# California Water Service Company

## 2010 Urban Water Management Plan

## Salinas District

# ADOPTED

June 2011

# Table of Contents

**TABLE OF CONTENTS** ........ **3**
**LIST OF FIGURES** ........ **5**
**LIST OF TABLES** ........ **6**
**CONTACT SHEET** ........ **9**
**1 PLAN PREPARATION** ........ **11**
1.1 PURPOSE ........ 11
1.2 COORDINATION ........ 11
1.3 PLAN ADOPTION ........ 12
1.4 WATER MANAGEMENT TOOLS ........ 12
1.5 PLAN ORGANIZATION ........ 13
1.6 IMPLEMENTATION OF PREVIOUS UWMP ........ 14
**2 SYSTEM DESCRIPTION** ........ **15**
2.1 SERVICE AREA DESCRIPTION ........ 15
2.2 SERVICE AREA POPULATION ........ 19
2.3 SERVICE AREA CLIMATE ........ 25
**3 SYSTEM DEMANDS** ........ **27**
3.1 DISTRIBUTION OF SERVICES ........ 27
3.2 HISTORICAL AND CURRENT WATER DEMAND ........ 28
3.3 WATER DEMAND PROJECTIONS ........ 30
*3.3.1 Senate Bill No. 7 Baselines and Targets ........ 34*
*3.3.2 Low Income Housing Projected Demands ........ 39*
3.4 TOTAL WATER USE ........ 40
**4 SYSTEM SUPPLIES** ........ **43**
4.1 WATER SOURCES ........ 43
4.2 PURCHASED WATER ........ 44
4.3 SURFACE WATER ........ 44
4.4 GROUNDWATER ........ 44
*4.4.1 Basin Boundaries and Hydrology ........ 47*
*4.4.2 Groundwater Management Plan ........ 47*
4.5 RECYCLED WATER ........ 48
*4.5.1 Wastewater Collection ........ 48*
*4.5.2 Estimated Wastewater Generated ........ 48*
*4.5.3 Potential Water Recycling ........ 49*
4.6 DESALINATED WATER ........ 50
4.7 TRANSFER OR EXCHANGE OPPORTUNITIES ........ 51
4.8 WATER SUPPLY PROJECTS ........ 51
**5 WATER SUPPLY RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING** ........ **53**
5.1 WATER SUPPLY RELIABILITY ........ 53
5.2 DROUGHT PLANNING ........ 54
*5.2.1 Normal-Year Comparison ........ 55*
*5.2.2 Single Dry-Year Comparison ........ 56*
*5.2.3 Multiple Dry-Year Comparison ........ 57*
5.3 FACTORS AFFECTING RELIABILITY OF SUPPLY ........ 58
5.4 WATER QUALITY ........ 59

5.5 Water Shortage Contingency Plan ....................61
*5.5.1 Water Shortage Contingency Plan Scope ....................61*
*5.5.2 Water Conservation/Water Supply Team....................63*
*5.5.3 Water Supply Allocation Plan....................63*
*5.5.4 Allocation Methodology and Customer Information ....................64*
*5.5.5 Drought Stages ....................66*
*5.5.6 Water Supply Conditions and Trigger Levels ....................70*
*5.5.7 Water Use Restriction Enforcement....................71*
*5.5.8 Analysis of Revenue and Expenditure Impacts ....................71*
*5.5.9 Catastrophic Water Supply Interruption....................73*

**6 DEMAND MANAGEMENT MEASURES....................75**

6.1 Statewide Urban Water Demand Reduction Policies ....................75
6.2 Conservation Master Plans ....................77
6.3 Water Savings Requirements ....................78
6.4 Conservation Program Analysis....................81
6.5 Conservation Program Portfolio ....................83

**7 CLIMATE CHANGE ....................87**

7.1 Introduction....................87
7.2 Strategy ....................87
7.3 Potential Climate Change Effects....................88
7.4 Historical Climate Data Summary ....................88
7.5 Climate Change Guidance....................92

**8 COMPLETED UWMP CHECKLIST ....................93**

8.1 Review Checklist ....................93

**APPENDIX A-1: RESOLUTION TO ADOPT UWMP....................101**

**APPENDIX A-2: CORRESPONDENCES....................103**

**APPENDIX A-3: RESOLUTION TO ADOPT UWMP....................105**

**APPENDIX B: SERVICE AREA MAP....................107**

**APPENDIX C: WATER SUPPLY, DEMAND, AND PROJECTION WORKSHEETS ....................109**

**APPENDIX D: DWR'S GROUNDWATER BULLETIN 118 ....................111**

**APPENDIX E: TARIFF RULE 14.1 WATER CONSERVATION AND RATIONING PLAN, AND LOCAL ORDINANCES ....................112**

**APPENDIX F: WATER EFFICIENT LANDSCAPE GUIDELINES ....................113**

**APPENDIX G: CONSERVATION MASTER PLAN....................115**

**APPENDIX H: MONTEREY COUNTY GROUNDWATER MANAGEMENT PLAN ....................117**

## List of Figures

Figure 2.1-1: General Location of Salinas District – Monterey County....................................... 15
Figure 2.1-2: Distribution of Services per Community ................................................................ 16
Figure 2.1-3: General Service Area ............................................................................................... 17
Figure 2.1-4: Major Fault Lines near the Salinas District ............................................................ 18
Figure 2.2-1: Approximated SAM with US Census 2000 Tract Map .......................................... 19
Figure 2.2-2: Historical & Projected Services ............................................................................... 21
Figure 2.2-3: Estimated Population Comparison........................................................................... 23
Figure 2.2-4: Estimated Housing Comparison............................................................................... 24
Figure 2.3-1: Average Monthly Temperature and Rainfall ........................................................... 25
Figure 2.3-2: Monthly Average ETo Values .................................................................................. 26
Figure 3.1-1: Distribution of Services (2010)................................................................................. 27
Figure 3.2-1: Historical Sales ........................................................................................................ 28
Figure 3.2-2: Historical Service Counts.......................................................................................... 29
Figure 3.2-3: Historical Demand per Service ................................................................................. 29
Figure 3.2-4: Percent of Total Demand by Type of Use (2010)..................................................... 30
Figure 3.3-1: Historical & Projected Demand ................................................................................ 31
Figure 3.4-1: Historical & Projected Sources................................................................................. 41
Figure 4.4-1: District Well Level Average ..................................................................................... 46
Figure 4.5-1: Estimated District Annual Wastewater Generated.................................................... 49
Figure 5.1-1: Comparison of Annual Rainfall to Historical Average............................................ 53
Figure 7.4-1: The Climate Regions of California .......................................................................... 89
Figure 7.4-2: Maximum Temperature Departure for Central Coast Region ................................. 90
Figure 7.4-3: Mean Temperature Departure for Central Coast Region........................................ 91
Figure 7.4-4: Minimum Temperature Departure for Central Coast Region ................................. 91
Figure 7.4-5:  Annual Precipitation in Central Coast Region........................................................ 92

## List of Tables

Table 1.2-1: Coordination with Appropriate Agencies (Table 1) ... 12
Table 1.5-1: Plan Organization ... 13
Table 2.2-1: Summary of Census 2000 Data ... 20
Table 2.2-2: Proposed Developments ... 21
Table 2.2-3: Population - Current and Projected (Table 2) ... 22
Table 2.3-1: Average Annual Climate (Table 3) ... 25
Table 3.3-1: Actual 2005 Water Deliveries – AF (Table 3) ... 32
Table 3.3-2: Actual 2010 Water Deliveries – AF (Table 4) ... 32
Table 3.3-3: Projected 2015 Water Deliveries – AF (Table 5) ... 33
Table 3.3-4: Projected 2020 Water Deliveries - AF (Table 6) ... 33
Table 3.3-5: Projected 2025 and 2030 Water Deliveries - AF (Table 7) ... 33
Table 3.3-6: Projected 2035 and 2040 Water Deliveries - AF (Table 7) ... 34
Table 3.3-7: Cal Water Districts Sorted by Hydrologic Region ... 35
Table 3.3-8: Regional SBx7-7 Targets for Cal Water Districts in Central Coast Hydrologic Region ... 35
Table 3.3-9: Base Period Ranges (Table 13) ... 37
Table 3.3-10: Daily Base Per Capita Water Use-10-Year Range (Table 14) ... 37
Table 3.3-11: Daily Base Per Capita Water Use-5-Year Range (Table 15) ... 38
Table 3.3-12: Salinas District SBx7-7 Targets ... 38
Table 3.3-13: Low-income Projected Water Demands (Table 8) ... 39
Table 3.4-1: Additional Water Uses and Losses - AFY (Table 9 and 10) ... 40
Table 3.4-2: Total Water Use – Actual and Projected AFY (Table 11) ... 40
Table 4.1-1: Planned Water Supplies (Table 16) ... 44
Table 4.4-1: Amount of Groundwater Pumped – AFY (Table 18) ... 46
Table 4.4-2: Amount of Groundwater projected to be pumped – AFY (Table 19) ... 46
Table 4.5-1: Recycled Water-- Wastewater Collected and Treated-AFY (Table 21) ... 49
Table 4.5-2: Disposal of wastewater (non-recycled) AFy (Table 34) ... 49
Table 4.5-3: Recycled Water - Potential Future Use-AFY (Table 23) ... 50
Table 5.2-1: Basis of Water Year Data (Table 27) ... 54
Table 5.2-2: Supply Reliability – gal/service/yr (Table 28) ... 54
Table 5.2-3: Supply Reliability – Current Water Sources - AFY (Table 31) ... 55
Table 5.2-4: Supply and Demand Comparison - Normal Year - AF (Table 32) ... 55
Table 5.2-5: Supply and Demand Comparison – Single Dry Year - AF (Table 33) ... 56
Table 5.2-6: Supply And Demand Comparison - Multiple Dry Year Events – AFY (Table 34) ... 57
Table 5.3-1: Factors Resulting In Inconsistency of Supply (Table 10) ... 58
Table 5.5-1: Demand Reduction Stage 1 (Table 36) ... 67
Table 5.5-2: Demand Reduction Stage 2 (Table 36) ... 68
Table 5.5-3: Demand Reduction Stage 3 (Table 36) ... 69
Table 5.5-4: Demand Reduction Stage 4 (Table 36) ... 70
Table 5.5-5: Water Supply Triggering Levels (Table 35) ... 71
Table 6.1-1: MOU Best Management Practices ... 76
Table 6.3-1: SBx7-7 and MOU Gross Water Savings Requirements ... 78
Table 6.3-2: Adjusted Baseline Demand Projection ... 80

Table 6.3-3: New Program Savings Required for SBx7-7 and MOU Compliance ..................... 80
Table 6.4-1: Cal Water Conservation Programs ........................................................................... 82
Table 6.5-1: Recommended Program Levels................................................................................. 84
Table 6.5-2: Projected Water Savings by Program....................................................................... 85
Table 7.4-1: Cal Water Districts Sorted by Climate Region ........................................................ 89
Table 8.1-1: Urban Water Management Plan Checklist (organized by legislation number)........ 93

# California Water Service Company
# 2010 Urban Water Management Plan
# Contact Sheet

This plan was prepared by the Water Resource Planning Group in California Water Service Company's Engineering Department. Thomas A. Salzano, Water Resources Planning Supervisor, is responsible for the plan's preparation and can be reached at the address and telephone number listed below:

| | |
|---|---|
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| Phone: | **(408) 367-8340** |
| Fax: | **(408) 367-8427** |
| District Office: | **Salinas District**<br>**254 Commission Street**<br>**Salinas, CA 93901-3737** |
| District Manager: | **Mike Jones** |
| District Phone: | **(831) 757-3644** |

# 1 Plan Preparation

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 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 the Salinas community since 1962.

## 1.1 Purpose

California Water Code §10644(a) requires urban water suppliers to file with the Department of Water Resources, the California State Library, and any city or county within which the supplier provides water supplies, a copy of its Urban Water Management Plan (UWMP), no later than 30 days after adoption. All urban water suppliers as defined in Section 10617 (including wholesalers), 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.

This UWMP is a foundation document and source of information for a Water Supply Assessment and a Written Verification of Water Supply. An UWMP also serves as:

- A long-range planning document for water supply,
- Source data for development of a regional water plan, and
- A source document for cities and counties as they prepare their General Plans.
- A key component to Integrated Regional Water Management Plans.

## 1.2 Coordination

Cal Water completed a draft of the UWMP for the District on April 1, 2011. The draft was sent to the agencies listed in Table 1.2-1 for review and comment. Copies of the draft plan are available at Cal Water's corporate office in San Jose, and District office for public review and comment.

Cal Water conducted a formal public meeting to present information on its Salinas District UWMP on June 16, 2011 from 3:00-5:00 p.m. at the following location:

California Water Service Company
Salinas Customer Service Center
254 Commission Street
Salinas, CA 93901

| Table 1.2-1: Coordination with Appropriate Agencies (Table 1) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Agency** | **Participated in developing the plan** | **Commented on the draft** | **Attended public meetings** | **Was contacted for assistance** | **Was sent a copy of the draft plan** | **Was sent a notice of intention to adopt** | **Not involved/ No information** |
| **City of Salinas** | | | | ✓ | ✓ | ✓ | |
| **Monterey County Water Resources Agency** | | | | ✓ | ✓ | ✓ | |
| **County of Monterey** | | | | ✓ | ✓ | ✓ | |

## 1.3 Plan Adoption

The deadline for final comments was June 15, 2011. The final plan was adopted by the Vice President of Engineering & Water Quality on June 24, 2011 and was submitted to California Department of Water Resources within 30 days of approval. Appendix A presents a copy of the signed Resolution of Plan Adoption. In addition to the resolution, Appendix A also contains the following:

- Any comments received during the public review of this plan.
- Minutes from the public meeting.
- Correspondence between Cal Water and participating agencies.

A copy of the final version of this report will be sent to the agencies listed in Table 1.2-1 and to the California State Library.

## 1.4 Water Management Tools

Cal Water uses the following water management tools to optimize management of water resources for the District:

- Computerized Hydraulic Model for analysis of various operating conditions within the water distribution network and for planning operational and facility improvements. For smaller systems, a simple model is maintained that only models trunk lines, key sources, and major delivery points.
- Supervisory Control and Data Acquisition (SCADA) system that provides information as to how the water system is operating, provides operational control functions, and maintains a historical record of selected data.
- Revenue Management Solutions (RMS) is an information system that Cal Water uses to maintain detailed historical records including the water sales and customer service connections.

- District Report on Production (DROP) is a database that maintains water production data for wells and purchased amounts from wholesale service connections.
- Geographical Information Systems (GIS) that combines multiple sources of information and allows data to be electronically mapped for analysis and understanding of growth and constraints on land development and water use.
- Laboratory Information Management System (LIMS) provides water quality data for detailed constituent analysis of raw and finished water, determination of compliance with state and federal drinking water standards, and trends in water quality changes.
- Water Supply and Facilities Master Plan for identification of near and long term capital improvement projects for water system facilities and equipment using all of the above tools and Cal Water experience in design and construction.
- Computerized Maintenance Management System (CMMS) is a computerized database system that tracks asset data, assigns and schedules maintenance work orders, and reports on maintenance related activities. A CMMS allows a business to manage maintenance work more effectively and is a stepping stone towards Asset Management (AM).
- Groundwater Level Monitoring Program tracks groundwater fluctuations over time and is used to inform resource management and well maintenance decisions.

## 1.5 Plan Organization

This plan is organized as described in the following outline. The corresponding provisions of the California Urban Water Management Planning Act are included as references. Tables in this plan have cross-references to the tables as listed in the "Guidebook to Assist Water Suppliers to Prepare a 2010 Urban Water Management Plan" prepared by the California Department of Water Resources.

| Section | Table 1.5-1: Plan Organization | Act Provision |
|---|---|---|
| Contact Sheet | List of Contact Persons | - |
| Section 1 | Plan Preparation<br>This section describes the requirement and the purpose of the Urban Water Management Planning Act, coordination, plan adoption, schedule, and management tools. | §10620 (d)(2)<br>§10621(a -b)<br>§10635(b)<br>§10642<br>§10643<br>§10644 (a)<br>§10645 |
| Section 2 | System Description<br>This section describes the District service area and includes area information, population estimate, and climate description. | §10631 (a) |
| Section 3 | System Demands<br>This section describes the water supply projection methodology used to estimate water demands and supply requirements to 2040. It also includes a discussion of SBx7-7 baselines and targets. | §10631<br>§10608.20(e) |
| Section 4 | System Supplies | §10631 |

| Section | Table 1.5-1: Plan Organization | Act Provision |
|---|---|---|
| | This section includes a detailed discussion of the water supply sources. | §10633<br>§10634 |
| Section 5 | Water Supply Reliability and Water Shortage Contingency Planning<br>This section includes a discussion of the water supply reliability and describes the District's planning for water shortages during drought and emergency situations. | §10620<br>§10631 (d)<br>§10632<br>§10634<br>§10635 (a) |
| Section 6 | Demand Management Measures<br>This section describes Cal Water's conservation programs. | §10631 |
| Section 7 | Climate Change<br>This section contains a discussion of climate change. | |
| Section 8 | DWR Checklist<br>This section includes the completed DWR UWMP Checklist. | |
| Appendix A | Resolution To Adopt The Urban Water Management Plan<br>This section includes the following:<br>1) Resolution<br>2) Letters to and comments from various agencies<br>3) Minutes from the public hearing<br>4)Correspondence between Cal Water and participating agencies | §10621 (b)<br>§10642<br>§10644 (a) |
| Appendix B | Service Area Map<br>This appendix includes the service area map of the District as filed with the Public Utilities Commission. | - |
| Appendix C | Water Supply, Demand, And Projection Worksheets<br>This section includes the spreadsheets used to estimate the water demand for the District. | - |
| Appendix D | DWR Groundwater Bulletin 118<br>Sections from the Department of Water Resources Bulletin 118 are included as reference and provide details of the basin for the District. | §10631 (b)(1-4) |
| Appendix E | Tariff Rule 14.1 Water Conservation And Rationing Plan and Local Ordinances<br>This section contains the tariff rule and ordinances for reference. | - |
| Appendix F | Water Efficient Landscape Guidelines<br>This section contains the Guideline for Water Efficient Landscape that Cal Water uses at its properties, including renovations. | - |
| Appendix G | Conservation Master Plan<br>This section contains the District's Conservation Master Plan. | §10631 (j) |

## 1.6 Implementation of Previous UWMP

Cal Water will follow the California Water Code and file an UWMP at least once every five years on or before December 31, in years ending in five and zero. Since Cal Water operates 24 separate service districts the UWMP for each district has historically been submitted every third year to coincide with its California Public Utilities Commission (CPUC) general rate case (GRC) schedule. This method divided the districts into three sets that followed an established three-year schedule. The Plan for Salinas was last submitted as part of the 2007 grouping. Cal Water has since eliminated these groupings and will now file a GRC for all districts every third year and an UWMP every fifth year.

# 2 System Description

## 2.1 Service Area Description

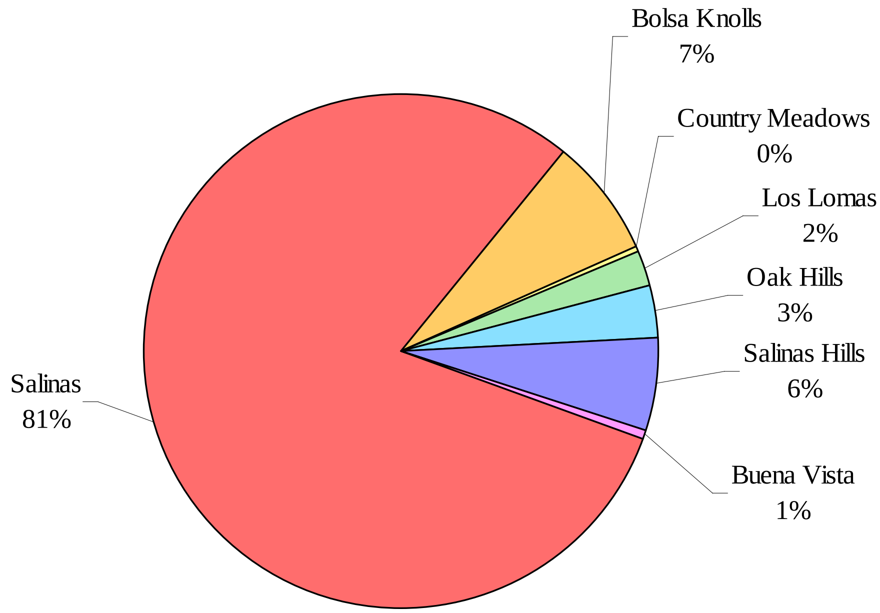
The Salinas District is located in northern Monterey County approximately 15 miles northeast of the City of Monterey. Figure 2.1-1 shows a general location map of the District. Salinas is primarily a residential community supported by an agricultural economy. The community is located on the flood plain of the Salinas River.

**Figure 2.1-1: General Location of Salinas District – Monterey County[1]**


[1] http://www.city-data.com/city/Salinas-California.html

The Salinas District serves about 70 percent of the residents of the City of Salinas and the residents of the unincorporated communities of Bolsa Knolls, Las Lomas, Oak Hills, Country Meadows, Salinas Hills, and Buena Vista. The distribution of services per community as a percentage of the total District is shown in Figure 2.1-2. Alco Water Company serves the segment of the City of Salinas not served by Cal Water.

