California Water Service

2015 Urban Water Management Plan

Visalia 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 Visalia District since 1926 with the purchase of the Visalia Water Company. The District serves the communities of Visalia, Mullen, and Tulco.

The UWMP is a foundational document and source of information about Visalia 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 Visalia 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 Visalia 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, Visalia 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.

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

Visalia 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)
5410016	Visalia	41,899	24,762
5410045	Fairway	Consolidated with Visalia	
5400935	Mullen Water System	42	21
5410046	Oak Ranch	Consolidated with Visalia	
5410041	Tulco Water System	179	70
	Total	**42,120**	**24,853**

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 region in which the Visalia District is located, Cal Water participates with the Kaweah Delta Water Conservation District (KDWCD), the City of Visalia and others in the Groundwater Management Plan (GMP) established under the provisions of Assembly Bill 3030. KDWCD is the lead agency in this effort. KDWCD has historically focused on the conservation of flows of the Kaweah River for groundwater recharge. Cal Water is also a stakeholder group participant to Kaweah River Basin Integrated Regional Water Management Plan adopted December 2014.

2.3 Individual or Regional Planning and Compliance

Urban water suppliers may elect to prepare individual or regional UWMPs (CWC §10620(d)(1)). Visalia 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, Visalia 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: Visalia 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: Visalia 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 Visalia 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. Visalia 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
Visalia District has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.
Wholesale Water Supplier Name
The Visalia District does not receive water from wholesale water suppliers

2.5.2 Coordination with Other Agencies and the Community

Visalia 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 May 11, 2016, to present the draft of the UWMP, address questions, and receive comments. Cities and counties receiving the public hearing notification from Visalia 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 Visalia 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

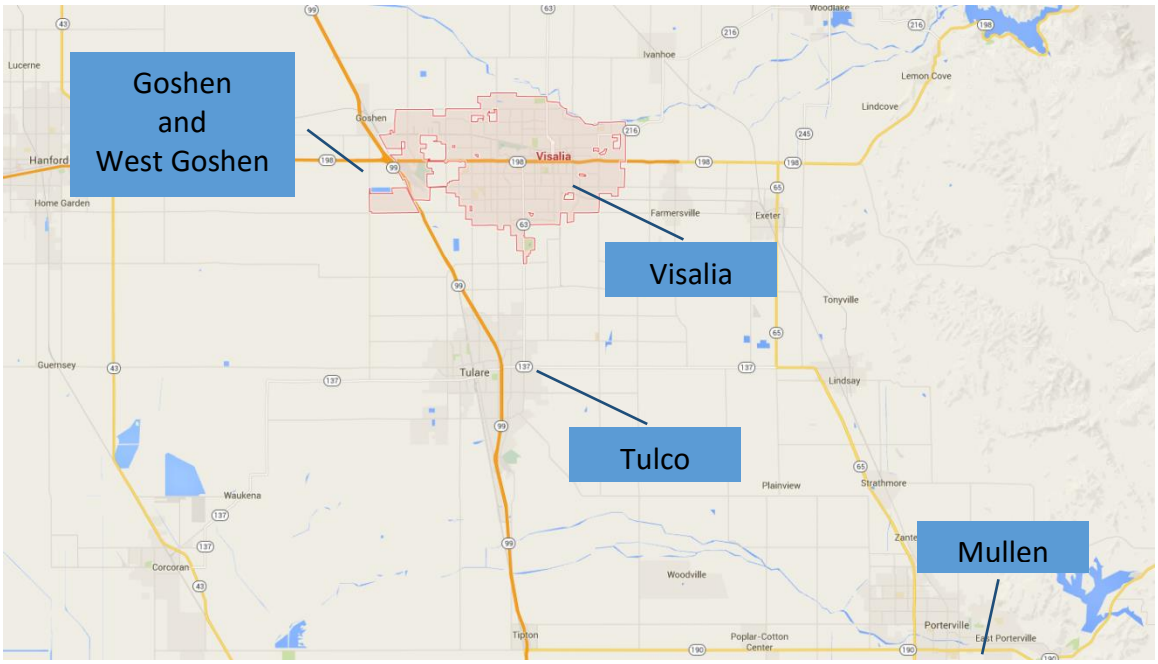
3.1 Service Area General Description

The Visalia District is located in Tulare County, serving the City of Visalia and segments of unincorporated Tulare County including the communities of Goshen, Mullen, and Tulco. It is situated in the Tulare Lake hydrologic region, within the King-Kaweah-Tule Rivers sub-area. The service area is built upon the alluvium of the Kaweah River. The District lies approximately 42 miles southeast of the City of Fresno and 75 miles north of the City of Bakersfield. Major transportation links in the District include the Golden State Highway (State Route 99), State Route 63 and State Route 198. The Southern Pacific and the Atchison, Topeka and Santa Fe Railroads provide rail service to the region. Figure 3-1 shows a general location map of the District.

The Kaweah River provides drainage for the southern Sierra Nevada Mountains. This river splits east of Visalia forming the St. Johns River that flows just north of Visalia while the Kaweah River continues south. Lake Kaweah is located on the Kaweah River about twenty miles upstream from the city. This 183,000 AF reservoir is operated by the U.S. Army Corps of Engineers and provides both flood control and irrigation water storage.

The Visalia District was formed in 1926 with the purchase of the Visalia Water Company. The District delivers local groundwater and operates 73 wells across the four service areas. Over the last five years, the District delivered an average of 27 million gallons of water per day to 42,120 service connections.

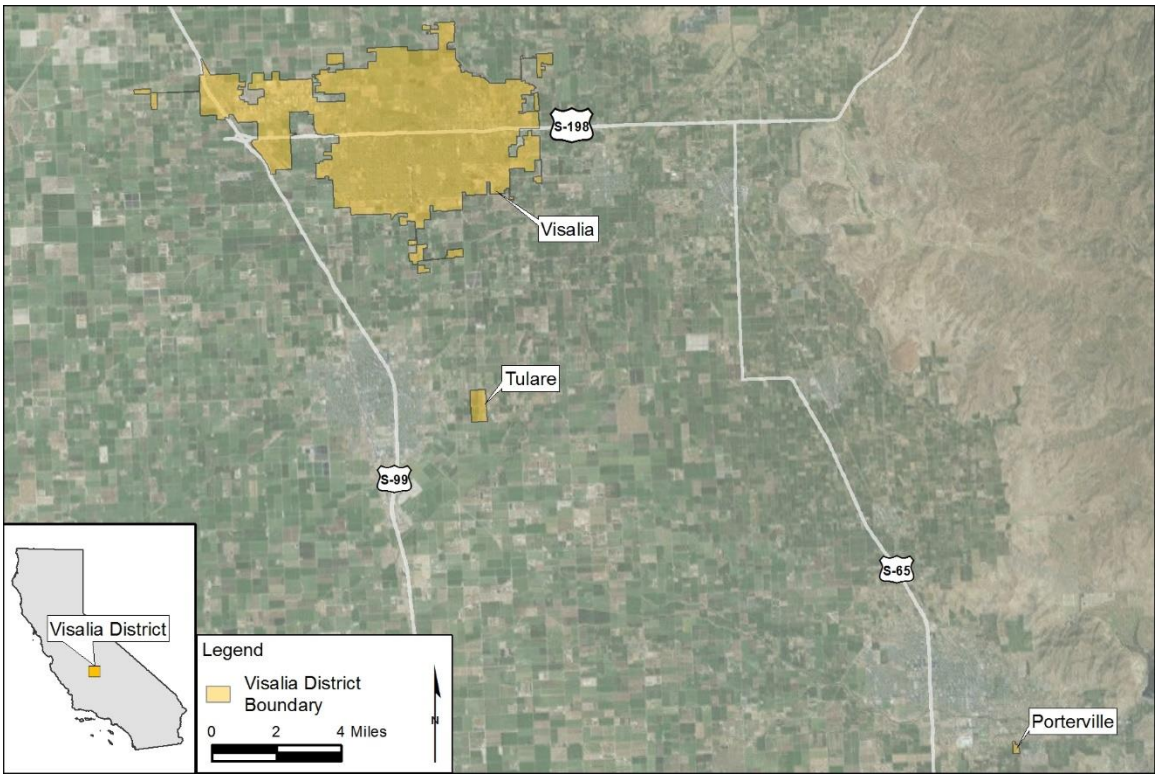
Figure 3-1. General Location of Visalia District Service Areas



3.2 Service Area Maps

A detailed service area map is provided in Appendix E. Figure 3-2 shows the District's Visalia and Goshen service areas boundaries.

Figure 3-2. Visalia District Service Area Boundaries



3.3 Service Area Climate

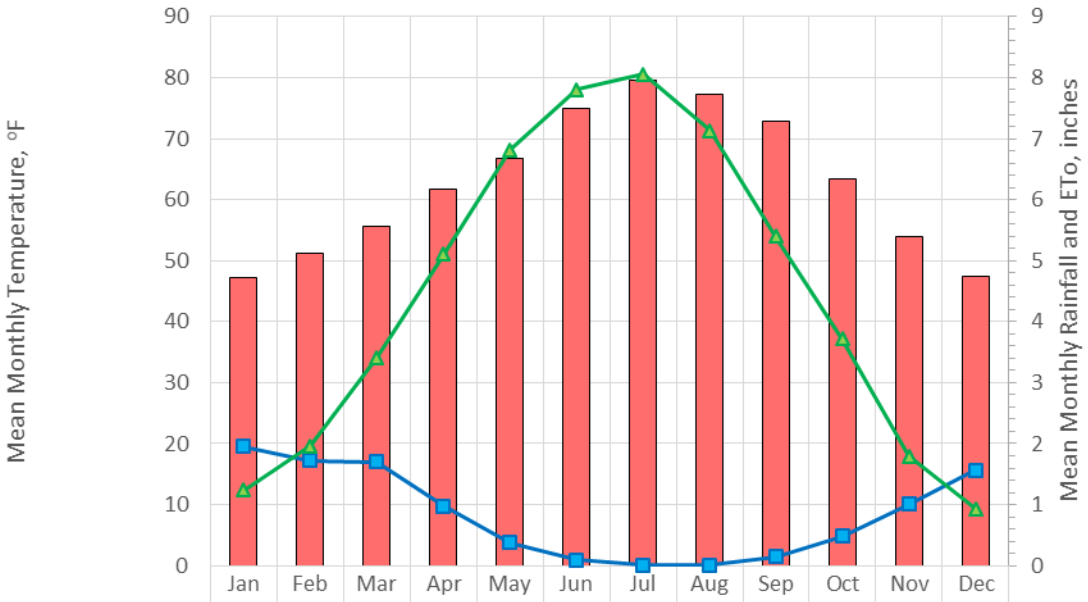
The climate for the Visalia District is moderate with hot dry summers and cool winters. The majority of precipitation falls during late autumn, winter, and spring. Figure 3-3 displays monthly averages for rainfall, reference evapotranspiration (ETo), and daily air temperature. Additional climate data is provided in Appendix F, worksheet 13. 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 10 inches of rainfall, annually. ETo averages 53 inches, annually. Annual rainfall is 19 percent of ETo, on average. This indicates that the Visalia District is located in a water-deficient environment. The desert landscape with poorly developed soils and scrubby vegetation are evidence of this low amount of naturally available water. Nearly all irrigation requirements are met with District water sources due to the lack of rainfall in the region. Annual rainfall in Visalia District is highly variable, as shown in Figure 3-4, and has been below average in eight of the last ten years.

