	California Water Service: South San Francisco District
Select one or both	
☐	Agency is a wholesaler
☑	Agency is a retailer
Fiscal or Calendar Year	
☑	UWMP Tables Are in Calendar Years
☐	UWMP Tables Are in Fiscal Years
Units of Measure	
☑	Acre Feet (AF)
☐	Million Gallons (MG)
☐	Hundred Cubic Feet (CCF)

2.5 Coordination and Outreach

Coordination with other water suppliers, cities, counties, and other community organizations in the region is an important part of preparing an UWMP (CWC §10620; CWC §10642). This section identifies the agencies and organizations South San Francisco District sought to coordinate with during preparation of this plan.

2.5.1 Wholesale and Retail Coordination

Urban retail water suppliers relying on one or more wholesalers for water supply are required to provide these wholesalers with information regarding projected water supply and demand. South San Francisco District provided information regarding projected water supply and demand to the wholesale water suppliers listed in Table 2-4.

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

2.5.2 Coordination with Other Agencies and the Community

South San Francisco District coordinated with cities, counties, and other community organizations during preparation of this UWMP. Cal Water provided notice to these entities and the communities it serves 60 days prior to the public hearing it held on June 8, 2016, to present the draft of the UWMP, address questions, and receive comments. Cities and counties receiving the public hearing notification from South San Francisco District as required per CWC §10621 (b) are listed in Table 10-1 in Chapter 10 of this plan.

Chapter 3
System Description

This chapter provides a description of South San Francisco District's water system and the service area, including climate, population, and demographics, to help in understanding various elements of water supply and demand.

This chapter includes the following sections:

3.1 Service Area General Description

3.2 Service Area Map(s)

3.3 Service Area Climate

3.4 Service Area Population and Demographics

3.1 Service Area General Description

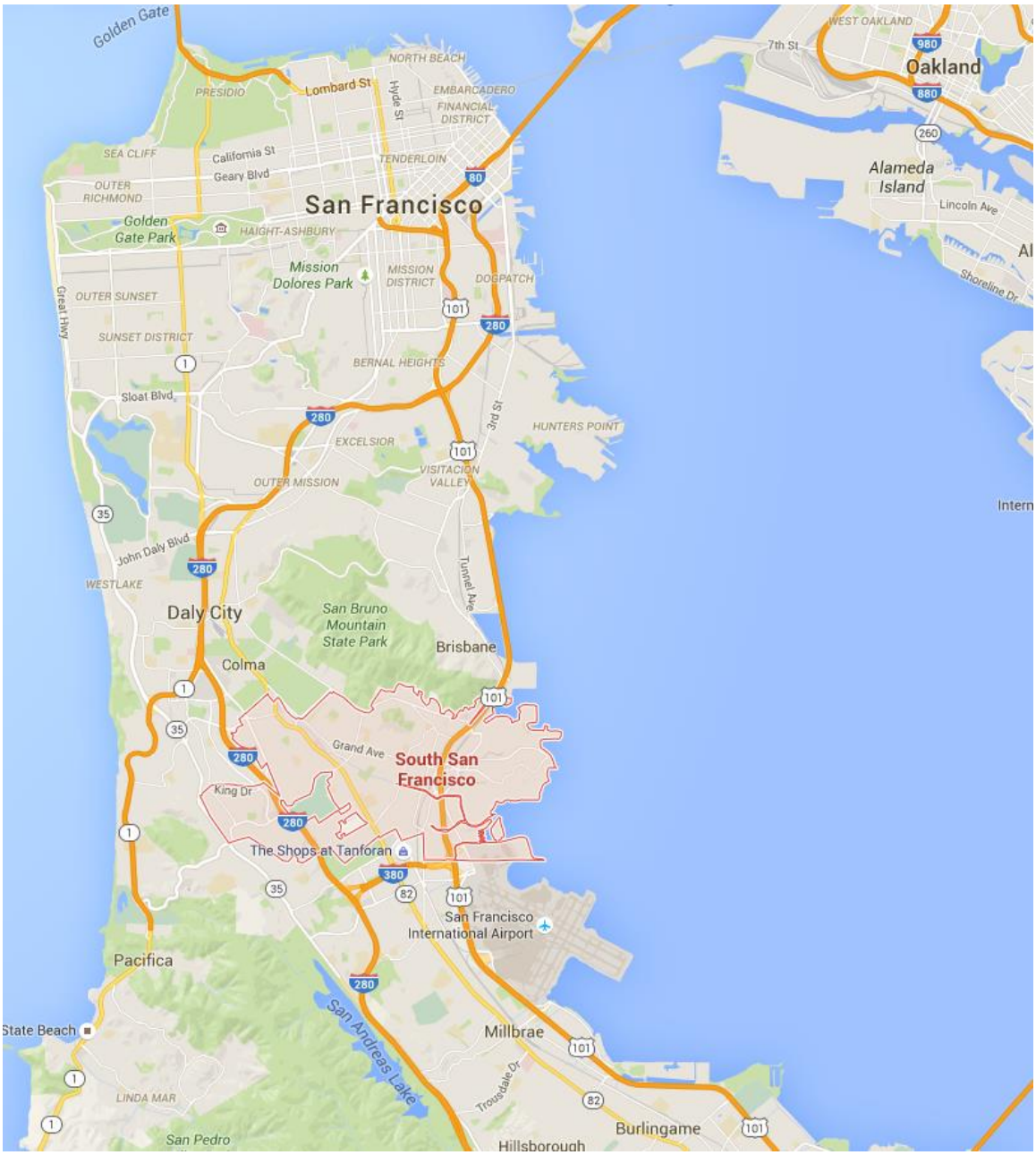
The South San Francisco District is located in northern San Mateo County approximately six miles south of the City of San Francisco. A general location of South San Francisco District is shown in Figure 2.1-1. The District serves the communities of South San Francisco, Colma, a small portion of Daly City, and an unincorporated area of San Mateo County known as Broadmoor, which lies between Colma and Daly City. The major transportation links through the District are Interstate 280 and U.S. Highway 101. Immediately to the south of the District is the San Francisco International Airport. A general location map of the District is shown in Figure 3-1.

The District is built upon the Bay Plain and the northern foothills of the Coastal Range. The system is bounded on the north by San Bruno Mountain, on the west and northwest by Daly City, on the south by the City of San Bruno and on the east by the San Francisco Bay. The San Andreas Fault rift zone forms the major geologic features of the area as it passes along the western boundary of the service area. The Hayward Fault is located on the east side of San Francisco Bay. A major earthquake on either fault could result in a disruption of water service. Elevations in the service area range from just above sea level on the eastern boundary to over 500 feet above sea level on the northern boundary. This marked variation in elevation requires 15 separate pressure zones for effective system operation.

The South San Francisco District was formed in 1931 with the purchase of the South San Francisco Water Company, the San Carlos Water Company, and the San Mateo water system from Pacific Water Company. Water served by the District is a combination of local

groundwater and water purchased from the San Francisco Public Utilities Commission's (SFPUC) Hetch Hetchy system. The District operates five groundwater wells, 21 booster pumps, 12 storage tanks, and 144 miles of pipeline. Over the last five years, the District delivered and average of 7 million gallons of water per day to more than 16,000 service connections.

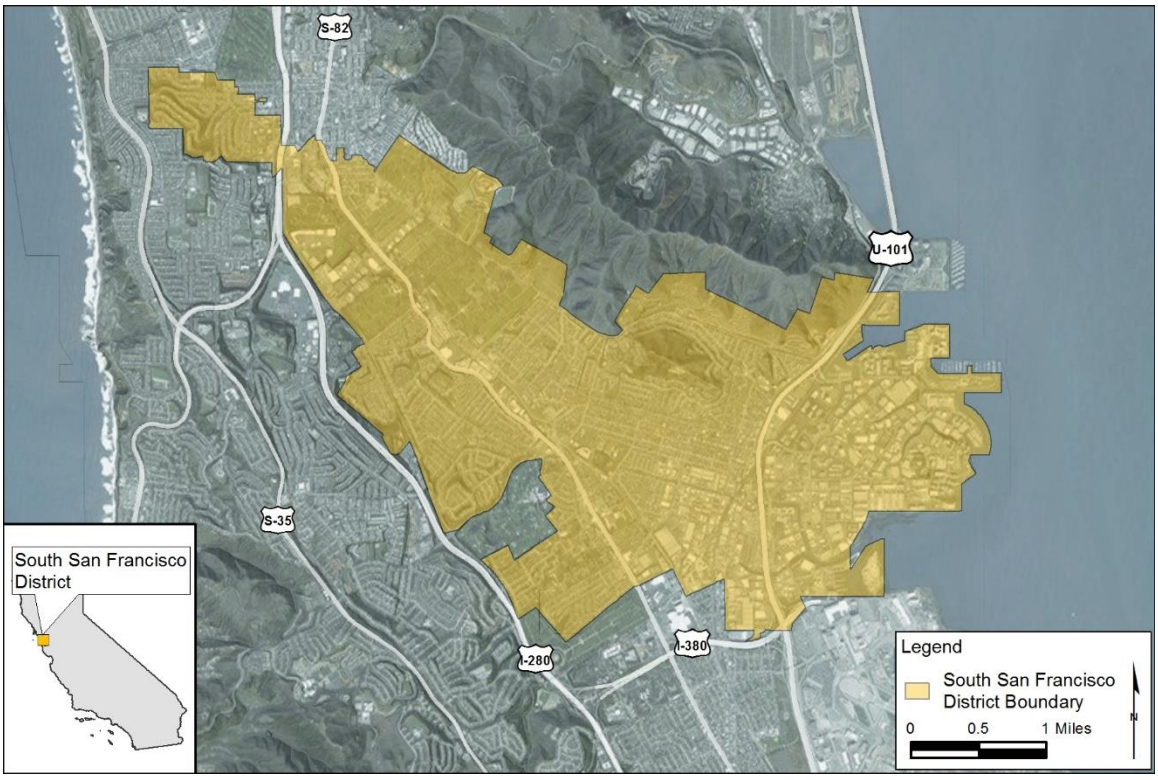
Figure 3-1. General Location of South San Francisco District



3.2 Service Area Maps

A detailed service area map is provided in Appendix E. Figure 3-2 shows the service area boundaries.

Figure 3-2. South San Francisco District Service Area Boundaries



3.3 Service Area Climate

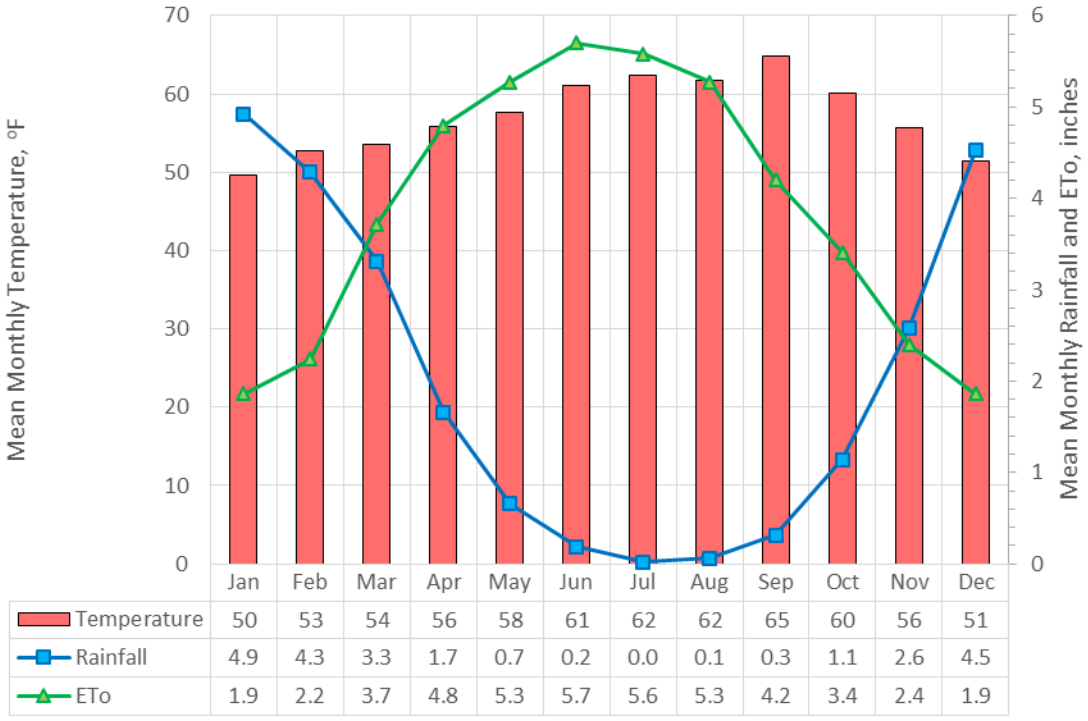
The South San Francisco District has a Mediterranean climate regulated by the Pacific Ocean. The area is characterized by warm summers and cool winters. Figure 3-3 displays monthly averages for rainfall, reference evapotranspiration (ETo), and daily air temperature. Additional climate data is provided in Appendix F, worksheet 3. Rainfall and temperature data are obtained from the PRISM Climate Group.[1] ETo values are from the California Irrigation Management Information System (CIMIS).[2]

On average, the District receives about 24 inches of rainfall, annually. ETo averages 46 inches, annually. Annual rainfall is 51 percent of ETo, on average. During summer and early fall months, nearly all irrigation requirements are met with District water sources

[1] www.prism.oregonstate.edu.
[2] CIMIS Zones Map, Zone 3.

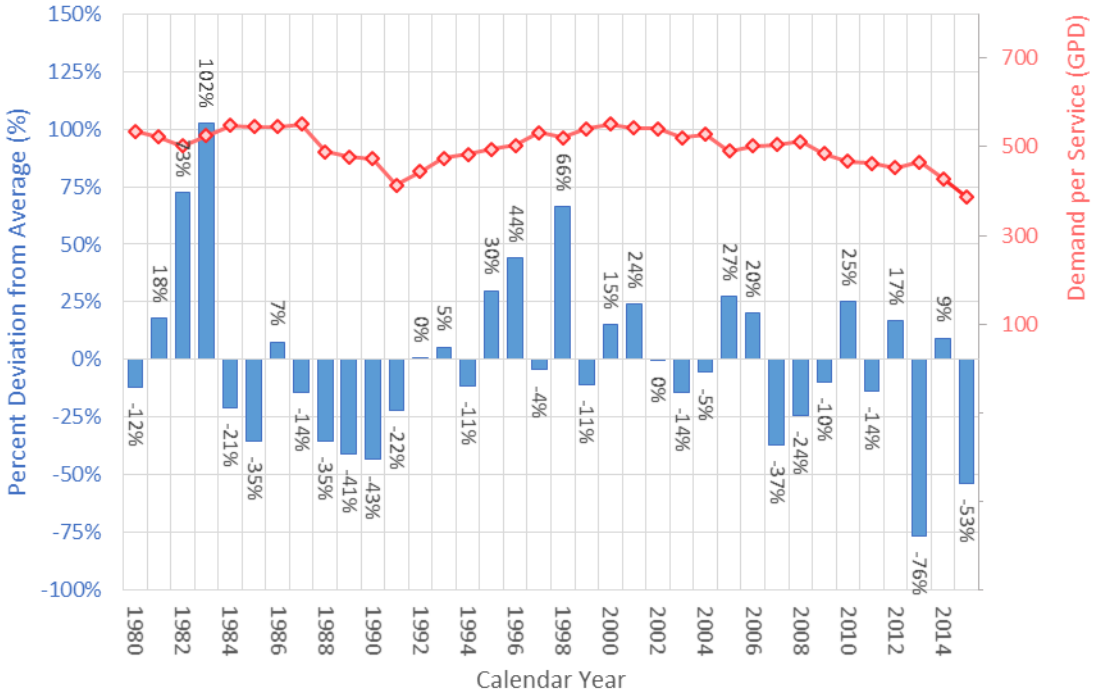
due to the lack of summer rainfall in the region. Annual rainfall in South San Francisco District also is highly variable, as shown in Figure 3-4. Annual rainfall has been below average in six of the last ten years. Calendar year 2013 was the driest year on record, receiving just 24 percent of average rainfall.

Figure 3-3. Average Monthly Temperature, Rainfall, and ETo



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperature	50	53	54	56	58	61	62	62	65	60	56	51
Rainfall	4.9	4.3	3.3	1.7	0.7	0.2	0.0	0.1	0.3	1.1	2.6	4.5
ETo	1.9	2.2	3.7	4.8	5.3	5.7	5.6	5.3	4.2	3.4	2.4	1.9

Figure 3-4. Annual Rainfall Deviation from Average



3.3.1 Climate Change

Potential impacts of climate change on District water demands and supplies are discussed in Chapters 4 (System Water Use), 6 (System Supplies), and 7 (Water Supply Reliability Assessment). Here it is noted that climate change is expected to bring higher average temperatures and greater variability in weather, with the potential for more frequent and deeper droughts.

The National Climatic Data Center (NCDC) has established 11 climate regions within California. Each region is defined by unique characteristics, and is shown in Figure 3-5. The South San Francisco District is located in the Central Coast Region (region F on the map). The Central Coast Region has experienced a general warming trend in the last several decades, as shown in Figure 3-6. Since 1895, maximum and minimum temperatures have increased at a rate of 1.24 °F and 2.23 °F per 100 years, respectively. More recently, since 1975, maximum and minimum temperatures have increased at a rate of 1.46 °F and 3.76 °F per 100 years, respectively.

Figure 3-5. Climate Regions of California

A. North Coast Region
B. North Central Region
C. Northeast Region
D. Sierra Region
E. Sacramento-Delta Region
F. Central Coast Region
G. San Joaquin Valley Region
H. South Coast Region
I. South Interior Region
J. Mojave Desert Region
K. Sonoran Desert Region

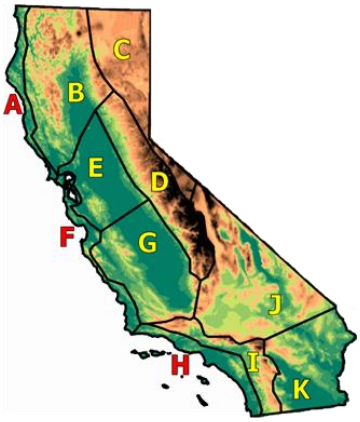
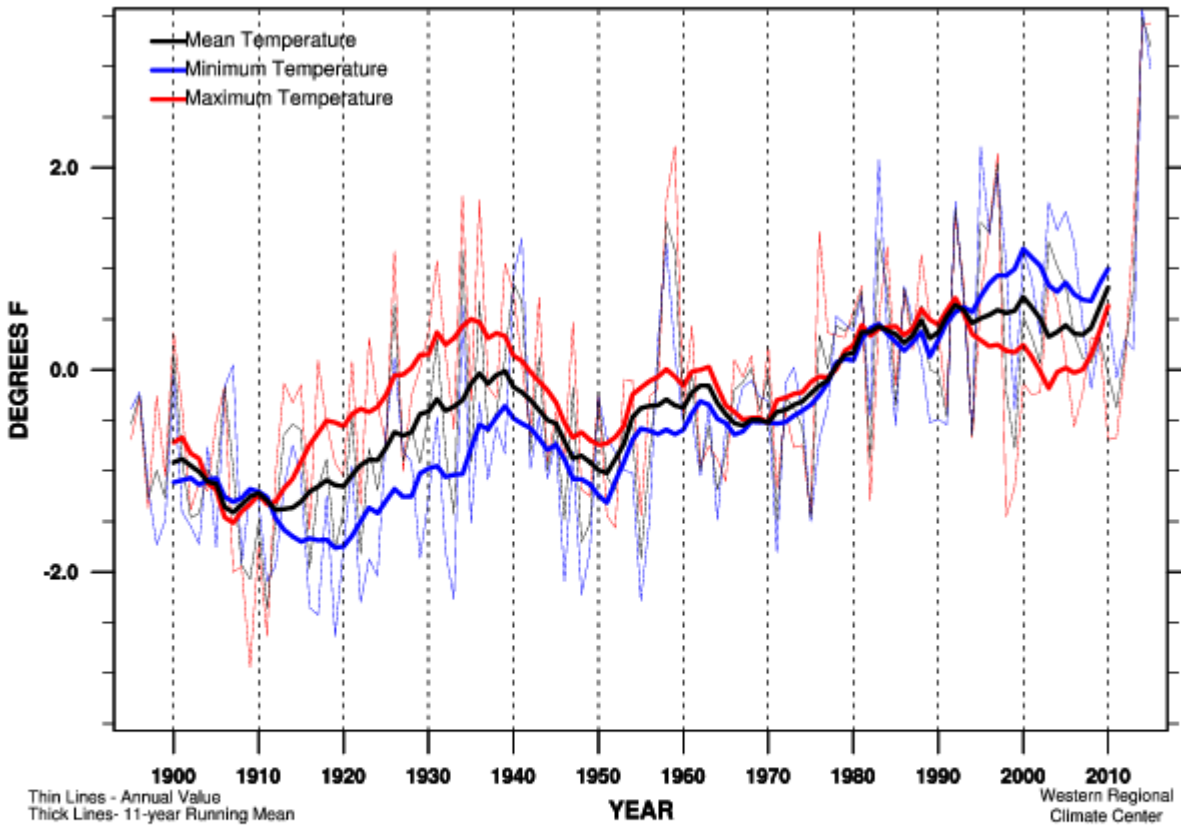


Figure 3-6. Temperature Departure, Central Coast Region



	Maximum Temperature	Minimum Temperature
Linear Trend 1895-present	+ 1.24 (± 0.50) °F/100yr	+ 2.23 (± 0.46) °F/100yr
Linear Trend 1949-present	+ 2.01 (± 1.28) °F/100yr	+ 3.60 (± 1.09) °F/100yr
Linear Trend 1975-present	+ 1.46 (± 2.87) °F/100yr	+ 3.76 (± 2.55) °F/100yr

3.4 Service Area Population and Demographics

Cal Water estimates the service area population was 61,223 in 2015. Service area population has been growing at an annual rate of 0.71 percent for the past 15 years. Between the 2000 and 2010 Censuses, it grew at an average annual rate of 0.64 percent. Between 2010 and 2015, population growth quickened to an average annual rate of 0.86 percent per year. Going forward, service area population is projected to increase at a rate of 0.72 percent annually until the end of the 2040 planning horizon. This is based on the long-term growth rate of single-family housing units and an acceleration in the construction of multi-family housing units.