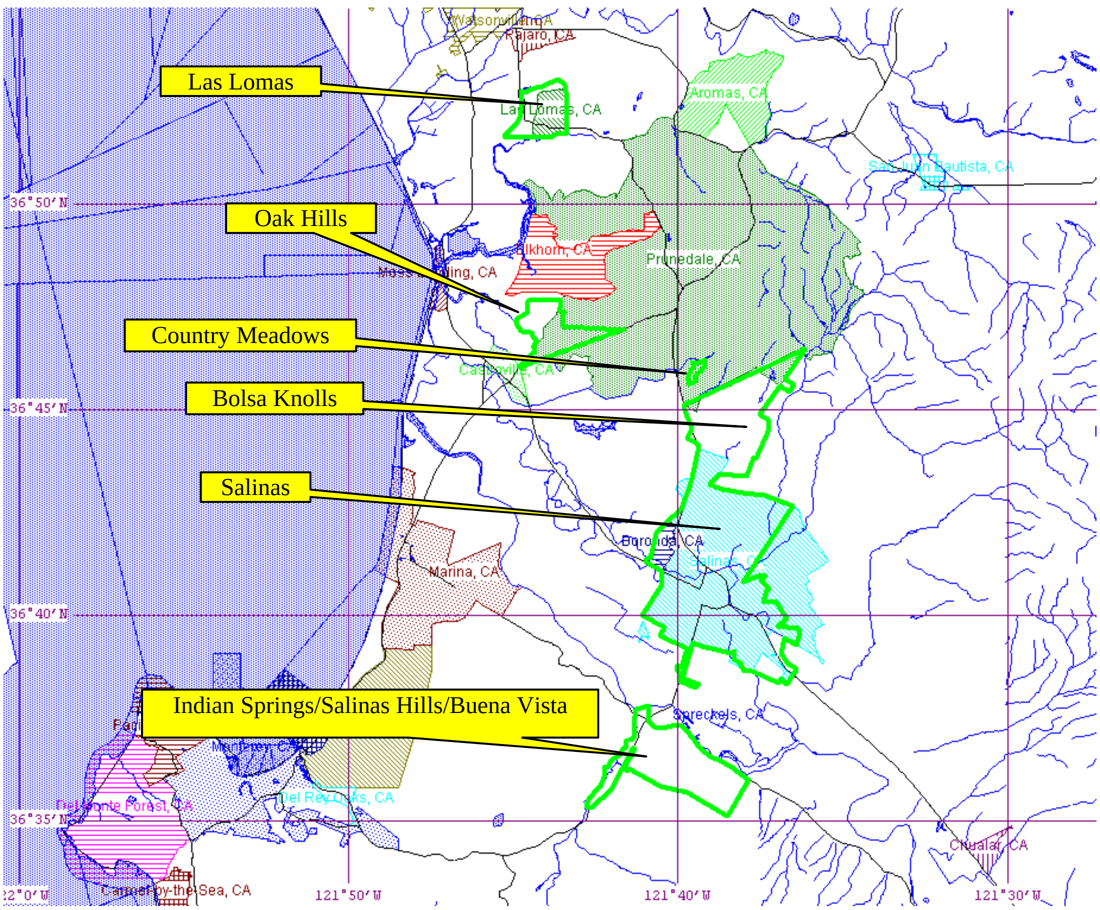
**Figure 2.1-2: Distribution of Services per Community**



The general service area can be seen in Figure 2.1-3. The Salinas and Bolsa Knolls systems are linked hydraulically while all of the other systems are small isolated systems. For the purposes of this planning study all data on demand and services have been combined into a consolidated value and reported as a single unit. Salinas is surrounded by large parcels of land. Portions of this land have been developed for agricultural functions. This land could be developed for residential, commercial, or industrial uses if required for urban expansion; thus the potential for growth is substantial.

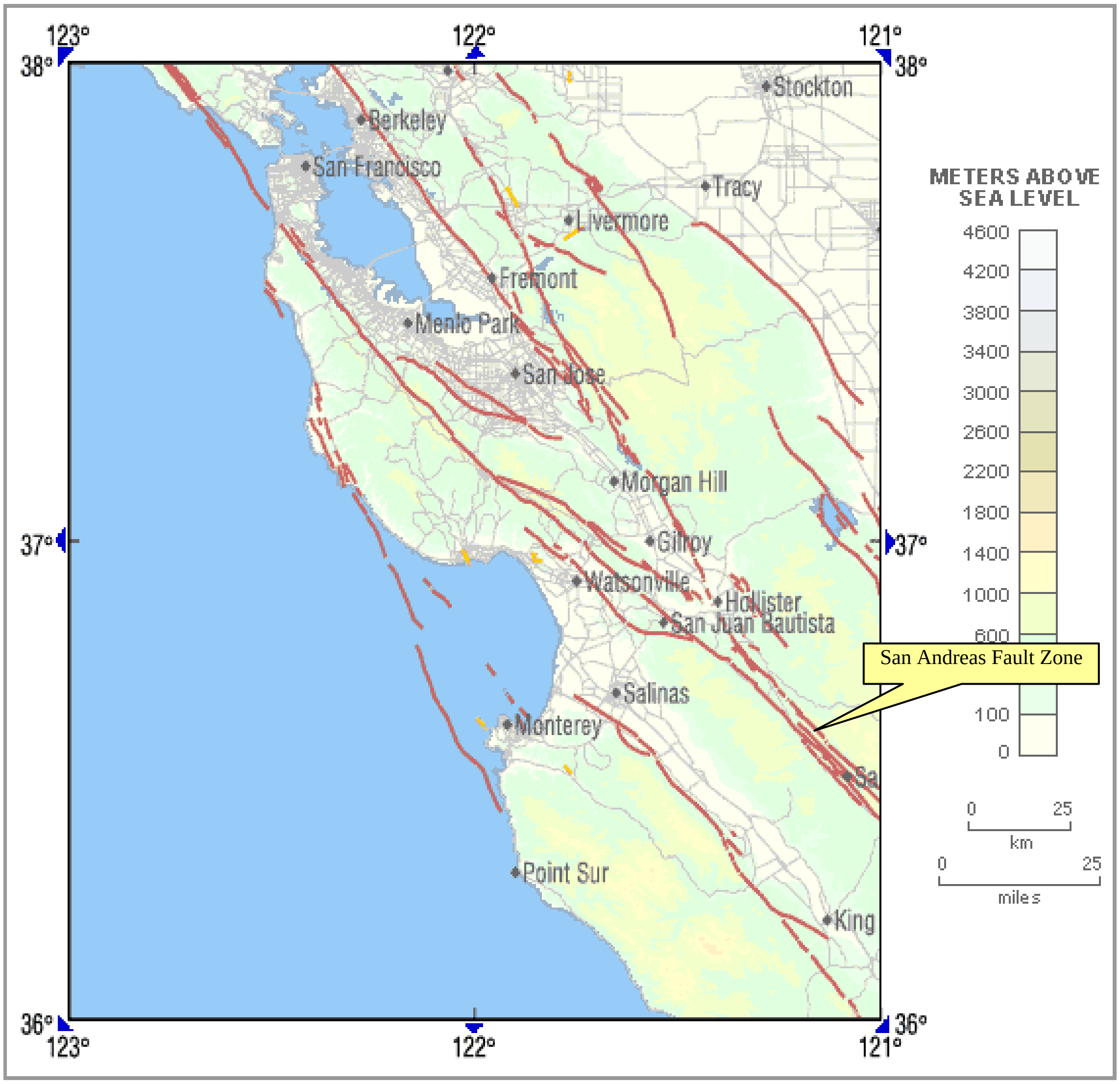
The major transportation route in the area is State Highway 101; the Southern Pacific Railroad also serves the area. The Salinas Municipal Airport is located in the southeast corner of the city.

**Figure 2.1-3: General Service Area**



The most significant geological features in the area are two strike-slip faults: the San Andreas Fault lies 13 miles to the east and the Rinconada Fault that lies five miles to the west of the District, as shown in Figure 2.1-4.[2] Salinas is in the northern section of the Central Coast hydrologic region and is within both the Pressure and Eastside sub-areas of the Salinas Valley groundwater basin.

**Figure 2.1-4: Major Fault Lines near the Salinas District**




Source: USGS

[2] United State Geological Service, Earthquake Hazards Program, Downloaded from: http://quake.wr.usgs.gov/info/faultmaps/119-35.html

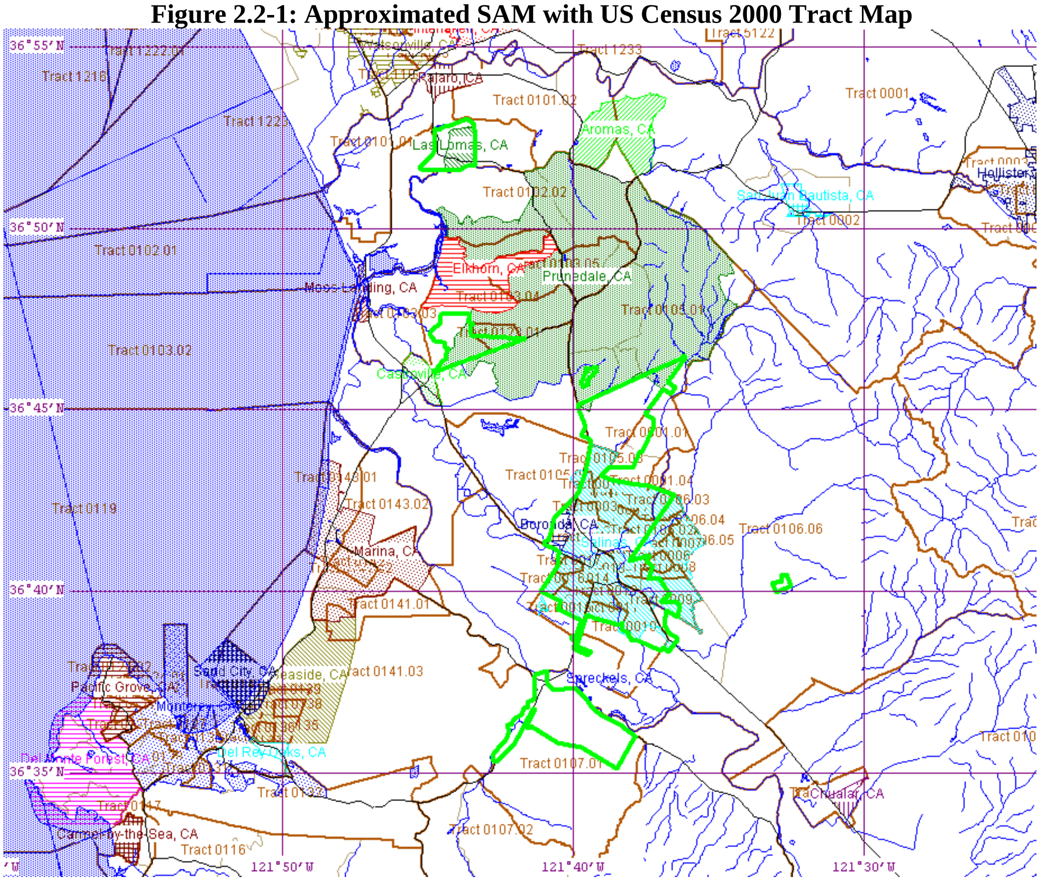
## 2.2 Service Area Population

Cal Water's Salinas District is growing at a rate of -0.03 percent based on growth in total services over the past five years. This rate reflects a slower pace of growth than has been seen historically, and is evidence of the current slowdown in the housing market.

Based on 2000 U.S. Census data, considering actual service connection growth and assuming that density has remained unchanged since the census was conducted, Cal Water estimates that as of December 2009, the District's population is approximately 129,700. A density of 3.43 persons per residential service (single family services plus multifamily units) was used for this estimate.

The process for estimating population in the Salinas District began by overlaying the U.S. Census 2000 Block data with the Cal Water service area map (SAM), as shown in Figure 2.2-1.

**Figure 2.2-1: Approximated SAM with US Census 2000 Tract Map**



A summary of the census data for the year 2000 is shown in Table 2.2-1. LandView 5 and MARPLOT ® software were used to generate the data[2].

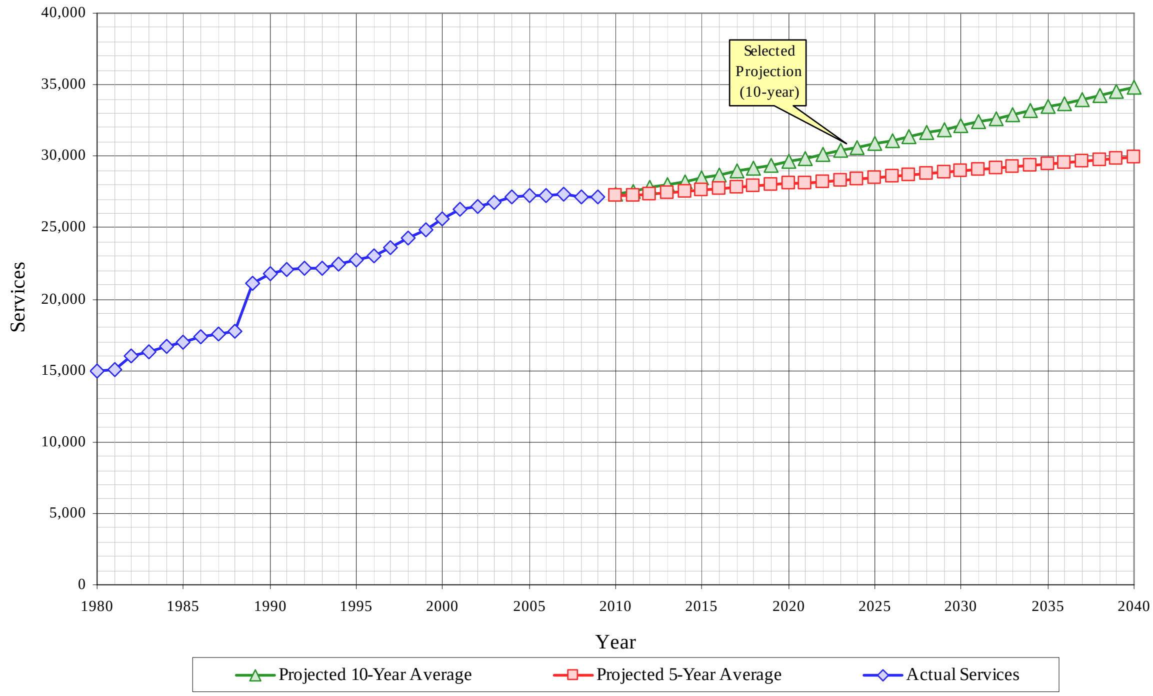
| Table 2.2-1: Summary of Census 2000 Data | | | |
|---|---|---|---|
| | **Census Blocks** | **Population** | **Housing Units** |
| Salinas Service Area | 779 | 119,652 | 34,866 |

This data was used as a baseline for estimating population starting in 2000. To calculate estimated population after 2000, the Census 2000 population was then divided by the total number of dwelling units served by Cal Water in 2000 to produce a population density value. This density was then multiplied by the number of Cal Water dwelling units in each future year.

To establish a range of future service counts the five-year, ten year, and Master Plan projected growth rates for each service type were continued through 2040. The five-year average is the short-term growth rate calculated from 2005 to 2009, which has an overall annual average growth rate of -0.03 percent. The ten-year average, the long-term growth rate calculated from 2000 to 2009, exhibits an overall annual average growth rate of 0.91 percent. As shown in the following graph, the ten-year growth rate has the strongest correlation with the historical trend. A comparison of service connection growth rates is shown in Figure 2.2-2.

[2] LandView 5 and MARPLOT ® software, US Census Bureau/Environmental Protection Agency, downloaded from: http://www.census.gov/geo/landview/lv5/lv5.html, http://www.epa.gov/ceppo/cameo/marplot.htm

**Figure 2.2-2: Historical & Projected Services**




The ten-year growth rate is projecting an increase of 7,480 total services by 2040. The majority of the new services will be residential services which will account for 85 percent of the total, or an increase of 6,392 residential service connections. Cal Water was selected as the water service provider for three known projects to be developed. The development projects are listed in Table 2.2-2.

| Table 2.2-2: Proposed Developments | |
|---|---|
| Housing Development | Dwelling Units |
| Central Area Specific Plan | 3,610 |
| Rancho San Juan | 1,147 to 3,653 |
| Rancho Los Robles sub-development | 101 |
| Total | 4,858 to 7,364 |

The ten-year growth rate projection includes a sufficient amount of service connections to cover the proposed developments and any additional redevelopments that may occur in the District. At this time the status of these development projects is unknown. It is likely that with the downturn in the housing market these developments will be delayed until there is a demand. Because of this Cal Water expects minimal growth in the next several years, and none of these projects will result a sudden increase in service counts above what was previously expected.

Cal Water's Water Supply and Facilities Master Plan used a growth rate that included these developments and produced a rate that is significantly greater than the ten-year average growth rate. Because this rapid rate of growth is no longer expected to occur, the Master Plan growth rate was not selected to project future service counts.

The available land around Salinas could easily accommodate sustained growth at either growth pattern; however, for the purposes of this plan the ten-year average growth rate was considered more in line with regional planning, and as such was used to forecast potential customer demand. Cal Water's Water Supply and Facilities Master Plan includes an assessment of future water demand and is based on a detailed review of the City of Salinas General Plan and Monterey County's Rancho San Juan Specific Plan. While the Rancho San Juan development is only partly in Cal Water's existing service area, we anticipate, based on discussions with the developer, serving the entire project. Thus, the ten-year average growth rate with its greater overall growth rate is a more appropriate forecasting value.

Cal Water estimates the service area's population could reach 196,800 by 2040. Table 2.2-3 lists the population growth in 5-year increments.

**Table 2.2-3: Population - Current and Projected (Table 2)**

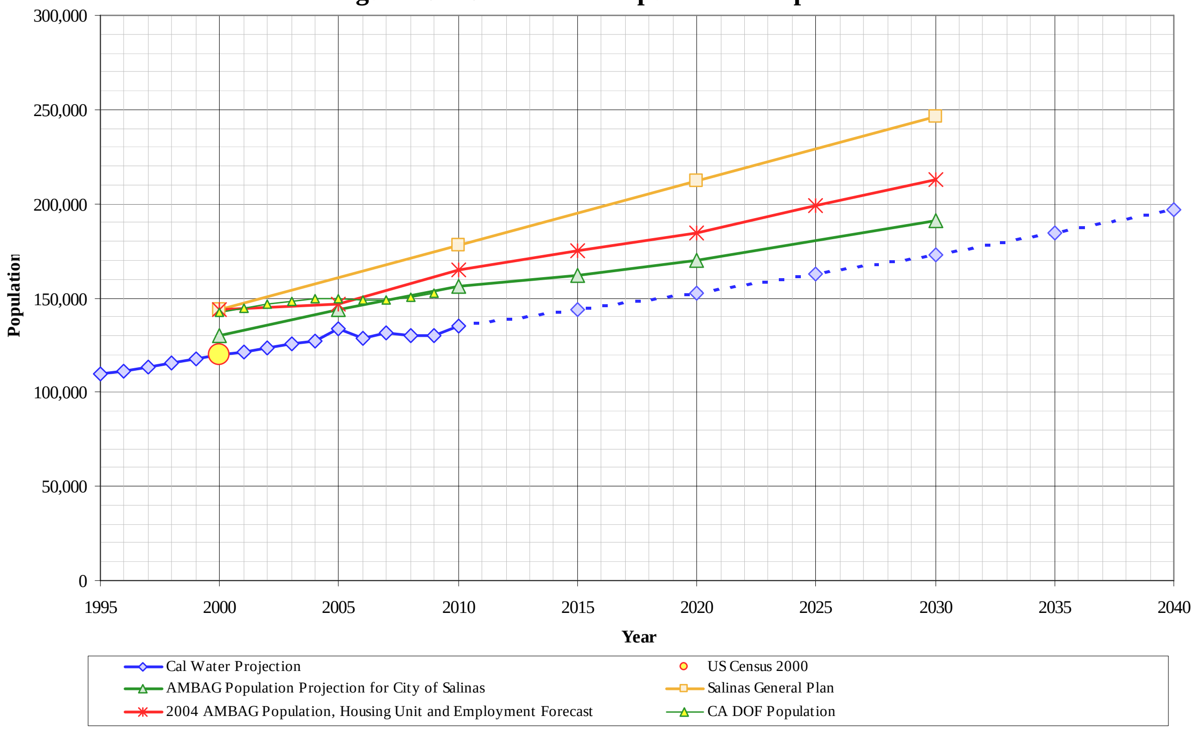
| | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| **Service Area Population** | 133,440 | 134,870 | 143,470 | 152,690 | 162,580 | 173,190 | 184,580 | 196,800 |

The population estimates for the District are compared to projections made by other governmental agencies, as shown in Figure 2.2-3. Cal Water's population projection is compared to the projections presented by the Association of Monterey Bay Area Governments (AMBAG)[3], the Salinas General Plan[4], and California Department of Finance.