[1] www.prism.oregonstate.edu.
[2] CIMIS Zones Map, Zone 12.

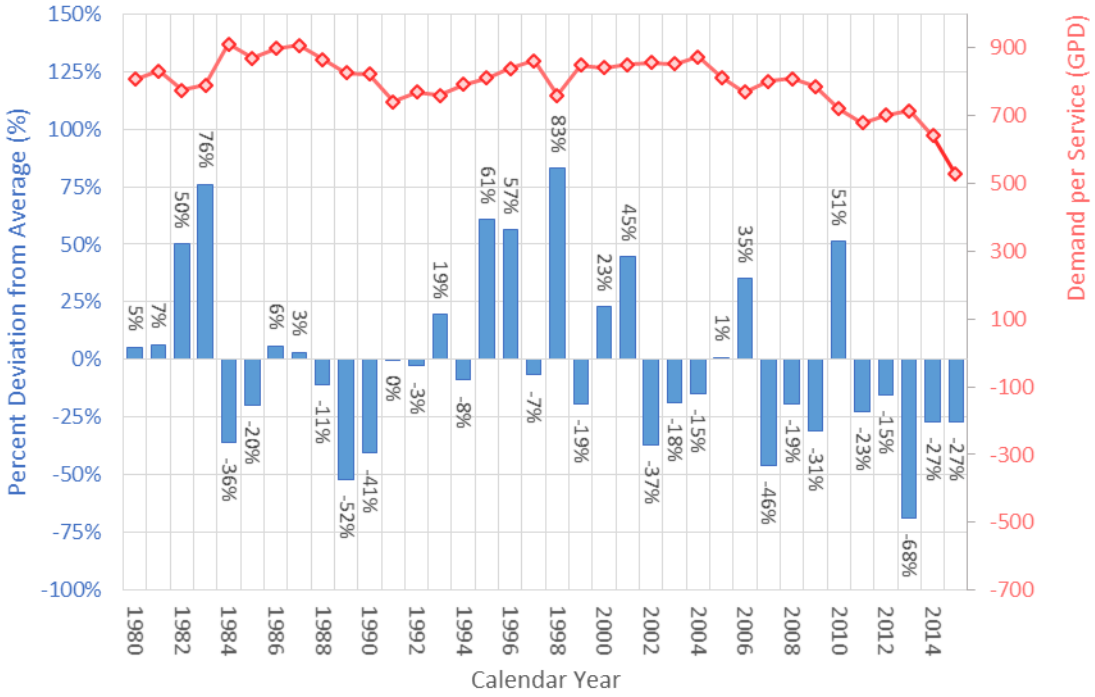
Calendar year 2013 was the driest year on record, receiving just 32 percent of average rainfall.

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



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperature	47	51	56	62	67	75	80	77	73	63	54	47
Rainfall	2.0	1.7	1.7	1.0	0.4	0.1	0.0	0.0	0.1	0.5	1.0	1.6
ETo	1.2	2.0	3.4	5.1	6.8	7.8	8.1	7.1	5.4	3.7	1.8	0.9

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 Visalia District is located in the San Joaquin Valley Region (region G on the map). The San Joaquin Valley 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 0.59 °F and 2.62 °F per 100 years, respectively. More recently, since 1975, maximum and minimum temperatures have increased at a rate of 4.16 °F and 5.86 °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

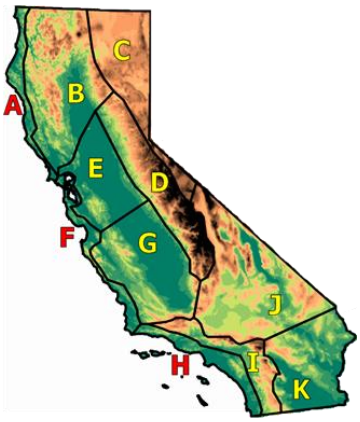
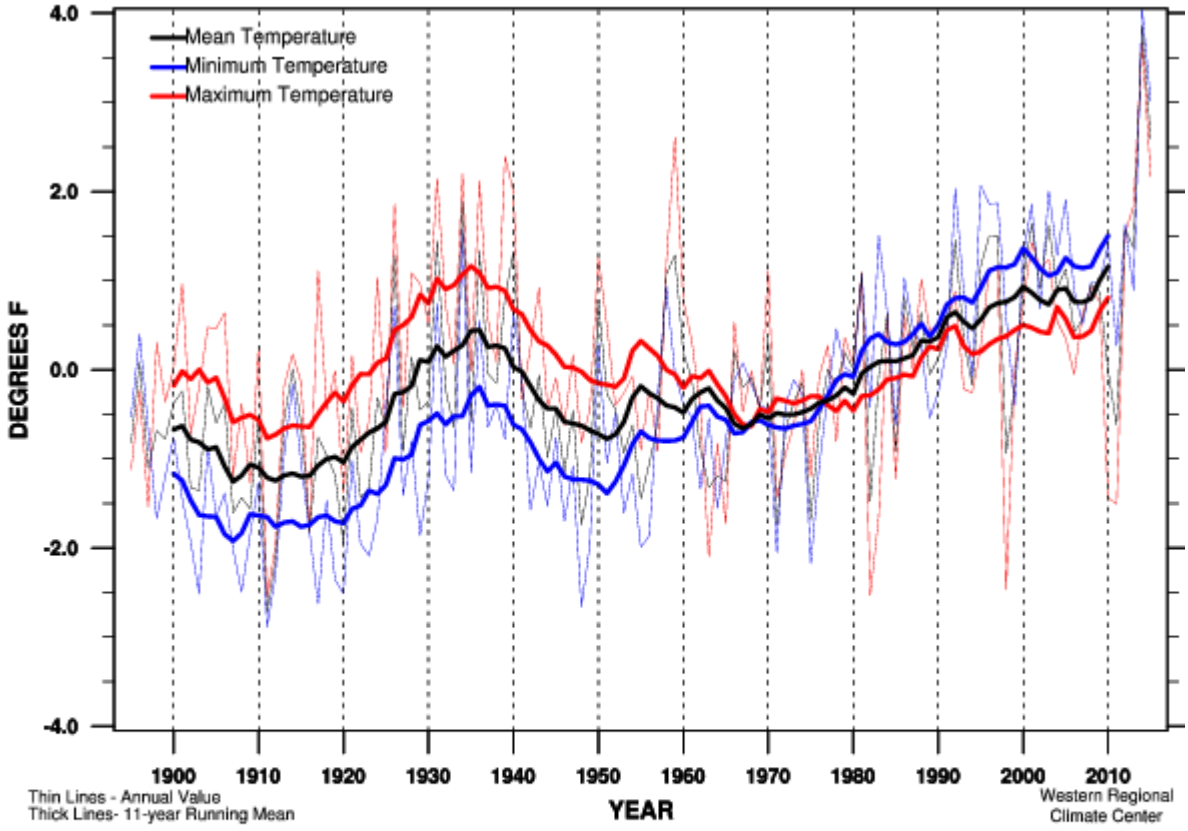


Figure 3-6. Temperature Departure, San Joaquin Valley Region



	Maximum Temperature	Minimum Temperature
Linear Trend 1895-present	+ 0.59 (± 0.57) °F/100yr	+ 2.62 (± 0.49) °F/100yr
Linear Trend 1949-present	+ 1.74 (± 1.41) °F/100yr	+ 4.68 (± 1.07) °F/100yr
Linear Trend 1975-present	+ 4.16 (± 2.96) °F/100yr	+ 5.86 (± 2.40) °F/100yr

3.4 Service Area Population and Demographics

In addition to the City of Visalia, the District serves several unincorporated portions of Tulare County, most notably the community of Goshen. Cal Water estimates the service area population was 138,404 in 2015. Service area population has been growing at an annual rate of 2.3 percent for the past 15 years. Between the 2000 and 2010 Censuses, it grew at an average annual rate of 2.75 percent. Between 2010 and 2015, population growth slowed to an average annual rate of 1.43 percent per year. The slowdown in population growth is partly attributed to the 2007-09 housing market collapse and subsequent recession.

The Visalia District is a rapidly growing district that is increasing service connections through redevelopment of existing service areas and by delivering new service to undeveloped portions of Visalia and adjacent unincorporated areas of Tulare County, most notably the community of Goshen. The Visalia system is surrounded by and includes large parcels of land used for agricultural functions. As the City has grown the land use within the Urban Development Boundary (UDB) has shifted from agricultural to urban uses, drawing more people to the City.

The City of Visalia makes up the vast majority of the population served by the District. For this reason projected population shown in Table 3-1 ties directly to the City of Visalia's General Plan growth assumptions. The General Plan forecasts average population growth of 2.65 percent per year between 2010 and 2030.[3] The population projection in Table 3-1 adopts this growth rate forecast for 2015 to 2030, resulting in a projected population of 204,896 in 2030. This is about 5,000 below the General Plan forecast for 2030. The difference is due to the slow down in growth between 2010 and 2015, as discussed above.