To estimate current service area population, Cal Water uses MARPLOT and LandView 5 software to intersect District service area boundaries with Census Blocks from the 2000 and 2010 Censuses. This yields estimates of the number of housing units and population within each Census Block in the District for 2000 and 2010. From these data, Cal Water estimates the total population and the average number of persons per housing unit in the District. Cal Water applies the average number of persons per housing unit to the number of housing units served to calculate service area population in non-Census years.

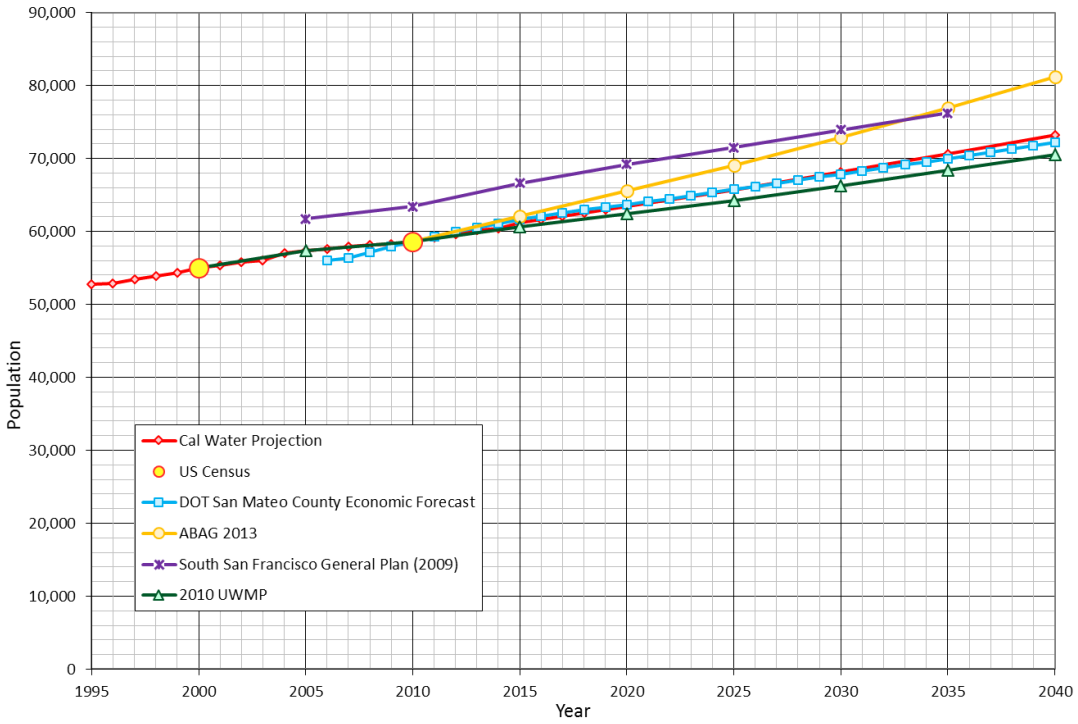
Between the 2000 and 2010 Censuses, the average number of persons per household decreased slightly from2.94 to 2.89. The projection of future population is based on the lower housing unit density. Projected service area population is given in Table 3-1.

Table 3-1: Population - Current and Projected

	2015	2020	2025	2030	2035	2040
Population Served	61,223	63,430	65,732	68,133	70,639	73,254

Cal Water's current population projection for South San Francisco District is compared in Figure 3-7 to the projection made in its 2010 UWMP. The figure also shows projections based on population growth rate forecasts for cities served by the District prepared by the Association of Bay Area Governments (ABAG) and contained in the South San Francisco General Plan, as well as a projection based on California Department of Transportation's (DOT) countywide population growth rate forecast.

Figure 3-7. Population Projection Comparison



Chapter 4
System Water Use

This chapter provides a description and quantifies the South San Francisco District's current water use and the projected uses through the year 2040. For purposes of the UWMP, the terms "water use" and "water demand" are used interchangeably.

This chapter is divided into the following subsections:

4.1 Recycled vs Potable and Raw Water Demand

4.2 Water Uses by Sector

4.3 Distribution System Water Losses

4.4 Estimating Future Water Savings

4.5 Water Use for Lower Income Households

4.6 Climate Change

4.1 Recycled versus Potable and Raw Water Demand

This plan maintains a clear distinction between recycled, potable, and raw water uses and supplies. Recycled water is addressed comprehensively in Chapter 6, but a summary of recycled water demand is included in Table 4-3 of this chapter. The primary focus of this chapter is historical and projected potable and raw water uses in the district.

4.2 Water Uses by Sector

4.2.1 Historical Potable and Raw Water Uses

Actual water use in 2015 by customer category is shown in Table 4-1. Total system demand in 2015 was 7,064 AF. District water use in 2015 was strongly affected by the Drought Emergency Regulation adopted by the State Water Resources Control Board in May of 2015 (SWRCB Resolution No. 2015-0032). Among other things, the Drought Emergency Regulation mandated urban retail water suppliers reduce potable water use between June of 2015 and February of 2016 by percentage amounts specified by the State Water Resources Control Board. The South San Francisco District was ordered to reduce potable water use by 8 percent over this period relative to use over the same period in 2013. Between June and December 2015, water use in South San Francisco was 21.7 percent less than water use over the same period in 2013.

Table 4-1: Retail: Demands for Potable and Raw Water - Actual		
Use Type	2015 Actual	
	Level of Treatment When Delivered	Volume (AF)
Single Family	Drinking Water	2,404
Multi-Family	Drinking Water	348
Commercial	Drinking Water	3,212
Industrial	Drinking Water	663
Institutional/Governmental	Drinking Water	219
Other	Drinking Water	16
Losses	Drinking Water	201
	Total	**7,064**

Residential customers account for approximately 86 percent of services and 40 percent of water use in the District, most of which is associated with single-family water use. Figure 4-1 shows the distribution of services in 2015. Figure 4-2 shows historical water sales by customer category.

Figure 4-1. Distribution of Services in 2015

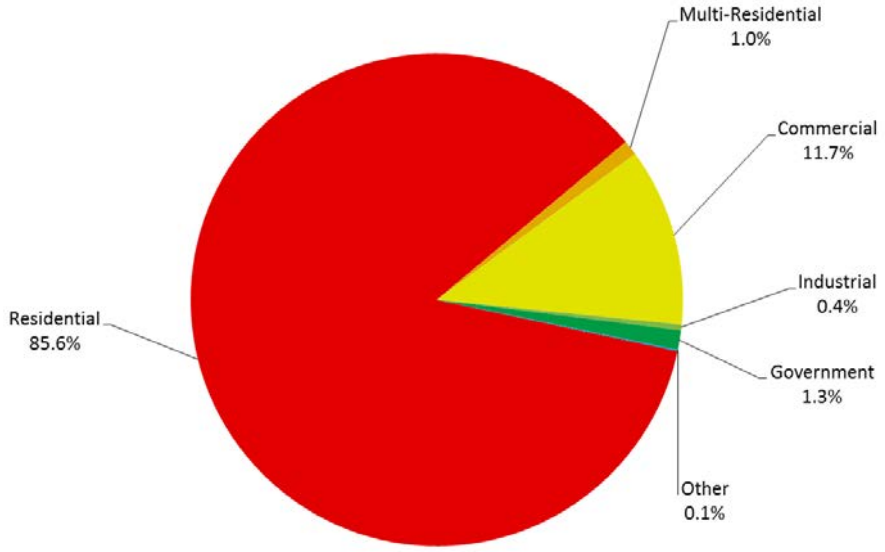
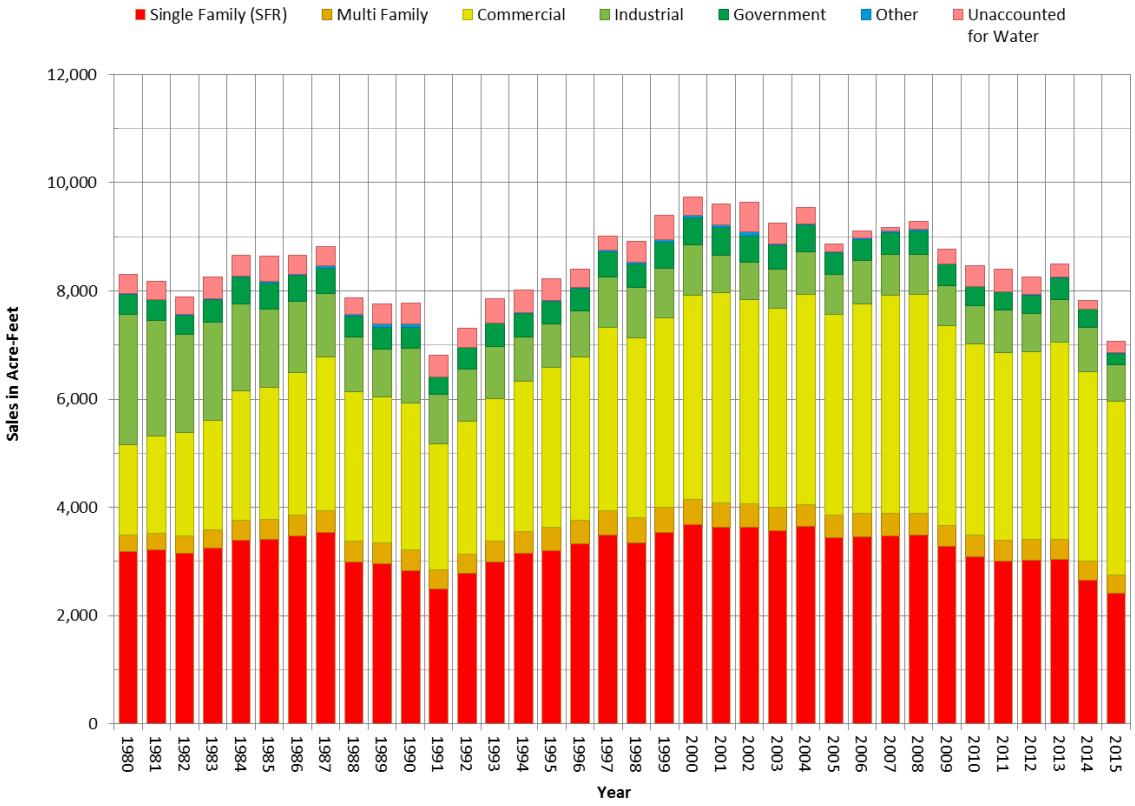


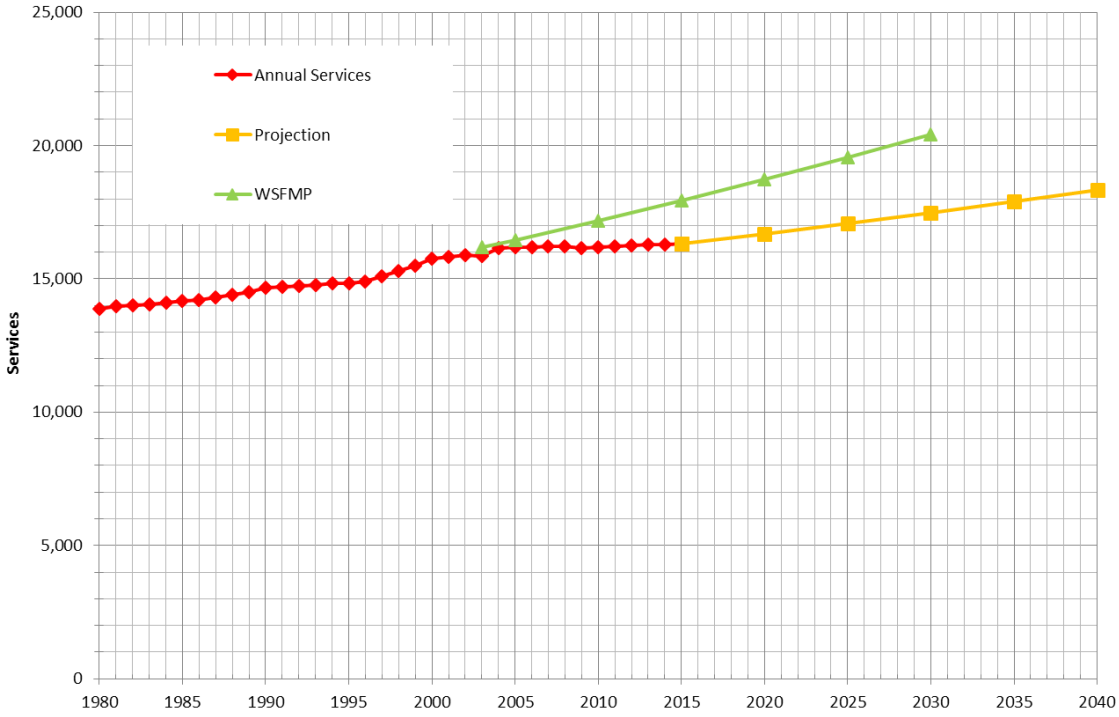
Figure 4-2. Historical Sales by Customer Category



4.2.1 Projected Potable and Raw Water Uses

Projected water demands by customer category through 2040 are shown in Tables 4-2. Future demands are estimated as the product of future services and expected water use per service. Future services are based on historical growth rates in the District. Single-family residential services are projected forward using the historical growth rate for the last 20 years while multi-family services are projected using the 5-year historical growth rate. Commercial and industrial services are projected forward using the historical growth rate for the past 15 and 20 years, respectively. The forecast assumes no change in the number of institutional services. The projected average annual growth rate in services across all customer categories is approximately 0.5 percent. Historical and projected services are shown in Figure 4-3. Also shown in the figure is the services projection from Cal Water's 2009 Water Supply and Facility Master Plan (WSFMP).

Figure 4-3. Historical and Projected Services



Expected water use per service, shown in Figure 4-4, is based on weather-normalized historical use, adjusted for future expected water savings from plumbing codes and District conservation programs. Weather normalization of historical use was done econometrically using the California Urban Water Conservation Council GPCD Weather Normalization Methodology. Expected water savings from plumbing codes are presented in Section 4.4. Expected water savings from District conservation programs and projected compliance with the District's SB X7-7 2020 per capita water use target are discussed in Chapter 9. The projected trend in average use per service shown in Figure 4-4 does not account for possible effects of climate change on future demand. The potential effects of climate change on demand are discussed in Section 4.6.

Projected water uses in Table 4-2 and Figure 4-4 are predicated on unrestricted demands under normal weather conditions. Demands are assumed to partially rebound by 2020 from 2015 levels on the assumption that the State Water Resources Control Board's mandatory water use reductions end by October 2016, as currently scheduled. The difference between actual and projected demands in 2020 will critically depend on the accuracy of this assumption. If the Emergency Drought Regulations are continued beyond October 2016, then the likelihood of actual demands being less than projected demands in 2020 would be significantly increased.

Figure 4-4. Historical and Projected Average Use per Service in Gallons per Day

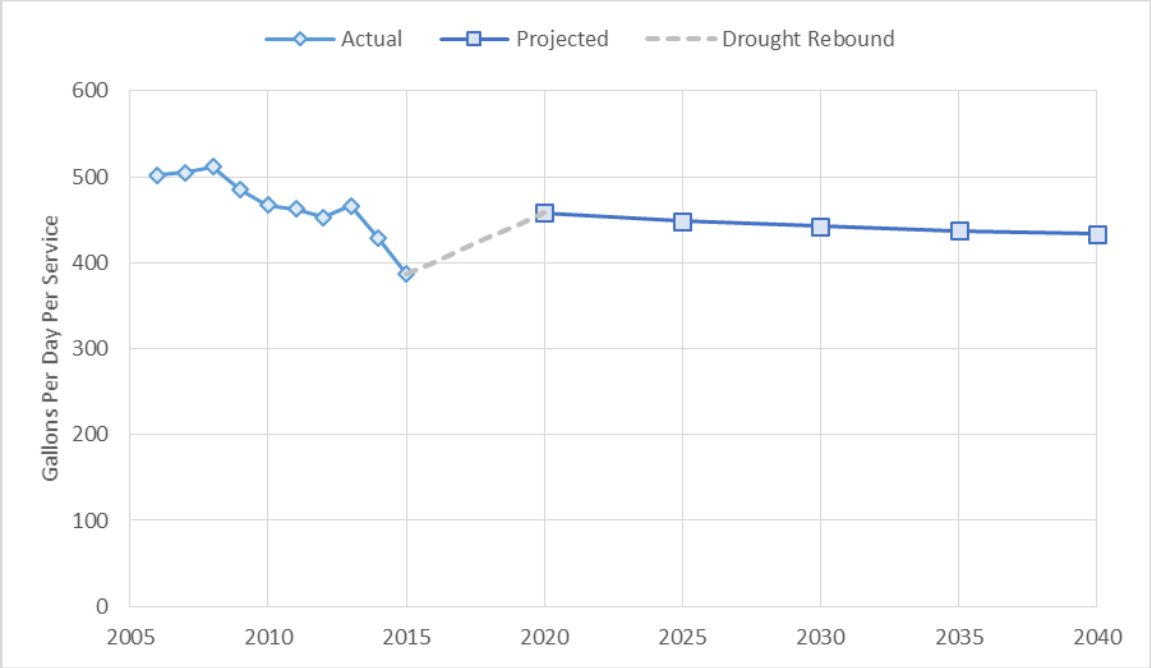


Table 4-2: Retail: Demands for Potable and Raw Water - Projected					
Use Type	Projected Water Use (AF)				
	2020	2025	2030	2035	2040
Single Family	3,159	3,125	3,124	3,146	3,180
Multi-Family	402	394	396	404	417
Commercial	3,698	3,723	3,764	3,800	3,839
Industrial	695	730	768	807	848
Institutional/Governmental	371	367	363	360	358
Other	15	15	15	15	15
Losses	220	226	232	238	244
Total	**8,560**	**8,580**	**8,662**	**8,770**	**8,901**

4.2.2 Total Water Demand Including Recycled Water

Total water demands, including recycled water uses, are shown in Table 4-3. Current and projected recycled water use is discussed in Chapter 6, Section 6.5.

Table 4-3: Retail: Total Water Demands						
	2015	2020	2025	2030	2035	2040
Potable and Raw Water *From Tables 4-1 and 4-2*	7,064	8,560	8,580	8,662	8,770	8,901
Recycled Water Demand *From Table 6-4*	0	0	0	0	0	0
Total Water Demand	**7,064**	**8,560**	**8,580**	**8,662**	**8,770**	**8,901**

4.3 Distribution System Water Losses

For the 2015 UWMP, urban retail water suppliers are required to quantify distribution system water losses for the most recent 12-month period available. For the South San Francisco District, this period is January 1 to December 31 2014. System water loss was calculated using the DWR Water Audit Method, as described in Appendix L of the UWMP Guidelines. Distribution system water loss is reported in Table 4-4. The DWR Water Audit Method calculates two types of water losses: (1) apparent losses and (2) real losses. Apparent losses include unauthorized consumption, metering errors, and data errors. Apparent losses represent unauthorized or unrecorded water delivered to customers. Real losses include distribution system discharges, spills, and leaks of water. Real losses represent a physical loss of water to the system. Table 4-4 reports combined apparent and real distribution system water loss. A copy of the completed water balance worksheet for the South San Francisco District is provided in Appendix M. Actions the South San Francisco District is taking to reduce real and apparent distribution system water losses are discussed in Chapter 9.

Table 4-4: Retail: Water Loss Summary Most Recent 12 Month Period Available	
Reporting Period Start Date	Volume of Water Loss*
01/2014	57
*Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.	

4.4 Estimating Future Water Savings

The projections of future water use in Table 4-2 incorporate expected water savings from plumbing codes and appliance standards for residential and commercial toilets, urinals, clothes washers, dishwashers, and showerheads. These savings are commonly referred to as *passive water savings* to differentiate them from water savings resulting from water supplier conservation programs, which are termed *active water savings*. Active water savings resulting from the South San Francisco District's implementation of demand

management measures are discussed in Chapter 9 of this plan. The estimates of passive water savings presented in this chapter were developed with the Alliance for Water Efficiency's *Water Conservation Tracking Tool* using data on the vintage, number, and water using characteristics of residences and businesses within South San Francisco District's service area.

Confirmation that the water use projections contained in this plan incorporate projected future water savings from plumbing codes and appliance standards is provided in Table 4-5. The estimated volume of future water savings from plumbing codes and standards is summarized in Table 4-6.

Table 4-5: Retail Only: Inclusion in Water Use Projections	
Future Water Savings Included Y/N	Yes
If "Yes" to above, state the section or page number where citations of the codes, ordinances, etc… utilized in demand projections are found.	Location in UWMP: Section 4.4 of Chapter 4
Lower Income Residential Demands Included	Yes

Table 4-6: Retail Only: Future Passive Savings						
	2015	2020	2025	2030	2035	2040
Passive Savings (AF)	10	163	289	391	475	544

The following codes and standards form the basis for the estimated volume of future passive water savings:

- AB 715, enacted in 2007, requires that any toilet or urinal sold or installed in California on or after January 1, 2014 cannot have a flush rating exceeding 1.28 and 0.5 gallons per flush, respectively. AB 715 superseded the state's previous standards for toilet and urinal water use set in 1991 of 1.6 and 1.0 gallons per flush, respectively. On April 8, 2015, in response to the Governor's Emergency Drought Response Executive Order (EO B-29-15), the California Energy Commission approved new standards for urinals requiring that they not consume more than 0.125 gallons per flush, 75% less than the standard set by AB 715.

- Water use standards for residential and commercial clothes washers and dishwashers are established by the U.S. Department of Energy through its authority under the federal Energy Policy and Conservation Act. Water use efficiency is summarized by the

water factor for the appliance which measures the gallons of water used per cycle per cubic foot of capacity. A typical top-loading residential clothes washer manufactured in the 1990s had a water factor of around 12. In 2015, the allowable water factor for top- and front-loading residential clothes was reduced to 8.4 and 4.7, respectively. In 2018, water factor standard for top-loading residential clothes washers will be reduced to 6.5. In 2010 the allowable water factor for top- and front-loading commercial clothes washers was reduced to 8.5 and 5.5, respectively. The maximum water factor for Energy Star compliant top- and front-loading washers is 3.7 and 4.3, respectively. EPA estimates that Energy Star washers comprised at least 60 percent of the residential market and 30 percent of the commercial market in 2011.[3] An Energy Star compliant washer uses about two-thirds less water per cycle than washers manufactured in the 1990s. Federal dishwasher water use efficiency standards were last updated in 2013. The maximum water use for standard and compact sized dishwashers is 5.0 and 3.5 gallons per cycle, respectively.