[3] Association of Monterey Bay Area Governments (AMBAG), document downloaded from: http://www.ambag.org/pdf/forecast/ForecastResults.pdf

[4] Salinas General Plan document downloaded from: http://www.ci.salinas.ca.us/CommDev/GenPlan/GenPlanFinal/Elements/HE_Tech_2.html

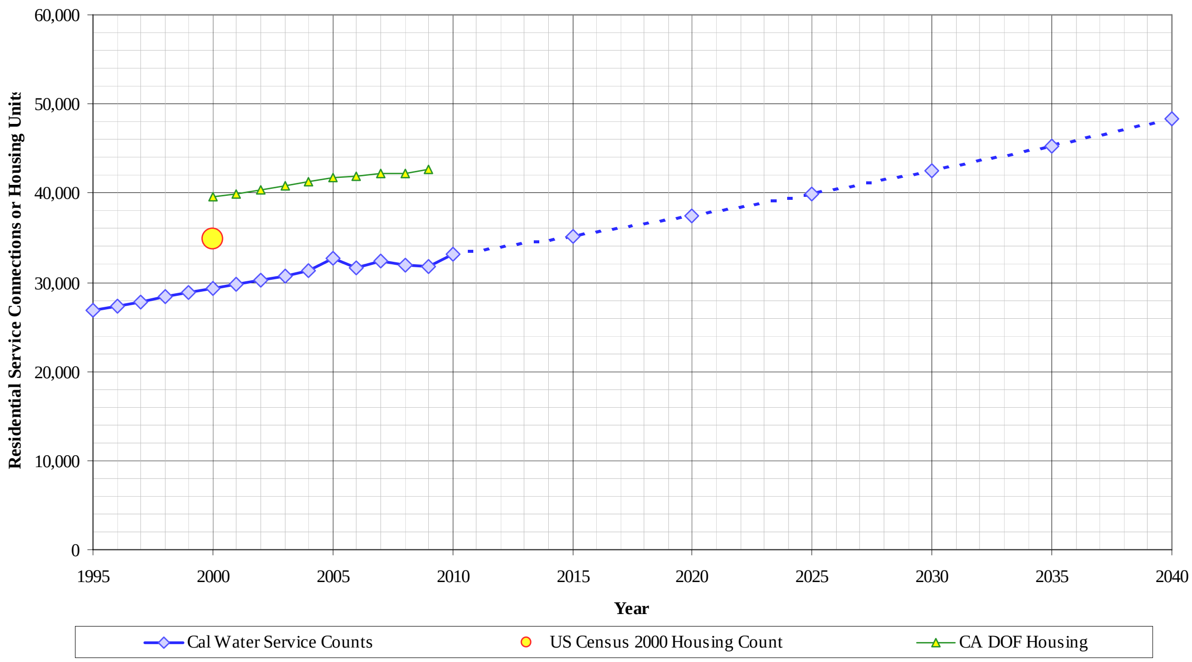
**Figure 2.2-3: Estimated Population Comparison**




From the graph above, we can see that the growth rate projected by Cal Water is similar than the projected rate of increase estimated by both AMBAG and the City of Salinas. However, both these projections include areas of the City of Salinas that are not included in Cal Water's service area. These areas, when developed, are also more likely to be higher density than many of the areas currently served by Cal Water. As a result the total population figures for these projections are greater, as is the rate of increase.

Similarly, the housing count was estimated by comparing the US Census 2000 data and the service counts for the Salinas District, Figure 2.2-4. The service count for the year 2000 is lower than the US Census 2000 housing units estimate. This is most likely the result of district service connections including one meter that serves several housing units, such as duplexes or apartments, whereas the US Census data combines all of the housing units (single and multifamily residences). The US Census 2000 housing unit figures were established by summarizing the individual census blocks enclosed within the service area of the District. The California DOF data is larger because it includes areas of Salinas not served by Cal Water.

**Figure 2.2-4: Estimated Housing Comparison**



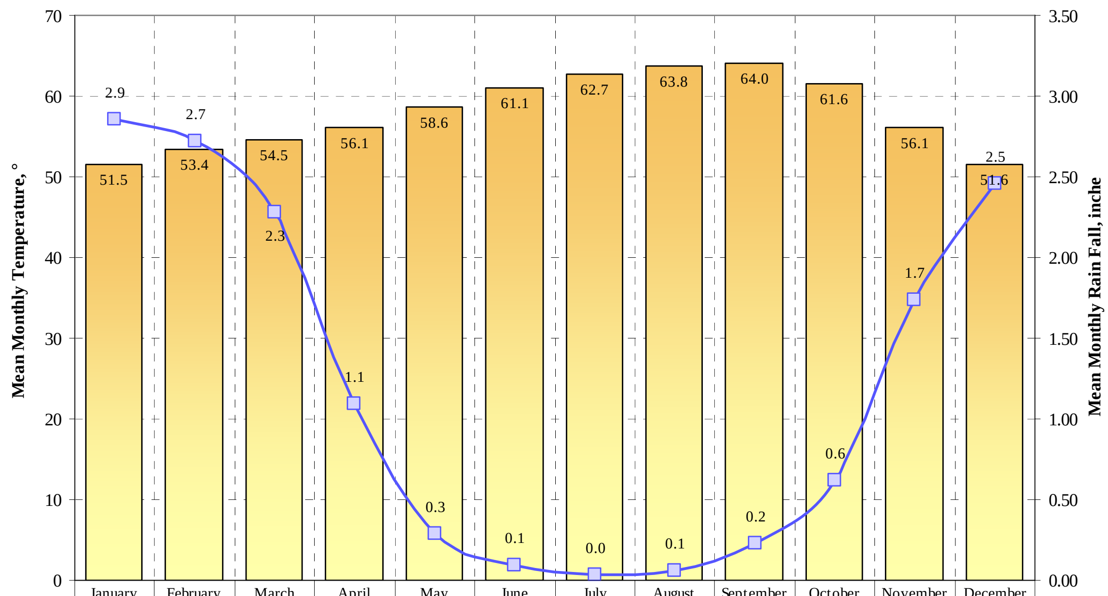
## 2.3 Service Area Climate

The climate for the Salinas District is moderate with warm dry summers and cool winters. The majority of precipitation falls during late autumn, winter, and early spring. Table 2.3-1 lists the average annual conditions for the weather station in Salinas. Additional climate data is provided in the Appendix C, worksheet 18.

| Table 2.3-1: Average Annual Climate (Table 3) | | |
|---|---|---|
| **Average Temperature** | **Average Rainfall** | **Annual Total Evapo-transpiration** |
| 57.9°F | 14.5 inches | 39.0 inches |

Figure 2.3-1 displays the average monthly temperature and rainfall[5].

**Figure 2.3-1: Average Monthly Temperature and Rainfall**

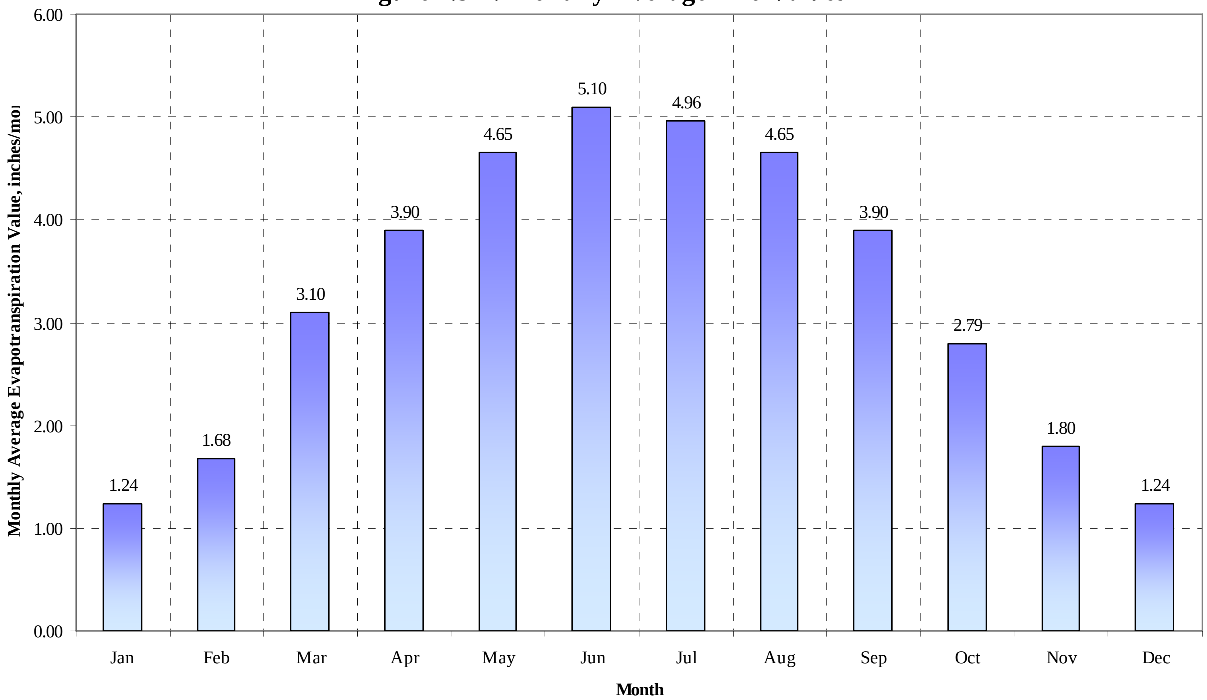



| | January | February | March | April | May | June | July | August | September | October | November | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Temperature | 51.5 | 53.4 | 54.5 | 56.1 | 58.6 | 61.1 | 62.7 | 63.8 | 64 | 61.6 | 56.1 | 51.6 |
| Rainfall | 2.86 | 2.72 | 2.28 | 1.09 | 0.29 | 0.09 | 0.03 | 0.06 | 0.23 | 0.62 | 1.74 | 2.46 |

5 Western Regional Climate Center, Salinas Station, http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?casali+nca

Figure 2.3-2 displays the monthly average evapotranspiration values for the area of the District[6]. Evapotranspiration is the sum of water loss from a watershed because of the processes of evaporation from the earth's surface and transpiration from plant leaves. The annual estimated transpiration for Salinas is 39.0 inches. The average annual rainfall of 14.5 inches is only 37 percent of the annual total evapotranspiration value.

**Figure 2.3-2: Monthly Average ETo Values**




[6] California Irrigation Management Information System (CIMIS), EvapoTranspiration (Eto) Zones Map - Zone 15, http://wwwcimis.water.ca.gov/cimis/welcome.jsp

# 3 System Demands

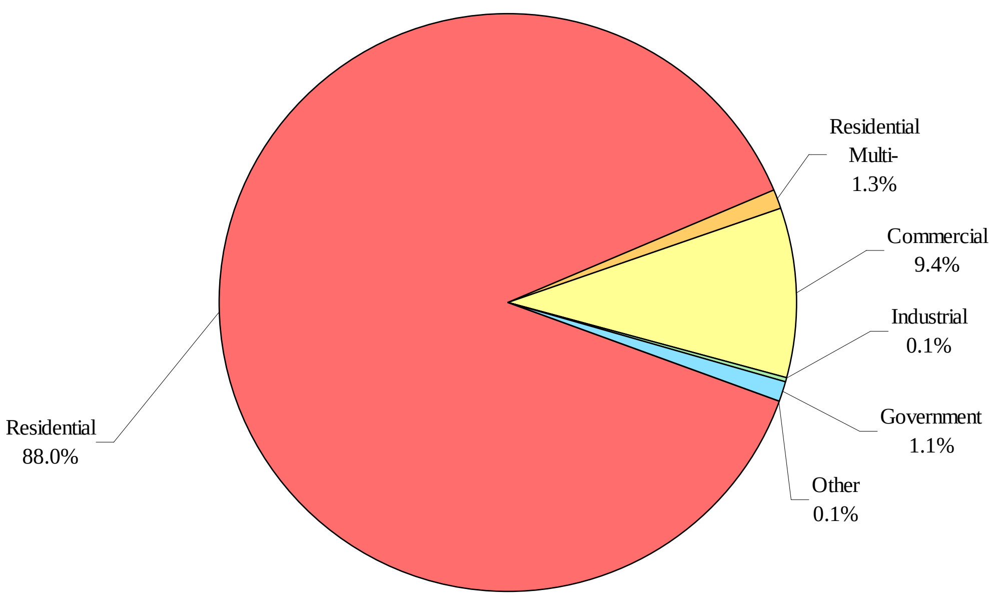
## 3.1 Distribution of Services

Cal Water classifies customer service connection categories as follows:

- Single Family Residential
- Multi Family Residential
- Commercial
- Industrial
- Government
- Other

Land use in the Salinas District is dominated by residential and commercial activities, as seen in the distribution of services for the District, Figure 3.1-1. Single-family residential services account for 88.0 percent of all services; multifamily residential services represent 1.3 percent and commercial services 9.4 percent. Thus, 98.7 percent of all services are for residential and commercial facilities. The remaining 1.3 percent includes industrial, governmental uses, and other functions such as temporary construction meters.

**Figure 3.1-1: Distribution of Services (2010)**



## 3.2 Historical and Current Water Demand

Demand per service was established as a function of historical sales and service data. Historical sales values are illustrated in Figure 3.2-1. Historical service counts are illustrated in Figure 3.2-2.

**Figure 3.2-1: Historical Sales**

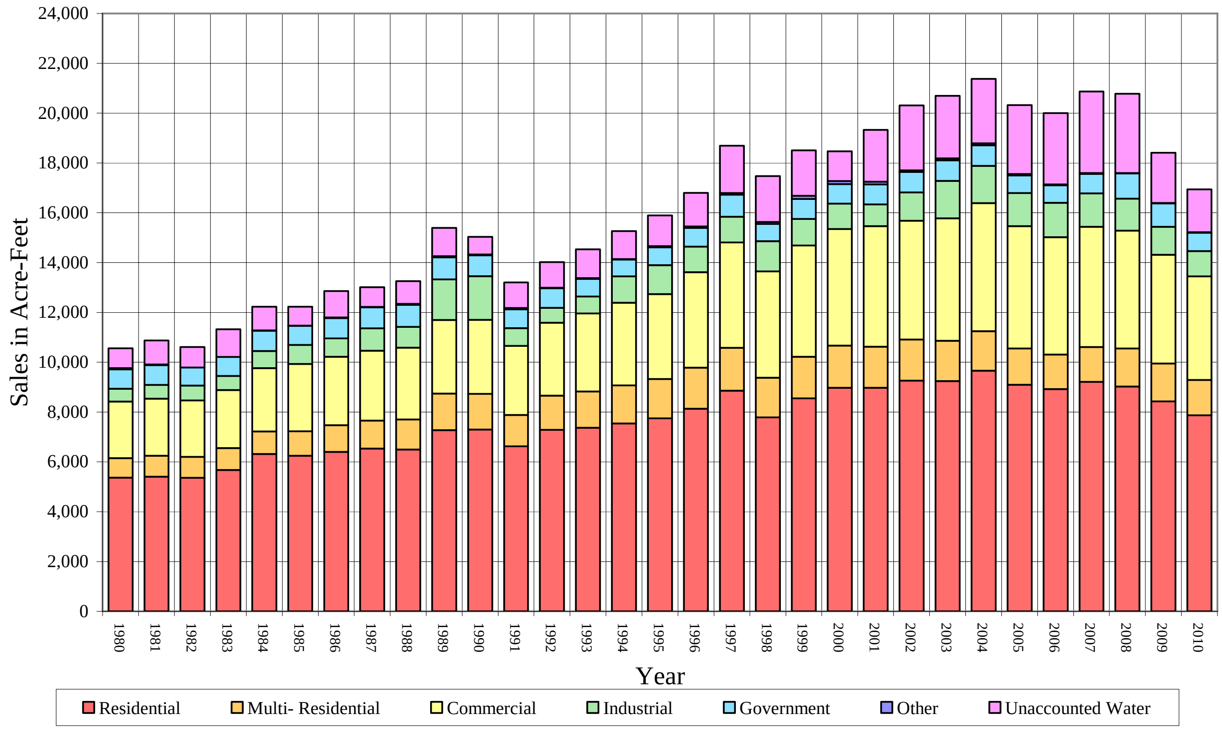
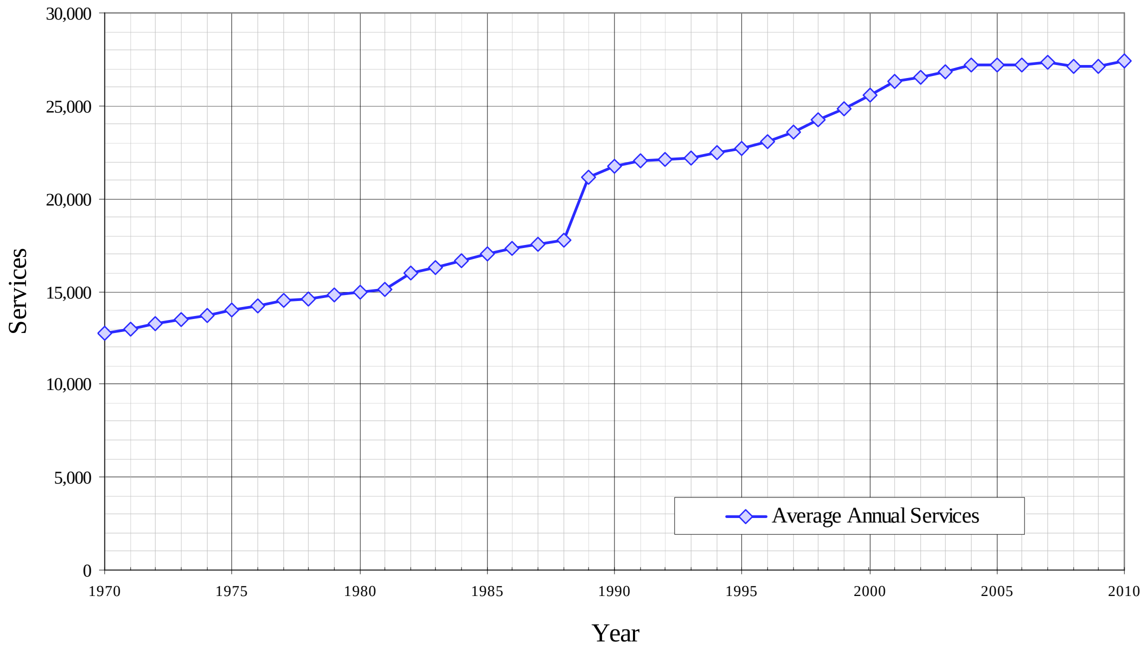
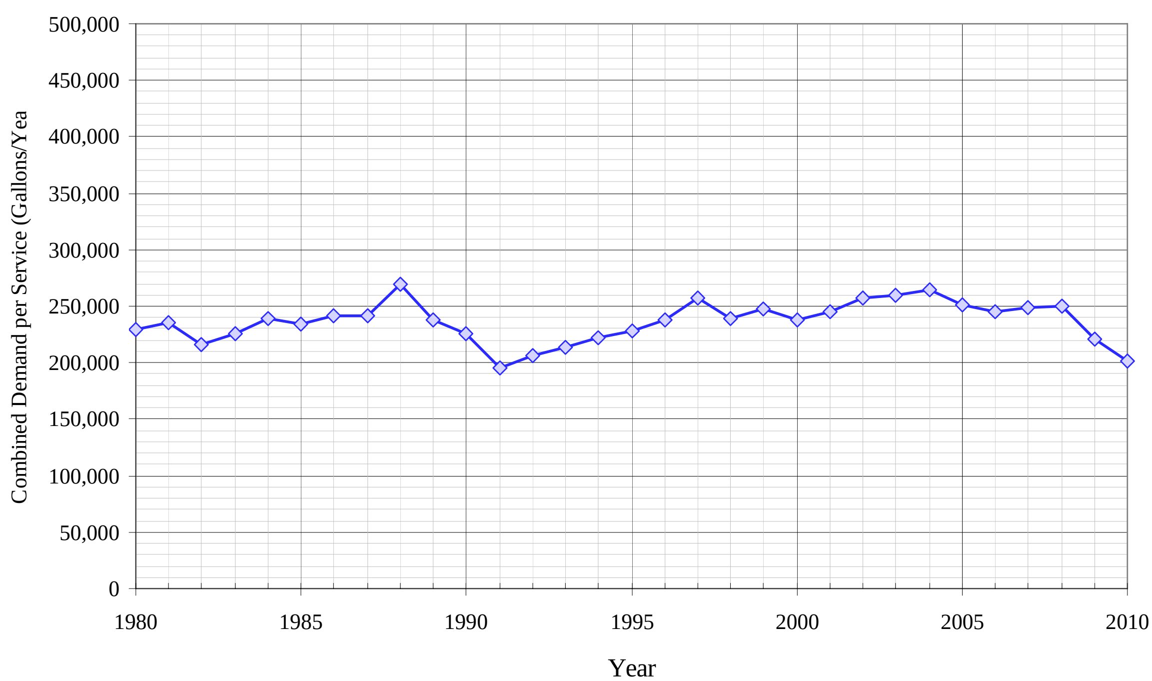


**Figure 3.2-2: Historical Service Counts**




The combined demand for all services generally fluctuates between 200,000 and 260,000 gallons per service per year. Historical demand per service figures are shown in Figure 3.2-3.

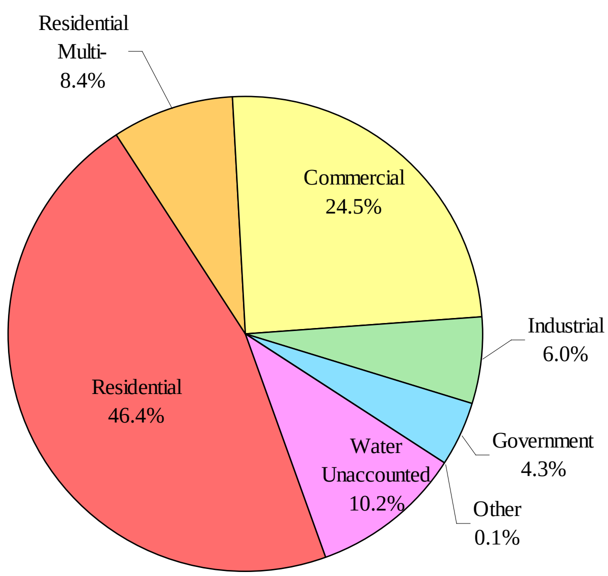
**Figure 3.2-3: Historical Demand per Service**



Demand began declining in 1989 in response to the last drought and was capped by a reduction in 1991 as compared to 1990. Since 1991 demand has steadily increased until a reduction was seen in response to the most recent drought from 2006-2007.

Single family residential water use represents the one of the smallest demand per service segments in the District with a 5-year average of 125,396 gallons per service per year, yet this category uses 46.4 percent of the total demand. The multifamily residential use was 8.4 percent of the total demand with a demand per service that has a 5-year average of 1,473,607 gallons per service per year. The combined residential sector component of demand is equal to 54.8 percent of total demand.