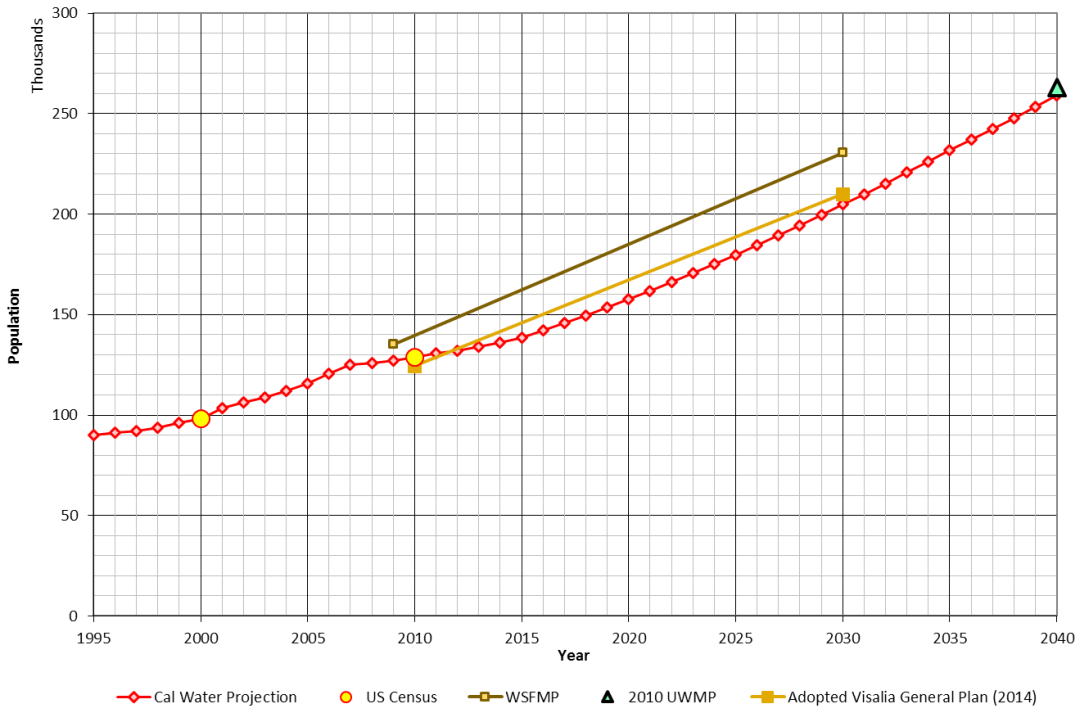
The forecast assumes growth slows after 2030. For the period 2030 to 2035 the projection is based on an average growth rate of 2.5 percent. This is assumed to decrease further to 2.25 percent for the period 2035 to 2040.

Cal Water's population projection for Visalia District is compared in Figure 3-7 to the projections made in its 2009 Water Supply and Facilities Master Plan (WSFMP) and 2010 UWMP, as well as Visalia's General Plan.

[3] The General Plan estimates a 2010 population of 124,440 and projects a 2030 population of 210,000. This corresponds to an annual average growth rate of 2.65% between 2010 and 2030. Visalia General Plan Update, Adopted October 14, 2014.

Table 3-1: Population - Current and Projected						
Population Served	2015	2020	2025	2030	2035	2040
	138,404	157,741	179,779	204,896	231,821	259,102

Figure 3-7. Population Projection Comparison



Chapter 4
System Water Use

This chapter provides a description and quantifies the Visalia 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 24,853 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 Visalia District was ordered to reduce potable water use by 32 percent over this period relative to use over the same period in 2013. Between June and December 2015, water use in Visalia was 26.1 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	15,338
Multi-Family	Drinking Water	1,479
Commercial	Drinking Water	4,526
Industrial	Drinking Water	366
Institutional/Governmental	Drinking Water	2,001
Other	Drinking Water	96
Losses	Drinking Water	1,048
	Total	**24,853**

Residential customers account for approximately 89 percent of services and 68 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

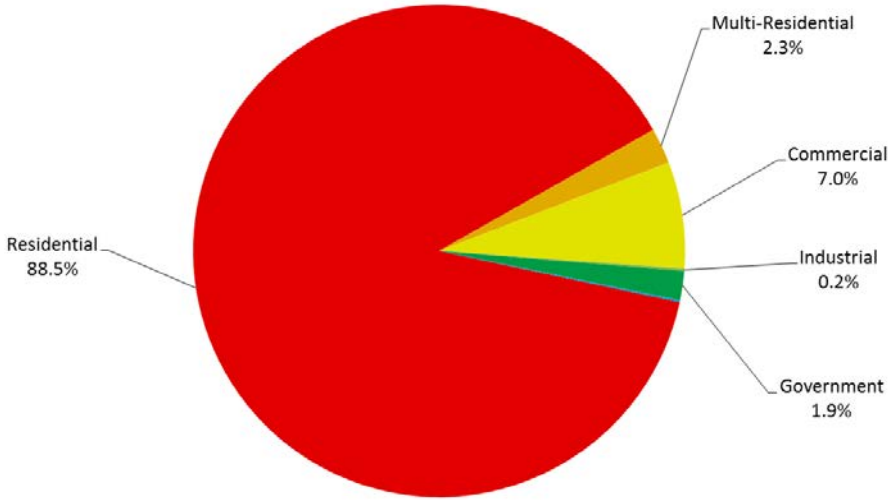
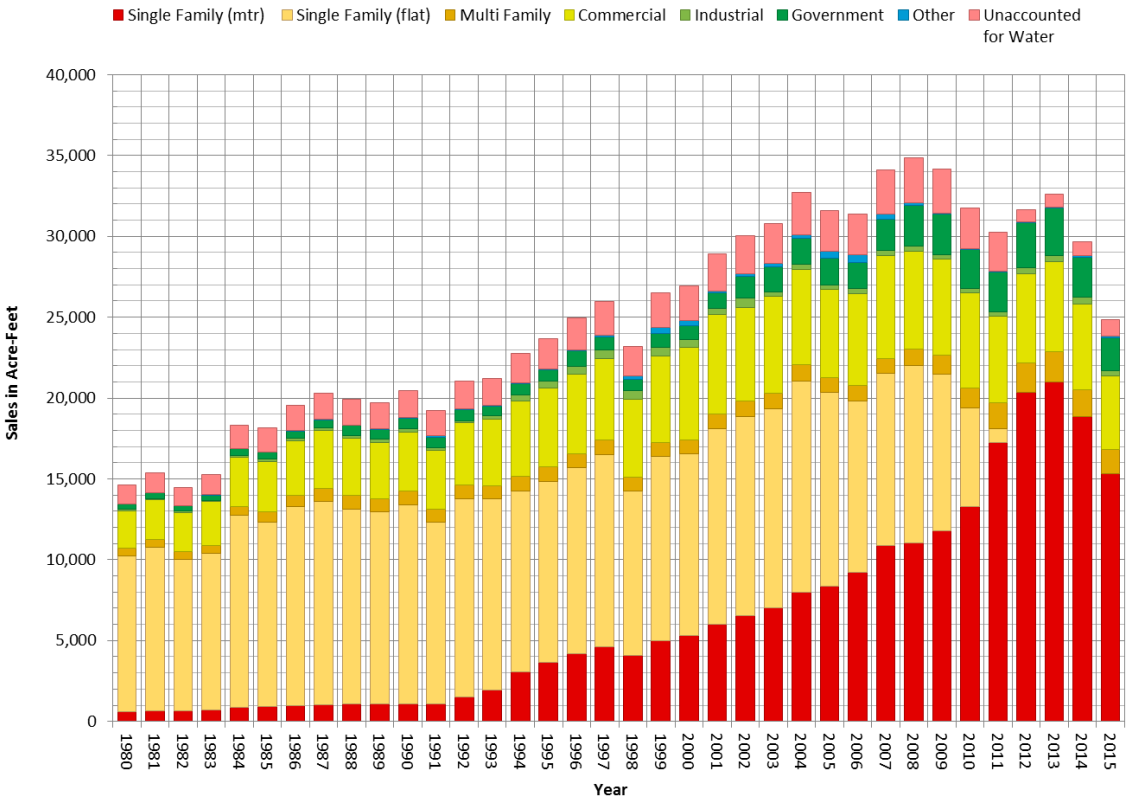


Figure 4-2. Historical Sales by Customer Category

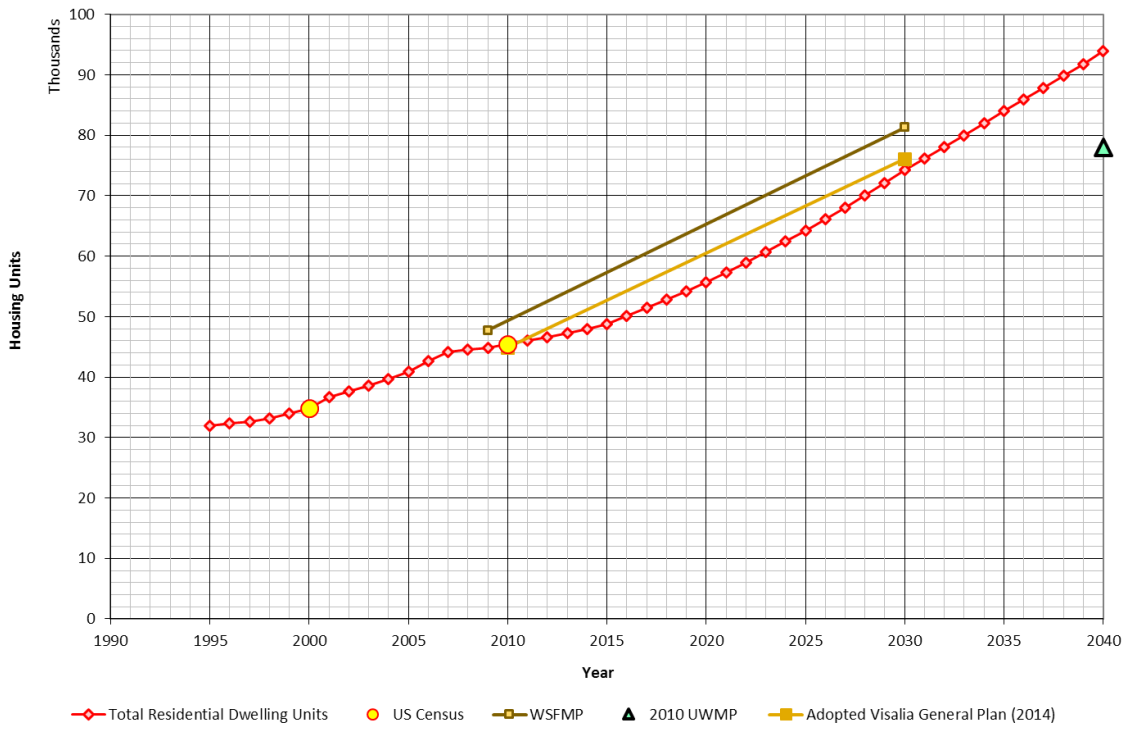


4.2.2 Projected Potable and Raw Water Uses

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 and projected growth rates in the District and City of Visalia planning documents. Single- and multi-family residential services are projected forward using the population growth rate and persons per household assumptions contained in the City of Visalia's General Plan. Commercial, industrial and institutional services are projected forward using the historical growth rate for the past 15 years. The projected average annual growth rate in services across all customer categories is approximately 2.65 percent.[4] Historical and projected housing units are shown in Figure 4-3. Also shown in the figure is the housing projection from Cal Water's Water Supply and Facility Master Plan and 2010 UWMP.