- New construction and renovations in California are now subject to CalGreen Code requirements. CalGreen includes prescriptive indoor provisions for maximum water consumption of plumbing fixtures and fittings in new and renovated properties. CalGreen also allows for an optional performance path to compliance, which requires an overall aggregate 20% reduction in indoor water use from a calculated baseline using a set of worksheets provided with the CalGreen guidelines.

- SB 407, enacted in 2009, mandates that all buildings in California come up to current State plumbing fixture standards within this decade. This law establishes requirements that residential and commercial property built and available for use on or before January 1, 1994 replace plumbing fixtures that are not water conserving, defined as “noncompliant plumbing fixtures” as follows:
    - any toilet manufactured to use more than 1.6 gallons of water per flush;
    - any urinal manufactured to use more than one gallon of water per flush;
    - any showerhead manufactured to have a flow capacity of more than 2.5 gallons of water per minute; and
    - any interior faucet that emits more than 2.2 gallons of water per minute.

  For single-family residential property, the compliance date is January 1, 2017. For multi-family and commercial property, it is January 1, 2019. In advance of these dates, the law requires effective January 1, 2014 for building alterations and improvements to all residential and commercial property that water-conserving plumbing fixtures replace all noncompliant plumbing fixtures as a condition for issuance of a certificate

[3] EPA Energy Star Unit Shipment and Market Penetration Report Calendar Year 2011 Summary.

of final completion and occupancy or final permit approval by the local building department.

SB 407 also requires effective January 1, 2017 that a seller or transferor of single-family residential property disclose to the purchaser or transferee, in writing, the specified requirements for replacing plumbing fixtures and whether the real property includes noncompliant plumbing. Similar disclosure requirements go into effect for multi-family and commercial transactions January 1, 2019. SB 837, passed in 2011, reinforces the disclosure requirement by amending the statutorily required transfer disclosure statement to include disclosure about whether the property is in compliance with SB 407 requirements. If enforced, these two laws will require retrofit of non-compliant plumbing fixtures upon resale or major remodeling for single-family residential properties effective January 1, 2017 and for multi-family and commercial properties effective January 1, 2019.

California has also adopted regulations governing the future use of landscape water use.

- The California Water Commission approved the State's updated Model Water Efficient Landscape Ordinance (MWELO) on July 15, 2015. The updated MWELO supersedes the State's MWELO developed pursuant to AB 1881. Local agencies have until December 1, 2015 to adopt the MWELO or to adopt a Local Ordinance which must be at least as effective in conserving water as MWELO. Local agencies working together to develop a Regional Ordinance have until February 1, 2016 to adopt. The size of landscapes subject to MWELO has been lowered from 2500 sq. ft. to 500 sq. ft. The size threshold applies to residential, commercial, industrial and institutional projects that require a permit, plan check or design review. Additionally, the maximum applied water allowance (MAWA) has been lowered from 70% of the reference evapotranspiration (ETo) to 55% for residential landscape projects, and to 45% of ETo for non-residential projects. This water allowance reduces the landscape area that can be planted with high water use plants such as cool season turf. For typical residential projects, the reduction in the MAWA reduces the percentage of landscape area that can be planted to high water use plants from 33% to 25%. In typical non-residential landscapes, the reduction in MAWA limits the planting of high water use plants to special landscape areas. The revised MWELO allows the irrigation efficiency to be entered for each area of the landscape. The site-wide irrigation efficiency of the previous ordinance (2010) was 0.71; for the purposes of estimating total water use, the revised MWELO defines the irrigation efficiency (IE) of drip irrigation as 0.81 and overhead irrigation and other technologies must meet a minimum IE of 0.75.

- CalGreen requires that automatic irrigation system controllers for new landscaping provided by a builder and installed at the time of final inspection must be weather- or

soil moisture-based controllers that automatically adjust irrigation in response to changes in plant water needs as weather or soil conditions change.

The estimates of future water savings in Table 4-6 do not include potential landscape water savings from implementation of MWELO or CalGreen because estimating these savings required data that was not available to the District at the time this plan was prepared, including data on existing and future landscape areas, plant materials, irrigation equipment, and probable enforcement of and compliance with the landscape design and irrigation equipment requirements.

4.5 Water Use for Lower Income Households

California Senate Bill No. 1087 (SB 1087), Chapter 727, was passed in 2005 and amended Government Code Section 65589.7 and Water Code Section 10631.1. SB 1087 requires local governments to provide a copy of their adopted housing element to water and sewer providers. In addition, it requires water providers to grant priority for service allocations to proposed developments that include housing units for lower income families and workers. Subsequent revisions to the UWMP Act require water providers to develop water demand projections for lower income single and multi-family households.

Cal Water does not maintain records of the income level of its customers and does not discriminate in terms of supplying water to any development. Cal Water is required to serve any development that occurs within its service area, regardless of the income level of the future residents. It is ultimately the City's or County's responsibility to approve or not approve developments within the service area.

As a benefit to its customers, Cal Water offers a Low Income Rate Assistance Program (LIRA) in all of its service districts. Under the LIRA Program lower income customers that qualify are able to receive a discount on their monthly bills.

For the purposes of estimating projected demand of lower income households, Cal Water used the City of South San Francisco's General Plan Housing Element to estimate the percentage of households in the service area that qualify as lower income.[4] Based on these data, 49 percent of total households are classified as lower income. Lower income households are defined as households with income that is less than or equal to 80 percent of the median income for the area. Projected residential water demand for lower income households is shown in Table 4-7. These demands are incorporated into the service area demand projection given in Table 4-2.

[4] City of South San Francisco Public Review Draft 2015-2023 Housing Element, Table 3.6-4. Accessed from http://www.ssf.net/DocumentCenter/View/8910

Table 4-7. Residential Demand of Lower Income Households						
	2015 (actual)	2020	2025	2030	2035	2040
Demand (AF)	1,338	1,731	1,710	1,711	1,725	1,748

4.6 Climate Change

A hotter and dryer climate is expected to increase demand for outdoor water use. Cal Water has econometrically estimated the sensitivity of class-level water demand to deviations in precipitation and temperature from their long-term averages using historical data on monthly water sales and weather for the District.[5] The weather effect is measured as predicted sales conditional on observed weather versus predicted sales conditional on long-term average weather. The predicted weather effect is then summed on an annual basis and expressed as a percentage of annual weather-normalized sales. An estimate of the variance in annual water sales caused by departures in precipitation and temperature from their long term averages was developed for each customer class. The variance estimates of class-level water sales were weighted and summed across classes for an aggregate district-level estimate of the standard deviation of water demand induced by variation in precipitation and temperature. The standard deviation in District demand due to weather variability is 3.6 percent. The maximum deviation, based on historical weather data, is 5.8 percent.

A selection of climate change scenarios for 2040 for the Southwest United States contained in the Regional Climate Trends and Scenarios for the U.S. National Climate Assessment, Part 5, is shown in Table 4-8, along with the expected effect on District water demand.[6] Based on the scenarios in the table, temperature increases by 2040 associated with climate change imply a 2 to 3 percent increase in demand relative to weather-normalized demand. This expected effect is solely due to predicted changes in temperature. While the climate change scenarios also include predicted changes in the pattern and amount of precipitation, this has not been included in Cal Water's demand modeling at this time due to the large uncertainty associated with these estimates.[7]

The predicted effect of climate change on demand is based on current patterns of outdoor water use. It does not account for changes households and businesses may make in the

[5] A&N Technical Services, Inc., Cal Water Long Term Water Demand Forecast Model, December 2014.
[6] Kunkel, K.E, L.E. Stevens, S.E. Stevens, L. Sun, E. Janssen, D. Wuebbles, K.T. Redmond, and J.G. Dobson, 2013: Regional Climate Trends and Scenarios for the U.S. National Climate Assessment. Part 5. Climate of the Southwest U.S., NOAA Technical Report NESDIS 142-5.
[7] Ibid. A discussion and depiction of the uncertainty around the precipitation forecasts is found on pages 55-56, Table 7, and Figure 27 of the cited report.

way they use water in the future given a warming climate. For example, social norms and economic incentives regarding the type and extent of residential and non-residential landscaping may change over time which could lead to outdoor water use having a lower share of total demand compared to what is currently observed. In this case, the predicted effect of climate change would be offset to some extent by changes in the way households and businesses use water.

Table 4-8. Climate Change Effect on Demand

Climate Scenario	Year 2040 degree C	Year 2040 degree F	% Change from mean Temperature	Effect on Demand
B1	1.4	2.5	3.4%	2.0%
A1B	1.6	2.9	3.9%	2.3%
A2	1.5	2.7	3.7%	2.1%
80%ile	2.0	3.6	4.9%	2.8%

Chapter 5
Baselines and Targets

With the adoption of the Water Conservation Act of 2009, also known as SB X7-7, the state is required to reduce urban water use by 20 percent by the year 2020. Each urban retail water supplier must determine baseline per capita water use during their baseline period and also target water use for the years 2015 and 2020 in order to help the state achieve the 20 percent reduction.

SB X7-7 defines an urban retail water supplier as "a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes." (CWC 10608.12) As shown in Chapter 2, the South San Francisco District meets both of these thresholds.

In this Chapter, the South San Francisco District demonstrates compliance with its per capita water use target for the year 2015. This will also demonstrate whether or not the District is currently on track to achieve its 2020 target. Compliance will be verified by DWR's review of the SB X7-7 Verification Tables submitted with this plan. These tables are included with this plan in Appendix I.

This chapter includes the following sections:

5.1 Wholesale Agencies

5.2 Updating Calculations from 2010 UWMP

5.3 Baseline Periods

5.4 Service Area Population

5.5 Gross Water Use

5.6 Baseline Daily per Capita Water Use

5.7 2015 and 2020 Targets

5.8 2015 Compliance Daily per Capita Water Use

5.9 Regional Alliance

5.1 Wholesale Agencies

Wholesale water suppliers are not required to establish and meet baseline and targets for daily per capita water use. However, they can provide important support to their retail water suppliers through adopted policies and programs to encourage demand reduction in their service area. Wholesale water suppliers can also participate in a Regional Alliance established to meet the region's daily per capita water use targets.

The South San Francisco District coordinated its demand reduction policies and programs with the wholesale water suppliers listed in Table 2-4.

5.2 Updating Calculations from 2010 UWMP

The District reported base period population and water use, selected the 2020 target method, and calculated its 2020 water use target in its 2010 UWMP. SB X7-7 allows the District to update these estimates, change the target methodology, and revise its 2020 urban water use target in its 2015 UWMP (CWC 10608.20).

Per the UWMP Guideline requirements, Cal Water has updated District population estimates to incorporate information from the 2010 Census that was not available at the time the 2010 UWMP was prepared. It has not changed the base period or methodology upon which the District's 2020 urban water use target is based. The updated population estimates are slightly higher than the estimates in the 2010 plan for most years. A comparison between the two sets of population estimates is provided in Appendix I. The revised population estimates did not result in a change to the District's 2020 water use target (when rounded to nearest whole GPCD).

5.3 Baseline Periods

Under SB X7-7 urban retail water suppliers must establish two baseline periods for historical water use and population in the District. The first of these is either a 10- or 15-year continuous period ending between 2004 and 2010. The second is a 5-year continuous period ending between 2007 and 2010. The 10-15 year period is used to establish the 2020 water use target under Method 1 (CWC 10608.20). The 5-year period is used to confirm that the selected 2020 target meets SB X7-7's minimum water use reduction requirements (CWC 10608.22). The baseline periods the District is using are summarized in SB X7-7 Table 1.

SB X7-7 Table 1: Baseline Period Ranges			
Baseline	**Parameter**	**Value**	**Units**
10- to 15-year baseline period	2008 total water deliveries	9,292	Acre Feet
	2008 total volume of delivered recycled water	0	Acre Feet
	2008 recycled water as a percent of total deliveries	0.00%	percent
	Number of years in baseline period[1]	10	years
	Year beginning baseline period range	1995	
	Year ending baseline period range[2]	2004	
5-year baseline period	Number of years in baseline period	5	years
	Year beginning baseline period range	2003	
	Year ending baseline period range[3]	2007	
[1]If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period.			
[2]The ending year must be between December 31, 2004 and December 31, 2010.			
[3]The ending year must be between December 31, 2007 and December 31, 2010.			

5.3.1 Determination of the 10-15 Year Baseline Period

The 10-15 year baseline period must be a continuous period ending between 2004 and 2010. It can be up to 15 years in length if recycled water comprised 10 percent or more of the retail urban water supplier's 2008 deliveries. Otherwise, the baseline period is set to 10 years.

The South San Francisco District did not have recycled water deliveries in 2008. Therefore it is using a 10-year baseline period commencing January 1, 1995 and running through December 31, 2004. The 10-year baseline period is unchanged from the 2010 UWMP.

5.3.2 Determination of the 5-Year Baseline

The 5-year baseline period must be a continuous period ending between 2007 and 2010. The South San Francisco District's 5-year baseline period commences January 1, 2003 and runs through December 31, 2007. The 5-year baseline period is unchanged from the 2010 UWMP.

5.4 Service Area Population

As noted above, Cal Water has updated the baseline period population estimates to incorporate information from the 2010 Census that was not available at the time the 2010

UWMP was prepared. Updating resulted in a small change in the original population estimates.

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

Cal Water uses a population estimation methodology based on overlaying Census Block data from the 2000 and 2010 Censuses with the District's service area. LandView 5 and MARPLOT software are used with these data to estimate population per dwelling unit for 2000 and 2010. The per dwelling unit population estimates are then combined with Cal Water data on number of dwelling units served to estimate service area population for non-Census years.

Cal Water also estimated service area population using DWR's Population Tool. The estimates prepared using Cal Water's methodology and DWR's Population Tool differed by significantly less than one percent. A comparison of the estimates generated by the two approaches is provided in Appendix I. Cal Water is electing to use the population estimates produced by its methodology in order to maintain consistency with population projections it has prepared in other planning documents and reports.

The population methodology and estimates used to calculate baseline and 2015 daily per capita water use are summarized in SB X7-7 Tables 2 and 3.

SB X7-7 Table 2: Method for Population Estimates	
Method Used to Determine Population (may check more than one)	
☐	**1. Department of Finance** (DOF) DOF Table E-8 (1990 - 2000) and (2000-2010) and DOF Table E-5 (2011 - 2015) when available
☐	**2. DWR Population Tool**
☑	**3. Other** DWR recommends pre-review

SB X7-7 Table 3: Service Area Population		
Year		**Population**
10 to 15 Year Baseline Population		
Year 1	1995	52,724
Year 2	1996	52,885
Year 3	1997	53,456
Year 4	1998	53,939
Year 5	1999	54,386
Year 6	2000	55,024
Year 7	2001	55,326
Year 8	2002	55,784
Year 9	2003	56,031
Year 10	2004	57,028
5 Year Baseline Population		
Year 1	2003	56,031
Year 2	2004	57,028
Year 3	2005	57,398
Year 4	2006	57,646
Year 5	2007	57,920
2015 Compliance Year Population		
2015		61,223

5.5 Gross Water Use

Annual gross water use is defined as the amount of water entering the District's distribution system over a 12-month period, excluding:

- Recycled water delivered within the service area
- Indirect recycled water
- Water placed in long-term storage
- Water conveyed to another urban supplier
- Water delivered for agricultural use

Gross water use must be reported for each year in the baseline periods as well as 2015. The South San Francisco District's annual gross water use is summarized in SB X7-7 Table 4. Volumes are in acre-feet. No water delivery exclusions are taken.

SB X7-7 Table 4: Annual Gross Water Use									
	Baseline Year	**Volume Into Distrib. System**	**Deductions**						**Annual Gross Water Use**
			Recycled Water	Exported Water	Change in Dist. System Storage (+/-)	Indirect Recycled Water	Water Delivered for Agricultural Use	Process Water	
10 to 15 Year Baseline - Gross Water Use									
Year 1	1995	8,226	0	0	0	0	0	0	8,226
Year 2	1996	8,403	0	0	0	0	0	0	8,403
Year 3	1997	9,008	0	0	0	0	0	0	9,008
Year 4	1998	8,917	0	0	0	0	0	0	8,917
Year 5	1999	9,394	0	0	0	0	0	0	9,394
Year 6	2000	9,738	0	0	0	0	0	0	9,738
Year 7	2001	9,606	0	0	0	0	0	0	9,606
Year 8	2002	9,633	0	0	0	0	0	0	9,633
Year 9	2003	9,245	0	0	0	0	0	0	9,245
Year 10	2004	9,549	0	0	0	0	0	0	9,549
10 - 15 year baseline average gross water use									**9,172**
5 Year Baseline - Gross Water Use									
Year 1	2003	9,245	0	0	0	0	0	0	9,245
Year 2	2004	9,549	0	0	0	0	0	0	9,549
Year 3	2005	8,869	0	0	0	0	0	0	8,869
Year 4	2006	9,101	0	0	0	0	0	0	9,101
Year 5	2007	9,169	0	0	0	0	0	0	9,169
5 year baseline average gross water use									**9,187**
2015 Compliance Year - Gross Water Use									
2015		7,064	0	0	0	0	0		**7,064**

5.6 Baseline Daily Per Capita Water Use

Baseline daily per capita water use is calculated by converting annual gross water use to gallons per day and dividing by service area population. Daily per capita water use for each baseline year and 2015 are summarized in SB X7-7 Table 5.

SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)				
Baseline Year		Service Area Population	Annual Gross Water Use (AF)	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	1995	52,724	8,226	139
Year 2	1996	52,885	8,403	142
Year 3	1997	53,456	9,008	150
Year 4	1998	53,939	8,917	148
Year 5	1999	54,386	9,394	154
Year 6	2000	55,024	9,738	158
Year 7	2001	55,326	9,606	155
Year 8	2002	55,784	9,633	154
Year 9	2003	56,031	9,245	147
Year 10	2004	57,028	9,549	149
10-15 Year Average Baseline GPCD				**150**
5 Year Baseline GPCD				
Baseline Year		Service Area Population	Annual Gross Water Use (AF)	Daily Per Capita Water Use (GPCD)
Year 1	2003	56,031	9,245	147
Year 2	2004	57,028	9,549	149
Year 3	2005	57,398	8,869	138
Year 4	2006	57,646	9,101	141
Year 5	2007	57,920	9,169	141
5 Year Average Baseline GPCD				**143**
2015 Compliance Year GPCD				
2015		61,223	7,064	**103**

5.7 2015 and 2020 Targets

Urban retail water suppliers may select from four GPCD target methods (CWC 10608.20).

- Target Method 1: 20% reduction from 10-year baseline GPCD
- Target Method 2: Water use efficiency performance standards
- Target Method 3: 95% of Hydrologic Region Target
- Target Method 4: Savings by water sector, DWR Method 4

Regardless of target method selected, the final target cannot exceed 95 percent of the 5-year baseline period average GPCD (CWC 10608.22).

The South San Francisco District has selected Target Method 3, which sets the 2020 target to either 95 percent of the San Francisco Bay Area Hydrologic Regional Target or 95 percent of the 5-year baseline average GPCD, whichever is less. This results in a 2020 target of 124 GPCD. The 2015 interim target of 137 GPCD is the midpoint between the 10-year baseline average GPCD and the 2020 target.

The District's GPCD baselines and targets are summarized in Table 5-1.

Table 5-1: Baselines and Targets Summary

Baseline Period	Start Years	End Years	Average GPCD	2015 Interim Target	Confirmed 2020 Target
10-15 year	1995	2004	150	137	124
5 Year	2003	2007	143		

5.8 2015 Compliance Daily per Capita Water Use

Compliance daily per capita water use in 2015 is summarized in Table 5-2. In reporting their compliance daily per capita water use, urban retail water suppliers may elect to consider the following factors and adjust the estimate accordingly (CWC 10608.24):

- Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.
- Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.
- Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.

Cal Water is not electing to make any adjustments to the District's compliance daily per capita water use in 2015. The South San Francisco District's 2015 compliance daily per capita water use is 103 gallons compared to its 2015 interim target of 137 gallons. The South San Francisco District is in compliance with its 2015 interim target.

The low per capita water use in 2015 partially reflects the impacts of the Drought Emergency Regulation adopted by the State Water Resources Control Board in May of 2015 (SWRCB Resolution No. 2015-0032). Among other things, the Drought Emergency

Regulation mandated urban retail water suppliers reduce potable water use between June of 2015 and February of 2016 by percentage amounts specified by the State Water Resources Control Board. The South San Francisco District was ordered to reduce potable water use by 8 percent over this period relative to use over the same period in 2013.

However, the Drought Emergency Regulation does not explain all of the decline in per capita water use, which has been trending downward since 2000 when it reached its zenith of 158 gallons per person per day. By 2014 this had fallen by 27 percent, to 115 GPCD. Between 2014 and the end of 2015, per capita water use had fallen an additional 11 percent, to 103 GPCD.

Table 5-2: 2015 SB X7-7 Compliance

2015 Actual GPCD	2015 Interim Target	Optional Adjustments to 2015 GPCD *From Methodology 8*				Actual as Percent of Target	In Compliance? Y/N
		Extraordinary Events	Economic Adjust	Weather Adjust	Adjusted Actual 2015 GPCD		
103	137	0	0	0	103	75%	YES

5.9 Regional Alliance

Urban retail water suppliers may report on the requirements of SB X7-7 individually or as a member of a "Regional Alliance." The South San Francisco District is a member of a Regional Alliance and this UWMP provides information on the District's progress towards meeting its SB X7-7 water conservation targets as both an individual urban retail water supplier and a member of a Regional Alliance.

The South San Francisco District has formed a Regional Alliance with other Cal Water urban retail water districts located in the San Francisco Bay Area Hydrologic Region. Compliance with the Regional Alliance's 2015 interim target is demonstrated in Appendix I and summarized in Table SB X7-7 RA Table 1 – Compliance Verification on the following page.

The Regional Alliance's 2015 compliance daily per capita water use is 110 gallons compared to its 2015 interim target of 164 gallons. The Regional Alliance is in compliance with its 2015 interim target.

SB X7-7 RA Table 1: Compliance Verification				
2015 GPCD (Actual)	2015 Interim Target GPCD	Economic Adjustment[1] *Enter "0" if no adjustment*	Adjusted 2015 GPCD *(if economic adjustment used)*	Did Alliance Achieve Targeted Reduction for 2015?
110	164	0	110	YES

[1]Adjustments for economic growth can be applied to either the individual supplier's data or to the aggregate regional alliance data (but not both), depending upon availability of suitable data and methods.