**Figure 3.2-4: Percent of Total Demand by Type of Use (2010)**




## 3.3 Water Demand Projections

Cal Water has historically made its water demand projections by first calculating individual growth rates for each of its service connection types. These growth rates were based on five or ten year averages of service count data, and were extended over the planning horizon resulting in projected service counts. A set of three demand per service values (low, average, high), which were based on past customer usage records, were then applied to the projected service counts to calculate projected water demands for each service type. Due to the passage of Senate Bill 7 (SBx7-7) this method is no longer used as the primary method for calculating projected demands. However, these calculations are still used as the basis for calculating projected services, population, and the distribution of demand amongst service connection types.

The method used in this UWMP to determine future water demands is a response to SBx7-7 requirements. It results in two demand projections; the unadjusted baseline demand, and the target demand. The unadjusted baseline water demand projection is the total demand expected without any achieved conservation. It is equal to forecasted population multiplied by the 2005-09 average, or 139 gpcd.

The target water demand projection includes conservations savings due to both passive and active demand management, which are described in Section 6. The target demand is calculated by multiplying SBx7-7 target gpcd values and projected population. These conservation savings are illustrated in the comparison of projected demands shown in Figure 3.3-1.

**Figure 3.3-1: Historical & Projected Demand**

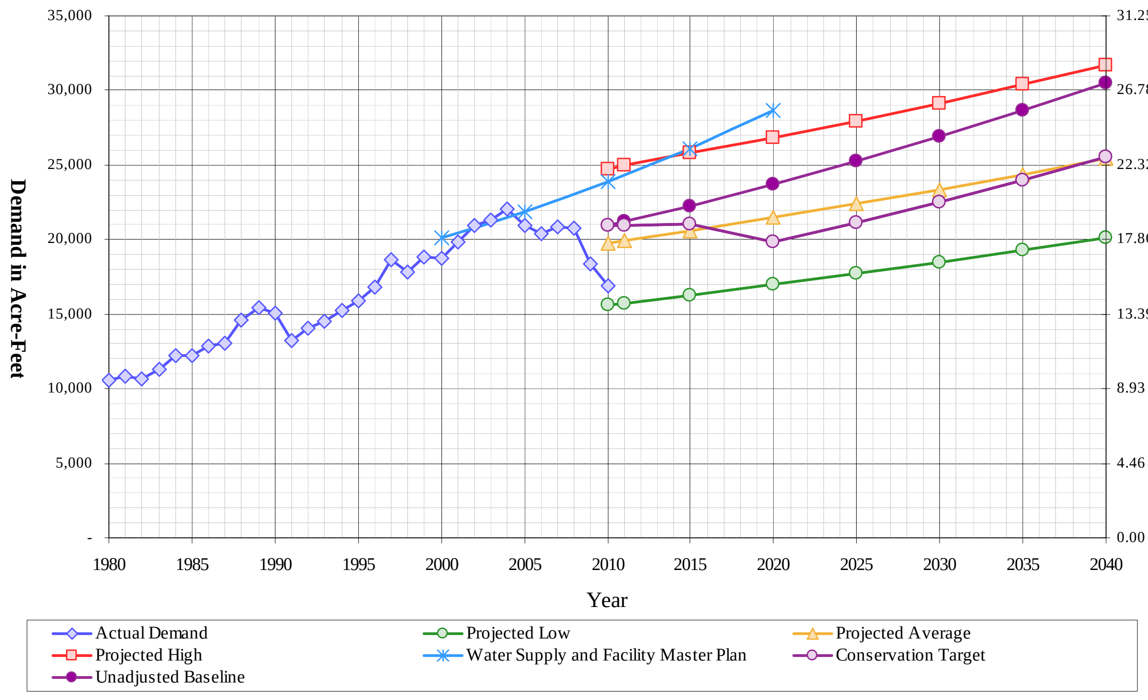



Figure 3.3-1 also shows the demand projection developed in Cal Water's Water Supply and Facilities Master Plan for the Salinas District. In this case water demands were projected using a unit demand methodology based on land uses in the City's General Plan. It is included here to provide a comparison to demands calculated for the purposes of SBx7-7 compliance.

The water demand projection calculation used for SBx7-7 compliance relies only on future population and gpcd target values. Projected water deliveries separated by customer type can not be determined by this method alone. To get a breakdown of future deliveries Cal Water used the ratio of individual deliveries for each class to the total amount that was developed for the previously used water demand projection. This ratio was applied to the total adjusted baseline demand, which resulted in the projected deliveries listed in Tables 3.3-1 through 3.3-6. These demands include the conservation savings associated with the demand management measures described in Section 6.

**Table 3.3-1: Actual 2005 Water Deliveries – AF (Table 3)**

| | 2005 | | | | |
|---|---|---|---|---|---|
| | Metered | | Not Metered | | Total |
| Water Use Sectors | # of accounts | Volume | # of accounts | Volume | Volume |
| Single family | 23,985 | 9,093 | 324 | 606 | 9,699 |
| Multi-family | 324 | 1,456 | - | - | 1,456 |
| Commercial | 2,639 | 4,914 | - | - | 4,914 |
| Industrial | 33 | 1,322 | - | - | 1,322 |
| Institutional/government | 196 | 719 | - | - | 719 |
| Landscape | - | - | - | - | - |
| Recycled | - | - | - | - | - |
| Other | 31 | 48 | - | - | 48 |
| Total | 27,208 | 17,552 | 324 | 606 | 18,157 |

**Table 3.3-2: Actual 2010 Water Deliveries – AF (Table 4)**

| | 2010 | | | | |
|---|---|---|---|---|---|
| | Metered | | Not Metered | | Total |
| Water Use Sectors | # of accounts | Volume | # of accounts | Volume | Volume |
| Single family | 24,148 | 7,865 | - | - | 7,865 |
| Multi-family | 371 | 1,427 | - | - | 1,427 |
| Commercial | 2,556 | 4,155 | - | - | 4,155 |
| Industrial | 33 | 1,021 | - | - | 1,021 |
| Institutional/government | 310 | 732 | - | - | 732 |
| Landscape | - | - | - | - | - |
| Recycled | - | - | - | - | - |
| Other | 21 | 16 | - | - | 16 |
| Total | 27,439 | 15,216 | 0 | 0 | 15,216 |

| Table 3.3-3: Projected 2015 Water Deliveries – AF (Table 5) | | | | | |
|---|---|---|---|---|---|
| | 2015 | | | | |
| | Metered | | Not Metered | | Total |
| Water Use Sectors | # of accounts | Volume | # of accounts | Volume | Volume |
| Single family | 24,970 | 9,997 | - | - | 9,997 |
| Multi-family | 398 | 1,899 | - | - | 1,899 |
| Commercial | 2,714 | 4,551 | - | - | 4,551 |
| Industrial | 32 | 985 | - | - | 985 |
| Institutional/government | 327 | 1,580 | - | - | 1,580 |
| Landscape | - | - | - | - | - |
| Recycled | - | - | - | - | - |
| Other | 24 | 52 | - | - | 52 |
| Total | 28,465 | 19,064 | - | - | 19,064 |

| Table 3.3-4: Projected 2020 Water Deliveries - AF (Table 6) | | | | | |
|---|---|---|---|---|---|
| | 2020 | | | | |
| | Metered | | Not Metered | | Total |
| Water Use Sectors | # of accounts | Volume | # of accounts | Volume | Volume |
| Single family | 25,972 | 9,399 | - | - | 9,399 |
| Multi-family | 425 | 1,833 | - | - | 1,833 |
| Commercial | 2,839 | 4,303 | - | - | 4,303 |
| Industrial | 32 | 890 | - | - | 890 |
| Institutional/government | 342 | 1,494 | - | - | 1,494 |
| Landscape | - | - | - | - | - |
| Recycled | - | - | - | - | - |
| Other | 25 | 49 | - | - | 49 |
| Total | 29,635 | 17,969 | - | - | 17,969 |

| Table 3.3-5: Projected 2025 and 2030 Water Deliveries - AF (Table 7) | | | | |
|---|---|---|---|---|
| | 2025 | | 2030 | |
| | Metered | | Metered | |
| Water Use Sectors | # of accounts | Volume | # of accounts | Volume |
| Single family | 27,014 | 9,983 | 28,098 | 10,607 |
| Multi-family | 454 | 1,998 | 484 | 2,179 |
| Commercial | 2,970 | 4,596 | 3,106 | 4,912 |
| Industrial | 32 | 909 | 32 | 929 |
| Institutional/government | 358 | 1,596 | 375 | 1,706 |
| Landscape | - | - | - | - |
| Recycled | - | - | - | - |
| Other | 27 | 52 | 28 | 56 |
| Total | 30,854 | 19,136 | 32,123 | 20,388 |

| Table 3.3-6: Projected 2035 and 2040 Water Deliveries - AF (Table 7) | | | | |
|---|---|---|---|---|
| | 2035 | | 2040 | |
| | Metered | | Metered | |
| **Water Use Sectors** | # of accounts | Volume | # of accounts | Volume |
| **Single family** | 29,225 | 11,274 | 30,398 | 11,985 |
| **Multi-family** | 517 | 2,377 | 552 | 2,594 |
| **Commercial** | 3,250 | 5,250 | 3,399 | 5,613 |
| **Industrial** | 32 | 949 | 32 | 970 |
| **Institutional/government** | 392 | 1,823 | 410 | 1,949 |
| **Landscape** | - | - | - | - |
| **Recycled** | - | - | - | - |
| **Other** | 29 | 60 | 30 | 64 |
| **Total** | 33,445 | 21,733 | 34,822 | 23,176 |

### 3.3.1 Senate Bill No. 7 Baselines and Targets

Cal Water is in the process of expanding current conservation programs and developing new programs for its 24 service districts. Over the next five years, Cal Water conservation program expenditures are likely to increase significantly due in large measure to recently adopted state policies requiring significant future reductions in per capita urban water use. These include the passage of Senate Bill No. 7 (SBx7-7) in November 2009, which mandated a statewide 20 percent reduction in per capita urban water use by 2020, as well as recent decisions by the California Public Utilities Commission (CPUC) directing Class A and B water utilities to adopt conservation programs and rate structures designed to achieve reductions in per capita water use, and the *Memorandum of Understanding Regarding Urban Water Conservation in California* (MOU), of which Cal Water has been a signatory since 1991. In preparing for this program expansion, Cal Water has spent the past year developing five-year conservation program plans for each of its service districts. The complete Salinas District Conservation Master Plan is included as Appendix G.

SBx7-7, which was signed into law in November 2009, amended the State Water Code to require a 20 percent reduction in urban per capita water use by December 31, 2020. Commonly known as the 20x2020 policy, the new requirements apply to every retail urban water supplier subject to the Urban Water Management Planning Act (UWMPA).

The state is required to make incremental progress toward this goal by reducing per capita water use by at least 10 percent on or before December 31, 2015. SBx7-7 requires each urban retail water supplier to develop interim and 2020 urban water use targets in accordance with specific requirements. They will not be eligible for state water grants or loans unless they comply with those requirements.

The law provides each water utility several ways to calculate its interim 2015 and ultimate 2020 water reduction targets. In addition, water suppliers are permitted 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 SBx7-7 by either meeting their individual target or being part of a regional alliance that meets its regional target. For all Cal Water districts falling within the same hydrologic region, Cal Water intends to enter regional alliances as listed in Table 3.3-7. The Salinas District lies within the Central Coast hydrologic region, along with the King City District.

**Table 3.3-7: Cal Water Districts Sorted by Hydrologic Region**

| Hydrologic Region | Cal Water Districts in Region |
|---|---|
| North Coast | Redwood Valley |
| San Francisco Bay Area | Bear Gulch, Livermore, Los Altos, Mid- Peninsula, South San Francisco |
| Central Coast | King City, **Salinas** |
| South Coast | Dominguez, East LA, Hermosa-Redondo, Palos Verdes, Westlake |
| Sacramento River | Chico, Dixon, Marysville, Oroville, Willows |
| San Joaquin | Stockton |
| Tulare Lake | Bakersfield, Kern River Valley, Selma, Visalia |
| North Lahontan | None |
| South Lahontan | Antelope Valley |
| Colorado River | None |

District-specific and regional targets for Cal Water districts within the Central Coast hydrologic region are shown in Table 3.3-8. The 2015 and 2020 district-specific targets for Salinas District are 131 and 117 gpcd, respectively. Over the last five years District demand has averaged about 139 gpcd. Thus, per capita demand would need to fall by 7 percent by 2015 and by 18 percent by 2020 in order to meet these targets. Alternatively, if average per capita water use for the Salinas and King City does not exceed 134 gpcd in 2015 and 119 gpcd in 2020, then both districts will be in compliance with SBx7-7 requirements.

**Table 3.3-8: Regional SBx7-7 Targets for Cal Water Districts in Central Coast Hydrologic Region**

| District | Population | 2015 Target | 2020 Target |
|---|---|---|---|
| King City | 10,260 | 160 | 142 |
| Salinas | 124,970 | 131 | 117 |
| **Regional Targets[1]** | | **134** | **119** |

[1] Regional targets are the population-weighted average of the district targets.

The following analysis presents the individual SBx7-7 compliance targets for the Salinas District.

Under SBx7-7, an urban retail water supplier may adopt one of four different methods for determining the 2020 gpcd target:

1. Set the 2020 target to 80 percent of average GPCD for any continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.
2. Set the 2020 target as the sum of the following:
   a. 55 GPCD for indoor residential water use.
   b. 90 percent of baseline CII water uses, where baseline CII GPCD equals the average for any contiguous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.
   c. Estimated per capita landscape water use for landscape irrigated through residential and dedicated irrigation meters assuming water use efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Section 2.7 of Division 2 of Title 23 of the California Code of Regulations.
3. Set the 2020 target to 95 percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009).
4. A method determined by DWR through the urban stakeholder process.

For district-specific SBx7-7 compliance, targets were set to either 80 percent of baseline gpcd (Method 1) or 95 percent of the District's hydrologic region target (Method 3), whichever was greater. An analysis for Method 2 was not performed due to a lack of data necessary for this method. Method 4 was also not considered because it was not available when the Conservation Master Plan process began.

Under Method 1, the 2015 and 2020 targets are set to 90 percent and 80 percent of baseline water use, respectively. Baseline water use is the average water use for any continuous 10-year period ending between 2004 and 2010. For the Salinas District, the 10-year base period 1997-2006 yielded the maximum target under this method. The 2015 target is 131 gpcd and a 2020 target is 116 gpcd. Table 3.3-9 summarizes the base period ranges and Table 3.3-10 lists the per capita demand over the ten-year base period.

| Table 3.3-9: Base Period Ranges (Table 13) | | | |
|---|---|---|---|
| **Base** | **Parameter** | **Value** | **Units** |
| 10-15-year base period | 2008 total water deliveries | 17,600 | AF |
| | 2008 total volume of delivered recycled water | 0 | AF |
| | 2008 recycled water use as a percent of total deliveries | 0 | % |
| | Number of years in base period | 10 | years |
| | Year beginning base period range | 1997 | |
| | Year ending base period range | 2006 | |
| 5-year base period | Number of years in base period | 5 | years |
| | Year beginning base period range | 2003 | |
| | Year ending base period range | 2007 | |

| Table 3.3-10: Daily Base Per Capita Water Use-10-Year Range (Table 14) | | | | |
|---|---|---|---|---|
| **Base Period Year** | | **Distribution System Population** | **Daily System Gross Water Use (mgd)** | **Annual Daily Per Capita Water Use (gpcd)** |
| **Sequence Year** | **Calendar Year** | | | |
| Year 1 | 1997 | 111,130 | 15.0 | 135 |
| Year 2 | 1998 | 113,090 | 16.7 | 148 |
| Year 3 | 1999 | 115,650 | 15.9 | 137 |
| Year 4 | 2000 | 117,680 | 16.8 | 143 |
| Year 5 | 2001 | 119,650 | 16.7 | 139 |
| Year 6 | 2002 | 121,300 | 17.7 | 146 |
| Year 7 | 2003 | 123,300 | 18.7 | 152 |
| Year 8 | 2004 | 125,370 | 19.0 | 152 |
| Year 9 | 2005 | 127,290 | 19.7 | 155 |
| Year 10 | 2006 | 133,440 | 18.7 | 140 |
| | | | **Base Daily Per Capita Water Use** | 146 |

Under Method 3, the 2015 and 2020 targets are set to 95 percent of the 2015 and 2020 targets for the hydrologic region in which the district is located. Because the Salinas District is located in the Central Coast hydrologic region the Salinas District's 2015 target is 132 gpcd and the 2020 target is 117 gpcd.

The SBx7-7 target for 2020 cannot exceed 95 percent of the District's five-year baseline water use, where the baseline period ends no earlier than December 31, 2007 and no later than December 31, 2010. The District's 2020 target cannot exceed this level, regardless of which method is used to calculate it. The maximum allowable target in the Salinas District is 141 gpcd, as shown in Table 3.3-11. In this case, neither target calculation method results in a target exceeding the maximum allowable target, so no adjustment is necessary.

**Table 3.3-11: Daily Base Per Capita Water Use-5-Year Range (Table 15)**

| Base Period Year | | Distribution System Population | Daily System Gross Water Use (mgd) | Annual Daily Per Capita Water Use (gpcd) |
|---|---|---|---|---|
| Sequence Year | Calendar Year | | | |
| Year 1 | 2003 | 125,370 | 19.0 | 152 |
| Year 2 | 2004 | 127,290 | 19.7 | 155 |
| Year 3 | 2005 | 133,440 | 18.7 | 140 |
| Year 4 | 2006 | 128,570 | 18.2 | 142 |
| Year 5 | 2007 | 131,830 | 18.6 | 141 |
| | | | **Base Daily Per Capita Water Use** | 146 |

Based on the results of this analysis as shown in Table 3.3-12, the Method 3 targets were chosen for the Salinas District.

**Table 3.3-12: Salinas District SBx7-7 Targets**

| | |
|---|---|
| **Maximum Allowable Target** | |
| Base Period: | 2003-2007 |
| Per Capita Water Use: | 146 |
| Maximum Allowable 2020 Target: | 141 |
| **Method 1: 80% of Baseline Per Capita Daily Water Use** | |
| Base Period: | 1997-2006 |
| Per Capita Water Use: | 146 |
| 2015 Target: | 131 |
| 2020 Target: | 117 |
| **Method 3: 95% of Hydrologic Region Target** | |
| Hydrologic Region: | Central Coast |
| 2015 Target: | 132 |
| 2020 Target: | 117 |
| **Selected District Target** | |
| 2015 Target: | 132 |
| 2020 Target: | 117 |

### 3.3.2 Low Income Housing Projected Demands

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 Urban Water Management Planning 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 targeted 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.

For the purposes of estimating projected demands for low income households, Cal Water used information from the City of Salinas' Housing Element. The Housing Element estimates that 8.4 percent of homeowners and 23.8 percent of renters are in the lowest income group.[6] These percentages were applied to Cal Water's total projected single family and multi-family projected demands, respectively, producing the demands shown in Table 3.3-13.

**Table 3.3-13: Low-income Projected Water Demands (Table 8)**

| Low Income Water Demands | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|
| Single-family residential | 840 | 790 | 839 | 891 | 947 | 1,007 |
| Multi-family residential | 452 | 436 | 476 | 519 | 566 | 617 |
| **Total** | 1,292 | 1,226 | 1,314 | 1,410 | 1,513 | 1,624 |

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

[6] "City of Salinas, 2007-2014 Housing Element", City of Salinas, May 28, 2009, Page 2-13

## 3.4 Total Water Use

Cal Water does not currently sell water to other agencies, nor does it provide water for saline barriers, groundwater recharge, conjunctive use, or recycling. The potential additional water uses within Cal Water's service area are discussed and quantified in Section 4. For the purposes of this UWMP it is assumed that the only water sales to customers and distribution system losses are included in the total demand. The system losses are summarized in Table 3.4-1.

**Table 3.4-1: Additional Water Uses and Losses - AFY (Table 9 and 10)**

| Water Use | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|
| Sales to Other Agencies | - | - | - | - | - | - | - |
| Saline barriers | - | - | - | - | - | - | - |
| Groundwater recharge | - | - | - | - | - | - | - |
| Conjunctive use | - | - | - | - | - | - | - |
| Raw water | - | - | - | - | - | - | - |
| Recycled | - | - | - | - | - | - | - |
| Unaccounted-for system losses | 1,724 | 1,988 | 1,871 | 1,989 | 2,115 | 2,251 | 2,395 |
| Total | 1,724 | 1,988 | 1,871 | 1,989 | 2,115 | 2,251 | 2,395 |

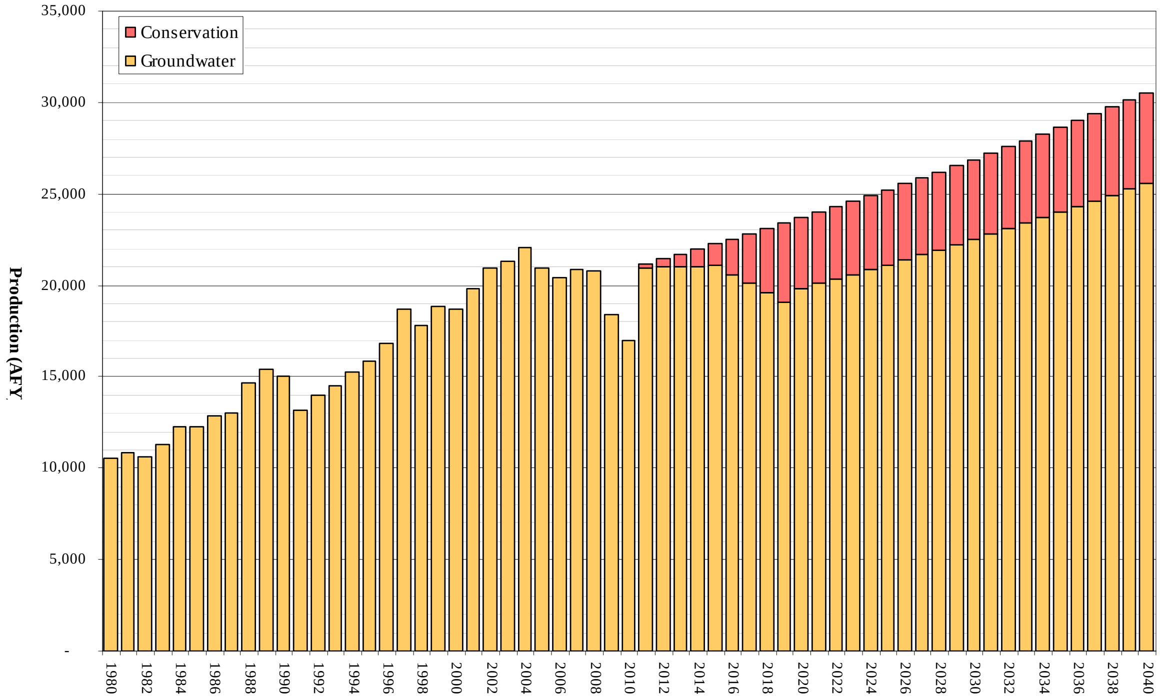
Actual and projected water use through 2040 is shown in Table 3.4-2. The values represent the total target demand projection based on SBx7-7 gpcd targets, including unaccounted for water.