[4] This corresponds to the 2014 City of Visalia General Plan's average annual rate of growth in population between 2010 and 2030.

Figure 4-3. Historical and Projected Housing Units



Expected water use per service, shown in Figure 4-4, is based on weather-normalized historical usage patterns, 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 water use under normal weather conditions without rationing.[5] 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

[5] The City of Visalia's water conservation ordinance which prohibits wasteful water uses is assumed to be in effect.

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

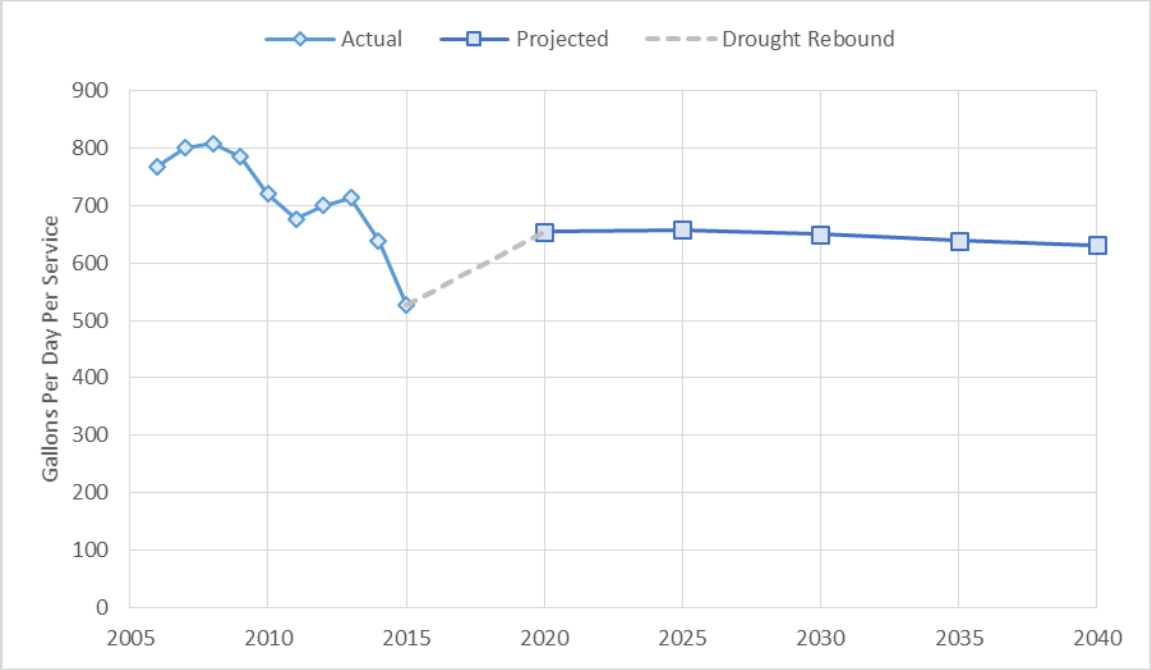


Table 4-2: Retail: Demands for Potable and Raw Water - Projected					
Use Type	Projected Water Use (AF)				
	2020	2025	2030	2035	2040
Single Family	23,644	27,290	31,255	34,991	38,802
Multi-Family	2,230	2,510	2,843	3,159	3,488
Commercial	5,043	5,464	5,894	6,230	6,602
Industrial	299	315	327	333	339
Institutional/Governmental	2,781	3,103	3,421	3,704	4,020
Other	158	183	209	231	255
Losses	781	953	1,143	1,311	1,481
Total	**34,937**	**39,818**	**45,092**	**49,959**	**54,987**

4.2.3 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*	24,853	34,937	39,818	45,092	49,959	54,987
Recycled Water Demand *From Table 6-4*	0	0	0	0	0	0
Total Water Demand	**24,853**	**34,937**	**39,818**	**45,092**	**49,959**	**54,987**

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 Visalia 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 Visalia District is provided in Appendix F. Actions the Visalia 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	471
*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 Visalia 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 Visalia 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)	27	523	977	1,388	1,763	2,106

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.[6] 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

[6] 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 Visalia's General Plan Housing Element to estimate the percentage of households in the service area that qualify as lower income.[7] Based on these data, 26 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.

[7] City of Visalia Housing Element: Background Report and Policy Document, Table 19. Accessed from http://www.ci.visalia.ca.us/civicax/filebank/blobdload.aspx?BlobID=3415

Table 4-7. Residential Demand of Lower Income Households						
	2015 (actual)	2020	2025	2030	2035	2040
Demand (AF)	4,312	6,635	7,641	8,743	9,782	10,844

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.[8] 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 2 percent. The maximum deviation, based on historical weather data, is 3.2 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.[9] 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.[10]

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

[8] A&N Technical Services, Inc., Cal Water Long Term Water Demand Forecast Model, December 2014.
[9] 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.
[10] 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 Visalia District is above both thresholds.

In this Chapter, the Visalia 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 Visalia District does not receive water from wholesale water suppliers.

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 lower 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 increased the District's 2020 water use target from 194 to 198 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	34,848	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	1999	
	Year ending baseline period range[2]	2008	
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 Visalia District did not have recycled water deliveries in 2008. Therefore it is using a 10-year baseline period commencing January 1, 1999 and running through December 31, 2008. 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 Visalia 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 were within 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	1999	95,989
Year 2	2000	98,325
Year 3	2001	103,510
Year 4	2002	106,382
Year 5	2003	108,946
Year 6	2004	112,207
Year 7	2005	115,674
Year 8	2006	120,590
Year 9	2007	124,972
Year 10	2008	126,088
5 Year Baseline Population		
Year 1	2003	108,946
Year 2	2004	112,207
Year 3	2005	115,674
Year 4	2006	120,590
Year 5	2007	124,972
2015 Compliance Year Population		
2015		138,404

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 Visalia 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	1999	26,509	0	0	0	0	0	0	26,509
Year 2	2000	26,921	0	0	0	0	0	0	26,921
Year 3	2001	28,915	0	0	0	0	0	0	28,915
Year 4	2002	30,065	0	0	0	0	0	0	30,065
Year 5	2003	30,810	0	0	0	0	0	0	30,810
Year 6	2004	32,700	0	0	0	0	0	0	32,700
Year 7	2005	31,576	0	0	0	0	0	0	31,576
Year 8	2006	31,352	0	0	0	0	0	0	31,352
Year 9	2007	34,101	0	0	0	0	0	0	34,101
Year 10	2008	34,848	0	0	0	0	0	0	34,848
10 - 15 year baseline average gross water use									**30,780**
5 Year Baseline - Gross Water Use									
Year 1	2003	30,810	0	0	0	0	0	0	30,810
Year 2	2004	32,700	0	0	0	0	0	0	32,700
Year 3	2005	31,576	0	0	0	0	0	0	31,576
Year 4	2006	31,352	0	0	0	0	0	0	31,352
Year 5	2007	34,101	0	0	0	0	0	0	34,101
5 year baseline average gross water use									**32,108**
2015 Compliance Year - Gross Water Use									
2015		24,847	0	0	0	0	0		**24,847**

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	1999	95,989	26,509	247
Year 2	2000	98,325	26,921	244
Year 3	2001	103,510	28,915	249
Year 4	2002	106,382	30,065	252
Year 5	2003	108,946	30,810	252
Year 6	2004	112,207	32,700	260
Year 7	2005	115,674	31,576	244
Year 8	2006	120,590	31,352	232
Year 9	2007	124,972	34,101	244
Year 10	2008	126,088	34,848	247
10-15 Year Average Baseline GPCD				**247**
5 Year Baseline GPCD				
Baseline Year		Service Area Population	Annual Gross Water Use (AF)	Daily Per Capita Water Use (GPCD)
Year 1	2003	108,946	30,810	252
Year 2	2004	112,207	32,700	260
Year 3	2005	115,674	31,576	244
Year 4	2006	120,590	31,352	232
Year 5	2007	124,972	34,101	244
5 Year Average Baseline GPCD				**246**
2015 Compliance Year GPCD				
2015		138,404	24,847	**160**

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 Visalia District has selected Target Method 1, which sets the 2020 target to either 80 percent of the 10-year baseline average GPCD or 95 percent of the 5-year baseline average GPCD, whichever is less. This results in a 2020 target of 198 GPCD. The 2015 interim target of 222 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	1999	2008	247	222	198
5 Year	2003	2007	246		

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 Visalia District's 2015 compliance daily per capita water use is 160 gallons compared to its 2015 interim target of 222 gallons. The Visalia 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 Visalia District was ordered to reduce potable water use by 32 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 2004 when it reached its zenith of 260 gallons per person per day. By 2014 this had fallen by 25 percent, to 195 GPCD. Between 2014 and the end of 2015, per capita water use had fallen an additional 18 percent, to 160 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		
160	222	0	0	0	160	72%	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 Visalia 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 Visalia District has formed a Regional Alliance with other Cal Water urban retail water districts located in the Tulare Lake 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 168 gallons compared to its 2015 interim target of 251 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?
168	251	0	168	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

The sole source of water supply for the customers of the Visalia District is groundwater. The District pumps from the Kaweah basin, which has been designated by DWR as critically overdrafted (COD). As will be discussed below, for purposes of this UWMP, groundwater is projected to provide all supply throughout the planning horizon. Cal Water will work with other agencies in the region to increase artificial recharge of the basin, and will evaluate other supplemental supplies, including water transfers, recycled water, and other sources.