Chapter 6
System Supplies

This chapter describes and quantifies the sources of water available to the South San Francisco District. The water furnished to customers in the District is a combination of purchased water and groundwater from Cal Water owned wells. The purchased water is from the San Francisco Public Utilities Commission (SFPUC). Cal Water's annual allocation of SFPUC supply is shared among the Bear Gulch, Mid-Peninsula, and South San Francisco Districts. The total amount available from SFPUC to all of its wholesale customers varies with hydrology. This total amount is then allocated among the wholesale customers according to an allocation scheme agreed to by the member agencies of the Bay Area Water Supply and Conservation Agency (BAWSCA). These two stages of allocation are discussed in detail below. In addition, the supply available to the South San Francisco District in any given year varies somewhat with the availability of local surface water supplies in the Bear Gulch district.

Cal Water, in conjunction with the City San Bruno, City of Daly City, and SFPUC, is participating in an evaluation of the Westside Groundwater Basin to estimate the safe yield of the basin and determine the feasibility of entering a conjunctive use program. Preliminary results indicate that under this scenario Cal Water's South San Francisco District would have a program pumping level or drought quantity of 1,535 AFY. This amount was chosen to represent Cal Water's expected supply of groundwater.

6.1 Purchased Water

Cal Water receives water from the City and County of San Francisco's Regional Water System (RWS), operated by the San Francisco Public Utilities Commission (SFPUC). This regional supply is delivered through a network of pipelines, tunnels and treatment plants as illustrated in Figure 6-1. The water purchased is treated by SFPUC prior to delivery to Cal Water. The District takes delivery from SFPUC from eleven active and three standby metered turnouts from SFPUC transmission lines.

The amount of imported water available to SFPUC's retail and wholesale customers is constrained by hydrology, physical facilities, and the institutional parameters that allocate the water supply of the Tuolumne River. Due to these constraints, the SFPUC is very dependent on reservoir storage to firm-up its water supplies.

The SFPUC serves its retail and wholesale water demands with an integrated operation of local Bay Area water production and imported water from the Hetch Hetchy Project in the Sierra Nevada Mountains. In practice, the local watershed facilities are operated to capture local runoff.

The Raker Act, which authorized the Hetch Hetchy project, prohibits the SFPUC from selling water from that project to a privately owned utility; however, local sources generated by the SFPUC are available for purchase by privately owned utilities. Section 6 of the Raker act states:

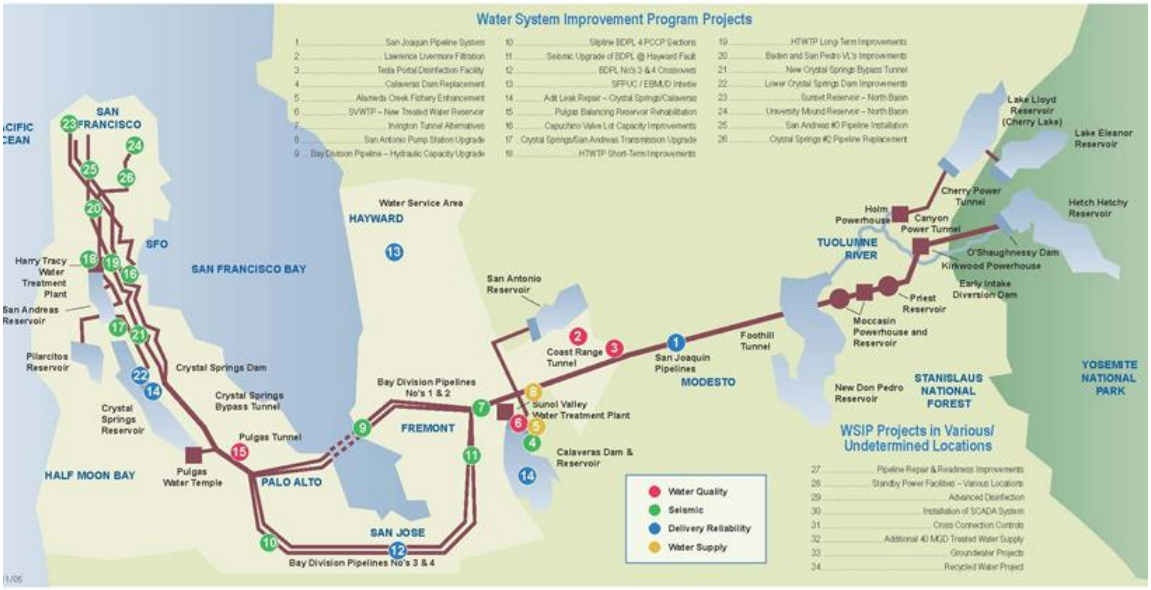
> *That the grantee [San Francisco] is prohibited from ever selling or letting to any corporation or individual, except a municipality or a municipal water district or irrigation district, the right to sell or sublet the water or the electric energy sold or given to it or him by the said grantee: Provided, that the rights hereby granted shall not be sold, assigned, or transferred to any private person, corporation, or association, and in case of any attempt to so sell, assign, transfer or convey, this grant shall revert to the Government of the United States.*

Cal Water's purchased water supply from the SFPUC is subject to the Water Supply Agreement (WSA) between the City and County of San Francisco and Wholesale Customers, which was adopted in July, 2009. As a means of addressing the aforementioned Raker Act exclusion the WSA contains Article 9.02 A. which identifies Cal Water as an investor owned utility company, and as such, has no claim to co-grantee status under the Act. In addition Article 9.02 B. states that:

> *The total quantity of water delivered by San Francisco to California Water Service Company shall not in any calendar exceed 47,400 acre-feet, which is the estimated average annual production of Local System Water. If San Francisco develops additional Local System Water after the Effective Date, it may (1) increase the maximum delivery amount stated herein; and (2) increase the Supply Assurance, but not necessarily both. San Francisco has no obligation to deliver water to California Water Service Company in excess of the maximum stated herein, except as such maximum may be increased by San Francisco pursuant to this subsection. The maximum annual quantity of Local System Water set forth in this subsection is intended to be a limitation on the total quantity of water that may be allocated to California Water Service Company, and is not an Individual Supply Guarantee for purposes of Section 3.02. The maximum quantity of Local System Water set forth in this subsection is subject to reduction in response to (1) changes in long-term hydrology or (2) environmental water requirements that may be imposed by or negotiated with state and federal resource agencies in order to comply with state or federal law or to secure applicable permits for construction of Regional Water System facilities. San Francisco shall notify California Water Service Company of any anticipated reduction of the quantity of Local System Water set forth in this subsection, along with an explanation of the basis for the reduction.*

Short term changes in hydrologic conditions such as drought and supply emergencies are governed by other provisions of the WSA including the two tiered allocation plan adopted by the BAWSCA membership as required in the WSA. This plan is described in Chapter 7.

Figure 6-1: SFPUC Water System Improvement Program (WSIP) Projects



In 1984, Cal Water, along with 29 other Bay Area water suppliers, signed a Settlement Agreement and Master Water Sales Contract (Master Contract) with San Francisco, supplemented by an individual Water Supply Contract. These contracts provided for a 184 mgd (annual average basis) Supply Assurance Allocation (SAA) to the SFPUC's wholesale customers collectively. This allocation was reached through negotiation in the early 1990s between the SFPUC and Bay Area Water Users Association (BAWUA), the predecessor organization to BAWSCA. In 2009 the Master Contract was extended through 2018, keeping the SAA at 184 mgd, but changing its name to the Individual Supply Guarantee (ISG).

Cal Water's ISG for the three districts was 35.39 mgd (39,642 AFY). Additionally, the acquisition of the Los Trancos County Water District in July 2005 allowed the transfer of its 0.11 mgd ISG to Cal Water. In 2009 Cal water acquired the Skyline County Water District, which also transferred its 0.181 mgd ISG to Cal Water. This increased Cal Water's total ISG for the three districts to 35.68 MGD (39,967 AFY).

The WSA allows the SFPUC to reduce water deliveries during droughts, emergencies, and for scheduled maintenance activities. The SFPUC and all wholesale customers adopted an Interim Water Shortage Allocation Plan in 2000 to address the allocation of water between San Francisco, wholesale customers, and individual wholesale customers during

water shortages of up to 20 percent of system-wide use. In 2010 the wholesale customers negotiated and have recently adopted a revised methodology for allocating supplies during shortages. This methodology is discussed in more detail in Chapter 7.

Water Supply Improvement Program (WSIP)

The SFPUC's WSIP provides goals and objectives to improve the delivery reliability of the RWS, including water supply reliability. The goals and objectives of the WSIP related to water supply are:

Program Goal	System Performance Objective
Water Supply – *meet customer water needs in non-drought and drought periods*	• Meet average annual water demand of 265 mgd from the SFPUC watersheds for retail and wholesale customers during non-drought years for system demands through 2018. • Meet dry-year delivery needs through 2018 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.

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 and San Andreas Reservoirs. The adopted WSIP retains this mix of water supply for all year types.

Water Supply – Dry-Year Types

The adopted WSIP includes the following water supply projects to meet dry-year demands with no greater than 20 percent system-wide rationing in any one year:

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 is constructing a new dam of equal height downstream of the existing dam. The Environmental Impact Report was certified by the San Francisco City Planning Commission in 2011, and construction is now ongoing. Construction of the new dam is slated for completion in 2018; the entire project should be completed in 2019.

Alameda Creek Recapture Project

The Alameda Creek Recapture Project will recapture the water system yield lost due to 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. The project's Draft Environmental Impact Report will be released in the spring of 2016, and construction will occur from spring 2017 to fall 2018.

Lower Crystal Springs Dam Improvements

The Lower Crystal Springs Dam Improvements were substantially completed in November 2011. While the project has been completed, permitting issues for reservoir operation have become significant. While the reservoir elevation was lowered due to Division of Safety of Dams 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 the original reservoir elevation can be restored.

Regional Groundwater Storage and Recovery Project

The Groundwater Storage and Recovery 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. The project seeks to balance the management of groundwater and surface water resources in a way that safeguards 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, allowing them to reduce the amount of groundwater that they pump from the South Westside Groundwater Basin. Over time, the reduced pumping would allow the aquifer to recharge and result in increased groundwater storage of up to 20 billion gallons.

The project's Final Environmental Impact Report was certified in August 2014, and the project also received Commission approval that month. The well station construction contract Notice to Proceed was issued in April 2015, and construction is expected to be completed in spring 2018.

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 is having ongoing discussions with the Oakdale Irrigation District for a one-year transfer agreement with the SFPUC for 2 mgd (2,240 acre-feet).

In order to achieve its target of meeting at least 80 percent of its customer demand during droughts at 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. The SFPUC's participation in regional water supply reliability efforts, such as the Bay Area Regional Desalination Project (BARDP), additional water transfers, and other projects may help to make up for this shortfall.

6.2 Groundwater

Groundwater has historically supplied ten to fifteen percent of the District's water demand. It is extracted from the Merced Formation of the Colma Creek Basin, a sub-basin of the Merced Valley Groundwater Basin. Locally this basin is referred to as the Westside Basin.

6.2.1 Basin Description

The Westside Basin is the largest groundwater basin in the San Francisco Bay Hydrologic Region. It is separated from the Lobos Basin to the north by a northwest trending bedrock ridge through the northeastern part of Golden Gate Park. The San Bruno Mountains bound the basin on the east. The San Andreas Fault and Pacific Ocean form its western boundary and its southern limit is defined by bedrock high that separates it from the San Mateo Plain Groundwater Basin. The basin opens to the Pacific Ocean on the northwest and San Francisco Bay on the southeast[8]. A detailed description of the basin is given in the DWR's Groundwater Bulletin 118 in Appendix G.[9]

6.2.2 Groundwater Management

In June 2003, Cal Water entered into an agreement with the SFPUC to implement a pilot conjunctive use program to test its practicality and potential impact on the regional groundwater basin and Lake Merced recovery. This conjunctive use program is an in-lieu replenishment operation where SFPUC delivers surplus surface water to Cal Water in exchange for a reduction in groundwater use. The wells were taken offline while Cal Water participated in the pilot program with the SFPUC. Cal Water resumed pumping groundwater in late 2008. During the pilot program the static depth to groundwater decreased by approximately 35 feet.

The Regional Groundwater Storage and Recovery Project (GSR Project) is a joint effort between SFPUC, Cal Water, and the Cities of Daly City and San Bruno to coordinate groundwater and surface water management in the South Westside Basin. This project would increase water supply reliability during dry years or emergency conditions. Cal Water, Daly City, and San Bruno are BAWSCA members who use groundwater from the South Westside Basin to augment their SFPUC supplies and are referred to as participating pumpers.

The SFPUC will install up to 16 new wells in the Westside Basin. There will be three operational action cycles within the proposed Groundwater Storage and Recovery Program, which are associated with the available SFPUC supply. When the SFPUC determines that there is surplus supply available they can call for a “Put” cycle during

[8] Ground Water Atlas of the United States, California and Nevada. U.S. Geological Survey, HA 730-B, 1995

[9] California's Ground Water Bulletin 118, 2003: San Francisco Bay Hydrologic Region; Merced Valley (Westside) Basin.

which they will deliver some of this surplus water to the program participants in-lieu of groundwater pumping by the participating pumpers, thus putting or leaving the groundwater in storage in the basin.

During normal supply years, SFPUC will deliver the normal quantities of imported supply to the participants who will also pump their Designated Quantity from the groundwater basin. Then when imported supplies are short the participating pumpers will pump their Designated Quantities and receive groundwater produced from the aforementioned SFPUC wells, and an equally reduced quantity of imported water.

The SFPUC wells will only be operated to extract the previously stored or banked supply. The expected groundwater storage gained from this reduced pumping is approximately 61,000 acre-feet. With that amount of additional groundwater available in the basin, the agencies could pump at rate of 7.2 mgd for a 7.5-year dry period.

Project facilities would include wells, disinfection, and distribution pipelines as needed, which will be paid for by the SFPUC. SFPUC will pay all operation costs when the take cycle is authorized. During non-drought emergencies the SFPUC wells would be available to the participating pumpers to provide additional redundant supply capacity. However, the operational cost for such an event would be paid for by the participating pumper.

In January 2015, the SFPUC awarded this $42.9 million construction contract to Ranger Pipelines, Inc. Construction started in spring 2015 and completion is anticipated in spring 2018.

The District produces groundwater from an un-adjudicated basin; however, Cal Water has voluntarily limited the annual production of groundwater from the Westside (Merced Valley) Basin to 500 million gallons annually in response to shared concerns raised in a study prepared for the City of Daly City that focused on local groundwater conditions.

In 1999 the Westside Basin Partners proposed a Groundwater Management Plan, but that plan was not adopted by Cal Water and the other local jurisdictions. However, the partners implemented many of the Basin Management Objectives from the Plan. In 2005, SFPUC published a final draft of its North Westside Groundwater Basin Management Plan, which covers the portion of the basin that is located in the City of San Francisco.

With SGMA passage in 2014 (see below for a detailed discussion of SGMA), a new effort is underway to update the Groundwater Management Plan into a Groundwater Sustainability Plan for the South Westside Basin. Cal Water is an active participant in this effort. A Letter of Mutual Understanding has been signed in 2016 by all of the agencies.

Sustainable Groundwater Management Act

Background – On September 16, 2014, Governor Brown signed into law Assembly Bill 1739, Senate Bill 1168, and Senate Bill 1319 (AB-1739, SB-1168, and SB-1319). This three-bill legislative package is known collectively as the Sustainable Groundwater Management Act (SGMA). SGMA was amended in the later part of 2015 by Senate Bill 13, Senate Bill 226 and Assembly Bill 1390 to provide clarity to the original law and guidance on groundwater adjudications. This new legislation defines sustainable groundwater management as the "management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results" [Water Code § 10721(u)]. The legislation defines "undesirable results" to be any of the following effects caused by groundwater conditions occurring throughout the basin [Water Code § 10721(w) (1-6)]:

- Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply;
- Significant and unreasonable reduction of groundwater storage;
- Significant and unreasonable seawater intrusion;
- Significant and unreasonable degraded water quality;
- Significant and unreasonable land subsidence;
- Surface water depletions that have significant and unreasonable adverse impacts on beneficial uses of the surface water.

The legislation provides for financial and enforcement tools to carry out effective local sustainable groundwater management through formation of Groundwater Sustainability Agencies (GSA's) consisting of local public agencies, water companies regulated by the CPUC and mutual water companies. The legislation requires that GSA's within High and Medium Priority basins under the California Statewide Groundwater Elevation Monitoring (CASGEM) program subject to critical conditions of overdraft prepare and submit a Groundwater Sustainability Plan (GSP) for the basin by January 31, 2020 [Water Code § 10720.7(a) (1)], and requires GSA's in all other groundwater basins designated as High or Medium Priority basins to prepare and submit a GSP by January 31, 2022 [Water Code § 10720.7 (a) (2)]. Following State approval, the basin would thereafter be managed under the GSP The legislation does not require adjudicated basins to develop GSPs, but they are required to report their water use.

Intended Outcomes and Benefits – The key intended outcomes and benefits of SGMA are numerous, and include:

- Advancement in understanding and knowledge of the State's groundwater basins and their issues and challenges;
- Establishment of effective local governance to protect and manage groundwater basins;
- Management of regional water resources for regional self-sufficiency and drought resilience;
- Sustainable management of groundwater basins through the actions of GSA's, utilizing State assistance and intervention only when necessary;
- All groundwater basins in California are operated to maintain adequate protection to support the beneficial uses for the resource;
- Surface water and groundwater are managed as "a Single Resource" to sustain their interconnectivity, provide dry season base flow to interconnected streams, and support and promote long-term aquatic ecosystem health and vitality;
- A statewide framework for local groundwater management planning, including development of sustainable groundwater management best management practices and plans;
- Development of comprehensive and uniform water budgets, groundwater models, and engineering tools for effective management of groundwater basins;
- Improved coordination between land use and groundwater planning;
- Enforcement actions as needed by the SWRCB to achieve region-by-region sustainable groundwater management in accordance with the 2014 legislation.

To assist in attaining the above outcomes, the California Department of Water Resources (DWR) will provide GSA's with the technical and financial assistance necessary to sustainably manage their water resources. The benefits of these outcomes include:

- A reliable, safe and sustainable water supply to protect communities, farms, and the environment, and support a stable and growing economy;
- Elimination of long-term groundwater overdraft, an increase in groundwater storage, avoidance or minimization of subsidence, enhancement of water flows in stream systems, and prevention of future groundwater quality degradation.

Cal Water Position – Cal Water's groundwater basin philosophy continues to be to work collaboratively with all stakeholders in the basins where we operate and to do what is best for the groundwater basin including the sharing of burden(s) and benefits on an equitable basis with said stakeholders. Cal Water recognizes and deeply supports the goals, objectives, and intended outcomes of the SGMA. Moreover, the company recognizes the numerous challenges of the legislation along a variety of technical, legal, political, and financial/economic dimensions, particularly when the geographical diversity of the Company's service territory is considered. None-the-less, Cal Water intends to take an active role in the local and state-wide management of groundwater resources over the next 5-25+ years by fully supporting and participating in the principal edicts of SGMA. A number of specific steps that the Company intends to take with respect to this position and role include (among others):

- Outreach to public agencies to ensure that the Company's presence, rights and interests, as well as historical and current resource management concerns are honored/incorporated within the GSA and GSP formulation process(es);

- Outreach to applicable local and regulatory agencies to ensure that the Company is at full participation, while also meeting the requirements and expectations set forth by SGMA;

- The enhanced use of digital/electronic groundwater monitoring equipment and other new technology aimed at measuring withdrawal rates, pumping water levels, and key water quality parameters within the context of day-to-day operations;

- Full participation in the development of GSP's and formulation of groundwater models being constructed in basins where the Company has an operating presence;

- Full participation in individual and/or joint projects aimed at mitigating seawater intrusion and other "undesirable results";

- Inclusion of sound groundwater management principles and data in all applicable technical reports, studies, facility master plans, and urban water management plans (including this 2015 update), particularly as these undertakings relate or pertain to water resource adequacy and reliability;

- Inclusion of sound groundwater management principles and data in all general rate case (GRC) filings and grant applications to ensure that resource management objectives remain visible and central to Cal Water's long-term planning/budgeting efforts;

SGMA related information in the 2015 UWMP – The Urban Water Management Plans prepared by Cal Water over the past decade, including the 2015 update, already contain many of the elements required by SGMA and thus already serve as a road map toward the implementation of SGMA and the basin GSP. The UWMP addresses all water supply

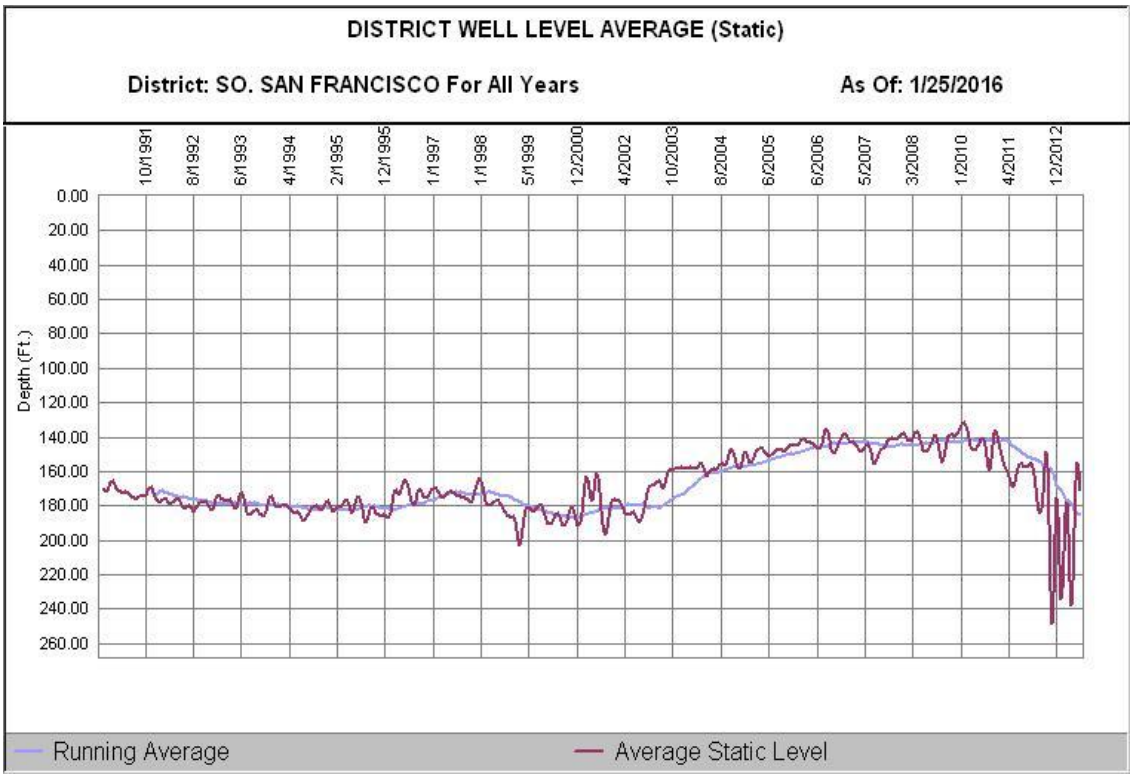
sources including groundwater. SGMA's specific concerns with groundwater are addressed as follows:

- Chapter 4 addresses Cal Water's historic and future customer growth and water demand in the basin.
- Chapter 6 addresses Cal Water's historic and future water supplies in the basin.
- Chapter 6 addresses the potential actions Cal Water will need to take to develop additional water supplies to maintain supply reliability.
- Chapter 6 discusses water quality and necessary actions to protect and decontaminate water supplies.
- Chapter 6 addresses supplementing water supplies with recycled water.
- Chapter 7 addresses the projected ability of the combined supply, including groundwater, to reliable serve customer demands under normal, single-dry-year and multiple-dry-year conditions.