**Table 3.4-2: Total Water Use – Actual and Projected AFY (Table 11)**

| | 2005 (Actual) | 2010 (Actual) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| Water Use | 20,933 | 16,940 | 21,053 | 19,840 | 21,125 | 22,504 | 23,984 | 25,572 |

Figure 3.4-1 shows the planned sources of supply based on these demands through 2040. At this time only groundwater and conservation are included as sources of supply. Cal Water's efforts to secure alternative supplies are discussed in the following section.

**Figure 3.4-1: Historical & Projected Sources**



# 4 System Supplies

## 4.1 Water Sources

The water supply for the customers of the Salinas District is completely reliant on groundwater wells as the sole water source. For reasons to be explained later, groundwater will likely continue to be the only source of supply for many years. Potential future supply sources will be discussed in the following sections. But for the purposes of this UWMP, Cal Water will assume that groundwater will be the only source of supply over the planning horizon.

Determining the actual supply available to Cal Water in any given year is complicated by several factors. The first of which is that there has not been a legal adjudication of groundwater rights for basin pumpers. The aquifers of the Salinas Valley have been in a state of overdraft for many years. The effects of this are seen more directly in communities along the coast near the mouth of the Salinas River. Local hydrogeologic conditions vary amongst the different satellite water systems that make up the Salinas District. However, the aquifers surrounding the City of Salinas have seen a reduction in groundwater storage and the encroachment of the saline front due to salt water intrusion. The Monterey County Water Resources Agency (MCWRA) releases flows from San Antonio and Nacimiento reservoirs to provide groundwater recharge throughout the year and will continue to work towards balancing the water budget in the Salinas Valley.

Because of the difficulty in defining an exact supply quantity available to the Salinas District, the theoretical supply could be considered the amount that Cal Water has the ability to pump. The design capacity of all the active wells is currently 30,990 gpm, or an annualized equivalent of 49,987 AFY. However, this value greatly exceeds the projected water demand throughout the planning horizon of this UWMP, and it may be unrealistic to characterize the supply in this way. Cal Water recognizes the need for responsible management of groundwater resources and will remain committed to implementing conservation programs to minimize its pumping in the basin, and will remain supportive of the management efforts of MCWRA. Cal Water will only pump enough water to meet the needs of its customers. So for the purposes of this UWMP the available supply in future years is considered to be equal to the projected demand. The projected water supply source and volumes based on the SBx7-7 target demand are summarized in Table 4.1-1.

| Table 4.1-1: Planned Water Supplies (Table 16) (AFY) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Water Supply Sources** | **2010** | **2015** | **2020** | **2025** | **2030** | **2035** | **2040** |
| **Monterey County Water Resources Agency** | - | - | - | - | - | - | - |
| **Supplier produced groundwater** | 16,940 | 21,053 | 19,840 | 21,125 | 22,504 | 23,984 | 25,572 |
| **Transfers in or out** | - | - | - | - | - | - | - |
| **Exchanges In or out** | - | - | - | - | - | - | - |
| **Recycled Water (projected use)** | - | - | - | - | - | - | - |
| **Desalination** | - | - | - | - | - | - | - |
| **Total** | **16,940** | **21,053** | **19,840** | **21,125** | **22,504** | **23,984** | **25,572** |

## 4.2 Purchased Water

Cal Water does not purchase treated water for its customers in the Salinas District. MCWRA does not provide treated purchased water for urban use.

## 4.3 Surface Water

The Salinas District does not currently impound or divert surface water as a means to meet supply requirements. If it is built, Cal Water may participate in Phase II of the Salinas Valley Water Project (SVWP). The second phase of the SVWP would include diverting increased winter flood flows from the Salinas River for municipal or agricultural use.

## 4.4 Groundwater

All water delivered to the Salinas District customers is from groundwater. The groundwater is extracted from the aquifer segments of the Salinas Valley known as the Pressure Area and Eastside Area. The Salinas Valley Basin is in an overdraft condition. While the basin remains unadjudicated, the California Water Resources Control Board has initiated adjudication proceedings in the event that MCWRA cannot get the overdraft under control.

The Pressure sub-area is a region of gradually declining groundwater elevations. This area is characterized by three confined aquifer systems, overlain and separated by thick clay layers that act as aquicludes. These aquifers named for their relative depths are known as the “180 Foot", the “400 Foot”, and “900 Foot” aquifers.

The groundwater level in the Eastside sub-area is declining more rapidly than any other sub-area in the Salinas Valley. The Eastside Area is a region of unconfined yet randomly situated water bearing strata.

Since the surface elevation in Salinas ranges from 40 to 70 feet above sea level, the three aquifers of the Pressure Area are all situated below sea level. There is hydrologic continuity with the ocean in all three aquifers.

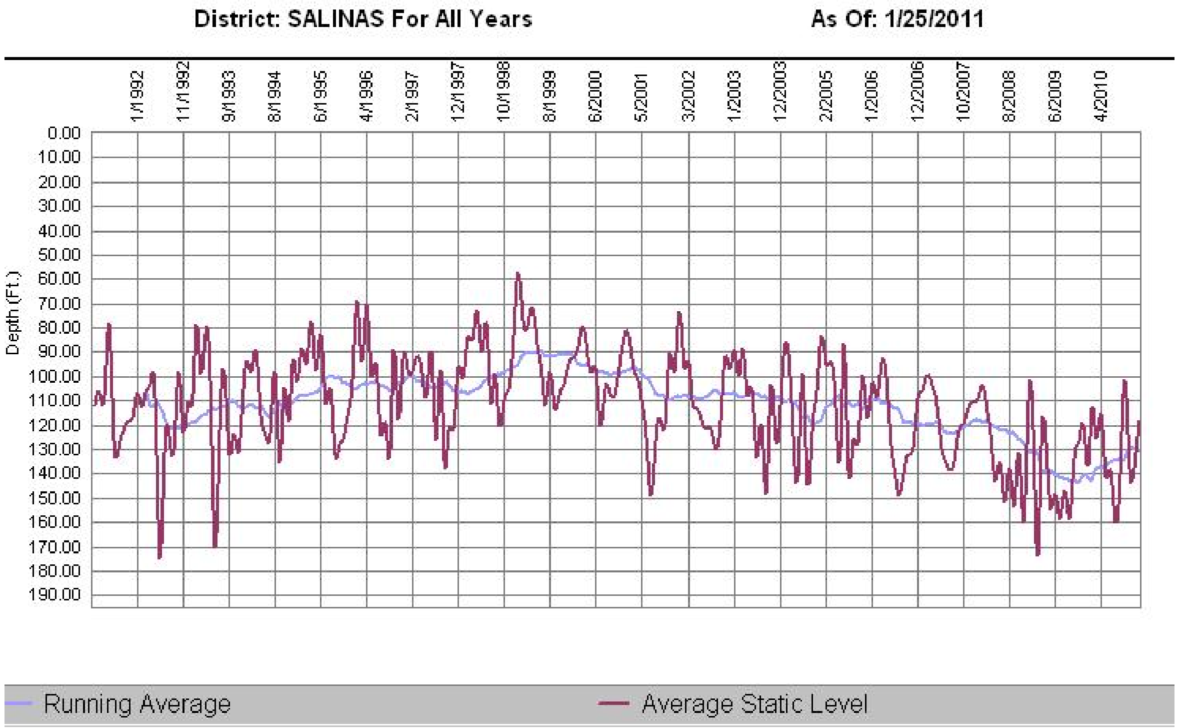
MCWRA has estimated that the annual non-drought overdraft of the Salinas Basin is approximately 45,300 AF per year. Because of the hydrologic continuity between the ocean and the aquifers of the Pressure Area, seawater has been intruding into these aquifers at a rate of approximately 28,800 AF per year. During the last drought, the annual overdraft escalated to 150,000 to 300,000 AF per year.

Groundwater production throughout the entire valley has contributed to the overdraft of the Salinas Basin. MCWRA numbers indicate that water levels have declined in all four of the basin's sub-areas. However, the minor declines in the Upper Valley and Forebay sub-areas appear to be in response to the extended drought conditions. Recharge in these two sub-areas from releases out of San Antonio and Nacimiento Reservoirs have historically stabilized the groundwater levels in these two sub-areas. Declines since 1987 are a result of reduced recharge supplies.

The intruding seawater has advanced into the 180 Foot aquifer to within one mile of Cal Water's closest well. Cal Water has shifted production as much as possible out of the 180 Foot and Eastside aquifers and located it further south and more in the 400 Foot aquifer of the Pressure area. The intruding seawater gives the stability to the groundwater elevation. Cal Water does not pump from the 900 Foot aquifer.

Except for annual deviation of approximately thirty-five feet, the average static groundwater levels in District wells since 1961 has changed elevation only during drought years. In 1976 and 1977, the running average level declined by twenty feet. Recovery occurred in 1982 and 1983 when storm runoff refilled local reservoirs allowing groundwater recharge activities to resume. With the extended drought conditions commencing in 1984, the running average elevation again began declining and by the summer of 1992 had dropped by thirty-five feet. The well level average since 1990 is shown in Figure 4.4-1.

**Figure 4.4-1: District Well Level Average**




The Salinas District has a total of 59 wells, including one leased well. In 2010, 42 of these wells were active and operational and one was in Standby status. The design capacity of the active operational wells is 30,990 gpm, a rate that could produce 44.6 mgd. The five-year average, average day demand is 18.4 mgd and the average maximum day demand is 30.1 mgd. The historic high for these parameters occurred in 2004 for average day at 19.4 mgd and in 2005 for maximum day at 31.8 mgd. However, with five separate isolated systems, the Salinas wells cannot deliver through the entire system.

The historical amount of the groundwater pumped in the District is shown in the Table 4.4-1.

| Table 4.4-1: Amount of Groundwater Pumped – AFY (Table 18) | | | | | |
|---|---|---|---|---|---|
| **Basin Name** | **2006** | **2007** | **2008** | **2009** | **2010** |
| Salinas Valley Basin | 20,431 | 20,865 | 20,778 | 18,414 | 16,940 |
| **% of Total Water Supply** | 100% | 100% | 100% | 100% | 100% |

The amount of groundwater projected to be pumped is shown in the Table 4.4-2.

| Table 4.4-2: Amount of Groundwater projected to be pumped – AFY (Table 19) | | | | | | |
|---|---|---|---|---|---|---|
| **Basin Name** | **2015** | **2020** | **2025** | **2030** | **2035** | **2040** |
| Salinas Valley | 21,053 | 19,840 | 21,125 | 22,504 | 23,984 | 25,572 |
| **% of Total Water Supply** | 100% | 100% | 100% | 100% | 100% | 100% |

### 4.4.1 Basin Boundaries and Hydrology

The following description and additional details of the basin are given in the DWR's Groundwater Bulletin 118, see Appendix D[7]:

The District has portions in both the 180/400 Foot Aquifer Subbasin (3-4.01) and the Eastside Aquifer Subbasin (3-4.02). The 180/400 Foot Aquifer Subbasin includes the lower reaches and mouth of the Salinas River. The Southwestern basin boundary is the contact of Quaternary Alluvium or Terrace Deposits with the granitic basement of the Sierra de Salinas. Further north along the western Salinas Valley margin the basin boundary is the contact with the Quaternary Paso Robles Formation, or Aromas Red Sands of the Corral de Tierra Area Subbasin. The extreme northwest boundary of the sub basin is shared with the Salinas Valley-Seaside Area Subbasin along the seaward projection of the King City Fault. The Subbasin is bounded by the Monterey Bay to the northwest. The northern sub basin boundary is shared with the Pajaro Valley Groundwater Basin and coincides with the inland projection of a 400-foot deep, buried clay-filled paleodrainage of the Salinas River. This acts as a barrier to groundwater flow between these sub basins. The northeastern boundary is shared throughout most of its length by the adjacent Salinas Valley-Eastside Subbasin, and to the north with a shorter length of the Langley area Subbasin. The northeastern boundary generally coincides with the northeastern limit of confining conditions in the 180/400-Foot Aquifer Subbasin and the location of State Highway 101. The southeastern boundary is shared with the Lower Forebay sub basin and is the approximate limit of confining conditions in an up-valley direction. The 180/400-Foot Aquifer Subbasin boundaries generally coincide with those of the Pressure Sub area of the Monterey County Water resources Agency (MCWRA).

The Eastside Aquifer sub basin extends from approximately five miles north of the city of Salinas to twenty five miles south of the town of Gonzales along the eastern side of the lower Salinas Valley. The sub basin is bounded to the north by the Pleistocene Aromas Red Sands of the Salinas Valley-Langley Area Subbasin. To the south, the sub basin shares a boundary with the Quaternary Alluvium deposits of the Salinas Valley-Lower Forebay Aquifer Subbasin. The western sub basin boundary generally coincides with the northeastern limit of confining conditions in the adjacent 180/400-Foot Aquifer Subbasin and with Sate Highway 101. The eastern boundary is the contact of the Quaternary Terrace deposits with granitic rocks of the Gabilan Range. The sub basin boundaries are generally correlative with those of the East Side sub area of the MCWRA. Intermittent streams such as the Natividad, Alisal, Quail, Parsons, Muddy and Johnson Creeks drain the western slopes of the Gabilan Range and flow across the Subbasin toward the Salinas River on the west side of the Valley.

### 4.4.2 Groundwater Management Plan

The groundwater basin that Cal Water pumps from is an un-adjudicated basin. Recharge efforts are managed by Monterey County Water Resources Agency. The Agency

[7] California's Ground Water Bulletin 118, 2003; Central Coast Hydrologic Region; Salinas Valley Groundwater Basin; Groundwater Basin Numbers: 3-4.01, 3-4.02

developed the Monterey County Groundwater Management Plan, which is included in Appendix H.

MCWRA requires annual extraction reports form all agricultural and municipal well operators; and has researched, developed and/or constructed projects to reduce seawater intrusion, manage nitrate contamination in the ground water, provide adequate water supplies to meet current and future needs, and to balance the ground water basin in the Salinas Valley.

## 4.5 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. The potential amount of recycled water that can be produced is proportional to the amount of wastewater that is generated by District, and is discussed in the following sections.

### 4.5.1 Wastewater Collection

The City of Salinas operates and maintains the sewer system consisting of gravity sewers, pumping stations, and force mains to collect wastewater from residential and industrial customers. The collected residential wastewater is discharged to trunk sewers and interceptors owned and operated by the Monterey Regional Water Pollution Control Agency (MRWPCA). The residential wastewater is conveyed to the MRWPCA Regional Treatment Plant for treatment.

### 4.5.2 Estimated Wastewater Generated

Estimates for the District’s wastewater production quantity since 1980 are shown in Figure 4.5-1 and were calculated by annualizing 90 percent of January water use in the Cal Water’s service area. The future quantity of waste generation is based on a linear equation of the historical estimates. The estimated volume of wastewater generated for the District in five-year increments to the year 2040 is presented in Table 4.5-1. According to MRWPCA, 60 percent of all the effluent it receives is recycled and used for agricultural irrigation outside Cal Water’s service area. The values in Table 4.5-2 represent only the amount of wastewater that is not reused.

**Figure 4.5-1: Estimated District Annual Wastewater Generated**


| Table 4.5-1: Recycled Water-- Wastewater Collected and Treated-AFY (Table 21) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Type of Wastewater** | **Treatment Level** | **2010** | **2015** | **2020** | **2025** | **2030** | **2035** | **2040** |
| Total Collected and Treated | Tertiary | 10,282 | 10,749 | 11,237 | 11,749 | 12,284 | 12,845 | 13,433 |
| Volume Meeting Recycled Water Standard | Tertiary | 6,169 | 6,449 | 6,742 | 7,049 | 7,371 | 7,707 | 8,060 |

| Table 4.5-2: Disposal of wastewater (non-recycled) AFy (Table 34) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Method of Disposal** | **Treatment Level** | **2010** | **2015** | **2020** | **2025** | **2030** | **2035** | **2040** |
| Discharged to Monterey Bay | Tertiary | 4,113 | 4,300 | 4,495 | 4,699 | 4,914 | 5,138 | 5,373 |

## 4.5.3 Potential Water Recycling

The MRWPCA Regional Treatment Plant provides the residential wastewater service for the Salinas service area. The wastewater at the Regional Treatment Plant undergoes secondary treatment with trickling filters, followed by activated carbon, dual media filtration, and chlorine disinfection for recycled water. MRWPCA Regional Treatment Plant has a capacity to treat 29.6 million gallons per day of wastewater. During the summer months, 100 percent of the treated effluent (approximately 4,600 acre-feet per year) from the MRWPCA Regional Treatment Plant is recycled for agricultural irrigation of artichokes and a variety of crops. Wastewater is not recycled during the winter months, but is discharged without chlorination to Monterey Bay.

The City of Salinas Industrial Wastewater Treatment Plant has a capacity to treat 4 mgd but currently receives 2 mgd from industrial customers in Salinas. The wastewater at the industrial plant undergoes treatment with aeration ponds and is discharged to percolation/evaporation ponds without disinfection. Currently, treated wastewater from the industrial wastewater treatment plant is not recycled.

It is anticipated that no new reclaimed water customers will be acquired for the MRWPCA Regional Treatment Plant in the near future. All treated wastewater supplies are used for crop irrigation in the summer months. Using reclaimed water for any other purpose (e.g., commercial/residential irrigation and toilet flushing) is not considered economically viable during the next 20 years, because the City of Salinas is 10 miles from the treatment plant. The cost of transmission and distribution of recycled wastewater to the City could not be justified based on current and anticipated costs of water and of wastewater disposal. However, the potential exists to use recycled wastewater from the City of Salinas Industrial Wastewater Treatment Plant for crop irrigation within the next 20 years.

The agricultural reuse of treated wastewater from either of the treatment plants reduces the amount of groundwater pumping in the area. The use of recycled water for agriculture offsets part of the demand for surface water and groundwater. Because agricultural application utilizes all of the treated wastewater supply during the summer and is the only anticipated use of reclaimed water in the future, the projected recycled water supply for Cal Water's Salinas service area through the year 2040 is 0 acre-feet per year. Cal Water has not implemented any incentive programs to encourage recycled water use because they do not own and operate the wastewater system.

**Table 4.5-3: Recycled Water - Potential Future Use-AFY (Table 23)**

| User Type | Description | Feasibility | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|---|---|
| Agricultural | Irrigation | Yes | 6,449 | 6,742 | 7,049 | 7,371 | 7,707 | 8,060 |
| Landscape irrigation | Not replacing potable supply | No | 0 | 0 | 0 | 0 | 0 | 0 |
| Groundwater recharge | Indirect potable reuse | Yes | 4,300 | 4,495 | 4,699 | 4,914 | 5,138 | 5,373 |
| Total | | | 10,749 | 11,237 | 11,749 | 12,284 | 12,845 | 13,433 |

## 4.6 Desalinated Water

As noted above, seawater intrusion has been a problem in the Salinas Valley. There is potential to use desalinated water as a source of supply in the Salinas District. However, Salinas is significantly inland from the ocean and distribution would be a problem. Because of this it is unlikely that desalinated water would be a viable option in Salinas.

If Cal Water decided to use desalinated water to supply its customers it would most likely partner with other agencies or water retailers in the area in an effort to share the costs associated with building and operating an expensive desalination plant. California American Water Company (Cal-Am) originally proposed their Coastal Water Project (CWP) which involves building a desalination plant and piping the water down to their customers on the Monterey Peninsula.

Since then, the Water for Monterey County Coalition also proposed a solution to the supply shortage on the Monterey Peninsula that includes desalination as a means to provide projected future demands. Under the current proposal by Cal-Am and Marina Coast Water District, brackish groundwater would be treated to supply water for municipal and industrial uses, in addition to developing a recycled water program for landscape irrigation and groundwater replenishment. Cal Water is participating in the planning process.

Cal Water, in cooperation with the consultant Camp, Dresser, and McKee, conducted a *Feasibility Study for a Long Term Water Supply Plan* for the Salinas District. This study provided a detailed analysis of potential water supply solutions for Cal Water's service area, which included participation in the CWP. The results of the analysis indicated that primarily due to cost concerns, the CWP was not the preferred solution. Cal Water has a responsibility to provide its customers with the highest quality water in the most cost-effective manner. Because of this Cal Water has decided not to participate in the CWP at this time.