Kaweah Delta Water Conservation District (KDWCD) and other irrigation districts and companies have historically managed groundwater through the conjunctive use of surface water. KDWCD regularly provides programs that benefit local agricultural customers by making available additional surface water supplies for irrigation. These programs effectively reduce the withdrawals of groundwater resulting in in-lieu recharge of the aquifer. Groundwater is normally used by agriculture as an alternate source when surface supplies are not available, and is the sole source in areas within KDWCD jurisdiction that do not have access to surface water.

KDWCD also operates about 40 dedicated water management basins with a total area of approximately 2,100 acres for the multiple purposes of flood control and groundwater replenishment. The basins have the capacity to recharge approximately 983 acre-feet per day under optimal conditions. Normal operation of these facilities provides both the direct and indirect groundwater recharge of the basin in the form of conveyance losses and from agricultural applications of surface water that percolate into the aquifer.

In areas of the Lower Kaweah River such as Packwood and Cameron Creeks, surface water deliveries are managed by Tulare Irrigation District (TID) and other irrigation districts and companies. The City of Visalia maintains a groundwater recharge program that provides localized benefit to the Visalia District. Under this program the City works cooperatively with KDWCD and these irrigation districts and companies to manage groundwater resources.

The supply strategy recommended for the Visalia District in Cal Water's 2012 Integrated Water Supply Plan (IWSP) has two key program elements:

- Continue to Work with the City on its Groundwater Recharge Programs. The City's most recent estimate is that its 2013 agreement with the Tulare Irrigation District, coupled with potential future recharge opportunities, will provide about 7,500 AFY of new supply. This estimate must be verified and updated as additional information becomes available. In addition, an estimate of the sustainable pumping rate needs

further evaluation in the broader basin context as well as the area underlying Visalia. The preliminary sustainable pumping rate estimate for Visalia is 23,500 AFY, which hydrogeologists indicate is based on assumptions that require further investigation.[11] Near-term efforts should focus on improving these estimates to determine whether they should continue to be used or if not, what revised estimates should be used and what the implications of those revised estimates are with respect to determining the adequacy of future groundwater supply to meet future water demand.

- Continue to Implement Cal Water's Existing Water Conservation Programs in compliance with SBx7-7 requirements. Cal Water is committed to implementing an expanded water conservation program to increase demand reduction in the Visalia District. Projected increased water savings were incorporated into the demand forecast used in the IWSP, and in the updated forecast used in this UWMP. Near-term efforts should focus on continued program implementation and evaluation of user demand changes to confirm conservation program effectiveness and to determine what changes should be made to increase and/or maintain targeted demand reduction levels.

Since that planning effort, Cal Water's conservation programming has accelerated to minimize its pumping in the basin. Cal Water will also remain supportive of the management efforts of the KDWCD.

6.1 Purchased Water

Cal Water does not currently purchase imported water to serve demand in its Visalia District. KDWCD does have a contract with the Bureau of Reclamation to receive Central Valley Project (CVP) water from the Friant-Kern Canal. KDWCD could transfer a portion of this water to urban use, or could act as an intermediary in a water transfer between another CVP contractor and Cal Water.

6.2 Groundwater

Historically, groundwater has satisfied 100 percent of the Visalia District's water demand. The groundwater is extracted from the unconfined aquifer system of the Kaweah Delta that underlies the District.

6.2.1 Basin Description

The Kaweah Subbasin lies between the Kings Groundwater Subbasin on the north, the Tule Groundwater Subbasin on the south, crystalline bedrock of the Sierra Nevada

[11] The groundwater modeling study upon which this estimate is based is discussed below.

foothills on the east, and the Tulare Lake subbasin on the west. Major rivers and streams in the subbasin include the Kaweah and St. Johns Rivers.

6.2.2 Groundwater Management

The groundwater basin that the Visalia District pumps from is an un-adjudicated sub-basin almost entirely within the KDWCD boundaries. Cal Water participates with the KDWCD, the City of Visalia and others in the Groundwater Management Plan (GMP) established under the provisions of Assembly Bill 3030. The Kaweah Delta Water Conservation District is the lead agency in this effort. KDWCD has historically focused on the conservation of flows of the Kaweah River for groundwater recharge. In addition, Cal Water is working with the County of Tulare, Kaweah Delta Water Conservation District, Kings County Water District, Lakeside Irrigation District, St. Johns Water District, the cities of Woodlake, Farmersville and Exeter, and other entities within the Kaweah Sub-Basin on the formation of the Greater Kaweah Groundwater Sustainability Agency under the auspices of California's landmark Sustainable Groundwater Management Act. The formation of the Greater Kaweah GSA will be completed by the 2017 deadline established within SGMA.

In 2010 KDWCD updated the GMP in response to SB 1938 to include all the required elements. Cal Water participated as a stakeholder in the development of the Plan and is a signatory of the Memorandum of Understanding for the GMP. The latest version of the GMP is located on the KDWCD website[12] and release of an updated version of the GMP is pending. Cal Water also participates as a stakeholder in the Integrated Water Management process.

The groundwater management plan acknowledges a continuing decline in groundwater levels of the aquifer system below the Visalia District. In an effort to assist in mitigating this groundwater decline, The City of Visalia has established fees which are expected to fund groundwater recharge and other water resource projects within the City. The Groundwater Recharge revenues are derived from three fees: the Groundwater Recharge Fee, Groundwater Extraction Fee, and the Groundwater Mitigation Fee:

- The Groundwater Recharge Fee was created on December 17, 2001 through an adopted Resolution 2001-09 which adds a fee for groundwater recharge as part of a cooperative agreement with KDWCD to increase groundwater recharge efforts. The fee is collected from residents by the City and is based on the size of the water service line. First priority of recharge fees is for the acquisition of water and other activities to improve groundwater levels. This fee currently generates approximately $142,000 per year. The portion of the fee that is not sent to KDWCD is available for use by the City to fund groundwater recharge efforts. 5,358 AF were purchased and recharged

[12] http://www.kdwcd.com/groundwater_management_plan_-_amended__2015_.pdf

under this program during the 2010 calendar year, which was a wetter than average year, making Class 2 water available for purchase.

- The Groundwater Impact Fee became effective January 2006 and is charged to Cal Water or anyone who pumps groundwater within the City, which includes all residential, commercial and industrial water suppliers. This fee is $15.30 per acre foot of water pumped. Cal Water has paid approximately $444,000 annually to City annually as a result of this fee, and the City can use this revenue for the purchase of additional surface water to use for recharge during wet years and to build recharge capacity, such as the proposed East Side Regional Park project, which is still in the planning phase. This 100-acre site will include 80 acres of recharge basins.

- The Groundwater Overdraft Mitigation Fee became effective August 2005 and is charged to any person seeking to annex property. This fee is $1,196 per acre of land to be developed or its equivalent value in surface water rights and generates approximately $243,000 per year.

All fees in this fund are to be used for acquisition of surface water rights and surface water supplies, development of groundwater recharge facilities, reconfiguration of stormwater facilities designed to retain as much stormwater as possible within and near the City, enhancement of the City's cooperative programs with local water management agencies and companies, development of more efficient water delivery systems, and other activities to improve groundwater levels and increase supply of water to the City. The City purchased and recharged 2,482 AF and the Visalia Water Management Committee purchased and recharged 5,358 AF in 2010. Since 2005 the City and the Visalia Water Management Committee have purchased and recharged approximately 22,000 AF for an annual average of 1,467 AF.

The City has started the planning and design of the East Side Regional Park and Groundwater Recharge Project with a series of workshops to establish user needs and define plan alternatives. The project will include a large regional park with groundwater replenishment and stormwater capture facilities.

The Visalia Water Management Committee adopted its 2016 Annual Plan which focuses on continuing the regular business of the Committee and includes:

- Administer program funds per the Management Committee's funding objectives of 70% for groundwater improvement projects, 20% for surface water purchases for groundwater recharge and 10% for acquisition of available surface water rights.
- Continue to investigate and pursue other groundwater recharge improvement projects, including studies for delivery system improvements and optimization.

- Acquire imported surface water to conduct groundwater recharge activities for the benefit of the City's groundwater supply, if obtainable at reasonable cost and recharge locations are available.
- Continue efforts to identify and acquire property for development of recharge facilities and continue efforts to identify and acquire surface water rights for groundwater recharge.

It is understood that ultimately the reliability of the water supply to the Visalia District is a function of the long term balance between aquifer replenishment and groundwater extraction. To better plan for ways to achieve this balance the City of Visalia and KDWCD participated in the development of a numerical groundwater model that encompasses the Visalia Urban Development Boundary. The model results indicate that with current programs, overdraft of the basin will continue. Future modeling will need to assist in the land use decision-making process, analysis of various recharge opportunities to determine the most effective strategies, and the determination of a sustainable rate of withdrawal.

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 with 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 processes.
- 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

Table 6-A summarizes the sustainable annual pumping volumes estimated by the basin modeling described above. Cal Water's share of the basin safe yield is estimated at 23,000 AFY.