6.2.3 Overdraft Conditions

Cal Water regularly monitors the groundwater level of its wells. Figure 6-2 shows the average ground water level for the South San Francisco District from 1990 to 2013. The groundwater level increased about 35 feet between 2003 and 2007, as Cal Water, San Bruno, and Daly City suspended groundwater pumping while participating in a pilot conjunctive use program with SFPUC. Levels fell considerably beginning in 2010 due to drought conditions.

Figure 6-2: Average Ground Water Level for the District



The May 2011, HydroFocus Westside Basin Model, version 3.1 identifies a sustainable municipal pumping rate of 6.9 mgd. Cal Water, Daly City, and San Bruno will coordinate their respective pumping such that the 6.9 mgd value is not exceeded on an annual basis (or other mutually agreed upon averaging period). Cal Water has from the beginning of discussions regarding the GSR Project offered to limit its planned production of groundwater from the Westside Basin to 1.37 mgd, which at 1,535 AFY is in line with the current pumping capacity and historical production from the basin.

6.2.4 Historical Pumping

The amount of groundwater currently being and pumped is shown in Table 6-1.

Table 6-1 Retail: Groundwater Volume Pumped (AF)						
Groundwater Type	Location or Basin Name	2011	2012	2013	2014	2015
Alluvial Basin	Merced Valley (Westside) Basin	515	606	995	1,028	1,312
Total		**515**	**606**	**995**	**1,028**	**1,312**

6.3 Surface Water

Cal Water does not have rights to any surface water to use as a supply for South San Francisco District. However, surface water is ultimately the source of SFPUC's supply for Cal Water.

6.4 Stormwater

There are no plans to capture stormwater for beneficial reuse in the District.

6.5 Wastewater and Recycled Water

The recycling of wastewater offers several potential benefits to Cal Water and its customers. Perhaps the greatest of these benefits is to help maintain a sustainable groundwater supply either through direct recharge, or by reducing potable supply needs by utilizing recycled water for appropriate uses (e.g., landscape, irrigation) now being served by potable water. Currently, no wastewater is recycled for direct reuse from the domestic or industrial wastewater streams in the District.

6.5.1 Recycled Water Coordination

Cal Water relies on and coordinates with the following wastewater collection, treatment and recycling agencies for wastewater treatment and recycling:

- North San Mateo County Sanitation District
- South San Francisco and San Bruno Water Quality Control Plant

6.5.2 Wastewater Collection, Treatment, and Disposal

The North San Mateo County Sanitation District (NSMCSD) treats a portion of the wastewater from Cal Water's South San Francisco service area communities of Broadmoor and portions of Colma. Other communities within the NSMCSD include Westlake, Westborough County Water District, Daly City, and the San Francisco County Jail. Municipal wastewater is generated in the NSMCSD service area by residential, commercial, and limited industrial sources. NSMCSD owns, operates and maintains its sewer system consisting of gravity sewers and pumping stations.

South San Francisco and San Bruno own and operate the South San Francisco Water Quality Control Plant (SSFWQCP). Wastewater from Cal Water's South San Francisco service area communities of South San Francisco and Colma is treated at the SSFWQCP. Wastewater from San Bruno and a small portion of Daly City is also treated at the SSFWQCP, but these areas are not within Cal Water's service area. The sewer system

includes gravity lines and force mains that combine both wastewater and storm water runoff.

The wastewater at the North San Mateo Wastewater Treatment Plant (NSMWTP) undergoes primary and secondary treatment. The NSMWTP has a capacity to treat 10.3 MGD average daily flow but currently receives 6.2 MGD from the NSMCSD service area. Effluent is discharged to an outfall at Thornton Beach via pipeline. Secondary non-public contact treated water is currently recycled from the NSMWTP for irrigation of landscaped medians in Westlake. Recycled water is not provided in Cal Water's South San Francisco service area by the NSMWTP.

The wastewater at the SSFWQCP undergoes primary and secondary treatment with chlorination and de-chlorination before being discharged to the San Francisco Bay. The SSFWQCP also provides de-chlorination for chlorinated effluent for Burlingame, Millbrae, and the San Francisco International Airport. The SSFWQCP has design capacity to treat 13 MGD average daily flow. The average dry weather flow through the facility is 9 million gallons per day (MGD). Peak wet weather flows can exceed 60 MGD. The SSFWQCP does not provide recycled water.

Table 6-2 Retail: Wastewater Collected Within Service Area in 2015						
Percentage of 2015 service area covered by wastewater collection system *(optional)*						
Percentage of 2015 service area population covered by wastewater collection system *(optional)*						
			Receiving Wastewater Treatment			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected in 2015 (AF)	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?
North San Mateo County Sanitation District	Estimated	2,382	North San Mateo County Sanitation District	North San Mateo Wastewater Treatment Plant	No	
City of South San Francisco, City of Colma	Estimated	3,500	South San Francisco and San Bruno	South San Francisco Water Quality Control Plant	Yes	
Total Wastewater Collected from Service Area in 2015:		**5,882**				

Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2015

☐ No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.

Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level	2015 Volumes (AF)			
							Waste water Treated	Discharged Treated Waste water	Recycled Within Service Area	Recycled Outside of Service Area
South San Francisco Water Quality Control Plant	San Francisco Bay			Bay or estuary outfall	Yes	Secondary, Disinfected - 23	16,253	16,253	0	0
						Total	**16,253**	**16,253**	**0**	**0**

6.5.3 Recycled Water System

There is currently a coordinated recycled water effort between the Cities of South San Francisco and San Bruno, SFPUC, and Cal Water to reduce potable water demands on the SFPUC supply and reduce groundwater pumping in the Westside Basin. Cal Water would benefit from both of these goals, as it is the water provider for many of the potential customers. Cal Water serves users in the South San Francisco District with both SFPUC water and groundwater.

The City of Daly City currently produces 2.77 million gallons per day (mgd) of recycled water. This recycled water is used for irrigation at the San Francisco Golf Club, Olympic Club, Lake Merced Golf Club, Harding Park Golf Club, and several city parks and medians. Daly City and the SFPUC are jointly pursuing the Feasibility of Expanded Tertiary Recycled Water Facilities Project, which will provide approximately 3 mgd of additional recycled water irrigation supply to the cemeteries in the Town of Colma and other parks and schoolyards. The goal of the project is to reduce reliance on the groundwater basin and to create a local, drought-proof water supply. This expansion in currently in pre-design (2016) with construction to expecting to occur in 2018-2019.

6.5.4 Recycled Water Beneficial Uses

Cal Water examined the potential for recycled water use in the South San Francisco District in the District's Water Supply and Facilities Master Plan. It was again explored in Cal Water's Integrated Long Term Water Supply Plan for the three Peninsula Districts. These studies found a potential for 0.61 mgd of recycled water demand in the South San Francisco District. Because of the low demand and high unit cost, this supply is not being immediately pursued. Cal Water will continue to evaluate the development of recycled water and will participate in a project if it becomes cost-effective.

Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area									
✓	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.								
Name of Agency Producing (Treating) the Recycled Water:									
Name of Agency Operating the Recycled Water Distribution System:									
Supplemental Water Added in 2015									
Source of 2015 Supplemental Water									
Beneficial Use Type	General Description of 2015 Uses	Level of Treatment	2015	2020	2025	2030	2035	2040 (opt)	
Agricultural irrigation									
Landscape irrigation (exc 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									
		Total:	**0**	**0**	**0**	**0**	**0**	**0**	
IPR - Indirect Potable Reuse									

Table 6-5 Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual		
✓	Recycled water was not used in 2010 nor projected for use in 2015. The supplier will not complete the table below.	
Use Type	2010 Projection for 2015	2015 actual use
Agricultural irrigation		
Landscape irrigation (exc 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		
Total		

6.5.5 Actions to Encourage and Optimize Future Recycled Water Use

Cal Water's supply portfolio in some districts already includes recycled water; elsewhere, the Company is participating in studies of the possibility of adding this supply source. Cal Water is eager to expand its portfolio to provide recycled water to its customers wherever possible, and to form partnerships with other agencies and jurisdictions to accomplish this. Any such project must be economically feasible. Approval of such an investment by the CPUC is contingent on a demonstration that it is beneficial to ratepayers.

Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Reduced rates	Provide recycled water at a reduced rate as compared to potable water.	n/a	No est.
Review service area	Review customers in service are for potential recycled water service	ongoing	No est.
		Total	**0**

6.6 Desalinated Water Opportunities

Cal Water explored the possibility of developing desalinated water as a source of supply in its Water Supply and Facilities Master Plan for the District. It was examined in more detail in the Integrated Long Term Water Supply Plan for the three Peninsula Districts. Other agencies are also investigating a number of potential regional and local desalination projects which could be developed to provide potable water to the Cal Water Peninsula Districts.

Potential Regional Project

The Bay Area Regional Desalination Project (BARDP) will develop one or two desalination plants to produce reliable potable water. The participating agencies would either directly receive desalinated water or exchange other water among them. Participating agencies include Contra Costa Water District (CCWD), East Bay Municipal Utility District (EBMUD), SFPUC, Santa Clara Valley Water District (SCVWD), and Zone 7 Water Agency.

The BARDP evaluation process started in 2003 with the screening of 22 potential sites, narrowing those down to three sites. The 2007 feasibility study screened and ranked combinations of location, operation, and conveyance scenarios according to six issues: environmental, permitting, institutional/legal, cost, public perception, and reliability. The highest performing configuration was a 65 mgd facility in the City of Pittsburg, co-located with the existing Mirant Power Plant. BARDP is currently conducting a Regional Reliability Study[10].

[10] http://www.regionaldesal.com/schedule.html

Potential Local Projects

In January 2011, Cal Water completed, with the assistance of Camp, Dresser, and McKee, a Long Term Water Supply Plan for the three Peninsula Districts (LTWSP). This LTWSP confirmed that a sizeable demand to supply gap exists or can be anticipated for these communities during drought conditions. Current detailed information on the projected gap is presented in Chapter 7.

The LTWSP indicates that most viable alternatives to address this supply gap are through the development of desalination and/or water transfers. Cal Water intends to continue its investigation of these two alternatives.

The desalination options involve high pressure membrane technology to remove the salts from the water. Two sources of water were considered: brackish groundwater and Bay water (either through an open intake or through slant wells). Based on the projected costs, brackish water desalination (with potential yields up to 5 mgd) is the most attractive option for meeting Cal Water needs. A bay water option, while more expensive, is also attractive as it would provide greater capacity and provide opportunity for Cal Water to supply water to others both inside and outside of the service area.

Cal Water intends to conduct a more detailed feasibility investigation and, if results are positive, prepare a preliminary engineering analysis of the recommended desalination option. Implementing desalination will require 6 to 9 years. Several immediate steps are necessary over the next year for Cal Water to refine the costs including: verifying feasible brackish groundwater yield capacity, determining the best well location, confirming feasibility of brine discharge locations, siting treatment facilities based on land availability and costs, and determining the need for pilot testing. If a larger capacity facility is justified by interest from other parties, the next step would be to identify potential open water intake locations and determine costs.

The estimated cost of this detailed feasibility investigation and engineering analysis of the desalination option is $2.6 million, with a duration of 4-5 years. In order to proceed, Cal Water must first obtain approval to conduct the study from the California Public Utilities Commission.

6.7 Exchanges or Transfers

The Integrated Long Term Water Supply Plan for the Three Peninsula Districts also examined several water transfer options as a means to augment existing supplies. These include Delta transfers, pre-1914 water rights transfers, “green option” transfers, and transfers of SFPUC water between BAWSCA agencies.

6.7.1 Exchanges

Cal Water does not have any planned exchanges at this time.

6.7.2 Transfers

Delta Transfers

The majority of the Delta transfers are between SWP and CVP contractors, providing a shift in supply, but using the same infrastructure for transfer of these supplies. Non SWP and CVP contractors have lower rights for accessing, availability, and capacity available for wheeling or groundwater storage. In drought years this provides a low level of certainty of being able to contract for, or obtain these types of transfer agreements.

Increasing reliability of long-term transfers requires addition of storage. In the case of the SWP, CVP, or transfer of supplies off of the central valley rivers this has most often been done as groundwater storage in Kern County, with its attendant additional costs. There has been a significant demand by other SWP contractors for these groundwater storage options.

Even with contracts for transfer in place storage, may be required to offset the seasonal availability of the Delta supplies. In addition, these supplies would still need to be transferred from the Delta to the Peninsula Districts. This would most likely occur either through the South Bay Aqueduct (SBA) or SCVWD transmission system from San Luis Reservoir. Wheeling agreements would be required with DWR for transfers through the SBA, and additional agreements with either ACWD or SCVWD. That water would then need to be conveyed through other agency systems to the District service areas, or ACWD would transfer part of its SFPUC supply to the Districts.

Not including conveyance/wheeling charges, the price for Delta transfer supply depends on the source, but currently is around $200/AF from the Sacramento Valley, and $400 to $900/AF for San Joaquin transfers. During dry years these costs tend to increase. These costs do not include wheeling from the Delta to the Bay Area or then to the Peninsula Districts.

Pre-1914 Water Right Transfers

Another potential group of water transfers are pre-1914 water right supplies. These supplies have higher priority than post-1914 and the majority of the SWP and CVP rights. As such, they are not subject to the same environmental and institutional cutbacks seen with the Delta supplies recently.

These pre-1914 rights are more reliable during droughts than other rights, and as such have a higher value and cost. One of the key issues is conveyance of that supply to the

purchaser. This adds complexity to the transfer arrangements, and increases the costs for wheeling of the supply.

The two main issues associated with the pre-1914 rights are the long-term availability, especially during droughts, and the cost for purchase of the supply and the wheeling or infrastructure costs to transfer this supply to the Peninsula Districts.

Transfers of "Green Option" Supply

The conservation offset, or green option, is based on implementation of agricultural water use efficiencies in the Lower Tuolumne River Watershed (LTRW) (i.e. Modesto Irrigation District [MID] and Tuolumne Irrigation District [TID] service areas). The green option reduces irrigation water requirements through implementation of agricultural water efficiency measures, instead of fallowing land which can cause third-party impacts.

The Tuolumne river option has many advantages, including the high level of water quality. If the project is a direct offset for releases to MID and TID this would be equivalent to Hetch Hetchy supply. If this is water released from Don Pedro then additional treatment would be required. In either case, conveyance would be through the SFPUC system, and would not require other wheeling agreements outside of those with SFPUC.

Transfers between SFPUC wholesale customers

The water supply agreements with SFPUC allow the transfer of supply between wholesale customers without penalty, or additional charges. However, the agreements do not allow carry over from year to year if purchases were less than the interim supply agreement. This transfer mechanism can be used if other wholesale customers have excess supply, either due to their contract capacity, or if Cal Water were to fund other projects within these agencies that may free up SFPUC supply for transfer.

Since it is likely that some form of transfer can be implemented sooner than desalination, Cal Water is considering this to be a short term solution to the identified supply gap.

6.7.3 Emergency Interties

Cal Water has emergency interties with Brisbane, San Bruno, Daly City, and City of San Francisco

6.8 Future Water Projects

Cal Water, together with other agencies, continues to investigate the feasibility and cost effectiveness of several future supply alternatives:

- Adding treatment and well capacity to maximize the yield of the basin.

- The distribution recycled water.
- Brackish water desalination.

Table 6-7 Retail: Expected Future Water Supply Projects or Programs						
	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
✓	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format. LOCATION OF THE NARRATIVE______Section 6.8___________					
Name of Future Projects or Programs	Joint Project with other agencies?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Agency
		If Yes, Agency Name				*This may be a range*

6.9 Summary of Existing and Planned Sources of Water

Table 6-8 shows the actual total supply volumes for calendar year 2015 . Table 6-9 shows the projected supply volumes through 2040. Since Cal Water's SFPUC supply is shared among all three of its districts on the San Francisco Peninsula to provide the operational flexibility to distribute the supply as needed in each system depending on the availability of local supplies and conditions within each district, the entries in these tables are totals across all three districts.

Consistent with the SFPUC projections that are discussed in Chapter 7, the purchased supplies, along with the local supplies of the South San Francisco and Bear Gulch Districts will be sufficient to serve the combined normal year demand through 2040. Therefore, the supply amounts shown in Table 6-9 equal the projected demand in each year.

Table 6-8 Retail: Water Supplies (Combined MPS, SSF, BG) — Actual (AF)

Water Supply	Additional Detail on Water Supply	2015		
		Actual Volume	Water Quality	Total Right or Safe Yield *(optional)*
Purchased or Imported Water		28,404	Drinking Water	
Surface water		437	Drinking Water	
Groundwater		1,312	Drinking Water	
Total		**30,153**		

Table 6-9 Retail: Water Supplies — Projected (AF)

Water Supply	Projected Water Supply *Report To the Extent Practicable*									
	2020		**2025**		**2030**		**2035**		**2040** *(opt)*	
	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*
Purchased or Imported Water	37,430		37,485		37,852		38,354		38,972	
Surface Water	1,260		1,260		1,260		1,260		1,260	
Groundwater	1,535		1,535		1,535		1,535		1,535	
Total	**40,225**		**40,280**		**40,647**		**41,149**		**41,767**	

6.10 Climate Change Impacts to Supply

Cal Water recently completed an initial study of climate change impacts for a sample of its districts, including the South San Francisco District.[11] The sample districts account for 85% of Cal Water's total 2014 production and reflect the diversity of all Cal Water districts, including geographic, hydrologic, and climatic conditions and primary and secondary supply sources. The study was undertaken because it is critical for Cal Water to gain a better understanding of the potential impacts of climate change on the availability of its diverse supplies. The impacts are inherently uncertain, but Cal Water believes that the only responsible course is to carefully incorporate climate change into its ongoing water supply planning.

The initial study represents a first step in that path. In order for Cal Water to determine how its long-term water supply planning should reflect climate change impacts, it must first have an understanding of what the impacts of climate change on its supply sources might be. That was the purpose of the study.

Changes in climate can affect the availability of local groundwater and surface water supplies, as well as purchased imported supplies. This study separately addressed the impacts on each of these for each sample district. It relied on the best available projections of changes in climate (temperature and precipitation) through the end of the century, and then used the climate projections to examine how surface water flows and groundwater recharge rates may change. The study generally relied on studies done by or data provided by wholesale suppliers.

The study results provide an integrated view of how projected climate changes may affect water supply availability for Cal Water's service districts, and represent a first step in integrating potential future climate change impacts into Cal Water's ongoing supply planning.

6.10.1 Estimating Changes in Climate

Climate change is primarily driven by increased concentrations of greenhouse gases (GHGs) in the atmosphere. The trajectory of future climate change is a function of the rate at which those concentrations are projected to increase and the manner in which the atmosphere and oceans respond to increased concentrations. Both are difficult to model. Thus, while the scientific community overwhelmingly agrees that climate change will occur (and indeed may already have begun), the trajectory of those changes is very uncertain.

[11] California Water Service Company, *Potential Climate Change Impacts on the Water Supplies of California Water Service*. January 2016.

The projections of temperature and precipitation that underlie this study are based on 40 of the latest Global Circulation Models (GCMs) run as part of the Coupled Model Intercomparison Project Phase 5 (CMIP5). Generally speaking, this type of approach is termed an ensemble analysis, for which the downscaled climate projections for any particular Cal Water Service District were based on the median of the 40 downscaled GCM datasets. The GCMs used by the analysis are driven by two GHG emission pathways that bound the possible trajectories of GHG concentrations.

6.10.2 Impacts of Climate Change on Water Supplies

Since the supplies for each district consist of a mix of local surface water, local groundwater, and/or purchased imports, climate change impacts were estimated for each of these components. Based on the breakdown of district production among the supply sources, Table 6-10 shows the ranges of projected overall climate change impacts on available supply, relative to the historic average. The climate change study combined the Mid-Peninsula, South San Francisco, and Bear Gulch districts, since they share a purchased supply allocation.

Supply reductions due to climate change are projected to be between 6% and 15% for these districts by the end of the century.

Table 6-10 Projected Changes in Average Available Supply due to Climate Change				
District	Percentage Change in Supply			
		2020	2050	2100
BK	Minimum	-10%	-10%	-12%
	Maximum	-12%	-16%	-20%
VIS	Minimum	-7%	-8%	-8%
	Maximum	-9%	-10%	-14%
KRV	Minimum	-13%	-16%	-19%
	Maximum	-16%	-21%	-31%
MPS/SSF/BG	Minimum	0%	-2%	-6%
	Maximum	0%	-7%	-15%
LAS	Minimum	-3%	-3%	-10%
	Maximum	-4%	-18%	-28%
CH	Minimum	2%	2%	0%
	Maximum	3%	1%	-3%
ORO	Minimum	0%	8%	5%
	Maximum	0%	-8%	-7%
DOM/HR/PV	Minimum	0%	0%	-1%
	Maximum	0%	-2%	-3%
STK	Minimum	0%	0%	-8%
	Maximum	0%	-14%	-17%
SLN	Minimum	-6%	-6%	-6%
	Maximum	-7%	-7%	-7%

6.10.3 Next Steps and Key Conclusions

Possible next steps for Cal Water's study of climate change include:

- Methodological enhancements to reduce some of the uncertainties in the results;
- Development and acquisition of better and more complete data;
- Extending the study to other Cal Water districts;
- Developing a plan to mitigate anticipated climate change impacts on supply; and
- Integrating climate change into the Company's ongoing water supply planning.