## 4.7 Transfer or Exchange Opportunities

If groundwater supplies are found to be insufficient to meet future demands, Cal Water could pursue transfer or exchange opportunities in its Salinas District. Surface water rights could be leased or purchased to provide additional supply either through direct delivery of treated water to Cal Water customers or by artificially recharging groundwater and using existing wells.

## 4.8 Water Supply Projects

A very aggressive well replacement program is needed to maintain adequate supply in the Salinas District. Over the next few years, many wells need to be replaced due to nitrates, uranium, MTBE, and sand. This does not account for the unforeseeable problems that may come up.

As noted earlier, the *Feasibility Study for a Long Term Water Supply Plan* for the Salinas District evaluated potential water supply solutions for Cal Water's service area. The many supply options analyzed included drilling new wells, providing treatment to existing wells, promoting conservation, using desalinated water, and diverting surface water. These options were ranked using several criteria to determine the feasibility of each. Due primarily to regulatory and cost constraints the desalination and surface water diversion options ranked low on the list of potential solutions. Because of this, groundwater will likely continue to be the only source of supply until the benefits of these other options outweigh their costs. As a result, future water supply projects will mainly include drilling wells and retrofitting older wells with treatment facilities.

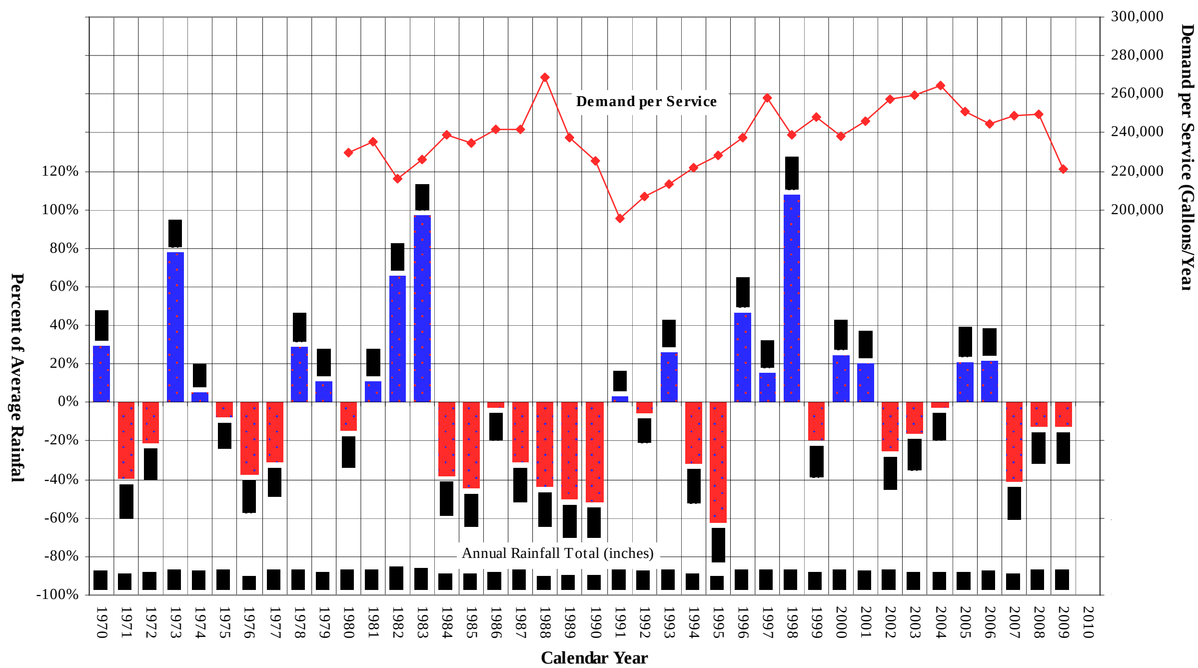
# 5 Water Supply Reliability and Water Shortage Contingency Planning

## 5.1 Water Supply Reliability

Because the Salinas District relies only on groundwater it is difficult to define an exact supply available in any given type of hydrologic year. Storage in the groundwater basin will provide a buffer against years with decreased precipitation while wetter years will recharge natural supplies. As a result Cal Water can not compare total supply volumes as it would in areas that are supplied either by local reservoirs or by imported surface water. Because we have made the assumption that the total supply will equal demand, the annual hydrologic variation can be discussed in terms of overall demand. In general, water use tends to increase during drier years as potable water is used for purposes that would normally be supplied by natural precipitation, such as outdoor landscape irrigation.

A chart comparing annual rainfall since 1970 to the average annual rainfall is shown in Figure 5.1-1. The average annual rainfall for the District is 14.6 inches.

**Figure 5.1-1: Comparison of Annual Rainfall to Historical Average**



## 5.2 Drought Planning

For the purposes of this analysis 2004 was chosen as the most recent normal hydrologic year when rainfall was 2.9 percent (14.1 in) below average. 2007 was chosen as the single dry year and had a rainfall of 41 percent (8.6 in) below average. The multiple dry year range used in this analysis was from 1987-1990, which coincides with the extended drought California experienced during this time.

| Table 5.2-1: Basis of Water Year Data (Table 27) | |
|---|---|
| **Water Year Type** | **Base Year (s)** |
| **Average Water Year** | 2004 |
| **Single-Dry Water Year** | 2007 |
| **Multiple-Dry Water Years** | 1987-1990 |

The normal method of comparing dry year supply to average conditions doesn't work as well in an area supplied only by groundwater as it would in areas with a surface supply. Because groundwater is the sole source the Salinas District's dry year supply is buffered by the relatively large amounts of storage present in the basin. If the assumption that the total available supply will equal the total demand in any year is made, comparing the supplies in past years doesn't usually provide meaningful results. The primary reason for this is that growth within the service area leads to increased demands over time, regardless of hydrologic conditions. And because the Salinas District has grown at a rapid rate in the past, demand has increased dramatically over short time periods.

Perhaps a better indication of annual variability would be the variation in customer demand between normal and single dry or multiple dry years. This can be seen in the overall average demand per service values for the District, as shown in Table 5.2-2. The data suggests a typical pattern where demand increases at the beginning of the drought and is gradually reduced as dry conditions persist. This reduction generally happens as a result of increased conservation requests by water providers and a general awareness of the problem by customers.

| Table 5.2-2: Supply Reliability – gal/service/yr (Table 28) | | | | | |
|---|---|---|---|---|---|
| **Average / Normal Water Year** | **Single Dry Water Year** | **Multiple Dry Water Years** | | | |
| 264,253 | 248,947 | 241,478 | 268,885 | 268,885 | 237,492 |
| % of Normal | 94% | 91% | 102% | 102% | 90% |

For the reasons described above, groundwater supplies are not limited during dry hydrologic years. An adequate supply to meet customer demands is expected to be available during multiple-dry year events. During future dry periods customer water use patterns are expected to be similar to past events. Table 5.2-3 shows the minimum supplies that would be available in a multiple dry year event from 2011-2013, starting with a normal year in 2010. The supply amounts were calculated by applying the percentages from years 1-3 in Table 5.2-2 to the SBx7-7 target demand projection for those years.

**Table 5.2-3: Supply Reliability – Current Water Sources - AFY (Table 31)**

| Water Supply Source | Average / Normal Water Year Water Supply | Multiple Dry Water Year Water Supply | | |
|---|---|---|---|---|
| | | 2011 | 2012 | 2013 |
| Groundwater | 20,925 | 19,148 | 21,351 | 21,377 |
| % of Normal Year | 100% | 92% | 102% | 102% |

## 5.2.1 Normal-Year Comparison

Water supply and demand patterns change during normal, single dry, and multi dry years. To analyze these changes, Cal Water relies on historical usage to document expected changes in future usage in water demand; such as, assuming increasing demand due to increased irrigation needs or a decrease in demand due to awareness of drought conditions.

For this analysis the normal supply is considered equal to the target water demand projection. Conservation savings is already incorporated into this projection, therefore groundwater is the only supply source. Table 5.2-4 indicates that groundwater will be reliable throughout the planning horizon of this UWMP and that no supply deficiencies are expected.

**Table 5.2-4: Supply and Demand Comparison - Normal Year - AF (Table 32)**

| | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|
| Supply totals | 21,053 | 19,840 | 21,125 | 22,504 | 23,984 | 25,572 |
| Demand totals | 21,053 | 19,840 | 21,125 | 22,504 | 23,984 | 25,572 |
| Difference | 0 | 0 | 0 | 0 | 0 | 0 |
| Difference as % of Supply | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Difference as % of Demand | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |

### 5.2.2 Single Dry-Year Comparison

In general, and from operational records, the District's demand has shown to increase during a single-dry years as compared to normal years. The water demand increases due to maintenance of landscape and other high water uses that would normally be supplied by precipitation. In this case, water demand was somewhat les than in the normal year. The supply and demand values shown in Table 5.2-5 were calculated by increasing the target demand projection in each year by the percentage listed for the single dry year in Table 5.2-2. Again, Cal Water assumes that the total supply will equal the demand in all future years. Therefore, the supply is 100 percent reliable in single dry years.

**Table 5.2-5: Supply and Demand Comparison – Single Dry Year - AF (Table 33)**

| | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|
| Supply totals | 19,833 | 18,691 | 19,902 | 21,200 | 22,595 | 24,090 |
| Demand totals | 19,833 | 18,691 | 19,902 | 21,200 | 22,595 | 24,090 |
| Difference | 0 | 0 | 0 | 0 | 0 | 0 |
| Difference as % of Supply | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Difference as % of Demand | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |

### 5.2.3 Multiple Dry-Year Comparison

As noted earlier, water demand generally increases early in a multiple dry year period then gradually decreases as the drought persists and customers respond to conservation messaging. This pattern is evident in Table 5.2-6 where demands at the beginning of each five year period are higher than in the normal year scenario, and demands decrease each year thereafter. The supplies and demands shown here are calculated by multiplying the target demand projection for that year by the percentages listed in Table 5.2-2 for the multiple dry year period. Again, no supply deficiency is expected.

**Table 5.2-6: Supply And Demand Comparison - Multiple Dry Year Events – AFY (Table 34)**

| | | 2015 | 2020 | 2025 | 2030 | 2035 |
|---|---|---|---|---|---|---|
| Multi-dry year first year supply | Supply Totals | 19,238 | 18,130 | 19,304 | 20,564 | 21,917 |
| | Demand Totals | 19,238 | 18,130 | 19,304 | 20,564 | 21,917 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| | Difference as % of Supply | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | Difference as % of Demand | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Multi-dry year second year supply | Supply Totals | 20,944 | 20,442 | 21,769 | 23,192 | 24,717 |
| | Demand Totals | 20,944 | 20,442 | 21,769 | 23,192 | 24,717 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| | Difference as % of Supply | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | Difference as % of Demand | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Multi-dry year third year supply | Supply Totals | 20,451 | 20,699 | 22,045 | 23,488 | 25,036 |
| | Demand Totals | 20,451 | 20,699 | 22,045 | 23,488 | 25,036 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| | Difference as % of Supply | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | Difference as % of Demand | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |

## 5.3 Factors Affecting Reliability of Supply

Although there is an overdraft condition in the basin the demand will be met with the current supply even in multiple dry years. A prolonged drought event could impact supply reliability if water levels drop below the screened interval in certain wells, rendering them useless. However, based on historic dry periods, the supply has been adequate to meet demands, and water levels have recovered in wet years.

Well capacities are expected to increase over time as aging wells are taken out of service and replaced with new high capacity wells. Total capacity is also expected to increase as treatment systems are applied to wells with water quality problems.

Historically, the Salinas District has not experienced a supply shortfall during extended drought events. Although groundwater levels have decreased during these times they have always recovered. Cal Water expects that a normal supply of groundwater will be available during multiple year droughts. Therefore, the assumption that the available water supply will equal the actual demand still applies.

Groundwater levels in Cal Water wells have declined during extended drought events but have generally recovered in subsequent wet or normal years. One dry year is not a threat to the reliability of groundwater supply in the Salinas District. MCWRA's more recent groundwater management efforts such as the SVWP have reduced overdraft and increased the reliability of the supply. Because of this Cal Water expects to be able to meet 100 percent of dry year demands through 2040 with groundwater. Therefore, the assumption that the available water supply will equal the actual demand still applies.

Although the historical climatic record shows that the demand can be met by the supply, other factors which may impact the reliability of supply are listed in Table 5.3-1.

**Table 5.3-1: Factors Resulting In Inconsistency of Supply (Table 10)**

| Name of supply | Legal | Environmental | Water Quality | Climatic |
|---|---|---|---|---|
| Groundwater | ✓ | | ✓ | ✓ |

As stated above, the Salinas Groundwater Basin is unadjudicated. Efforts to reduce overdraft and adjudicate the basin could leave Cal Water with a limited supply. If this were to happen Cal Water would need to explore other sources of supply.

Historically, Cal water has been able to meet all state and federal water quality regulations. Chemicals of concern in the Salinas District include nitrate, volatile organic compounds, MTBE, uranium, and iron and manganese. None of these chemicals is expected to cause significant problems with the quality of water delivered to Cal Water's customers. Wells that test above current Maximum Contamination Level (MCL) for these compounds are either retrofitted with wellhead treatment technologies, or are taken out of service.

As noted earlier, short-term drought events should not pose a serious threat to the reliability of supply. The reliability of supply would decrease as the drought event continued and the depth to groundwater increased.

## 5.4 Water Quality

The drinking water delivered to customers in the Salinas 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 in the Salinas District is dynamic and varies with wells and location. Over the years, some of the District's wells have experienced declines in water quality due to nitrates, volatile organic compounds (VOCs), MTBE, uranium, and iron and manganese. Since 1999 Cal Water has removed one well from service due to high levels of MTBE.

Six wells during the past 13 years were placed on inactive status because of non-complying water quality. The most common problem has been nitrates, which can be removed by treatment. Cal Water has installed nitrate treatment on four wells. Another emerging concern is MTBE, the additive used in gasoline, getting into the groundwater and contaminating well water. One well has been put on inactive status because of MTBE. Other wells are being monitored closely to determine whether there are trends showing increases in MTBE. Cal Water is using natural materials and activated carbon to treat water from this well, but continues to look for more cost effective means for removing MTBE. Some wells have shown a trend toward increases in volatile organic compounds (VOCs), which can be removed by activated carbon.

A major future water quality concern is arsenic. The new arsenic MCL of 10 parts per billion (ppb) set by the US Environmental Protection Agency became effective in January 2006. There is a possibility that the state of California may set a lower standard such as 5 ppb or even less. This new MCL could impact the availability of several wells for water production.

In light of the costs of treatment for removing the constituents discussed, Cal Water will continue to assess both existing and new treatment technologies to determine whether it is more economical to treat a particular well or shut it down and replace it with a newly constructed well in a location with complying water quality and where there does not appear to be any nearby contamination sources.

Another issue affecting sustainable use of wells in the Salinas District is sanding. Sanding can be the result of corrosion of the well screens, which enlarges the openings thereby permitting sand to be drawn into the well. Sand further erodes the well screen and the pump, which causes the holes to get even bigger. Thus, the sanding problem worsens in time. Increases of sand in a well can be an indicator of a possible future casing collapse, or simply result in the well no longer being productive. Sanding also wears out the pump and causes lower efficiency.

Two regional water quality conditions may ultimately impact the availability and use of the Salinas water supply; seawater intrusion and nitrate contamination. The intrusion of seawater into the Salinas Valley has been a problem for many years. A solution was identified as early as 1946 when the State of California proposed a three-part remedy:

- Construct several large reservoirs to capture excess storm flow on the upper reaches of the Salinas River and its tributaries.
- Recharge groundwater in the upper valley and Forebay sub-areas of the Salinas Valley with the captured runoff
- Extract portions of the augmented groundwater and transmit it via a conveyance system to the Eastside and Pressure sub-areas of the basin so that the water users in this northern most region of the valley can reduce their use of groundwater.

The first two parts of this solution have been constructed and are in operation. Nacimiento and San Antonio reservoirs were built and are operated by the MCWRA. The water that they capture is released in a controlled manner to recharge the aquifers in the upper and Forebay areas through the natural riverbed.

The final part of the solution however, has never been implemented. As a result, the lack of serious groundwater recharge in the north valley means that the groundwater production in the north valley continues to add to the overdraft of the Pressure and Eastside aquifers, which permits the seawater intrusion to continue.

Several years ago, the Castroville Irrigation Project was constructed. This project produces high quality irrigation water for agricultural use out of treated wastewater supplied from the regional wastewater plant in Marina. This recycled water offsets some of the local groundwater production and alleviates a portion of the problem. However, this project does not provide a complete solution.

A conceptual design for Phase II of the Salinas Valley Water Project (SVWP) has been made by MCWRA. Under this plan additional winter flood flows would be diverted from the Salinas River. These diversions, up to 10,000 AFY, could be used for direct use by urban customers. However, there is no timeline for construction of Phase II of the SVWP. The SVWP would also require a voter approved bond measure to pay for its construction. Because of this Cal Water can not count on the SVWP to provide future demand in the Salinas District.

The severity of the ongoing seawater intrusion and the major impact it could have on the regional economic base if not resolved has prompted the State of California Water Resources Control Board to begin the research phase of a potential basin adjudication action. At this time it is unknown how this situation will affect the Salinas District.

## 5.5 Water Shortage Contingency Plan

This section contains an updated version of Cal Water's Water Shortage Contingency Plan. The Water Shortage Contingency Plan was last revised in response to the drought that California experienced between 1987 and 1992. The first version of the Plan was included in each subsequent UWMP update.

California's most recent drought event that began in the spring of 2006, coupled with the Delta pumping restrictions, brought increased awareness to the importance of drought preparedness. By the spring of 2008 it became apparent that several of Cal Water's service districts had the potential for water supply shortages and potential wholesaler allocations in the following year. In response, a Conservation/Supply Team was formed to develop a plan for addressing these potential issues. Through this process Cal Water learned valuable lessons and is better prepared for extended droughts or other long term water shortages. The results of this planning process are summarized in this Water Shortage Contingency Plan.

### 5.5.1 Water Shortage Contingency Plan Scope

The Water Shortage Contingency Plan is a unique document designed to address specific conditions that may occur from time to time in Cal Water's service areas. It can be triggered by several types of events but is primarily used as a response to longer term drought conditions. The Water Shortage Contingency Plan provides a comprehensive company-wide strategy for approaching water supply shortages that may last from several months to several years in duration.

Other triggers may include a partial loss of supply due to a mechanical failure of either Cal Water or wholesale supplier facilities resulting from natural disasters, chemical contamination, or other water quality issues. These two types of triggers are unlikely in larger districts where operational changes can more easily be made in one part of the system to overcome supply shortages in other parts of the system. However, in smaller isolated systems that rely heavily on one source of supply, a partial loss of this supply could necessitate the implementation of the Water Shortage Contingency Plan. Generally, this type of water supply shortage would not last as long as those caused by drought.

There are some important distinctions that should be made between the Water Shortage Contingency Plan and other programs and plans that Cal Water has for each district. Cal Water also maintains an Emergency Response Plan (ERP) for each service area. The ERP is similar to the Water Shortage Contingency Plan in that it may include a loss of supply and inability to serve our customers with normal quantities of water. However, the ERP is designed to manage crises that occur more suddenly and are caused by events such as natural disasters, technological failures, chemical contamination, or national security emergencies.

The ERP provides a guide for district and general office personnel to follow in response to one of these emergencies. It includes the policies, responsibilities, and procedures to be used to protect public safety and includes the setup of an Emergency Operations Center and implementation of the Standardized Emergency Management System. The ERP also describes the necessary inter-jurisdictional coordination and provides the communications and notification plan to insure an efficient response to the emergency.

The ERP for each district was completed in 2004 in response to the Public Health and Safety and Bioterrorism and Response Preparedness Act (H.R. 3448) of 2002. They were then updated in May of 2008. Cal Water is planning to rewrite the ERPs in the next few years. These new Plans will include more detailed district-specific information and will be designed to be used as a manual for Cal Water personnel during emergency situations.

Cal Water is also in the process of developing Water Conservation Master Plans for each district. These Water Conservation Master Plans are different from the Water Shortage Contingency Plans in that they are designed to permanently reduce per capita water use by Cal Water's customers. The Water Conservation Master Plans are not associated with any short or long term loss of supply but will have the effect of making existing supplies last further into the future. In the short term, this will also provide increased supply reliability.

The water use targets selected by Cal Water for each service area are consistent with current regulations. In general, this will mean a reduction in per capita demand. Specific reductions will vary by service area and are contained in the service-area specific Water Conservation Master Plans. The annual level of funding for these programs will be determined through each General Rate Case filed with the California Public Utilities Commission (CPUC). The Water Conservation Master Plan will be discussed in more detail in Section 5 of this UWMP.

### 5.5.2 Water Conservation/Water Supply Team

As mentioned earlier, Cal Water formed a Conservation/Supply Team in response to the water shortage conditions that were forecasted for 2009. This Team consisted of an interdepartmental group of personnel that guided the planning process for the company-wide response to the drought. Members of the Conservation/Supply Team include:

- Vice President of Regulatory and Corporate Communications
- Vice President of Customer Service, Human Resources, and Information Technology
- Director of Corporate Communications
- Director of Customer Service
- Conservation Manager
- Chief Engineer
- Water Resources Planning Supervisor
- Manager of Rates
- Manager of Operations
- Maintenance Manager
- Billing Manager
- Regulatory Accounting Manager
- Meter Operations Supervisor
- Support Staff

The Conservation/Supply Team held regular meetings to discuss strategies for all aspects of drought preparation such as water supply monitoring, public communications, wholesale and customer allocations, information technology improvements, and financial impacts. Additional staff participated as needed as the planning process progressed.