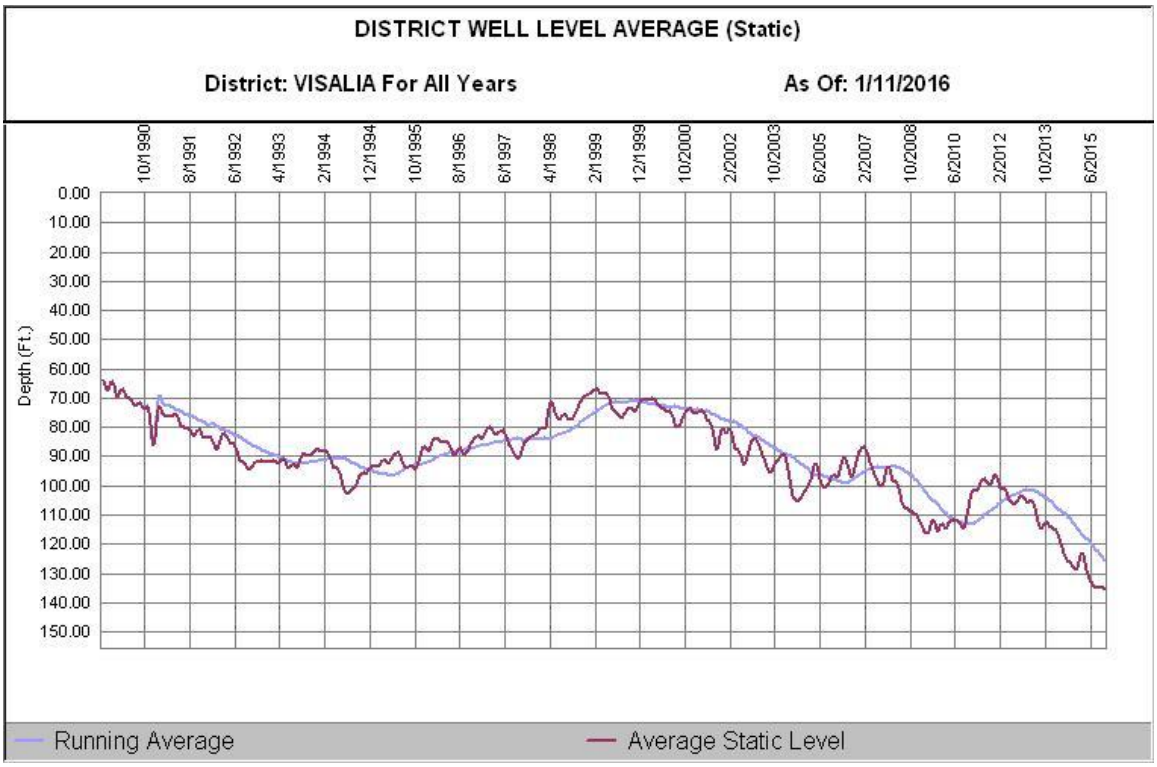
Table 6-A: Preliminary Sustainable Pumping Estimates			
Sustainable Pumping Estimate (AFY) [1]	Area (Acres)	Description of Area	Comments on Differences
23,000	17,764	Allocation of Sustainable Pumping Estimate to Cal Water in Visalia urban area.	Based on 1989-2006 average Cal Water pumping vs. total urban pumping.
28,000	17,764	Total Sustainable Pumping Estimate in Visalia urban area	Based on 1989-2006 average urban pumping and storage change
600,000	340,000	Safe Yield for KDWCD Model Domain (using net of subsurface inflows and outflows) for 1981-1999	
1. Sustainable pumping estimates are preliminary, subject to revision, and may be updated in response to new groundwater modeling information, changing basin conditions, and implementation of SGMA. Estimates are rounded to the nearest 1,000 AFY (Visalia urban area) and the nearest 100,000 AFY (KDCWD Model Domain).			

The Kaweah Subbasin is designated by the Department of Water Resources (DWR) as being critically overdrafted. Additional details on the basin are given in the DWR's Groundwater Bulletin 118, which is included in Appendix G. [13]

Figure 6-1 shows that average static groundwater elevations in the district have declined up to 70 feet over the past 25 years. The elevations did recover during the relatively wet period of the late 1990s. But since 2000, the levels have sharply decreased. The declining groundwater level is the result of both reduced surface water for recharge and increased pumping due to urban growth and agricultural demand.

[13] California's Ground Water Bulletin 118, 2003; Tulare Lake Hydrologic Region; San Joaquin Valley Subbasin; Groundwater Basin Number: 5-22.11.

Figure 6-1: Average Water Level of All District Wells



6.2.4 Historical Pumping

The volume of groundwater pumped by Cal Water since 2011 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	Kaweah Sub-basin	30,260	31,627	32,600	29,686	24,853
Total		**30,260**	**31,627**	**32,600**	**29,686**	**24,853**

6.3 Surface Water

The IWSP evaluated surface supply options that involved direct treatment and delivery to Visalia District customers. Cal Water does not currently have any surface water rights in the Visalia area and does not use surface water as a direct supply source for its Visalia customers. The most promising alternatives identified involve purchase or transfer of San Joaquin River water, either through purchase of Friant Project water, or long-term transfer of San Joaquin River Exchange Contractor Water Authority members. Either of these options has the potential to meet long-term water supply needs for the Visalia

District. Cal Water will continue to carefully investigate these alternatives, but since that work is still in an early stage, it is assumed for purposes of this UWMP that there will be no direct surface supplies and that Cal Water will rely on the two IWMP strategies (enhanced artificial basin recharge and water conservation activities).

6.4 Stormwater

While Cal Water has no current plans to capture stormwater for beneficial use in the Visalia District, the City of Visalia has been improving and upgrading its infrastructure to capture and recharge stormwater to the groundwater basin.

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 in the District. However, the City's Water Conservation Plant Upgrade Project will begin producing Title 22 Recycled Water in 2017 for exchange with TID. The potential amount of recycled water that can be produced is proportional to the amount of wastewater that is generated by the District, and is discussed in the following sections.

6.5.1 Recycled Water Coordination

Cal Water supports the upgrade of the Water Conservation Plant (WCP) that the City of Visalia is undertaking to provide tertiary treatment and produce Title 22 recycled water.

6.5.2 Wastewater Collection, Treatment, and Disposal

The City of Visalia owns and operates the primary sewer system within the Visalia District. A small portion of the wastewater produced in the District is disposed of in on-site septic systems, principally in current and former county islands. The City's system consists of gravity sewers, pumping stations, and force mains to collect wastewater from residential, commercial, and industrial customers. The collected wastewater is discharged to trunk sewers and interceptors and conveyed to the WCP, which is not within the Visalia District boundaries.

The wastewater undergoes secondary treatment with trickling filters, activated sludge, and chlorination. Currently, the treated effluent is routed to the City's Basin 4 retention pond. This will be discontinued in 2017 once the plant upgrade is completed and recycled water deliveries begin to TID and City properties.

The WCP has a capacity to treat 22 MGD but under Regional Water Quality Control Board (RWQCB) Waste Discharge Requirements Order No. R5-2006-0091 is limited to its permit capacity of 20 MGD. The WCP received 10.7 mgd in 2015, from residential, commercial, and industrial customers in the City of Visalia and from other parts of unincorporated Tulare County, down from 11.5 mgd in 2013.

Table 6-2 shows the volume of wastewater collected from District customers in 2015. Data was provided by the City.

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)*	

Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected in 2015 (AF)	Receiving Wastewater Treatment			
			Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area?	Is WWTP Operation Contracted to a Third Party?
City of Visalia	*Estimated*	11,956	*City of Visalia*	Visalia Water Conservation Plant	*No*	
Total Wastewater Collected from Service Area in 2015:		**11,956**				

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?	Treat-ment Level	2015 Volumes			
							Waste water Treated	Discharged Treated Waste water	Recycled Within Service Area	Recycled Outside of Service Area
						Total				

6.5.3 Recycled Water System

As mentioned above, the City is currently upgrading its wastewater treatment facilities to treat all of the effluent to a tertiary level. Upgrades to the WCP are planned to be complete by 2017. At that time the City expects 100 percent of the treated effluent to be reused through transfer and exchange agreements with TID and for landscape irrigation at Plaza Park and Valley Oaks golf course. Until then, the treated effluent is being routed to the Basin 4 retention pond. By 2040 the volume of water reused under these programs could reach over 27,000 AFY.

In addition to the construction of an upgraded treatment facility, the project also includes a distribution system for the delivery of recycled water to locations near the WCP. A backup delivery system has been built to Recharge Basin No. 4 to eliminate the possibility of discharges to Mill Creek. The recycled water would be used for several purposes including agricultural irrigation on City owned properties surrounding both the Visalia Airport and the WCP, and for landscape irrigation at Plaza Park and the Valley Oaks Golf Course. These end uses presently use pumped groundwater to provide their irrigation water supply needs and are not served by Cal Water.

The City of Visalia and TID executed an Agreement for Exchange of Water Supplies in March 2013 (see Appendix G). The Agreement specifies that the City will deliver 11,000 to 13,000 AF of recycled water to TID, and in exchange, TID will provide an annual average of 5,500 to 6,500 AF of its Central Valley Project allocation to the City for its groundwater recharge program.

6.5.4 Recycled Water Beneficial Uses

The treated effluent from the WCP is now being placed in a retention basin pending completion of the City's Water Conservation Plant upgrade in 2017. At that point, recycled water will be sent to TID in exchange for water to recharge the groundwater basin. None of the recycled water will be used by District customers.

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 excluding 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

The two adopted strategies adopted in the 2012 IWSP did not include provision of recycled water to Visalia District customers. The IWSP concluded that distribution of recycled water to Visalia District customers was not a feasible water supply strategy.

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			
✓	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
NA	NA	NA	NA

6.6 Desalinated Water Opportunities

There are no opportunities for the development of desalinated water in the District. Visalia is located in the eastern Central Valley at a great distance from any potential source of saline water.

6.7 Exchanges or Transfers

The participants in the previously mentioned groundwater management plan see the importation of additional surface water into the sub-basin as an important element to achieving a balanced groundwater condition. As has already been mentioned, KDWCD is already the beneficiary of contracts for water supplies to be developed and delivered by the federal Central Valley Project.

Besides the additional water to be delivered into the area as a contract entitlement, the status as a long-term contractor also affords improved access to surplus federal water supplies that may be available from other federal contractors or which may be surplus to the federal project's overall immediate demands. Monies are being set aside by both Kaweah Delta Water Conservation District and the City of Visalia which would enable the purchase of such water supplies when they come available.

If a surface supply could be obtained it would come from two possible sources. The first is from Section 215 of the Reclamation Reform Act (RRA) of 1982 which allows for water designated as non-storable irrigation water to be released due to flood control criteria or unmanaged flood flows. KDWCD has access to this water and continues to work towards maximizing use of these excess flows.

The second possibility is to work directly with agricultural users to obtain a water transfer or exchange. These agricultural transfers can be permanent or interruptible. Permanent agricultural transfers involve the permanent acquisition of agricultural water rights and the transfer or change of a water right to municipal and industrial uses either in the form of the cessation of irrigation on formerly irrigated lands or through transfer of flood flows for indirect potable reuse. Interruptible agricultural transfers consist of temporary

agreements where agricultural water rights can be used for other purposes. The agreement with agricultural users allows for the temporary cessation of irrigation so that the water can be used to meet Visalia's municipal needs.