Three critical messages emerged from the study:

- Cal Water supplies in the 21st century are likely to be adversely affected by climate change.

- These impacts will vary considerably across districts, depending on geography and source mix. For some districts, the impacts can be significant; for others, little or no impacts are projected.

The impacts will generally increase over time. Anticipated late-century impacts are forecast to be significantly higher in some districts than impacts at mid-century. Moreover, during the period that climate change is forecast to increasingly constrain supplies, demands are also generally forecast to increase, further exacerbating the adverse impacts on water supply reliability.

Chapter 7
Water Supply Reliability Assessment

This chapter addresses the reliability of the South San Francisco District's water supplies. Assessment of water supply reliability is complex and dependent upon a number of factors, such as the number of water sources, regulatory and legal constraints, hydrological and environmental conditions, climate change, and expected growth, among others. Based on available historical information and projections of future water uses, regulatory and legal constraints, and hydrological and environmental conditions, including climate change, Cal Water has made its best determination of the future reliability of the South San Francisco District's water supplies.

7.1 Constraints on Water Sources

WATER SUPPLY AGREEMENT WITH SFPUC

In July 2009, the wholesale customers and San Francisco adopted the Water Supply Agreement (WSA). Key features of that Agreement include:

Individual Supply Guarantee

San Francisco has a perpetual commitment (Supply Assurance) to deliver 184 mgd to the 24 permanent wholesale customers collectively. San Jose and Santa Clara are not included in the Supply Assurance commitment and each has temporary and interruptible water supply contracts with San Francisco. The Supply Assurance is allocated among the 24 permanent wholesale customers through Individual Supply Guarantees (ISG), which represent each wholesale customer's allocation of the 184 mgd Supply Assurance. Cal Water's total ISG for the three districts is 35.68 mgd.

2018 Interim Supply Limitation

As part of its adoption of the Water System Improvement Program (WSIP) in October 2008, discussed separately herein, the SFPUC adopted a water supply limitation, the Interim Supply Limitation (ISL), which limits sales from San Francisco Regional Water System (RWS) watersheds to an average annual of 265 mgd through 2018.

All 26 wholesale customers and San Francisco are subject to the ISL. The wholesale customers' collective allocation under the ISL is 184 mgd and San Francisco's is 81 mgd. Although the wholesale customers did not agree to the ISL, as further discussed below, the WSA provides a framework for administering the ISL.

Interim Supply Allocations

The Interim Supply Allocations (ISAs) refer to San Francisco's and each individual wholesale customer's share of the Interim Supply Limitation (ISL). On December 14, 2010, the SFPUC established each agency's ISA through 2018. In general, the SFPUC based the wholesale customer allocations on the lesser of the projected fiscal year 2017-18 purchase projections or Individual Supply Guarantees. The ISAs are effective only until December 31, 2018 and do not affect the Supply Assurance or the Individual Supply Guarantees, both discussed separately herein. San Francisco's ISA is 81 mgd. Cal Water's ISA is 35.68 mgd.

As stated in the WSA, the wholesale customers do not concede the legality of the Commission's establishment of the ISAs and Environmental Enhancement Surcharge, discussed below, and expressly retain the right to challenge either or both, if and when imposed, in a court of competent jurisdiction.

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.

2018 SFPUC Decisions

In the WSA, there are three decisions the SFPUC committed to making before 2018 that will 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.

Additionally, there have been recent changes to instream flow requirements and customer demand projections that will affect water supply planning beyond 2018. As a result, the SFPUC has developed a Water Management Action Plan (Water MAP) to

provide necessary information to address the 2018 decisions and to begin developing a water supply program for the 2019 to 2035 planning horizon. The water supply program will enable the SFPUC to continue to meet its commitments and responsibilities to wholesale and retail customers, consistent with the priorities of the SFPUC.

The Water MAP is slated for SFPUC Commission discussion in 2016. The discussion resulting from the questions described in the Water MAP will help guide the water supply planning objectives through 2035. While the Water MAP is not a water supply program, it presents pertinent information that will help develop the SFPUC's future water supply planning program. At this time, and for purposes of long-term planning, it is assumed that deliveries from the RWS to San Francisco's wholesale customers will not be in excess of 184 mgd.

Water Shortage Allocation Plan

The Water Shortage Allocation Plan (WSAP) allocates water from the Regional Water System (RWS) to retail and wholesale customers during system-wide shortages of 20 percent or less (the Tier One Plan). The WSAP has two components:

- The Tier One Plan, which allocates water between San Francisco and the wholesale customers collectively; and
- The Tier Two Plan, which allocates the collective wholesale customer share among the wholesale customers

Tier One Drought Allocation

The Tier One Plan allocates water between San Francisco and the wholesale customers collectively based on the level of shortage:

Table 7-A. SFPUC Tier One Drought Allocation

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

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

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 San Francisco and the wholesale customers to achieve necessary water use reductions during drought periods. During the current drought to date, the SFPUC has requested, but has not mandated, a 10 percent system-wide reduction since January 2014. The SFPUC has not yet been compelled to declare a water shortage emergency and implement the Tier One Plan because its customers have exceeded the 10 percent voluntary system-wide reduction in conjunction with the state-wide mandatory reductions assigned by the State Water Resources Control Board.

Tier Two Drought Allocation

The wholesale customers have negotiated and adopted the Tier Two Plan, the second component of the WSAP, which allocates the collective wholesale customer share among each of the 26 wholesale customers. This Tier Two allocation is based on a formula that takes into account multiple factors for each wholesale customer including:

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

The water made available to the wholesale customers collectively will be allocated among them in proportion to each wholesale customer's Allocation Basis, expressed in millions of gallons per day (mgd), which in turn is the weighted average of two components. The first component is the wholesale customer's Individual Supply Guarantee, as stated in the WSA, and is fixed. The second component, the Base/Seasonal Component, is variable and is calculated using the monthly water use for three consecutive years prior to the onset of the drought for each of the wholesale customers for all available water supplies. The second component is accorded twice the weight of the first, fixed component in calculating the Allocation Basis. Minor adjustments to the Allocation Basis are then made to ensure a minimum cutback level, a maximum cutback level, and a sufficient supply for certain wholesale customers.

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

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

The current Tier Two Plan will expire in 2018 unless extended by the wholesale customers.

POTENTIAL GROUNDWATER CONSTRAINTS

The groundwater supply is at risk from climatic and environmental issues. A groundwater investigation has found that storage volumes are predicted to decrease somewhat over time within the South San Francisco service area, even if groundwater pumping by Cal Water and others is maintained at historic levels. Negative changes in groundwater storage correspond to declining regional groundwater levels. Lowering of groundwater levels can create greater pumping lifts for municipal and private wells, and also increases the potential for saltwater intrusion from San Francisco Bay.

Concerns have also been expressed by many citizens' groups regarding the decline of Lake Merced during past droughts. In response, Cal Water joined in a partnership with the cities of San Bruno, Daly City and San Francisco to formulate a Groundwater Management Plan for this basin. Several consulting firms were retained to investigate this issue with the goals of protecting water quality and enhancing water supply reliability in the Westside Basin. The lake level has rebounded, due to the dedication of the SFPUC, CalTrout, the Committee to Save Lake Merced, and many other devoted stakeholders and groups.

WATER QUALITY

The water supplied by the SFPUC is of very high quality. No water quality concerns are thought to threaten supply reliability. The water delivered in the South San Francisco District meets all federal and state regulations. All drinking water standards are set by the U.S. Environmental Protection Agency under the authorization of the Federal Safe Drinking Water Act of 1974. In California, the state's State Water Resources Control

Board, Division of Drinking Water (DDW) can either adopt the USEPA standard or set state standards that are more stringent than those set by the federal government.

The drinking water delivered to customers in the South San Francisco District meets all federal and state water quality regulations.

The well field in the District has treatment for iron and manganese and blending for hexavalent chromium (Cr^{6+}), nitrates (NO_3), and Volatile Organic Compounds (VOCs). The well field is permitted for use only when the water is blended with SFPUC water. Although blending of sources with SFPUC achieves drinking water compliance, as the capacity of the well field is expanded, it is suspected that VOC contamination will negatively impact the effectiveness of blending for compliance. To continue operation with these sources, additional treatment technology for the removal of methyl tert-butyl ether (MTBE), 1,2-dichloropropane (DCP), and 1,2,3-trichloropropane (TCP) will need to be installed. The only treatment technologies currently approved by (DDW) to simultaneously remove these VOCs is Granular Activated Carbon (GAC).

Of the VOCs found in this well field, groundwater contamination from TCP-) poses the greatest threat to future compliance. DDW has identified TCP as a primary contaminant and is actively working to develop an MCL. It is anticipated that a draft MCL will be published in late 2016 with formal issuance of an MCL in 2017. TCP has been detected in every District well at levels likely to exceed the MCL. As a result, the District currently plans on installing a GAC treatment system to ensure compliance with any new TCP-related water quality regulations.

7.2 Reliability by Type of Year

Table 7-B shows the results of SFPUC's modeling of total wholesale supply availability over the historic record through 2011. Unconstrained wholesale supply in the table is 184 mgd. SFPUC defines a single dry year as the first year that storage levels decrease to the point that system-wide water supply rationing is necessary. As the table shows, with 2015 infrastructure available wholesale supply in those years is estimated at 152.6 mgd. SFPUC's multiple dry year cycle begins with one of these years, followed by two additional dry years in which storage levels drop further, such as the 1987-88 through 1989-90 sequence. The wholesale supply in the second and third years is estimated at 129.2 mgd.

Table 7-B. SFPUC Modeled Wholesale Deliveries						
Fiscal Year	Wholesale Demand (MGD)					
	184.0	184.0	184.0	184.0	184.0	184.0
	Projected Wholesale Allocation (MGD)					
	2015	2020	2025	2030	2035	2040
1920-21	184.0	184.0	184.0	184.0	184.0	184.0
1921-22	184.0	184.0	184.0	184.0	184.0	184.0
1922-23	184.0	184.0	184.0	184.0	184.0	184.0
1923-24	184.0	184.0	184.0	184.0	184.0	184.0
1924-25	152.6	184.0	184.0	184.0	184.0	184.0
1925-26	184.0	184.0	184.0	184.0	184.0	184.0
1926-27	184.0	184.0	184.0	184.0	184.0	184.0
1927-28	184.0	184.0	184.0	184.0	184.0	184.0
1928-29	184.0	184.0	184.0	184.0	184.0	184.0
1929-30	184.0	184.0	184.0	184.0	184.0	184.0
1930-31	184.0	184.0	184.0	184.0	184.0	184.0
1931-32	129.2	152.6	152.6	152.6	152.6	152.6
1932-33	184.0	184.0	184.0	184.0	184.0	184.0
1933-34	184.0	184.0	184.0	184.0	184.0	184.0
1934-35	152.9	184.0	184.0	184.0	184.0	184.0
1935-36	184.0	184.0	184.0	184.0	184.0	184.0
1936-37	184.0	184.0	184.0	184.0	184.0	184.0
1937-38	184.0	184.0	184.0	184.0	184.0	184.0
1938-39	184.0	184.0	184.0	184.0	184.0	184.0
1939-40	184.0	184.0	184.0	184.0	184.0	184.0
1940-41	184.0	184.0	184.0	184.0	184.0	184.0
1941-42	184.0	184.0	184.0	184.0	184.0	184.0
1942-43	184.0	184.0	184.0	184.0	184.0	184.0
1943-44	184.0	184.0	184.0	184.0	184.0	184.0
1944-45	184.0	184.0	184.0	184.0	184.0	184.0
1945-46	184.0	184.0	184.0	184.0	184.0	184.0
1946-47	184.0	184.0	184.0	184.0	184.0	184.0
1947-48	184.0	184.0	184.0	184.0	184.0	184.0
1948-49	184.0	184.0	184.0	184.0	184.0	184.0
1949-50	184.0	184.0	184.0	184.0	184.0	184.0
1950-51	184.0	184.0	184.0	184.0	184.0	184.0
1951-52	184.0	184.0	184.0	184.0	184.0	184.0
1952-53	184.0	184.0	184.0	184.0	184.0	184.0

Table 7-B. SFPUC Modeled Wholesale Deliveries						
Fiscal Year	Wholesale Demand (MGD)					
	184.0	184.0	184.0	184.0	184.0	184.0
	Projected Wholesale Allocation (MGD)					
	2015	2020	2025	2030	2035	2040
1953-54	184.0	184.0	184.0	184.0	184.0	184.0
1954-55	184.0	184.0	184.0	184.0	184.0	184.0
1955-56	184.0	184.0	184.0	184.0	184.0	184.0
1956-57	184.0	184.0	184.0	184.0	184.0	184.0
1957-58	184.0	184.0	184.0	184.0	184.0	184.0
1958-59	184.0	184.0	184.0	184.0	184.0	184.0
1959-60	184.0	184.0	184.0	184.0	184.0	184.0
1960-61	152.6	184.0	184.0	184.0	184.0	184.0
1961-62	129.2	152.6	152.6	152.6	152.6	152.6
1962-63	184.0	184.0	184.0	184.0	184.0	184.0
1963-64	184.0	184.0	184.0	184.0	184.0	184.0
1964-65	184.0	184.0	184.0	184.0	184.0	184.0
1965-66	184.0	184.0	184.0	184.0	184.0	184.0
1966-67	184.0	184.0	184.0	184.0	184.0	184.0
1967-68	184.0	184.0	184.0	184.0	184.0	184.0
1968-69	184.0	184.0	184.0	184.0	184.0	184.0
1969-70	184.0	184.0	184.0	184.0	184.0	184.0
1970-71	184.0	184.0	184.0	184.0	184.0	184.0
1971-72	184.0	184.0	184.0	184.0	184.0	184.0
1972-73	184.0	184.0	184.0	184.0	184.0	184.0
1973-74	184.0	184.0	184.0	184.0	184.0	184.0
1974-75	184.0	184.0	184.0	184.0	184.0	184.0
1975-76	184.0	184.0	184.0	184.0	184.0	184.0
1976-77	152.6	184.0	184.0	184.0	184.0	184.0
1977-78	129.2	152.6	152.6	152.6	152.6	152.6
1978-79	184.0	184.0	184.0	184.0	184.0	184.0
1979-80	184.0	184.0	184.0	184.0	184.0	184.0
1980-81	184.0	184.0	184.0	184.0	184.0	184.0
1981-82	184.0	184.0	184.0	184.0	184.0	184.0
1982-83	184.0	184.0	184.0	184.0	184.0	184.0
1983-84	184.0	184.0	184.0	184.0	184.0	184.0
1984-85	184.0	184.0	184.0	184.0	184.0	184.0
1985-86	184.0	184.0	184.0	184.0	184.0	184.0

Table 7-B. SFPUC Modeled Wholesale Deliveries						
Fiscal Year	Wholesale Demand (MGD)					
	184.0	184.0	184.0	184.0	184.0	184.0
	Projected Wholesale Allocation (MGD)					
	2015	2020	2025	2030	2035	2040
1986-87	184.0	184.0	184.0	184.0	184.0	184.0
1987-88	152.6	184.0	184.0	184.0	184.0	184.0
1988-89	129.2	152.6	152.6	152.6	152.6	152.6
1989-90	129.2	152.6	152.6	152.6	152.6	152.6
1990-91	129.2	132.5	132.5	132.5	132.5	132.5
1991-92	129.2	132.5	132.5	132.5	132.5	132.5
1992-93	129.2	132.5	132.5	132.5	132.5	132.5
1993-94	184.0	184.0	184.0	184.0	184.0	184.0
1994-95	184.0	184.0	184.0	184.0	184.0	184.0
1995-96	184.0	184.0	184.0	184.0	184.0	184.0
1996-97	184.0	184.0	184.0	184.0	184.0	184.0
1997-98	184.0	184.0	184.0	184.0	184.0	184.0
1998-99	184.0	184.0	184.0	184.0	184.0	184.0
1999-00	184.0	184.0	184.0	184.0	184.0	184.0
2000-01	184.0	184.0	184.0	184.0	184.0	184.0
2001-02	184.0	184.0	184.0	184.0	184.0	184.0
2002-03	184.0	184.0	184.0	184.0	184.0	184.0
2003-04	184.0	184.0	184.0	184.0	184.0	184.0
2004-05	184.0	184.0	184.0	184.0	184.0	184.0
2005-06	184.0	184.0	184.0	184.0	184.0	184.0
2006-07	184.0	184.0	184.0	184.0	184.0	184.0
2007-08	184.0	184.0	184.0	184.0	184.0	184.0
2008-09	184.0	184.0	184.0	184.0	184.0	184.0
2009-10	184.0	184.0	184.0	184.0	184.0	184.0
2010-11	184.0	184.0	184.0	184.0	184.0	184.0

For its planning, Cal Water defines these base years simply as the single year or three-year sequence of lowest SFPUC supplies. Thus, the single dry year for Cal Water assumes a SFPUC supply of 129.2 mgd with 2015 infrastructure and 132.5 mgd in subsequent years. The multiple dry year cycle is three consecutive years in which wholesale supply is 129.2 mgd in 2015 and 132.5 mgd beginning in 2020. According to information provided by BAWSCA, the Tier 2 allocation of the 129.2 mgd would result in Cal Water supplies of 27.81 mgd. The same allocation factor would result in Cal Water supplies of 28.52 mgd corresponding to the 132.5 mgd total wholesale supply.

From the years for which the SFPUC wholesale supply is 129.2/132.5 mgd, Cal Water chose 1990 as its single dry year; this is the driest of those years in Cal Water's historical precipitation record and therefore results in the highest Cal Water demand. The three year sequence for which the supplies are 129.2/132.5 in each year is 1990-1992.[12] Cal Water will use this sequence as its multiple dry years.

Cal Water's SFPUC supply is shared among all three of its districts on the San Francisco Peninsula. This provides the operational flexibility to distribute the supply as needed in each system depending on the availability of local supplies and conditions within each district. Therefore, in this chapter as in Chapter 6, entries in all table are totals for the three districts.

Table 7-1 Retail: Basis of Water Year Data

Year Type	Base Year	Available supplies if year type repeats	
		Agency may complete these columns for volume only, percent only, or both	
		Volume available (AF)	% of avg supply
Average Year	1927	42,762	100%
Single-Dry Year	1990	33,836	
Multiple-Dry Years 1st Year	1990	33,836	
Multiple-Dry Years 2nd Year	1991	34,223	
Multiple-Dry Years 3rd Year	1992	34,223	

NOTES: Available volumes are the maximum volumes across all forecast years in Tables 7-2, 7-3, and 7-4.

7.3 Supply and Demand Assessment

Table 7-2 shows the projected supply and demand totals for the 3 districts for a normal year. In normal years the full ISG of 35.68 MGD (39,967 AF) is available. Table 7-2 shows that this supply, together with the South San Francisco District groundwater supply and the Bear Gulch District surface supply is sufficient to serve the combined demands of the three districts. (The balance between supply and demand totals excludes usage reductions that are not directly a function of Cal Water supplies, but are externally-imposed by other entities, such as the 2015 state-mandated cutbacks.)

[12] SFPUC's fiscal years are mapped to the earlier calendar year, e.g. FY 1990-91 is mapped to calendar year 1990.

Table 7-2 Retail: Normal Year Supply and Demand Comparison (AF)					
	2020	2025	2030	2035	2040 *(Opt)*
Supply totals *(autofill fm Table 6-9)*	40,225	40,280	40,647	41,149	41,767
Demand totals *(autofill fm Table 4-3)*	40,225	40,280	40,647	41,149	41,767
Difference	**0**	**0**	**0**	**0**	**0**

Table 7-3 shows the projected supply and demand totals across the 3 districts for the single dry year. Based on historical records, the local surface supply from the Bear Gulch Reservoir provides approximately 351 AFY in single dry years. The South San Francisco District's normal groundwater supply of 1,535 AFY is expected to be fully available in single dry years. The supply totals shown in Table 7-3 include these volumes as well as the available SFPUC supplies of 28.52 mgd (31,950 AF). Projected shortages exceed 20% by the end of the planning period.

Table 7-3 Retail: Single Dry Year Supply and Demand Comparison (AF)					
	2020	2025	2030	2035	2040 (Opt)
Supply totals	33,836	33,836	33,836	33,836	33,836
Demand totals	41,984	42,041	42,425	42,947	43,591
Difference	**(8,148)**	**(8,205)**	**(8,589)**	**(9,111)**	**(9,755)**
Percent Shortage	**19%**	**20%**	**20%**	**21%**	**22%**

Table 7-4 shows the projected supply and demand totals for the multiple dry years.

Based on historical records, the local surface supply from the Bear Gulch Reservoir provides an average of approximately 609 AFY in multiple dry years.[13] The South San Francisco District's normal groundwater supply of 1,535 AFY is expected to be fully available in multiple dry years. The supply totals shown in Table 7-4 include these volumes as well as the available SFPUC supplies of 28.52 mgd (31,950 AF) in each of the three years. Shortages that can exceed 20% in the first year are followed by projected second and third year shortages of between 15% and 20%.

As shown in these three tables, the District has a sufficient supply during years under normal conditions. However, during one-year or multi-year droughts, shortfalls up to 20%

[13] The first year of the three-year sequence, which is assumed to have the same hydrology (1990) as the single-dry year, provides the same surface supply (351 AF) as the single-dry year. The subsequent years are assumed to provide 738 AF.

or more are projected. Under such conditions, Cal Water will implement its Water Shortage Contingency Plan, as described below in Chapter 8. In the current drought, District customers were asked to reduce their demand by 8% as specified by the State Board Resources Control Board. The District has exceeded this amount (20% reduction based on June 2015 to March 2016 totals). Cal Water is also striving to increase the water supply portfolio for this District and for the other two peninsula districts (Mid-Peninsula and Bear Gulch). As described above, these three Districts share Cal Water's SFPUC supply, and any supply added to one of these District will benefit the others.

Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison

		2020	2025	2030	2035	2040 (Opt)
First year	Supply totals	33,836	33,836	33,836	33,836	33,836
	Demand totals	41,984	42,041	42,425	42,947	43,591
	Difference	**(8,148)**	**(8,205)**	**(8,589)**	**(9,111)**	**(9,755)**
	% Shortage	**19%**	**20%**	**20%**	**21%**	**22%**
Second year	Supply totals	34,223	34,223	34,223	34,223	34,223
	Demand totals	40,764	40,819	41,192	41,700	42,327
	Difference	**(6,541)**	**(6,596)**	**(6,969)**	**(7,477)**	**(8,104)**
	% Shortage	**16%**	**16%**	**17%**	**18%**	**19%**
Third year	Supply totals	34,223	34,223	34,223	34,223	34,223
	Demand totals	39,758	39,812	40,176	40,671	41,283
	Difference	**(5,535)**	**(5,589)**	**(5,953)**	**(6,448)**	**(7,060)**
	% Shortage	**14%**	**14%**	**15%**	**16%**	**17%**

7.4 Regional Supply Reliability

Cal Water coordinates on an ongoing basis with all relevant agencies in the region to optimize the use of regional water supplies. This includes the SFPUC, the City of San Carlos, the City of San Mateo, Silicon Valley Clean Water, and other public and private entities with which Cal Water can collaborate to protect and enhance local groundwater and surface water resources.

Cal Water also has its own aggressive conservation program that has and will continue to reduce per-capita usage and therefore demands on critical water sources. Cal Water is committed to helping its customers use water efficiently and has developed a range of water conservation programs to support this goal. To ensure that it is providing the right mix of programs in the most cost-effective manner possible, Cal Water routinely conducts comprehensive conservation program analysis and planning. This is done on a five-year cycle in tandem with the UWMP. Cal Water's current Conservation Master Plan provides the basis for the information on the implementation of and expected water savings from Demand Management Measures (DMMs) presented in Chapter 9. A copy of the Conservation Master Plan is provided in Appendix L.Cal Water also monitors and supports the goals of the Bay Area IRWMP. These goals include:

- Promote environmental, economic and social sustainability
- Improve water supply reliability and quality
- Protect and improve watershed health and function and Bay water quality
- Improve regional flood management
- Create, protect, enhance, and maintain environmental resources and habitat

Chapter 8
Water Shortage Contingency Planning

This chapter describes the water shortage contingency plan for the South San Francisco District. The water shortage contingency plan includes the stages of response to a water shortage, such as a drought, that occur over a period of time, as well as catastrophic supply interruptions which occur suddenly. The primary objective of the water shortage contingency plan is to ensure that the District has in place the necessary resources and management responses needed to protect health and human safety, minimize economic disruption, and preserve environmental and community assets during water supply shortages and interruptions.

Rule 14.1, as filed with the California Public Utilities Commission (CPUC), serves as Cal Water's Water Shortage Contingency Plan (WSCP) and includes Mandatory Staged Restrictions of Water Use. In the event that more stringent measures are required, Cal Water may request the addition of Schedule 14.1 which includes Staged Mandatory Water Use Reductions.

On April 1, 2016, Cal Water filed its current Schedule 14.1 with the California Public Utilities Commission (CPUC).[14] The Schedule lays out the staged mandatory reductions and drought surcharges associated with Cal Water's Water Shortage Contingency Plan. This filing is consistent with Resolution W-5034, adopted by the Commission on April 9, 2015, ordering compliance with requirements of the State Water Resources Control Board (SWRCB).

Schedule 14.1 is an extension of the Water Shortage Contingency Plan provided in Rule 14.1. The information presented in this chapter, is based on the current versions of both Rule 14.1 and Schedule 14.1 which are based, in part, on the specific SWRCB requirements associated with the Governor's Executive Order requiring statewide cutbacks to address the unprecedented drought.

8.1 Stages of Action

Table 8-1 defines the four stages of action in Cal Water's WSCP.

[14] Schedule 14.1, along with the underlying Cal Water Rule 14.1 are included as Appendix J.

Table 8-1 Retail: Stages of WSCP		
Stage	Complete One or Both	
	Percent Supply Reduction[1]	Water Supply Condition
	numerical value as percent	*narrative description*
1	Up to 10%	Minimal shortage
2	Up to 20%	Moderate shortage
3	Up to 35%	Severe shortage
4	Greater than 35%	Critical shortage
[1] One stage in the WSCP must address a water shortage of 50%.		

8.2 Prohibitions on End Uses

Except where necessary, to address an immediate health or safety need, or to comply with a term or condition in a permit issued by a state or federal agency, customers are prohibited, at all times, from using potable water for the following actions, as each is declared a non-essential, wasteful use of water:

1. Use of potable water through a broken or defective plumbing fixture or irrigation system when Cal Water has notified the customer in writing to repair the broken or defective plumbing fixture or irrigation system, and the customer has failed to effect such repairs within seven (7) business days of receipt of such notice;

2. The application of potable water to landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures; and,

3. The use of a hose that dispenses potable water to wash vehicles, including cars, trucks, buses, boats, aircraft, and trailers, whether motorized or not, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use.

Restrictions of water use by Stage of the Water Shortage Contingency Plan are included in Table 8-2.

Table 8-2 Retail: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
1	Landscape - Limit landscape irrigation to specific days	Limited to no more than 3 days per week	Yes
1	Landscape - Limit landscape irrigation to specific times	Limited to 8 am and 6pm	Yes
1	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Must be repaired within 5 business days	Yes
1	Landscape - Restrict or prohibit runoff from landscape irrigation		Yes
1	Landscape - Other landscape restriction or prohibition	Prohibit application of potable water to outdoor landscapes within 48 hours of measurable rainfall.	Yes
1	Other - Require automatic shut off hoses		Yes
1	Other - Prohibit use of potable water for washing hard surfaces		Yes
1	Other	Limits filling ornamental lakes or ponds; prohibit use of potable water in a water feature except where the water is recirculated	Yes
2	Landscape - Limit landscape irrigation to specific days	Limited to no more than 3 days per week	Yes
2	Landscape - Limit landscape irrigation to specific times	Limited to 8 am and 6pm	Yes
2	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Must be repaired within 3 business days	Yes
2	Landscape - Restrict or prohibit runoff from landscape irrigation		Yes
2	Landscape - Other landscape restriction or prohibition	Prohibits irrigation of ornamental turf on public street medians with potable water; prohibit application of potable water to outdoor	Yes

Table 8-2 Retail: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
		landscapes within 48 hours of measurable rainfall.	
2	CII - Lodging establishment must offer opt out of linen service		Yes
2	CII - Restaurants may only serve water upon request		Yes
2	Other - Require automatic shut off hoses		Yes
2	Other - Prohibit use of potable water for washing hard surfaces		Yes
2	Other	Limits filling ornamental lakes or ponds; prohibit use of potable water in a water feature except where the water is recirculated	Yes
3	Landscape - Limit landscape irrigation to specific days	Limited to no more than 2 days per week	Yes
3	Landscape - Limit landscape irrigation to specific times	Limited to 8 am and 6pm	Yes
3	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Must be repaired within 2 business days	Yes
3	Landscape - Restrict or prohibit runoff from landscape irrigation		Yes
3	Landscape - Other landscape restriction or prohibition	Prohibits irrigation of ornamental turf on public street medians with potable water; prohibit application of potable water to outdoor landscapes within 48 hours of measurable rainfall.	Yes
3	CII - Lodging establishment must offer opt out of linen service		Yes
3	CII - Restaurants may only serve water upon request		Yes

Table 8-2 Retail: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
3	Other - Require automatic shut off hoses		Yes
3	Other - Prohibit use of potable water for washing hard surfaces	Prohibits use of potable water for street cleaning with trucks except for initial wash-down for construction purposes if street sweeping is not feasible	Yes
3	Other	Limits filling ornamental lakes or ponds; prohibit use of potable water in a water feature except where the water is recirculated	Yes
3	Other - Prohibit use of potable water for construction and dust control	Prohibited unless no other method or source of water can be used	Yes
4	Landscape - Prohibit all landscape irrigation	Prohibited except with hand-held bucket nozzle to maintain trees and shrubs.	Yes
4	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Must be repaired within 1 business day	Yes
4	Landscape - Restrict or prohibit runoff from landscape irrigation		Yes
4	CII - Lodging establishment must offer opt out of linen service		Yes
4	CII - Restaurants may only serve water upon request		Yes
4	Other - Require automatic shut off hoses		Yes
4	Other - Prohibit use of potable water for washing hard surfaces	Prohibits use of potable water for street cleaning with trucks	Yes
4	Other	Limits filling ornamental lakes or ponds; prohibit use of potable water in a	Yes

Table 8-2 Retail: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement?
		water feature except where the water is recirculated	
4	Other - Prohibit use of potable water for construction and dust control	No exceptions	Yes

8.3 Penalties, Charges, Other Enforcement of Prohibitions

In accordance with Rule 14.1, Cal Water is authorized to take the following actions to enforce restrictions of water use that are in effect:

First Violation: Cal Water shall provide the customer with a written notice of violation.

Second Violation: If Cal Water verifies that the customer has used potable water for non-essential, wasteful uses after having been notified of the first violation, Cal Water shall provide the customer with a second written notice of violation and is authorized to install a flow-restricting device on the customer's service line.

If Schedule 14.1 is implemented, Cal Water is authorized to take the following actions when its personnel verify a customer is using potable water for non-essential, wasteful uses.

First Violation: Cal Water shall provide the customer with a written notice of violation. In addition, Cal Water is authorized to take the following actions:

A. If the customer currently receives service through a metered connection, install a real-time water measurement device on the customer's service line and provide the customer with access to information from the device. The cost of the device, including installation and ongoing operating costs, may be billed to the customer, and nonpayment may result in discontinuance of service.

B. If the customer does not currently receive service through a metered connection, install a water meter on the customer's service line, charge the customer for water use pursuant to Cal Water's metered service tariffs and rules, and install a real-time water measurement device on the customer's service line and provide the customer with access to information from the device. The cost of the device, including

installation and ongoing operating costs, may be billed to the customer, and nonpayment may result in discontinuance of service.

Second Violation: If Cal Water verifies that the customer has used potable water for non-essential, wasteful uses after having been notified of the first violation, Cal Water shall provide the customer with a second written notice of violation. In addition to the actions prescribed under the first violation above, Cal Water is authorized to take the following actions:

A. Apply the following waste of water penalties, which are in addition to any other charges authorized by this Schedule or other Cal Water tariffs.

   i. If Stage 1 is in effect, $25
   ii. If Stage 2 is in effect, $50
   iii. If Stage 3 is in effect, $100
   iv. If Stage 4 is in effect, $200

B. At its sole discretion, waive the waste of water penalty if the customer participates in a water use evaluation provided by Cal Water and/or provides documentation to Cal Water proving that a drip irrigation system, micro spray irrigation system, high-efficiency sprinkler system, or properly programmed smart irrigation controller has been installed, after a notice of violation was delivered, and is in use at the customer's service address.

Third Violation: If Cal Water verifies that the customer has used potable water for non-essential, wasteful uses after having been notified of the second violation, Cal Water shall provide the first and second violations above, Cal Water is authorized to take the following actions:

A. Apply the following waste of water penalties, which are in addition to any other charges authorized by this Schedule or other Cal Water tariffs.

   i. If Stage 1 is in effect, $50
   ii. If Stage 2 is in effect, $100
   iii. If Stage 3 is in effect, $200
   iv. If Stage 4 is in effect, $400

B. At its sole discretion, waive the waste of water surcharge if the customer participates in a water use evaluation provided by Cal Water and/or provides documentation to Cal Water proving that a drip irrigation system, micro spray irrigation system, high-efficiency sprinkler system, or properly programmed smart irrigation controller has

been installed, after notice of violations have been delivered, and is in use at the customer's service address.

Fourth Violation: If Cal Water verifies that the customer has used potable water for non-essential, wasteful uses after having been notified of the third violation, Cal Water shall provide the customer with a fourth written notice of violation. In addition to actions set forth in previous violations prescribed above, Cal Water is authorized to install a flow-restricting device on the customer's service line.

Egregious Violations: Notwithstanding the foregoing framework for penalties, customers who Cal Water has verified are egregiously using potable water for non-essential, wasteful uses are subject to having a flow- restricting device installed on their service line. After providing the customer with one notice of egregious violation, either by direct mail or door hanger, which documents the egregious use of potable water for non-essential, wasteful uses and explains that failure to correct the violation may result in the installation of a flow-restricting device on the customer's service line, Cal Water is authorized to install a flow-restricting device on the customer's service line.

DROUGHT SURCHARGES

Cal Water may elect to implement actions such as water budgets with associated surcharges through the implementation of Schedule 14.1. An example of such a program is included in Appendix J.

8.4 Consumption Reduction Methods by Agencies

Table 8-3 Retail: Stages of WSCP - Consumption Reduction Methods		
Stage	Consumption Reduction Methods by Water Supplier	Additional Explanation or Reference *(optional)*
2	Expand Public Information Campaign	
2	Offer Water Use Surveys	Offered as part of standard conservation program. Will expand as needed to achieve additional savings.
2	Provide Rebates or Giveaways of Plumbing Fixtures and Devices	Offered as part of standard conservation program. Will expand as needed to achieve additional savings.
2	Provide Rebates for Landscape Irrigation Efficiency	Offered as part of standard conservation program. Will expand as needed to achieve additional savings.
2	Decrease Line Flushing	

Table 8-3 Retail: Stages of WSCP - Consumption Reduction Methods		
Stage	Consumption Reduction Methods by Water Supplier	Additional Explanation or Reference *(optional)*
2	Reduce System Water Loss	
2	Increase Water Waste Patrols	
2	Other	Mandatory water budgets and banking-- Water budgets will be based on a customer's consumption during a historical base period and will include a percentage reduction designed to meet necessary water-use reductions.
2	Implement or Modify Drought Rate Structure or Surcharge	Drought surcharges charged to customers for each unit of water used over the established water budget for the billing period. For Stage 2 surcharges are two times the highest residential tier rate, with exceptions discussed in Section 8.3
3	Expand Public Information Campaign	
3	Offer Water Use Surveys	Offered as part of standard conservation program. Will expand as needed to achieve additional savings.
3	Provide Rebates or Giveaways of Plumbing Fixtures and Devices	Offered as part of standard conservation program. Will expand as needed to achieve additional savings.
3	Provide Rebates for Landscape Irrigation Efficiency	Offered as part of standard conservation program. Will expand as needed to achieve additional savings.
3	Decrease Line Flushing	
3	Reduce System Water Loss	
3	Increase Water Waste Patrols	
3	Other	Mandatory water budgets and banking
3	Implement or Modify Drought Rate Structure or Surcharge	Drought surcharges charged to customers for each unit of water used over the established water budget for the billing period.
4	Expand Public Information Campaign	
4	Offer Water Use Surveys	Offered as part of standard conservation program. Will expand as needed to achieve additional savings.

Table 8-3 Retail: Stages of WSCP - Consumption Reduction Methods		
Stage	Consumption Reduction Methods by Water Supplier	Additional Explanation or Reference *(optional)*
4	Provide Rebates or Giveaways of Plumbing Fixtures and Devices	Offered as part of standard conservation program. Will expand as needed to achieve additional savings.
4	Provide Rebates for Landscape Irrigation Efficiency	Offered as part of standard conservation program. Will expand as needed to achieve additional savings.
4	Decrease Line Flushing	
4	Reduce System Water Loss	
4	Increase Water Waste Patrols	
4	Other	Mandatory water budgets and banking
4	Other	Mandatory water budgets and banking
4	Implement or Modify Drought Rate Structure or Surcharge	Drought surcharges charged to customers for each unit of water used over the established water budget for the billing period.
NOTES: The actions included may be implemented through a combination of Rule 14.1 and Schedule 14.1 and would be evaluated based on specific need.		

8.5 Determining Water Shortage Reductions

All customers in the District are metered. The metered demands will be used to monitor reductions that result from actions taken by Cal Water when implementing its WSCP.

8.6 Revenue and Expenditure Impacts

In 2008 the CPUC allowed for the creation of a Water Revenue Adjustment Mechanism (WRAM) and Modified Cost Balancing Accounts (MCBA). The goals of the WRAM and MCBA are to sever the relationship between sales and revenue to remove the disincentive to reduce water use. The WRAM and MCBA are designed to be revenue neutral in order to ensure that both the utility and ratepayers are neither harmed nor benefitted.

During the current drought, the CPUC authorized a memorandum account through Resolution W-4976 to track incremental drought-related costs and waste of water penalties which may be recovered through rates if deemed appropriate by the Commission.

8.7 Resolution or Ordinance

Cal Water is an investor-owned water utility that is regulated by the California Public Utilities Commission (CPUC). As such, it does not have the authority to adopt resolutions or ordinances. As described above, Rule 14.1, as filed with the California Public Utilities Commission (CPUC), serves as Cal Water's Water Shortage Contingency Plan and includes Mandatory Staged Restrictions of Water Use. In the event that more stringent measures are required, Cal Water may request the addition of Schedule 14.1 which includes Staged Mandatory Water Use Reductions. Cal Water will work with local planning and enforcement departments to ensure consistency with local resolutions and ordinances.

8.8 Catastrophic Supply Interruption

Cal Water has an Emergency Response Plan (ERP) in place that coordinates the overall company response to a disaster in any or all of its districts. In addition, the ERP requires each District to have a local disaster plan that coordinates emergency responses with other agencies in the area.

Cal Water also inspects its facilities annually for earthquake safety. To prevent loss of these facilities during an earthquake, auxiliary generators and improvements to the water storage facilities have been installed as part of Cal Water's annual budgeting and improvement process.

There are currently seven emergency connections with neighboring water systems. These connections will help to prevent the complete interruption of service in the event of a failure of water supply facilities by allowing water to be delivered to either system.

Mains, tanks, and pump stations are designed to deliver fire flows for normal residential, commercial, and industrial fires. Most storage tanks are designed to provide fire flows for minimum two hour duration. Facilities are not designed to handle wild fires such as the Oakland Hills fire, nor extended power outages that could be possible after a major forest fire, earthquake, or other disaster.

All Company field offices, including South San Francisco's, have backup generators for emergency radio, telephone, lights, fuel pumping, and computer control. Base radio transmitters have emergency power backup either by generator power or battery backup.

Cal Water has backup generators installed at two of its distribution sites as well as a portable generator for the district. While a majority of the water is supplied directly by the SFPUC, for those facilities that do require pumping there is permanent backup power installed.

8.9 Minimum Supply Next Three Years

Table 8-4 provides estimates of total supply volumes that would be produced if the hydrology of the multi-year drought period discussed in Chapter 7 were to occur in the immediate future. These volumes are equal to the projected 2020 supplies in Table 7-4.

Table 8-4 Retail: Minimum Supply Next Three Years (AF)			
	2016	2017	2018
Available Water Supply	7,266	7,300	7,296

Chapter 9
Demand Management Measures

This chapter provides a summary of past and planned demand management measure (DMM) implementation in the South San Francisco District, as well as an overview of the expected water savings and projected compliance with the Water Conservation Act of 2009 (SB X7-7).

This chapter contains the following sections:

9.1 Demand Management Measures for Wholesale Agencies

9.2 Demand Management Measures for Retail Agencies

9.3 Implementation over the Past Five Years

9.4 Planned Implementation to Achieve Water Use Targets

9.5 Members of the California Urban Water Conservation Council

9.1 Demand Management Measures for Wholesale Agencies

Because the South San Francisco District is a retail water supplier, this section does not apply.

9.2 Demand Management Measures for Retail Agencies

Cal Water centrally administers its conservation programs for its 24 districts. For purposes of this section, these programs have been grouped in accordance with the DMM categories in Section 10631(f) of the UWMP Act. These categories are:

(i) Water waste prevention ordinances
(ii) Metering
(iii) Conservation pricing
(iv) Public education and outreach
(v) Distribution system water loss management
(vi) Water conservation program coordination and staffing support, and
(vii) Other demand management measures

Following are descriptions of the conservation programs Cal Water operates within each of these DMM categories.

9.2.1 Water Waste Prevention Ordinances

Because of its investor owned status Cal Water enforcement of water use restrictions is authorized by the CPUC through Rule 14.1 or Schedule 14.1. Restrictions may also be regulated by ordinances passed by the local governments in each community served. Cal Water has worked with municipalities to pass ordinances and coordinate activities. Cal Water will continue this effort on an ongoing basis.

Due to worsening drought conditions, Cal Water filed Schedule 14.1 with the CPUC in the spring of 2015 which went into effect on June 1, 2015. Cal Water's Schedule 14.1 filing, which applies to both residential and non-residential customers, is responsive to Governor Brown's emergency drought declaration and executive order requiring a statewide 25% reduction in urban potable water use. It also complies with regulations adopted by the State Water Resources Control Board (State Board) and the CPUC to achieve that reduction by the end of February 2016. Schedule 14.1 puts measures in place to enable Cal Water to enforce the water-use prohibitions set by the State Board, including:

- Applying water to outdoor landscapes that causes runoff onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures
- Using a hose to wash motor vehicles unless the hose is fitted with a shut-off nozzle or device that causes it to cease dispensing water immediately when not in use
- Applying water to driveways and sidewalks
- Using water in a fountain or other decorative water feature, except where the water is part of a recirculating system
- Applying water to outdoor landscapes during and within 48 hours after measurable rainfall
- Using potable water to irrigate outside of new construction without drip or microspray systems
- Using potable water on street medians
- Filling or refilling ornamental lakes or ponds except to sustain existing aquatic life

Additionally, Schedule 14.1 requires that:

- Customers must fix leaks within their control within five business days of notification
- Hotel/motel operators must provide option to not have towels or linens laundered daily during a guest's stay, and must provide clear notice of this option in easy-to-understand language

- Restaurants and other eating and drinking establishments may only serve drinking water upon request

With the approval of the Schedule 14.1 filing, beginning June 1, 2015, individual customers in each Cal Water district were provided water budgets based upon their water use each month in 2013 minus the state-mandated reduction for the South San Francisco District of 8%. If a customer used less than his or her water budget, the unused water was carried forward, similar to rollover minutes on a cell phone plan. Water used in excess of the monthly budget was subject to a drought surcharge. The surcharge was discounted for customers on Cal Water's Low-Income Rate Assistance (LIRA) program. To help with compliance, the customer's monthly bill showed his or her water budget for the following month. Customers' water use history back to 2011 and their water budgets were also available online beginning in June of 2015.

Cal Water's Schedule 14.1 filing is included as Appendix J of this UWMP.

9.2.2 Metering

All service connections within the South San Francisco District are metered. Meters are read monthly and routinely maintained and calibrated. Customers are billed monthly based on their metered water use.

Cal Water is also piloting automatic meter reading (AMR) and advanced metering infrastructure (AMI) in several of its districts. AMI may be used by Cal Water in the future to detect and alert households of leaks and other possible problems as well as to provide customers with tailored water use information to help them use water more efficiently.