### 5.5.3 Water Supply Allocation Plan

During the most recent drought several of Cal Water's districts were faced with the possibility of reduced wholesale allocations of imported water. If implemented, Cal Water would need to reduce its use of this supply proportionally in order to meet regional conservation targets and avoid wholesaler imposed penalties for overuse. Cal Water would have to request customers to reduce water use, usually to the same level as required by the wholesaler.

These reductions could either be voluntary or mandatory depending on the severity of the cutback required. If mandatory rationing is deemed necessary, retail customer allocations would need to be implemented. To determine the methodology used for customer allocations a cross-functional Water Allocation Team was formed. The Water Allocation Team consisted of a subset of the Conservation/Supply Team and was tasked with developing the details of how the allocation process would be handled internally by Cal Water. The Water Allocation Team reported back to the Conservation/Supply Team at the regular meetings.

The Water Allocation Team meetings resulted in a comprehensive strategy that is summarized in Cal Water's Water Supply Allocation Plan. The Water Supply Allocation Plan details the methodology used for determining customer allocations, conducting public communications, tracking water use, assessing penalties, and processing appeals.

The Water Supply Allocation Plan also outlines regulatory actions that must be taken in order to implement mandatory allocations. If it is determined that mandatory allocations are likely to be necessary in a particular district Cal Water will file a Tier 2 advice letter with the CPUC that describes the need for mandatory allocations as well as our methodology and plan for implementation. A public hearing is required during the 30 days following this filing and all customers in the affected district will be notified of the hearing. If, after the 30 day period, it is determined that mandatory allocations are necessary, Cal Water will file a Tier 1 advice letter with the CPUC, which would make mandatory allocations effective 5 days following the filing.

Cal Water has the legal authority to implement mandatory allocations only after requesting from the CPUC that Tariff Rule 14.1, Mandatory Conservation Plan, be added to existing tariffs. *Section A. Conservation – Nonessential or Unauthorized Water Use* of Tariff Rule 14.1 identifies specific water use prohibitions. Prior to implementing mandatory allocations Cal Water will communicate details of the Plan to all customers.

### 5.5.4 Allocation Methodology and Customer Information

The Water Allocation Team's methodology for determining customer allocations was decided through careful consideration of all available information. Throughout this process the Team tried to maintain fairness to all customers and develop a plan that was easy to understand and communicate. Secondary concerns included impacts to Cal Water such as the ease of implementation and revenue shortfalls.

Customer allocations will be calculated on a monthly basis for each "premise", or customer location. The required cutback will be a percent reduction from prior use compared to baseline time period. The percentage reduction and baseline that Cal Water uses will be consistent with those used by the regional wholesaler. This will be done to ensure regional coordination between agencies and to offer a clear message to the public. In districts that do not have an imported supply and therefore no wholesaler, Cal Water will choose the percent reduction depending on the severity of the water shortage.

In most cases the percent reduction will be kept constant on an annual basis. It will be reviewed and adjusted as necessary in the spring of each year after the water supply picture becomes clear for the following dry season. In most districts Cal Water does not have direct control over long term storage of imported water and will rely on the California Department of Water Resources, U.S. Bureau of Reclamation, and regional water wholesalers to manage carryover storage between years. In some cases it may be necessary to adjust these percentages mid-year, if, for example, a district is not meeting its reduction target. The allocation period will end when Cal Water determines that the water shortage no longer exists and ample supplies are available on an ongoing basis.

A minimum allocation will be given to single-family residential customers whose monthly allocation would fall below a level that is considered necessary for health and safety. These minimum allocations will be calculated for each district and will include water for indoor consumption on a per capita basis and also a percentage of normal water for outdoor use such as landscape irrigation. Multi-family, commercial, industrial, government, and other service connection categories will not be subject to minimum allocations.

Cal Water will provide customers the opportunity to bank unused water that has been allocated in a billing period. A customer will bank their unused allocation in a given billing period which can then be used to offset a future month where the customer exceeds their allocation. There is no limit to the amount of water that can be banked by a customer. All banked water will expire once allocations are determined to no longer be needed.

As a deterrent to exceeding monthly allocations and to offset penalties that Cal Water may incur from wholesale agencies, a penalty rate will be applied to a customer's water use that is in excess of their allocation. This penalty rate will be charged in addition to the normal tiered rate for every unit (Ccf) above the allocation during a billing period.

If a customer feels that their allocation does not represent their current need, or to dispute penalties assessed to their account, customers can file an appeal with their local district. The appropriate personnel will review the appeal and issue a judgment in writing. The appeals will be reviewed according to rules outlined in the Water Supply Allocation Plan.

During a water shortage priority will be given to uses that promote public health and safety. These uses include residential indoor use and other sanitary purposes. On a case by case basis Cal Water will decide that certain services are seen as essential, such as hospitals, and may exempt the customer from allocations. The second priority will be given to commercial and industrial water use in an effort to minimize financial impacts to local businesses. And finally, outdoor irrigation has the lowest priority.

If Cal Water requests voluntary reductions, all customer categories will be asked to make the same percent reduction. If mandatory reductions are required, which in general means a reduction of greater than 15 percent, Cal Water may develop different demand reduction targets for each connection category. This will be done to enforce the priorities listed above and to ensure that the correct mix of targets are chosen so that the overall district demand reduction goal is reached.

### 5.5.5 Drought Stages

Cal Water has developed a four stage approach to drought response that corresponds to specific levels of water supply shortage. At each higher stage Cal Water will become more aggressive in requiring water use reductions from its customers. The decision to enter a new stage will be made by careful consideration of a variety of factors including wholesale supply, availability of alternative supplies, time of year, and regional coordinated activities. These stages are designed to guide Cal Water personnel in making informed decisions during water shortages. A certain amount of flexibility is built in to the stages to allow for the unique characteristics of each water shortage event and the unique characteristics within each of Cal Water's districts. In each progressive stage the actions taken in earlier stages will be carried through to the next stage either at the same or at an increased intensity level, thereby becoming more restrictive.

When the water conditions in a district appear to warrant the activation of the Shortage Contingency Plan's Demand Reduction Stages, whether that be via implementing Stage 1, the movement from one Stage to a higher stage, the movement from a higher stage back down to a lower stage, or deactivating the use of Demand Reduction Stages altogether; the Water Conservation /Water Supply Team will consider those conditions at hand and prepare a recommendation on the appropriate action to be taken by the Company. The Team's recommendation will be presented by the Chief Engineer to the Vice President of Engineering and Water Quality. If the Vice President of Engineering and Water Quality concurs with the WC/WS Team recommendation, then he or she will take that recommendation to the President and Chief Executive Officer. The President & CEO will make the final determination as to whether or not the recommended action is to be taken by the Company.

If it is determined that the Company will implement or change the active Demand Reduction Stage for a given District, then a press release will be made in a manner that advises the customers served by that district of this determination. This press release will explain the desired outcome of the action to implement the appropriate stage. Upon making that determination Cal Water will immediately begin implementing the specific actions identified for the determined stage as outlined in the reminder of this section of the Shortage Contingency plan.

Stage 1 covers water shortages of up to 10 percent and can be used to address annual variations in precipitation and mild drought events that may last only a year or two. All reductions in Stage 1 are voluntary and impacts to customers are minimal. The actions to be taken by Cal Water in Stage 1 are listed in Table 5.5-1.

**Table 5.5-1: Demand Reduction Stage 1 (Table 36)**

| Stage | Water Supplier Actions |
|---|---|
| **1. Minimal**<br><br>5 to 10 percent Shortage<br><br>Up to 10 percent Reduction Goal<br><br>Voluntary Reductions | **Cal Water will:**<br><br>Request voluntary customer conservation as described in CPUC Rule 14.1.<br><br>Maintain an ongoing public information campaign.<br><br>Maintain conservation kit distribution programs.<br><br>Maintain school education programs.<br><br>Maintain incentive programs for high efficiency devices.<br><br>Coordinate drought response with wholesale suppliers and cities.<br><br>Lobby cities for passage of drought ordinances.<br><br>Discontinue system flushing except for water quality purposes.<br><br>Request that restaurants serve water only on request. |

Stage 2 includes water shortages of between 10 and 20 percent. Stage 2 will be entered during prolonged water shortages of moderate severity such as those caused by a multi-year drought. Reduction methods can either be voluntary or mandatory depending on the severity of the water shortage. Allocations would likely be implemented when the shortage exceeds 15 percent. Customers will begin to notice moderate impacts to normal water use and companies may begin to have financial impacts. In Stage 2 Cal Water will intensify its conservation efforts by implementing the actions listed in Table 5.5-2. All actions from Stage 1 will be carried through or intensified in Stage 2.

| Table 5.5-2: Demand Reduction Stage 2 (Table 36) | |
|---|---|
| **Stage** | **Water Supplier Actions** |
| **2. Moderate**<br><br>10 to 20 Percent Shortage<br><br>Up to 20 Percent Reduction Goal<br><br>Voluntary or Mandatory Reductions | **Cal Water will:**<br><br>Increase or continue all actions from Stage 1.<br><br>Implement communication plan with customers, cities, and wholesale suppliers.<br><br>Request voluntary or mandatory customer reductions.<br><br>File Schedule 14.1 with CPUC approval if necessary.<br><br>Request memorandum account to track penalty rate proceeds and other drought related expenses.<br><br>Lobby for implementation of drought ordinances.<br><br>Monitor water use for compliance with reduction targets. |

Stage 3 represents a severe water shortage emergency with a reduction in supply of between 20 and 35 percent. This stage can be triggered by the most severe multi-year droughts, major failures in water production and distribution facilities, or by water quality concerns, especially in smaller isolated systems. A shortage of this magnitude may begin to seriously impact public health and safety, and cause significant financial hardships on local businesses. All reductions will be mandatory and customer allocations would be necessary. During Stage 3 Cal Water will take the following actions listed in Table 5.5-3, which includes all the actions from Stage 2.

**Table 5.5-3: Demand Reduction Stage 3 (Table 36)**

| Stage | Water Supplier Actions |
|---|---|
| **3. Severe**<br><br>20 to 35 Percent Shortage<br><br>Up to 35 Percent Reduction Goal<br><br>Mandatory Reductions | **Cal Water will:**<br><br>Increase or continue all actions from previous stages.<br><br>Implement mandatory conservation with CPUC approval.<br><br>Install flow restrictors on repeat offenders.<br><br>Require customers to have high efficiency devices before granting increased allocations.<br><br>Require participation in survey before granting an increased allocation. |

Stage 4 is a critical water shortage emergency with a reduction of supply of at least 35 and potentially above 50 percent. This represents an exceptional crisis that could be caused only by the most severe multi-year drought, natural disaster, or catastrophic failure of major water supply infrastructure. Impacts to public health and safety would be significant. In Stage 4 Cal Water will take the additional actions listed in Table 5.5-4 while also continuing or increasing actions from Stage 3.

| Table 5.5-4: Demand Reduction Stage 4 (Table 36) | |
|---|---|
| **Stage** | **Water Supplier Actions** |
| **4. Critical**<br><br>35 to 50+ Percent Shortage<br><br>Up to and above a 50 percent Reduction Goal<br><br>Mandatory Reductions | **Cal Water will:**<br><br>Increase or continue all actions from previous stages.<br><br>Discontinue service for repeat offenders.<br><br>Monitor water use weekly for compliance with reduction targets.<br><br>Prohibit potable water use for landscape irrigation. |

## 5.5.6 Water Supply Conditions and Trigger Levels

In many of Cal Water's service districts at least a portion of the supply is provided by purchased water imported through a wholesale water agency. In these cases the wholesaler generally sets reduction targets based on their supply portfolio for the year, and Cal Water's Water Shortage Allocation Plan will be triggered by these agencies. The Salinas District does not receive any purchased water from wholesale agencies and instead must rely on groundwater as the sole source of supply. As a result setting triggering mechanisms is more difficult.

Because of the large storage capacity of the aquifers surrounding the Salinas District acute water shortages during droughts are unlikely. However, Cal Water recognizes that prudent management of groundwater resources is essential to the sustainability of long term supplies and may still ask for reductions in water use by its customers. The duration and degree of cutback required will be similar to those in other areas of the state that rely on imported water. The shortage thresholds are shown in Table 5.5-5.

| Table 5.5-5: Water Supply Triggering Levels (Table 35) | |
|---|---|
| Stage | Percent Shortage |
| Stage 1 | 5 to 10% supply reduction |
| Stage 2 | 10 to 20% supply reduction |
| Stage 3 | 20 to 35% supply reduction |
| Stage 4 | 35 to 50% supply reduction |

### 5.5.7 Water Use Restriction Enforcement

Because of its investor owned status Cal Water has limited authority to enforce water use restrictions unless Rule 14.1 is enacted through CPUC approval. Restrictions on water use prior to enacting Rule 14.1 must be regulated by ordinances passed by the local governments in each community served. Cal Water has worked with municipalities to pass ordinances and will continue this effort on an ongoing basis. Rule 14.1 contains a detailed list of the water use restrictions common to many of these ordinances, and is included as Appendix E of this UWMP. The City of Salinas and the Counties of Monterey and Santa Cruz have passed water conservation ordinances, which are included in Appendix E.

Cal Water maintains extensive water use records on individual metered customer accounts. These records are reviewed in the districts to identify potential water loss problems. In order to protect itself against serious and unnecessary waste or misuse of water, Cal Water may meter any flat rate service and apply the regularly established meter rates where the customer continues to misuse or waste water beyond five days after Cal Water has given the customer written notice to remedy such practices.

During all stages of water shortages, production figures are reported to and monitored by the district manager. Consumption will be monitored through these daily production figures in the district for compliance with necessary reductions.

Cal Water, after one written warning, shall install a flow-restricting device on the service line of any customer observed by Cal Water personnel to be using water for any non-essential or unauthorized use defined in Section A. of Tariff Rule 14.1. Repeated violations of unauthorized water use will result in discontinuance of water service.

### 5.5.8 Analysis of Revenue and Expenditure Impacts

Cal Water is an investor-owned water utility and, as such, is regulated by the CPUC. On March 8, 1989, the Commission instituted an investigation to determine what actions should be taken to mitigate the effects of water shortages on the State's regulated utilities and their customers. In decision D. 90-07-067, effective July 18, 1990, the Commission authorized all utilities to establish memorandum accounts to track expenses and revenue shortfalls caused both by mandatory rationing and by voluntary conservation efforts.

Subsequently, D. 90-08-55 required each class A utility (more than 10,000 connections) seeking to recover revenues from a drought memorandum account to submit; for Commission approval, a water management program that addresses long-term strategies for reducing water consumption. Utilities with approved water management programs were authorized to implement a surcharge to recover revenue shortfalls recorded in their drought memorandum accounts.

However, the Commission's Decision 94-02-043 dated February 16, 1994, states:

> *10. Now that the drought is over, there is no need to track losses in sales due to residual conservation.*
> *11. The procedures governing voluntary conservation memorandum accounts (see D.92-09-084) developed in this Drought Investigation will no longer be available to water companies as of the date of this order.*
> *12. Procedures and remedies developed in the Drought Investigation that are not specifically authorized for use in the event of future drought in these Ordering Paragraphs will no longer be available to water companies as of the date of this order except upon filing and approval of a formal application.*
> *(CPUC Decision 94-02-043, Findings of Fact, paragraphs 10-12)*

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 implement conservation rates and conservation programs especially in times of drought. WRAM and MCBA are designed to ensure that the utilities and ratepayers are proportionally affected when conservation rates are implemented, so that neither party is harmed nor benefits. Because of these regulatory developments Cal Water expects to increase the implementation of conservation rates and conservation programs on a permanent basis.

During water supply shortages Cal Water would expect to see a reduction in revenue. The amount of this reduction would depend on the total amount of water being conserved and the price (tier rate) at which the cutbacks were made for each customer. In other words, the reduction would be roughly equivalent to the quantity charge for the amount of water saved. Cal Water would still receive its monthly service charge fees.

Cal Water has adequate reserves to overcome this short term reduction. These reductions in revenue would also be recovered through the WRAM and MCBA. Through the WRAM and MCBA Cal Water will be able to track its revenue impacts and expenditures during water shortages and recover these losses through the CPUC rate case process in future years. Because of these new mechanisms Cal Water is assured that it will have adequate reserves available to operate normally under water shortage conditions.

Expenditures will not increase due to a mild water shortage condition. Any expenditure made during this time will come out of the normal conservation budget that has been approved by the CPUC. Actions that may be taken include public information campaigns that draw attention to the shortage and steer customers towards our other conservation programs (toilet rebates, washing machine rebates, home audits, etc) that are available. These programs will be paid for by money that is already budgeted. Therefore no additional expenditures will take place. If the water shortage warrants mandatory allocations, Cal Water would need to file an advice letter with the CPUC to seek approval to implement mandatory allocations. This process would include securing any additional funding necessary for the administration of this program. Again, these costs would be recovered through the MCBA and WRAM.

### 5.5.9 Catastrophic Water Supply Interruption

As mentioned earlier, Cal Water has an 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.

# 6 Demand Management Measures

## 6.1 Statewide Urban Water Demand Reduction Policies

As mentioned earlier, Cal Water is in the process of significantly expanding its conservation programs. Inter-related state-level policies and agreements aimed at reducing urban water use have provided much of the impetus for this change. The policies include: (1) recent decisions by the California Public Utilities Commission (CPUC) directing Class A and B water utilities to reduce per capita urban water demand; (2) state legislation mandating urban water suppliers to reduce per capita demand 20 percent by 2020; and (3) the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU). This section discusses these requirements, their relationship to one another, and their relationship to Cal Water's overall conservation strategy.

The CPUC's Decision 07-05-062 directed Class A and B water utilities to submit a plan to achieve a 5 percent reduction in average customer water use over each three-year rate cycle. This policy was refined under Decision 08-02-036, which established a water use reduction goal of 3 to 6 percent in per customer or service connection consumption every three years once a full conservation program, with price and non-price components, is in place. These decisions anticipated enactment of policies by the State legislature to reduce urban water use in California 20 percent by 2020.

SBx7-7 requires the state to achieve a 20 percent reduction in urban per capita water use by December 31, 2020. The state is required to make incremental progress toward this goal by reducing per capita water use by at least 10 percent on or before December 31, 2015. SBx7-7 requires each urban retail water supplier to develop interim and 2020 urban water use targets. Urban retail water suppliers will not be eligible for state water grants or loans unless they comply with SBx7-7's requirements.

There are three ways in which a water supplier can comply with the MOU. The first way is to implement a set of water conservation best management practices (BMPs) according to the requirements and schedules set forth in Exhibit 1 of the MOU. The second way, called Flex Track compliance, is to implement conservation programs expected to save an equivalent or greater volume of water than the BMPs. The third way, similar to SBx7-7, is to reduce per capita water use. Each of these compliance options is briefly described below.

Originally, the MOU established a set of BMPs that signatories agreed to implement in good faith. For each BMP, the MOU established the actions required by the water supplier (e.g. site surveys, fixture and appliance rebates, water use budgets, volumetric pricing and conservation rate designs), the implementation schedule, and the required level of effort (in the MOU this is referred to as the coverage requirement). Additionally, the MOU established the terms by which a water supplier could opt out of implementing a BMP.

BMPs are grouped into five categories. Two categories, Utility Operations and Education, are “Foundational BMPs” because they are considered to be essential water conservation activities by any utility and are adopted for implementation by all signatories to the MOU as ongoing practices with no time limits. The remaining BMPs are “Programmatic BMPs” and are organized into Residential, Commercial, Industrial, and Institutional (CII), and Landscape categories. Table 6.1-1 shows the BMPs by category. The requirements and coverage levels of each BMP are set forth in Exhibit 1 of the MOU. As of the date of this UWMP, Cal Water is in process of completing and submitting BMP reports to the CUWCC for the period 2009-2010. Submission was delayed due to delays in the CUWCC reporting forms being made available.

**Table 6.1-1: MOU Best Management Practices**

| BMP Group | BMP Name |
|---|---|
| 1. Utility Operations Programs (F) | Conservation Coordinator |
| | Water Waste Prevention |
| | Wholesale Agency Assistance Programs |
| | Water Loss Control |
| | Metering & Volumetric Rates |
| | Retail Conservation Pricing |
| 2. Education Programs (F) | Public Information Programs |
| | School Education Programs |
| 3. Residential (P) | Residential Assistance Program |
| | Landscape Water Surveys |
| | High Efficiency Clothes Washer Program |
| | Watersense Toilet Program |
| | Watersense Specifications for Residential Development |
| 4. Commercial, Industrial, Institutional (P) | Reduce baseline CII water use by 10% in 10 years |
| 5. Landscape (P) | Large Landscape Water Budget Programs |
| | Large Landscape Water Surveys |

F = Foundational BMP, P = Programmatic BMP

Under Flex Track, a water supplier can estimate the expected water savings over the 10-year period 2009-2018 if it were to implement the programmatic BMPs in accordance with the MOU’s schedule, coverage, and exemption requirements, and then achieve these water savings through any combination of programs it desires. Thus, through the Flex Track compliance option, a water supplier agrees to save a certain volume of water using whatever it determines to be the best combination of programs. Because the savings target depends on the programmatic BMP coverage requirements, which in turn are functions of service area size and composition of demand, the volume of water to be saved under this compliance option must be calculated separately for each supplier. The methodologies and tools for water suppliers to implement these calculations are still being developed by the CUWCC.

Under the gpcd option, a water supplier can comply with the MOU by reducing its baseline gpcd by 18 percent by 2018. The baseline is the ten-year period 1997-2006. The MOU also establishes interim gpcd targets and the highest acceptable levels of water use deemed to be in compliance with this option. The MOU's gpcd option is similar to using Method 1 to set the SBx7-7 target, except that it uses a fixed baseline period and only runs through 2018. This compliance option may be difficult to achieve for Cal Water districts that are part of a regional alliance for purposes of SBx7-7 compliance because savings as a percent of demand will vary considerably among the districts in the alliance. It may also conflict with district-specific SBx7-7 targets set using method 3 (hydrologic region-based target). Because of these potential conflicts, this is not considered a viable MOU compliance option for Cal Water districts.