Although these sources are available it is unlikely that Cal Water will purchase imported water directly from KDWCD for delivery to municipal and industrial customers in Visalia. Any increased acquisition of surface flows by KDWCD would most likely be used for aquifer recharge, and would be available to Cal Water through groundwater pumping.

Cal Water with Hills Valley Irrigation District and City of Bakersfield CVP water importation program was able to transfer water banked in the City of Bakersfield's groundwater bank, which is owned by Cal Water. The eight-year exchange agreement started in 2008. Under the agreement approximately 2,700 AF was delivered to City of Visalia for groundwater recharge.

6.8 Future Water Projects

As discussed above, as part of the Water Supply and Facilities Master Plan (WSFMP) for the Visalia District that was completed in 2012, Cal Water developed an Integrated Water Supply Plan (IWSP), which includes a detailed feasibility analysis of water supply alternatives. In particular, the IWSP considered future supplies that Cal Water projects will be available as a result of current and planned City of Visalia recharge programs and conversion of land from agricultural to urban uses. The City, with its current and planned programs to increase groundwater recharge through 2030, has an established framework in place for recharge activities. Cal Water has worked collaboratively with the City to develop and plan some of these programs and will continue to work with the City to support their implementation and to consider potential expansions.

Since future supply augmentations are primarily a function of City of Visalia projects and land use conversion, there are no Cal Water projects to enter on Table 6-7 below. Cal Water reiterates that it will work closely with the City and other agencies to ensure implementation of necessary projects to maintain the health of the groundwater basin.

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:_Sections 6-2, 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 volumes of groundwater production for calendar year 2015. Table 6-9 shows the projected supply volumes through 2040. Cal Water is assuming that current and planned basin recharge activities and land use conversions will result in sufficient groundwater supplies to meet demand through 2040. Therefore, the groundwater supply amounts shown in Table 6-9 equal the projected demand in each year. As the SGMA process unfolds and as Cal Water and its partners gain a better understanding of the basin and what is required to sustain it, this assumption will be continually reassessed. Future decisions on basin recharge activities and the potential development of other supply sources will be based on the accumulated knowledge gained about the groundwater basin.

Table 6-8 Retail: Water Supplies — Actual (AF)

Water Supply	Additional Detail on Water Supply	2015		
		Actual Volume	Water Quality	Total Right or Safe Yield *(optional)*
Groundwater		24,853	Drinking Water	
Total		**24,853**		

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)*
Groundwater	34,937		39,818		45,092		49,959		54,987	
Total	**34,937**		**39,818**		**45,092**		**49,959**		**54,987**	

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 Visalia.[14] 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.

[14] 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 average reductions in Visalia supplies due to climate change are estimated to be between 8% and 14% 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 Visalia 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 Visalia District's water supplies.

7.1 Constraints on Water Sources

As discussed in Chapter 6, there are long-term concerns about groundwater basin sustainability. Cal Water is working with the City of Visalia and other agencies to aggressively address these concerns.

Moreover, the aquifer levels tend to be quite reactive with respect to rainfall amounts, and basin-wide pumping basin elevations and Cal Water's ability to pump could be affected by an extended drought period, which may significantly reduce the available supply of groundwater, depending on the depth of wells throughout the District. In addition, as discussed in Chapter 6, climate change has the potentially to adversely affect the health of the basin.

Aside from these concerns about basin sustainability, water quality is also a concern. In the past, water quality concerns have not been a major issue in the Visalia District. However, emerging contaminants or reduced Maximum Contamination Levels for contaminants known to be present may affect the local availability of groundwater resources.

The drinking water delivered to customers in the Visalia District meets or surpasses all federal and state regulations. The U.S. Environmental Protection Agency as authorized by the Federal Safe Drinking Water Act of 1974 sets drinking water standards. A state can either adopt the USEPA standard or set state standards that are more stringent than those set by the federal government.

There are two general types of drinking water standards: Primary and Secondary. Primary Standards are designed to protect public health by establishing Maximum Contamination Levels (MCL) for substances in water that may be harmful to humans. MCLs are established very conservatively for each contaminant and are generally based on health

effects which may occur if a person were to drink three liters of the water per day for 70 years. Secondary Standards are based on the aesthetic qualities of the water such as taste, odor, color, and certain mineral content. These standards, established by the State of California, specify limits for substances that may affect consumer acceptance of the water.

The quality of groundwater produced by the District's active wells can vary depending on location. Several wells have been tested to produce water that exceeds the Secondary Standard for manganese; however, these wells have been taken out of service. Other issues of concern in the district is nitrate. The presence of this contaminant puts into question the potential availability of these facilities if the concentrations were to increase above the existing treatment capacity. Also of concern is the potential loss of other wells due to contaminate migration.

Additionally, some wells have been found to contain concentrations of volatile organic compounds (VOCs), particularly trichloroethylene (TCE), tetrachloroethylene (PCE) and carbon tetrachloride (CTC), which have, on occasion, exceeded the MCL for these substances. Treatment has been added to remove these compounds. A number of wells contain detectable concentrations of the inorganic compound nitrate. Cal Water is monitoring of pesticides (DBCP), nitrate, and pentachlorophenol. In all cases if the concentration of these compounds exceeds the MCL, the wells are taken out of service or appropriate treatment technologies are applied to remove the contaminant.

Groundwater contamination from 1,2,3-Trichloropropane (TCP) poses a significant threat to numerous Visalia District wells. The Division of Drinking Water 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 many of the Visalia District wells at levels likely to exceed the MCL. As a result, the District anticipates needing to install treatment on a number of TCP-contaminated wells. Cal Water is actively planning for the treatment of TCP-contaminated wells and is working to ensure compliance with any new TCP-related water quality regulations.

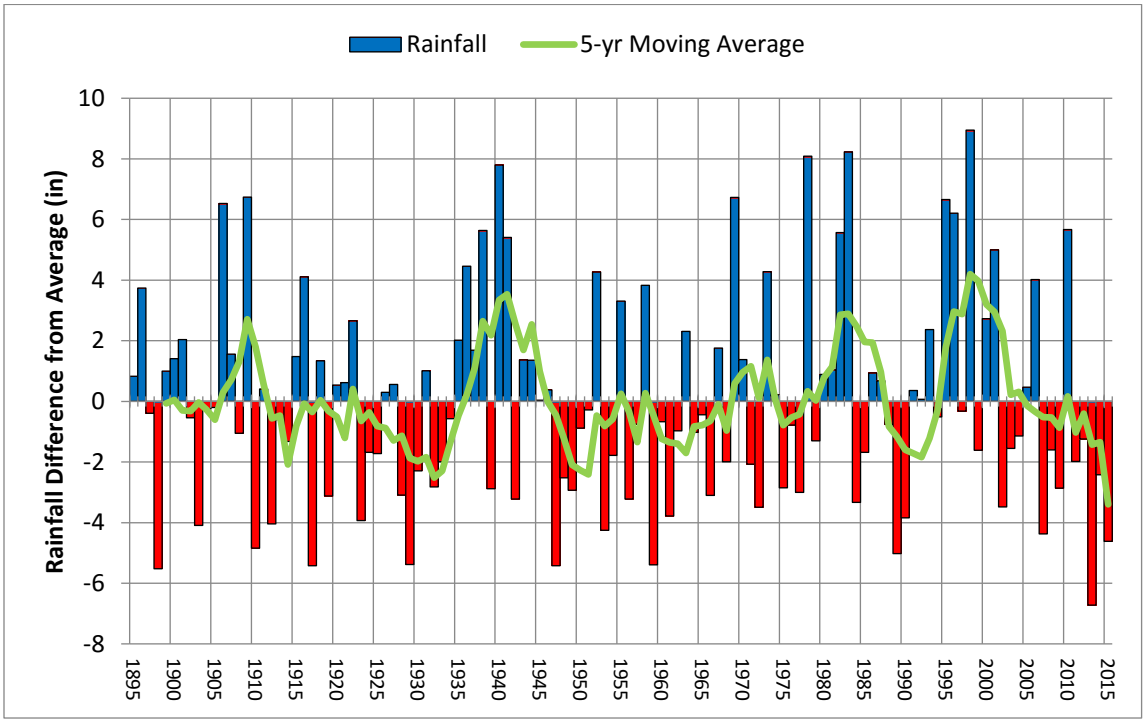
7.2 Reliability by Type of Year

Figure 7-1 compares annual rainfall to the historic average (9.98 inches). The designation of Base Years for drought planning shown in Table 7-1 below comes from the data underlying this chart. The driest year occurred in 2013 when the rainfall was approximately 67% percent below the historic average for the period from 1903 to 2015. (3.26 inches). This is taken as the single dry year shown in Table 7-1. The multiple dry-water years used are 2013 through 2015.

As discussed above, supplies are assumed to be sufficient to serve projected demands. The supply totals in Tables 7-2, 7-3, and 7-4 are therefore equal to the projected demands for each forecast year. Average year demands in Table 7-2 (and therefore available supply) come from the demand model described in Chapter 4 and are not associated with a particular base year. Demands for single and multiple dry years are adjusted to reflect the effects of monthly temperature and rainfall departures from average, based on the recorded monthly temperature and rainfall amounts for those years.

The available supplies in Table 7-1 are assumed to be equal to the maximum demands across all forecast years in Tables 7-2, 7-3, and 7-4. Cal Water expects that the assumption of the sufficiency of groundwater supplies, as augmented by expected enhanced recharge activities, to meet future demands through 2040 will be carefully evaluated and may be revised as part of the Groundwater Sustainability Plan required by SGMA.

Figure 7-1. Deviation of Annual Rainfall from Long-Term Average



Source: PRISM Climate Group, Oregon State University, http://prism.oregonstate.edu

Table 7-1 Retail: Basis of Water Year Data			
Year Type	Base Year	Available supplies if year type repeats[1]	
		Agency may complete these columns for volume only, percent only, or both	
		Volume available (AF)	% of avg supply
Average Year[2]		54,987	100%
Single-Dry Year	2013	56,774	
Multiple-Dry Years 1st Year	2013	56,774	
Multiple-Dry Years 2nd Year	2014	55,784	
Multiple-Dry Years 3rd Year	2015	55,781	

NOTES:
1. As discussed above, supplies are assumed to be sufficient to serve projected demands. The available supplies in this table are assumed to be equal to the maximum demands across all forecast years in Tables 7-2, 7-3, and 7-4. Cal Water expects the assumption of the sufficiency of groundwater supplies, as augmented by expected enhanced recharge activities, to meet future demands through 2040 will be carefully evaluated and may be revised as part of the Groundwater Sustainability Plan required by SGMA.
2. Average year demand (and therefore available supply) is not associated with a particular base year.