9.2.3 Conservation pricing

As an investor owned utility, Cal Water rates and charges are reviewed and authorized by the CPUC every three years. Starting in 2008 Cal Water adopted tiered rate designs for single family residential service. Uniform volumetric rate designs are employed by Cal Water for other water service classes. Current volumetric rates by class of service within South San Francisco District are provided in Table 9-1.

Table 9-1: Volumetric Water Rates by Class of Service ($/CCF)

Class of Service	Tier 1 (1-7 ccf)	Tier 2 (8-12 ccf)	Tier 3 (13+ ccf)	All units of water
Single Family	$5.21	$5.83	$7.21	
Non Residential				$5.83

Per the Memorandum of Understanding Regarding Urban Water Conservation in

California (MOU), conservation pricing provides economic incentives to customers to use water efficiently via a volumetric water rate. The MOU considers uniform, seasonal, tiered (block), and allocation-based rate designs as each being potentially consistent with conservation pricing, provided that either (1) 70% or more of total annual revenue is derived from the volumetric component of the rate design or (2) the proportion of total revenue from the volumetric component of the rate design equals or exceeds the long-run incremental cost of providing water service, or (3) the utility's metering technology, rate structure, and customer communication programs satisfy various requirements specified by the MOU.

The South San Francisco district's rate structure complies with Option 1 of the Urban MOU's definition of conservation pricing. Urban MOU BMP compliance reports are provided in Appendix L.

9.2.4 Public Education and Outreach

Cal Water's public outreach program is divided into four components, as follows:

Residential Customer Assistance – This category provides tailored assistance to residential customers through home water surveys and monthly water use reports. It provides assistance to residential customers wanting to reduce their indoor and outdoor water uses. While available to all residential customers, marketing of home water surveys is generally focused on high use residential customers.

Non-Residential Customer Assistance – This category provides tailored assistance to commercial customers through commercial water surveys, monthly landscape reports to large landscape customers, and large landscape water use surveys. It provides assistance to commercial customers wanting to reduce their use of water for sanitation, hygiene, process, and landscape purposes.

Public Information and School Education – Cal Water's public information program provides general information on the need for and value and methods of water conservation through multiple media outlets, including its website, direct mail, external print media, and radio. Cal Water's school education program includes the Cal Water H2O Challenge, a project-based learning competition for grades 4-6, Cal Water Town, an interactive online learning tool, and general information and learning materials for students and teachers.

Rebate Program Information and Marketing – Through its website, bill inserts, newsletters, and radio and print media, Cal Water advertises and markets a variety of conservation rebate programs, including rebate programs for high-efficiency toilets, urinals, and clothes washers, and irrigation equipment and landscape efficiency improvements.

9.2.5 Programs to Assess and Manage Distribution System Real Loss

Per the MOU, Cal Water annually quantifies the district's volume of apparent and real water loss. Cal Water's conservation staff have received training in the AWWA water audit method and component analysis process and have completed water balances for each Cal Water district using AWWA's water audit software. For the five-year period 2011-2015, apparent and real water loss in the South San Francisco District averaged 267 AF, or approximately 3 percent of total production.

In addition to its routine and planned system maintenance and water loss reporting, Cal Water is planning to implement a lift-and-shift sonic data logger leak detection program in the District starting in 2017. The lift-and-shift program will survey up to one-third of main miles annually in three shifts. Each leak detection shift will last approximately 80 days. Lift-and-shift sonic data logging technology will enable Cal Water to quickly and efficiently locate leaks in one part of the water distribution network and then redeploy the equipment to another part of the network. Staff will review sound files from the loggers for potential leak warnings and discuss this information with District management, who can then assign work orders for repair crews to investigate and repair leaks. Cal Water conservatively estimates the lift-and-shift program will reduce real water loss in the District by up to 30 AFY – enough water for about 90 households. Additional potential benefits of the program include reduced excavation of streets, less staff overtime spent responding to and repairing catastrophic main breaks, and improvement to the best management practices of the valve maintenance program. This program was submitted as part of Cal Water's 2015 General Rate Case with the CPUC and is subject to CPUC approval prior to implementing.

9.2.6 Water Conservation Program Coordination and Staffing Support

Because of its status as an investor owned utility, conservation program staffing positions must be approved by the CPUC through its General Rate Case every three years. Currently authorized conservation program staffing consists of five full-time positions, which include:

- One Conservation Program Manager
- One Conservation Program Analyst
- One Landscape Program Analyst
- Two Conservation Program Coordinators

These five staff positions manage all aspects of Cal Water's conservation programs deployed across 24 separate districts serving a combined population of about 2 million through 470,000 service connections. Staffing constraints have been one of the primary challenges Cal Water has faced in expanding the scope and reach of its conservation

programs throughout its service districts. To ensure adequate management and oversight of the expansion and utilization of its conservation programs, Cal Water is proposing in its current General Rate Case to add three additional Conservation Program Coordinator positions. Proposed staffing is summarized in Table 9-2. If approved, total staffing level would increase from 5 to 8 FTE positions. While this would still be below the average for conservation programs of similar size and scope operated by other water utilities, it would be a substantial improvement over Cal Water's current conservation program staffing levels.

Table 9-2: Planned Conservation Program Staffing

Staff Position	Responsibilities	Position Status
Conservation Program Manager	Long-term program planning and implementation; program budgeting and oversight; staff oversight and management; contracting and oversight of outside services	Existing
Conservation Program Coordinator	Management and oversight of conservation programs in Cal Water districts	2 Existing 3 Proposed
Conservation Program Analyst	Program analysis and reporting, including but not limited to preparation of reports related to CPUC requirements, urban water management plans, BMP compliance reports, and SB X7-7 compliance reports	Existing
Landscape Program Analyst	Analysis and tracking of landscape program implementation and performance; coordination of landscape program rollouts; GIS/GPS management; assist regional conservation program coordinators with management/oversight of landscape programs	Existing

9.2.7 Other Demand Management Measures

In addition to the DMM programs described above, Cal Water operates rebate, give-away, and direct installation programs aimed at plumbing fixture replacement and irrigation equipment and landscape efficiency improvements. Following are brief descriptions of each of these DMMs.

MaP Premium and Non-Premium Toilet Replacement – This program replaces old toilets with MaP certified high-efficiency toilets. Financial rebates, direct installation, and direct distribution are used to deliver toilets to customers. For residential customers, MaP premium certified toilets which have greater water savings potential are eligible for a $100 rebate while the rebate for MaP non-premium toilets is $50. For commercial customers, a rebate of $100 is available for valve-type toilets flushing 1.28 gallons or less and EPA WaterSense labeled tank-type toilets. Cal Water centrally administers the program. This program is available to all residential and non-residential customers. Cal Water markets the program through direct mail, print media, bill stuffers, and its website. Where advantageous, Cal Water partners with local or regional agencies and community organizations to offer the program.

Urinal Valve and Bowl Replacement – This program replaces old urinals with high-efficiency urinals meeting the new 0.125 gallon per flush water use standard adopted by the California Energy Commission in April 2015. Financial rebates of up to $150 are available to customers. The program targets offices and public buildings receiving significant foot traffic. Cal Water centrally administers the program. While this program is available to all non-residential customers, marketing focuses on prime targets, such as restaurants and high-density office buildings. Cal Water markets the program through direct mail, print media, bill stuffers, and its website.

Clothes Washer Replacement – This program provides customer rebates up to $150 for residential and up to $200 for non-residential high-efficiency clothes washers. The program targets single-family households, multi-family units, multi-family common laundry areas, and commercial coin-op laundries. Cal Water centrally administers the program, and markets the program through direct mail, print media, bill stuffers, and its website. This program is available to all residential and non-residential customers. Where advantageous, Cal Water partners with local or regional agencies to offer the program.

Residential Conservation Kit Distribution – This program offers Cal Water residential customers conservation kits featuring a range of water-saving plumbing retrofit fixtures. Kits are available at no charge to customers, who can request them via Cal Water's website, via mail, or by contacting or visiting their district. Each kit includes the following items: high-efficiency showerheads, kitchen faucet aerator, bathroom faucet aerators, full-stop hose nozzle, and toilet leak detection tablets. Cal Water centrally administers this program as part of a company-wide program operated in each of its districts. This program is available to all residential customers. Cal Water markets the program through direct mail, print media, bill stuffers, and through its website.

Smart Controllers Rebates/Vouchers – This program targets residential and non-residential customers with high landscape water use. The program offers financial incentives up to $125 for residential controllers and up to $25 per station for commercial-

grade controllers to either the customer or contractor for proper installation of the Smart Controller at customer sites. The landscape contractor has the direct relationship with customers and is typically the entity customers listen to when making landscape and irrigation decisions. The program educates contractors about the customer benefits of Smart Controllers along with proper installation of the devices. This program is offered to all residential and non-residential customers. Cal Water markets the program through direct mail, print media, bill stuffers, and its website.

High Efficiency Irrigation Nozzle Web Vouchers/Rebates – Water efficient sprinkler nozzles (popup and rotating) and integrated pressure-regulated spray bodies use significantly less water than a standard sprinkler head by distributing water more slowly and uniformly to the landscape. In addition to reducing water use, water directed from these nozzles reduces run-off onto streets and sidewalks with a more directed flow. Customers are able to obtain the nozzles and spray bodies either directly through Cal Water or via a web-voucher program. Restrictions on the number of nozzles individual customers may receive vary by customer class and/or landscape size. Cal Water centrally administers this program as part of a company-wide program operated in most of its districts.

Turf Buy-Back – This program offers customers a $1 per square foot rebate to replace turf with qualified drought-tolerant landscaping. Customer applications are screened to ensure program requirements are met, including before and after photos of the retrofitted landscape area. Turf replacement rebates were offered in a subset of Cal Water districts starting in 2014 and offered across all districts starting in 2015 as a drought response measure. Governor Brown's Executive Order B-29-15 calls on the Department of Water Resources to lead a statewide initiative, in partnership with local agencies, to replace 50 million square feet of lawns and ornamental turf with drought tolerant landscapes.

Table 9-3 summarizes the DMMs currently available to South San Francisco District customers.

Table 9-3: Cal Water DMMs Available to South San Francisco District Customers			
1. Plumbing Fixture Replacement	Customer Class Eligibility		
Rebates	SFR	MFR	COM
MaP Premium Toilet	✓	✓	✓
MaP Non-Premium Toilet	✓	✓	✓
Urinal Bowl & Valve (< 0.125 gal)			✓
Clothes Washer (In Unit)	✓	✓	
Clothes Washer (Commercial)		✓	✓
Direct Install			
MaP Premium Toilet	✓	✓	
MaP Non-Premium Toilet			
Urinal Valve (< 0.125 gal)			
Direct Distribution			
MaP Premium Toilet	✓	✓	
Conservation Kits (showerheads, aerators)	✓		✓
2. Irrigation Equipment/Landscape Upgrades			
Rebates/Vouchers			
Smart Irrigation Controller	✓	✓	✓
High Efficiency Irrigation Popup Nozzle	✓	✓	✓
High Efficiency Irrigation Rotating Nozzle	✓	✓	✓
High Efficiency Irrigation Spray Body		✓	✓
Turf Buy-Back	✓	✓	✓
Direct Distribution			
Smart Irrigation Controller		✓	✓
3. Residential Customer Assistance			
Residential Water Survey	✓	✓	
4. Non-Residential Customer Assistance			
Commercial Water Use Surveys			✓
Monthly Water Use Report			✓
Large Landscape Water Use Survey			✓
Note: MaP Premium toilets: flush vol <= 1.1 gallons; MaP Non-Premium: flush vol <= 1.28 gallons.			

9.3 Implementation over the Past Five Years

Implementation of customer DMMs over the past five years is summarized in Table 9-4. Estimated annual and cumulative water savings from customer DMM implementation is shown in the last row of the table. The water savings estimates are only for the customer DMMs listed in Table 9-3. They do not include water savings from water waste prevention ordinances, conservation pricing, general public information, or distribution system water loss management DMMs. Estimated water savings shown in Table 9-4 were calculated with the Alliance for Water Efficiency's Water Conservation Tracking Model.

Significant additional reductions in water demand were achieved in 2015 in response to the District's drought response measures, including its public information campaigns to save water and its Schedule 14.1 water use restrictions, water budgets, and drought surcharges that went into effect June 1, 2015. Relative to its 2013 reference year under the State Board's Emergency Regulation for Statewide Urban Water Conservation, water demand between June and December 2015 decreased by 21.7 percent. Per capita potable water use in 2015 was 103 GPCD compared to the District's SB X7-7 2015 interim water use target of 137 GPCD. As discussed in Chapter 5 and the next section, for purposes of SB X7-7 compliance, the District has formed a regional alliance with Cal Water's four other Bay Area water districts. Per capita potable water use in 2015 for the regional alliance was 110 GPCD compared to the regional alliance's 2015 interim water use target of 164 GPCD.

Table 9-4: Implementation of Customer DMMs: 2011-2015		
1. Plumbing Fixture Replacement	2011 – 2015 Total	Average Annual
Toilets & Urinals (number distributed)	2,776	555
Clothes Washers (number distributed)	1,554	311
Conservation Kits (number distributed)	1,787	357
2. Irrigation Equipment/Landscape Upgrades		
Smart Controllers (number distributed)	6	1
Nozzles & Spray Bodies (number distributed)	2,135	427
Turf Buy-Back (sq ft removed)	6,905	1,381
3. Residential Customer Assistance		
Surveys/Audits (homes receiving)	96	19
4. Non-Residential Customer Assistance		
Surveys/Audits (sites receiving)	13	3
Large Landscape Reports (sites receiving)	393	79
Estimated Water Savings (AF)	**401**	**80**
Note: Estimated water savings shown in the table are only for the 2011-2015 period. Water savings from customer DMMs implemented between 2011 and 2015 will continue after 2015 and last for the useful life of each DMM.		

Annual expenditure for implementation of customer DMMs over the past five years is summarized in Table 9-5. The table highlights expenditures from 2011 through 2015 for administrative, research, planning, program, and public information and school education.

Table 9-5: Annual DMM Expenditure: 2011-2015		
Expenditure Category	2011 – 2015 Total	Average Annual
Admin, R&D, planning	$276,094	$55,219
Program expenditures & incentives	$1,124,657	$224,931
Public information & school education	$155,221	$31,044
Total	**$1,555,971**	**$311,194**

9.4 Planned Implementation to Achieve Water Use Targets

Planned implementation of customer and water loss management DMMs for the period 2016 to 2020 are summarized in Table 9-6. Estimated annual and cumulative water

savings from customer and water loss management DMM implementation is shown in the last two rows of the table. The water savings estimates are only for the customer DMMs listed in Table 9-3 plus the leak detection program Cal Water has proposed to start in 2017. They do not include potential water savings from water waste prevention ordinances, conservation pricing, or general public information and school education DMMs. Estimated water savings shown in Table 9-6 were calculated with the Alliance for Water Efficiency's Water Conservation Tracking Model.

In addition to the DMMs shown in Table 9-6, Cal Water will continue to fully implement the water loss ordinance, metering, conservation pricing, public outreach, and conservation program coordination and staffing support DMMs described previously.

Annual expenditure for DMM implementation in the South San Francisco district, including pro-rated staffing costs, is expected to average $0.38 million. Cumulative expenditure for DMM implementation for the period 2016-2020 is expected to total $1.92 million. Of this total, approximately 55% is earmarked for plumbing fixture, irrigation equipment, and landscape efficiency upgrades; 16% is earmarked for public information and school education programs; 4% is earmarked for distribution system water loss management; 5% is earmarked for site surveys/audits and customer water use reports; and 19% is earmarked for administrative and labor costs.

Because Cal Water is an investor-owned utility, the planned programs and corresponding expenditures for the next five years are subject to CPUC review and approval. The amount of program implementation for 2016 shown in Table 9-6 is what was approved in Cal Water's last General Rate Case. The amounts of program implementation for 2017-2019 are what Cal Water has proposed in its current General Rate Case. Conservation programs and budgets for 2020 will be determined by the subsequent General Rate Case. However, the amounts shown for 2020 in Table 9-6 are consistent with the amounts recommended in Cal Water's current Conservation Master Plan (see Appendix L).

Table 9-6: Planned Implementation of Customer and Water Loss Management DMMs: 2016-2020					
1. Plumbing Fixture Replacement	2016	2017	2018	2019	2020
Toilets & Urinals (number distributed)	1,142	453	453	453	453
Clothes Washers (number distributed)	453	305	305	305	305
Conservation Kits (number distributed)	221	175	175	175	175
2. Irrigation Equipment/Landscape Upgrades					
Smart Controllers (number distributed)	28	8	8	8	8
Nozzles & Spray Bodies (number distributed)	8,120	2,700	2,700	2,700	2,700
Turf Buy-Back (sq ft removed)	25,000	25,000	25,000	25,000	25,000
3. Residential Customer Assistance					
Monthly home water reports (homes receiving)	4,181	4,181	4,181	4,181	4,181
Surveys/Audits (homes receiving)	100	30	30	30	30
4. Non-Residential Customer Assistance					
Surveys/Audits (sites receiving)	0	0	0	0	0
Large Landscape Reports (sites receiving)	0	0	0	0	0
5. Water Loss Management					
Leak Detection (miles of main)	0	16	25	33	33
Estimated Annual Water Savings (AFY)	**100**	**136**	**164**	**192**	**211**
Cumulative Water Savings (AF)	**100**	**236**	**401**	**593**	**803**

Cal Water puts all proposed conservation programs through a rigorous benefit-cost analysis as part of a comprehensive program review and assessment process. The benefit-cost analysis yields information on expected water savings over the useful life of each DMM, cost of water savings, and avoided water supply cost of water savings. Results are used to rank programs in terms of cost-effectiveness, calculate the overall program unit cost of saved water and program benefit-cost ratio for each district, and develop district conservation budgets. The proposed DMMs for the South San Francisco District have an overall program unit cost of saved water of $794/AF (in 2015 dollars) and a benefit-cost ratio of 2.5. The unit cost of saved water includes all direct program costs associated with implementation of the proposed conservation programs.

Projected SB X7-7 compliance water use for South San Francisco District in 2020 under planned levels of DMM implementation is 120 GPCD compared to its target water use of 124 GPCD.

SB X7-7 allows water suppliers to form regional alliances and set regional targets for purposes of compliance. Under the regional compliance approach, water suppliers within the same hydrologic region can comply with SB X7-7 by either meeting their individual target or being part of a regional alliance that meets its regional target. The regional target is calculated as the population-weighted average target for the water suppliers comprising the regional alliance.

For purposes of SB X7-7 compliance, the South San Francisco District has formed a regional alliance with Cal Water's four other Bay Area water districts. Projected 2020 potable water demand for the regional alliance under planned levels of DMM implementation is 149 GPCD compared to a regional alliance target of 150 GPCD.

South San Francisco District is projected to be in compliance with SB X7-7 in 2020 both individually and as a member of its regional alliance.

9.5 Members of the California Urban Water Conservation Council

Cal Water is a member of the California Urban Water Conservation Council (CUWCC). CUWCC members have the option of submitting their 2013–2014 Best Management Practice (BMP) annual reports in lieu of, or in addition to, describing the DMMs in their UWMP (CWC 10631). The BMP annual reports for the South San Francisco District are provided in Appendix L.

Chapter 10
Plan Adoption, Submittal, and Implementation

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

This chapter includes the following sections:

10.1 Inclusion of All 2015 Data

This UWMP includes the water use and planning data for the entire calendar year of 2015, per DWR UWMP Guidelines (pg. 2-11).

10.2 Notice of Public Hearing

Prior to adopting the Plan, Cal Water held two formal public hearings to present information on its South San Francisco District UWMP. The first on June 13, 2016, 10:00 AM at the following location:

Municipal Services Building, City Council Chambers
33 Arroyo Drive
South San Francisco, CA 94080

And the second public hearing on June 13, 2016, 5:30 PM at the following location:

Bayshore Customer Center
341 North Delaware Street
San Mateo, CA 94401

Two audiences were notified of the UWMP review at least 60 days prior to the public hearing: cities and counties, and the public. These audiences were noticed again with the specific date, time and location of the hearing at least two weeks prior to the public hearing. The notice to the public, as specified in Government Code 6066, can be found in Appendix D. Table 10-1 lists the cities and counties notified.

10.2.1 Notice to Cities and Counties

Table 10-1 Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
City of South San Francisco	✓	✓
City of Colma	✓	✓
City of Daly City	✓	✓
County Name	60 Day Notice	Notice of Public Hearing
San Mateo County	✓	✓

10.2.2 Notice to the Public

Notification to the public and to cities and counties also provided instructions on how to view the 2015 UWMP prior to the hearing, the revision schedule, and contact information of the UWMP preparer. A copy of this notice is included in Appendix D.

10.3 Public Hearing and Adoption

The deadline for public comments was June 20, 2016, one week after the public hearing. The final plan was formally adopted by Cal Water's Vice President of Engineering on June 20, 2016, and was submitted to California Department of Water Resources within 30 days of approval. Appendix B presents a copy of the signed Resolution of Plan Adoption. Appendix C contains the following:

- Letters sent to and received from various agencies regarding this plan
- Correspondence between Cal Water and participating agencies

10.4 Plan Submittal

This UWMP was submitted to DWR within 30 days of adoption and by the July 1, 2016 deadline. The submittal was done electronically through WUEdata, an online submittal tool. The adopted Plan was also sent to the California State Library and to the cities and counties listed in Table 10-1.

10.5 Public Availability

On or about May 30, 2016, a printed hard-copy of the Draft 2015 Urban Water Management Plan and the Conservation Master Plan were made available for review during normal business hours at the Bayshore District Customer Center, located at 341 North Delaware Street, San Mateo, CA 94401. An electronic version was also made available by visiting Cal Water's website:

https://www.calwater.com/conservation/uwmp.

10.6 Amending an Adopted UWMP

If the Plan is amended, each of the steps for notification, public hearing, adoption and submittal will also be followed for the amended plan.

Appendix A: UWMP Act Checklist

Appendix B: Resolution to Adopt UWMP

Appendix C: Correspondences

Appendix D: Public Meeting Notice

Appendix E: Service Area Map

Appendix F: Projection Analysis Worksheets (PAWS)

Appendix G: Supplemental Water Supply Information

Appendix H: DWR UWMP Tables Worksheets

Appendix I: DWR SB X7-7 Verification Forms

Appendix J: Schedule 14.1 and Local Conservation Ordinances

Appendix K: Water Efficient Landscape Guidelines

Appendix L: Conservation Master Plan

Appendix M: DWR/AWWA Water Balance Worksheet