7.3 Supply and Demand Assessment

Water supply and demand patterns change during normal, single dry, and multi dry years. Cal Water has relied on the demand modeling described in Chapter 4 to forecast demands for normal, single dry and multiple dry years. As described above, it is assumed that Cal Water's groundwater supply for the District will be able to serve those demands. (This 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.)

Table 7-2 shows the projected supply and demand totals for a normal year. The supply totals match those in Table 6-9; the demand totals match Table 4-3.

Table 7-2 Retail: Normal Year Supply and Demand Comparison (AF)					
	2020	2025	2030	2035	2040 *(Opt)*
Supply totals *(autofill fm Table 6-9)*	34,937	39,818	45,092	49,959	54,987
Demand totals *(autofill fm Table 4-3)*	34,937	39,818	45,092	49,959	54,987
Difference	**0**	**0**	**0**	**0**	**0**

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

Table 7-3 Retail: Single Dry Year Supply and Demand Comparison (AF)					
	2020	2025	2030	2035	2040 (Opt)
Supply totals	36,073	41,112	46,557	51,582	56,774
Demand totals	36,073	41,112	46,557	51,582	56,774
Difference	**0**	**0**	**0**	**0**	**0**

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

Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison (AF)						
		2020	2025	2030	2035	2040 (Opt)
First year	Supply totals	36,073	41,112	46,557	51,582	56,774
	Demand totals	36,073	41,112	46,557	51,582	56,774
	Difference	**0**	**0**	**0**	**0**	**0**
Second year	Supply totals	35,444	40,395	45,745	50,683	55,784
	Demand totals	35,444	40,395	45,745	50,683	55,784
	Difference	**0**	**0**	**0**	**0**	**0**
Third year	Supply totals	35,441	40,393	45,743	50,680	55,781
	Demand totals	35,441	40,393	45,743	50,680	55,781
	Difference	**0**	**0**	**0**	**0**	**0**

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 City of Visalia, Kaweah Delta Water Conservation District, 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 Kaweah River Basin IRWMP. These goals include:

- Promulgating management activities and projects that sustain water supplies, improve water use efficiency and flexibility, and address known impacts to the Basin.
- Supporting activities that maintain water quality, identify threats, and remediate water quality issues in the Basin.
- Focusing on groundwater management and projects that address the cause and impacts of the overdraft in the Plan area.

Chapter 8
Water Shortage Contingency Planning

This chapter describes the water shortage contingency plan for the Visalia 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).[15] 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

Cal Water may implement staged mandatory restrictions of water use, after notifying the Director of the CPUC's Division of Water and Audits by a Tier 1 advice letter in both hard-copy and emailed formats of its intent to implement a particular stage shown in Table 8-1 if:

a. Water supplies are projected to be insufficient to meet normal customer demand by Cal Water; or

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

b. A water supply shortage or threatened shortage exists; or
c. Water supplies are curtailed by a wholesale water suppliers; or
d. Directed to do so under a duly adopted emergency regulation by the CPUC or other authorized government agencies.

Numerous factors may contribute to the need to implement WSCP stages. During periods of potential supply shortage, Cal Water evaluates such factors on a district-by-district basis in conjunction with the CPUC, other local and regional water suppliers, and authorized government agencies. The supply reduction percentages shown in Table 8-1 reflect the approximate magnitude of demand reduction expected to be needed under each WSCP stage.

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

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?
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 landscapes within 48 hours of measurable rainfall.	Yes
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

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	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
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

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?
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 water feature except where the water is recirculated	Yes
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	
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.

Table 8-3 Retail: Stages of WSCP - Consumption Reduction Methods		
Stage	Consumption Reduction Methods by Water Supplier	Additional Explanation or Reference *(optional)*
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.
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. In the Visalia District the City of Visalia has passed a water conservation and water waste prohibition ordinance, which is included in Appendix J.

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.

Because of Visalia's relative geographical isolation, Cal Water does not currently have the ability to form inter-connections with neighboring water utilities for emergency purposes. Several small mutual water companies exist in the area but none have sufficient supply capacities to meet the demand requirements of Cal Water's customers.

Because the Visalia system is completely dependent on its own sources for supplying water to its customers, adequate backup power must be installed at a number of its facilities and because of transmission limitations within the main system these sites must be spread throughout the system. Currently Cal Water maintains backup power at multiple well sites as well as tank storage sites in the main system. These facilities are routinely tested, maintained, and replaced when necessary to maintain their operation.

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. Since District near-term supplies over a multi-year dry period are projected to be at least sufficient to serve demands, it is likely that current supply sources could produce more water. Cal Water does not have sufficient information to estimate how much more.

Table 8-4 Retail: Minimum Supply Next Three Years (AF)

	2016	2017	2018
Available Water Supply	36,073	35,444	35,441

Chapter 9
Demand Management Measures

This chapter provides a summary of past and planned demand management measure (DMM) implementation in the Visalia 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 Visalia 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. In the Visalia District the City of Visalia has passed a water conservation ordinance, which is included in Appendix J.

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 Visalia District of 32%. 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 Visalia 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 Visalia District are provided in Table 9-1.

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

Class of Service	Tier 1 (1-11 ccf)	Tier 2 (12-29 ccf)	Tier 3 (30+ ccf)	All units of water
Single Family	$1.30	$1.33	$1.49	
Non Residential				$1.45

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 Visalia District's rate structure, metering, and customer communication programs comply with Option 3 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 Visalia District averaged 1,171 AF, or approximately 4% 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 170 AFY – enough water for about 525 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 Visalia District customers.

Table 9-3: Cal Water DMMs Available to Visalia 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 26.1 percent. Per capita potable water use in 2015 was 160 GPCD compared to the District's SB X7-7 2015 interim water use target of 222 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 three other Tulare Lake area water districts. Per capita potable water use in 2015 for the regional alliance was 168 GPCD compared to the regional alliance's 2015 interim water use target of 250 GPCD.

Table 9-4: Implementation of Customer DMMs: 2011-2015

1. Plumbing Fixture Replacement	2011 – 2015 Total	Average Annual
Toilets & Urinals (number distributed)	2,750	550
Clothes Washers (number distributed)	1,000	200
Conservation Kits (number distributed)	4,667	933
2. Irrigation Equipment/Landscape Upgrades		
Smart Controllers (number distributed)	156	31
Nozzles & Spray Bodies (number distributed)	47,346	9,469
Turf Buy-Back (sq ft removed)	37,263	7,453
3. Residential Customer Assistance		
Surveys/Audits (homes receiving)	358	72
4. Non-Residential Customer Assistance		
Surveys/Audits (sites receiving)	9	2
Large Landscape Reports (sites receiving)	444	89
Estimated Water Savings (AF)	**803**	**161**

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	$319,372	$63,874
Program expenditures & incentives	$1,456,089	$291,218
Public information & school education	$246,240	$49,248
Total	**$2,021,702**	**$404,340**

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 Visalia District, including pro-rated staffing costs, is expected to average $0.63 million. Cumulative expenditure for DMM implementation for the period 2016-2020 is expected to total $3.17 million. Of this total, approximately 44% is earmarked for plumbing fixture, irrigation equipment, and landscape efficiency upgrades; 16% is earmarked for public information and school education programs; 9% is earmarked for distribution system water loss management; 11% 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)	315	370	370	370	370
Clothes Washers (number distributed)	25	25	25	25	25
Conservation Kits (number distributed)	50	100	100	100	100
2. Irrigation Equipment/Landscape Upgrades					
Smart Controllers (number distributed)	150	35	35	35	35
Nozzles & Spray Bodies (number distributed)	27,276	14,250	14,250	14,250	14,250
Turf Buy-Back (sq ft removed)	100,000	100,000	100,000	100,000	100,000
3. Residential Customer Assistance					
Monthly home water reports (homes receiving)	10,989	10,989	10,989	10,989	10,989
Surveys/Audits (homes receiving)	275	150	150	150	150
4. Non-Residential Customer Assistance					
Surveys/Audits (sites receiving)	6	4	4	4	4
Large Landscape Reports (sites receiving)	60	60	60	60	60
5. Water Loss Management					
Leak Detection (miles of main)	0	71	106	142	142
Estimated Annual Water Savings (AFY)	**392**	**526**	**616**	**706**	**752**
Cumulative Water Savings (AF)	**392**	**918**	**1,534**	**2,240**	**2,992**

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 Visalia District have an overall program unit cost of saved water of $436/AF (in 2015 dollars) and a benefit-cost ratio of 0.2. The unit cost of saved water includes all direct program costs associated with implementation of the proposed conservation programs. The low benefit-cost ratio is due to the fact that Visalia District can supply its customers with groundwater that has a low marginal pumping cost. However, because of declining groundwater levels in the region and future implementation of the Sustainable Groundwater Management Act, Cal Water is pursuing strategies, including investment in conservation, to reduce dependence on regional groundwater resources. The conservation measures also are needed if the Visalia District is to meet its SB X7-7 GPCD targets. The conservation measures in Table 9-6 are the least cost set of measures deemed capable of helping the District do this.

Projected SB X7-7 compliance water use for Visalia District in 2020 under planned levels of DMM implementation is 198 GPCD compared to its target water use of 198 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 Visalia District has formed a regional alliance with Cal Water's three other Tulare Lake area water districts. Projected 2020 potable water demand for the regional alliance under planned levels of DMM implementation is 222 GPCD compared to a regional alliance target of 223 GPCD.

Visalia 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 Visalia 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

10.2 Notice of Public Hearing

10.3 Public Hearing and Adoption

10.4 Plan Submittal

10.5 Public Availability

10.6 Amending an Adopted UWMP

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 a formal public hearing to present information on its Visalia District UWMP on May 11, 2016, 5:30 PM at the following location:

Visalia District Customer Service Center
216 North Valley Oaks Drive
Visalia, CA 93292

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 Visalia	✓	✓
County Name	60 Day Notice	Notice of Public Hearing
County of Tulare	✓	✓

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 May 18, 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 April 27, 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 Visalia District's Customer Center, located at 216 North Valley Oaks Drive, Visalia, CA 93292. 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