Cal Water plans to use Flex Track to comply with the MOU. This compliance option affords the most flexibility in selecting conservation programs suited to each Cal Water district and allows for more streamlined reporting. Because CUWCC tools for calculating a district's Flex Track savings target are not yet available, Cal Water developed its own target estimates for planning purposes. Cal Water will update these estimates as necessary following the release of the CUWCC Flex Track target calculator.

## 6.2 Conservation Master Plans

In an effort to address the statewide policies for urban water use reduction Cal Water developed Conservation Master Plans for each of its service districts. These Conservation Master Plans are designed to provide a framework for meeting these statewide policies and to chart a course for Cal Water's conservation programs over the next five years. The major tasks of the Conservation Master Plans include:

1. A complete review of State policies and development of a compliance strategy
2. Calculating all appropriate per capita targets
3. Determining water savings required from new programs
4. Performing an analysis of conservation programs
5. Developing a portfolio of conservation programs
6. Creating a plan for monitoring and update of Conservation Master Plans

Cal Water's Conservation Master Plans have a five year planning horizon and are designed to be updated in coordination with the UWMP for each district. The Conservation Master Plan for the Salinas District is included in its entirety as Appendix G. A discussion of baseline and target water use can be found in Section 3 of this UWMP. A summary of the water savings requirements and program portfolio is summarized in the following section.

## 6.3 Water Savings Requirements

The gross water savings required under SBx7-7 can be determined with a simple calculation by subtracting the target water demand from the unadjusted baseline demand. According to this calculation the Salinas District has a gross savings requirement of 1,187 AF from 2011-2015, as shown in Table 6.3-1.

As discussed earlier, because CUWCC tools for calculating a district's Flex Track savings target are not yet available, Cal Water developed its own target estimates for planning purposes. The targets are based on the expected water savings from cost-effective programmatic BMPs over the ten-year period 2009-2018. The coverage requirements for the programmatic BMPs were used to calculate the Flex Track targets. Expected water savings and cost-effectiveness were based on the conservation program specifications and avoided water supply costs. The supporting data and calculations are provided in Appendix G.

The differences between the unadjusted baseline demand, district-specific SBx7-7 target, and MOU Flex Track target are shown in Table 6.3-1. This shows the maximum amount of water savings needed for SBx7-7 compliance, as well as the savings required for MOU compliance. Because Salinas District is part of a regional alliance, the amount of water savings needed for SBx7-7 compliance may turn out to be less than the amount shown in the table. Also, some of the reduction in baseline demand needed to achieve SBx7-7 and MOU compliance will come from efficiency codes, response to adjustments in rates, and savings from past program implementation. The remainder will need to come from new conservation program activity.

**Table 6.3-1: SBx7-7 and MOU Gross Water Savings Requirements**

| Gross Water Savings Required by 2015 | SBx7-7 | MOU Flex Track |
|---|---|---|
| 2015 Unadjusted Baseline Demand | 22,257 AF | 22,257 AF |
| 2015 Target Demand | 21,070 AF | 22,179 AF |
| **Gross Savings Requirement** | **1,187 AF** | **78 AF** |

The unadjusted baseline demand described in Section 3 does not account for future changes in water demand due to the effects of plumbing fixture efficiency codes, changes in water rates, metering, and existing conservation programs. A portion of the gross savings requirements shown above are expected to come from these sources. The Conservation Master Plan includes an estimate of the volume of water saved as a result of these things. The results are used to adjust baseline demand so that the volume of water savings that will need to come from new conservation programs can be determined.

Two recent California laws are expected to accelerate the replacement of low efficiency plumbing fixtures – primarily toilets and showerheads – with higher efficiency alternatives.

- AB 715, passed in 2007, amended the California Building and Safety Code to require by January 1, 2014, that toilets sold or installed in California use no more than 1.28 gallons per flush. It also requires that urinals sold or installed use no more than 0.5 gallons per flush.

- SB 407, passed in 2009, amended the California Civil Code to require replacement of low efficiency plumbing fixtures with higher efficiency alternatives when a property undergoes alterations, improvements, or transfer. In the case of single-family residential properties, issuance of a certificate of final completion and occupancy or final permit approval by the local building department for building alterations or improvements will be conditional on the replacement of low efficiency plumbing fixtures beginning in 2014. Single-family property owners are required by law to replace any remaining non-compliant plumbing fixtures by no later than January 1, 2017. After this date, a seller or transferor of single-family residential real property must disclose in writing to the prospective purchaser or transferee whether the property includes any noncompliant plumbing fixtures. For multi-family and commercial properties non-compliant fixtures must be replaced by January 1, 2019. As with single-family properties, final permits or approvals for alterations or improvements are conditional on the replacement of low efficiency fixtures beginning in 2014.

The phase-in dates for AB 715 and SB 407 mean they will not greatly contribute to meeting the 2015 interim gpcd target under SBx7-7. But they will support meeting the 2020 target. Moreover, since the early 1990’s, the sale and installation of toilets manufactured to flush more than 1.6 gallons, showerheads manufactured to have a flow capacity more than 2.5 gallons per minute, and interior faucets manufactured to emit more than 2.2 gallons per minute has been prohibited. These requirements will continue to improve the efficiency of plumbing fixtures in older residential and commercial buildings.

Water savings from expected rate adjustments in Salinas District were also calculated. The estimates are based on inflation-adjusted changes in rates for 2011, 2012, and 2013, as contained in CPUC’s proposed GRC decision. Short-run price elasticity estimates used to calculate potential changes in demand were drawn from the CUWCC’s conservation rate guidebook.

In addition to savings from codes and rates, expected on-going water savings from conservation activity occurring in 2009 and 2010 were also taken into account. The adjusted baseline demand and savings associated with code changes, rate changes, and existing conservation programs are shown in Table 6.3-2.

| Table 6.3-2: Adjusted Baseline Demand Projection | | | | | |
|---|---|---|---|---|---|
| **Adjusted Baseline (AF)** | **2011** | **2012** | **2013** | **2014** | **2015** |
| Unadjusted Baseline | 21,182 | 21,445 | 21,712 | 21,982 | 22,257 |
| Less Savings from | | | | | |
| Codes | 54 | 105 | 155 | 203 | 267 |
| Schedule Rate Increases | 2 | 2 | -4 | -12 | -35 |
| Existing Programs | 33 | 33 | 33 | 26 | 18 |
| **Adjusted Baseline Demand** | **21,093** | **21,305** | **21,528** | **21,756** | **22,006** |
| Per Capita (GPCD) | 138 | 138 | 137 | 137 | 137 |

The amount of water savings required from new conservation programs is not the same for SBx7-7 and MOU Flex Track compliance. In the case of SBx7-7, the objective is to reduce 2015 per capita water use at least to the target of 131 gpcd, and any expected savings from codes, rates, and existing conservation programs can be credited toward meeting this goal. This is not the case for MOU Flex Track compliance, where the objective is to implement conservation programs that would save at least as much as the Flex Track target. Unlike SBx7-7, water savings from codes and rates cannot be credited against the Flex Track target. Only savings from existing conservation programs can be deducted.

Savings required from new conservation programs to meet SBx7-7 and MOU Flex Track compliance requirements are summarized in Table 6.3-3. In the case of SBx7-7, 2015 demand, after accounting for codes, scheduled changes in rates, and 2009-10 conservation program activity, is projected to exceed the SBx7-7 compliance target by 937 AF.

In the case of MOU Flex Track Compliance, water savings from conservation programs implemented in 2009 and 2010 are expected to generate about 18 AF of savings in 2015. This amount is deducted from the gross MOU Flex Track target, yielding a net MOU Flex Track target of 60 AF.

| Table 6.3-3: New Program Savings Required for SBx7-7 and MOU Compliance | | |
|---|---|---|
| **2015 Net Savings Requirement (AF)** | **SBx7-7** | **MOU Flex Track** |
| **Gross Savings Requirement** | **1,187** | **78** |
| Less | | |
| Savings from codes | 267 | NA |
| Savings from rates | -35 | NA |
| Savings from existing programs | 18 | 18 |
| *Subtotal Expected Savings* | *250* | *18* |
| **Savings Required from New Programs**[1] | **937** | **60** |
| [1]*Negative net savings indicates that no new program savings required for compliance* | | |

## 6.4 Conservation Program Analysis

Cal Water engaged in a detailed, multi-step process to identify the best mix of programs to achieve the required savings. The process began with an inclusive range of potential program concepts. These concepts were qualitatively analyzed to eliminate those that were clearly inappropriate for each district and thereby narrow the analytical focus to those remaining programs that were potentially appropriate. Those programs were then subjected to detailed quantitative analysis. This Section describes the steps of the analytical process for Salinas District, and the programs that emerged as potential components of a portfolio of programs for the district.

As a result of an exhaustive search of the literature, consultation with experts in the field, knowledge of conservation programming by other water suppliers, and the experience of the project team, a total of more than 75 conservation program concepts were defined. At this point in the process, the goal was to be as inclusive as possible. The list was therefore intentionally large to ensure that all possible program concepts were considered. Cal Water did not want to risk inadvertently excluding a program from consideration.

Once the range of program concepts was defined, the next step was to subject each program concept to a careful district-specific qualitative screen, the objective of which was to eliminate those program concepts that were clearly inappropriate.

A preliminary quantitative analysis was conducted on the programs that passed the qualitative screen. To do that, estimates were made of key savings and cost parameters for each of the programs. Where applicable, these estimates were based on prior Cal Water experience with similar programs. In the absence of such experience, the experience of other water suppliers, the expertise of the project team, consultation with national experts, and published figures, where available, were relied upon. In particular, estimates developed by the California Urban Water Conservation Council and the Alliance for Water Efficiency were utilized where such estimates were available. While in most cases, the savings assumptions for a program do not vary across districts, for several programs, they do due to district-specific characteristics of household size, climate, etc. Other than meter installation, program cost assumptions are uniform across districts, although in some cases, cost sharing with other water utilities reduce Cal Water’s share.

Using the results of the qualitative screening and preliminary quantitative analysis, Cal Water identified five core programs that it would run in every district over the next five years. In addition to the core programs, an additional set of non-core programs was selected. Unlike core programs, Cal Water may not offer non-core programs in every district or in every year. Implementation of non-core programs will depend on whether additional water savings are required for SBx7-7 compliance, MOU compliance, or to help address local supply constraints. Table 6.4-1 lists all Cal Water core and non-core conservation programs.

| Table 6.4-1: Cal Water Conservation Programs | | |
|---|---|---|
| Program Name | Description | Target Market |
| CORE PROGRAMS | | |
| Rebate/Vouchers for toilets, urinals, and clothes washers | Provide customer rebates for high-efficiency toilets, urinals, and clothes washers | All customer segments |
| Residential Surveys | Provide residential surveys to low-income customers, high-bill customers, and upon customer request or as pre-screen for participation in direct install programs | All residential market segments |
| Residential Showerhead/Water Conservation Kit Distribution | Provide residential showerhead/water conservation kits to customers upon request, as part of residential surveys, and as part of school education curriculum | All residential market segments |
| Pop-Up Nozzle Irrigation System Distribution | Offer high-efficiency pop-up irrigation nozzles through customer vouchers or direct install. | All customer segments |
| Public Information/Education | Provide conservation messaging via radio, bill inserts, direct mail, and other appropriate methods. Provide schools with age appropriate educational materials and activities. Continue sponsorship of Disney Planet Challenge program. | All customer segments |
| NON-CORE PROGRAMS | | |
| Toilet/Urinal Direct Install Program | Offer direct installation programs for replacement of non-HE toilets and urinals | All customer segments |
| Smart Irrigation Controller Contractor Incentives | Offer contractor incentives for installation of smart irrigation controllers | All customer segments |
| Large Landscape Water Use Reports | Expand existing Cal Water Large Landscape Water Use Report Program providing large landscape customers with monthly water use reports and budgets | Non residential customers with significant landscape water use and potential savings |
| Large Landscape Surveys & Irrigation System Incentives | Provide surveys and irrigation system upgrade financial incentives to large landscape customers participating in the Large Landscape Water Use Reports programs and other targeted customers | Non residential customers with significant landscape water use and potential savings |
| Food Industry Rebates/Vouchers | Offer customer/dealer/distributor rebates/vouchers for high-efficiency dishwashers, food steamers, ice machines, and pre-rinse spray valves | Food and drink establishments, institutional food service providers |
| Cooling Tower Retrofits | Offer customer/dealer/distributor rebates/vouchers of cooling tower retrofits | Non-residential market segments with significant HVAC water use |
| Industrial Process Audits and Retrofit Incentives | Offer engineering audits/surveys and financial incentives for process water efficiency improvement | Non-residential market segments with significant industrial process water uses |

Core and non-core programs were then subjected to a detailed benefit cost analysis, the results of which were used to inform program portfolio development discussed in the next section. The first step in this process was to refine and finalize the savings and cost specifications of each program. The program savings and cost assumptions enable the calculation of program benefits and costs to the utility and its ratepayers, and comparisons of these costs in the form of benefit-cost ratios. The tool used to do this comparison was a simplified version of the Alliance for Water Efficiency Tracking Tool. Following are descriptions of how the model calculates and compares conservation program benefits and costs.

## 6.5 Conservation Program Portfolio

This section presents the recommended conservation program portfolio for the Salinas District. The program analysis results described in the previous section provided the starting point for portfolio development. The next step was to determine the annual levels of program activity needed to, at minimum, meet Salinas District's water savings targets and local demand management goals. Several considerations informed these decisions, including budgetary constraints included in the current GRC decision, Cal Water conservation program administrative capacity, program market and water savings potential, and the program benefit-cost results.

The water savings requirement analysis showed that, after accounting for water savings from existing water efficiency codes and ordinances, scheduled adjustments to water rates, and past investment in conservation programs, projected 2015 baseline demand in Salinas District is projected to exceed the SBx7-7 target by 937 AF and the MOU Flex Track target by 60 AF. The analysis done for this plan suggests the District will not be able to meet its district-specific SBx7-7 target by 2015 and instead will need to rely on the regional compliance option. A key reason for this is the conservation program budgets that came out the most recent GRC. These budgets effectively limit the amount of conservation the district can undertake in 2011-13. Even with program implementation maximized in 2014-15, the modeling done for this plan indicates that District per capita demand in 2015 will exceed the SBx7-7 target. For the Salinas District, the programs selected and the activity level of each are shown in Table 6.5-1.

| Table 6.5-1: Recommended Program Levels | | | | | |
|---|---|---|---|---|---|
| **Program** | **Recommended Annual Activity Levels** | | | | |
| | **2011** | **2012** | **2013** | **2014** | **2015** |
| **CORE PROGRAMS** | | | | | |
| Rebates/Vouchers | | | | | |
| Toilets | 680 | 680 | 680 | 1,210 | 1,210 |
| Clothes Washers | 330 | 130 | 130 | 610 | 610 |
| Urinals | 0 | 0 | 0 | 0 | 0 |
| Customer Surveys/Audits | 370 | 400 | 400 | 780 | 780 |
| Conservation Kit Distribution | 820 | 820 | 820 | 990 | 990 |
| Pop-Up Nozzle Distribution | 9,750 | 9,750 | 9,750 | 11,700 | 11,700 |
| **NON-CORE PROGRAMS** | | | | | |
| Direct Install Toilets/Urinals | 500 | 500 | 500 | 2,670 | 2,670 |
| Smart Irr. Controller Vendor Incentives | 10 | 10 | 10 | 690 | 690 |
| Large Landscape Water Use Reports | 90 | 90 | 90 | 180 | 180 |
| Large Landscape Surveys/Incentives | 70 | 70 | 70 | 90 | 90 |
| Commercial Kitchen Rebates/Vouchers | 0 | 0 | 0 | 40 | 40 |
| Cooling Tower/Process Water Retrofit Incentives | 0 | 0 | 0 | 0 | 0 |

The program levels for 2011-2013 reflect the funding level approved in Cal Water's most recent General Rate Case (GRC) settlement with the CPUC. Program levels for 2014 and 2015 will be dependent on the outcome of Cal Water's 2014-2016 GRC filing.

Table 6.5-2 shows projected water savings associated with the programs listed above. The projected savings exceed the 2015 SBx7-7 and MOU Flex Track targets but are needed for the district to meet its 2020 SBx7-7 target.

**Table 6.5-2: Projected Water Savings by Program**

| Program | Annual Water Savings (AF) | | | | |
|---|---|---|---|---|---|
| | **2011** | **2012** | **2013** | **2014** | **2015** |
| **CORE PROGRAMS** | | | | | |
| Rebates/Vouchers | | | | | |
| Toilets | 22.6 | 44.3 | 65.1 | 102.7 | 138.8 |
| Clothes Washers | 7.0 | 10.3 | 13.5 | 25.1 | 36.2 |
| Urinals | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Customer Surveys/Audits | 15.4 | 33.5 | 49.8 | 87.2 | 120.8 |
| Conservation Kit Distribution | 12.8 | 24.0 | 33.9 | 45.2 | 55.1 |
| Pop-Up Nozzle Distribution | 39.0 | 78.0 | 117.0 | 163.7 | 210.5 |
| ***Subtotal Core Programs*** | ***96.7*** | ***190.1*** | ***279.3*** | ***424.0*** | ***561.5*** |
| | | | | | |
| **NON-CORE PROGRAMS** | | | | | |
| Direct Install Toilets/Urinals | 24.9 | 48.9 | 71.8 | 156.4 | 237.5 |
| Smart Irr. Controller Vendor Incentives | 0.1 | 0.1 | 0.2 | 15.6 | 31.1 |
| Large Landscape Water Use Reports | 6.2 | 6.2 | 6.2 | 13.5 | 13.5 |
| Large Landscape Surveys/Incentives | 9.6 | 19.3 | 28.9 | 40.5 | 52.0 |
| Commercial Kitchen Rebates/Vouchers | 0.0 | 0.0 | 0.0 | 4.8 | 9.6 |
| Cooling Tower/Process Water Retrofit Incentives | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| ***Subtotal Non-Core Programs*** | ***40.8*** | ***74.5*** | ***107.2*** | ***230.8*** | ***343.8*** |
| | | | | | |
| **Total Core and Non-Core Program Savings** | **137.6** | **264.6** | **386.5** | **654.7** | **905.3** |

Based on the above analysis the district is projected to achieve its district-specific 2015 SBx7-7 compliance target through a combination of passive and active savings. Appendix C, Worksheet 24, includes a comparison of conservation savings required to meet SBx7-7 compliance targets to the savings expected as a result of existing and planned programs, including passive savings due to code changes.

For the purpose of this analysis it is assumed that there will be a linear reduction in GPCD from 2015-2020 to achieve the district-specific 2020 SBx7-7 compliance target. Programs required to achieve 2020 SBx7-7 compliance will be outlined in the next Conservation Master Plan for the district, which will be included in the 2015 UWMP. The activity level of each future program will depend on Cal Water's success in obtaining the necessary funding through the CPUC rate case process.

As part of the Conservation Master Plan development, one page program summaries, or fact sheets were developed for each recommended program. These fact sheets provide a quick reference summarizing program design and marketing, expected level of customer participation, projected water savings, and proposed program expenditure for the period 2011 – 2015. The fact sheets for the Salinas District are included in Appendix G.

# 7 Climate Change

## 7.1 Introduction

Investigating climate change brings the prospect of examining both model-predicted outcomes and unforeseen changes to the environment. These changes may physically affect the water districts that Cal Water serves. Climate change does not just mean a change in average temperature within any particular region, but a change in the climatic conditions that creates or results in an increase in extreme weather events. These potential changes include a more variable climate with risks of extreme climate events that are more severe than those in the recent hydrologic record, in addition to sea level rise, a hotter and drier climate, and the likelihood that more of the uplands precipitation will fall as rain and not as snow.

## 7.2 Strategy

Cal Water intends to prepare a Climate Assessment Report in 2013 that will examine the regional impacts on water supply for each of its 24 service areas. This report will review any supply changes that may occur due to climate change and will outline mitigation and adaption methods to meet the needs of the District's service area. The following section, adapted from DWR's *Guidebook to Assist Water Suppliers to Prepare a 2010 Urban Water Management Plan*, provides a range of topics to be examined in Cal Water's Climate Assessment Report.

Responding to climate change generally takes two forms: mitigation and adaptation. Mitigation is taking steps to reduce our contribution to the causes of climate change by reducing greenhouse gas (GHG) emissions. Adaptation is the process of responding to the effects of climate change by modifying our systems and behaviors to function in a warmer climate. Regardless if climate change is manmade or a result of natural climate cycles, investigating mitigation and adaptive methods to better manage possible uncertainties in climatic changes will have more immediate benefits such as: cutting carbon emissions, reducing energy usage, possible economic development at the local level, and financial savings for Cal Water and the ratepayers.

<u>Mitigation</u>

In the water sector, climate change mitigation is generally achieved by reducing energy use, becoming more efficient with energy use, and/or substituting fossil fuel based energy sources for renewable energy sources. Water requires energy to move, treat, use, and discharge, thus water conservation is energy conservation. One possible mitigation method is to calculate conserved energy and GHGs not-emitted as water conservation targets are being met.

<u>Adaptation</u>

Climate change means more than just hotter days. Continued warming of the climate system may have considerable impact on the operation of Cal Water Districts, even if indirectly. For example, snow in the Sierra Nevada provides 65 percent of California's water supply. Predictions indicate that by 2050 the Sierra snowpack will be significantly reduced. Much of the lost snow will fall as rain, which flows quickly down the mountains during winter and cannot be stored in the current water system for use during the summer. This change in water runoff may severely impact groundwater recharge and other water supply networks. The climate is also expected to become more variable, bringing more droughts and floods. Cal Water districts will have to adapt to these new and more variable conditions.

## 7.3 Potential Climate Change Effects

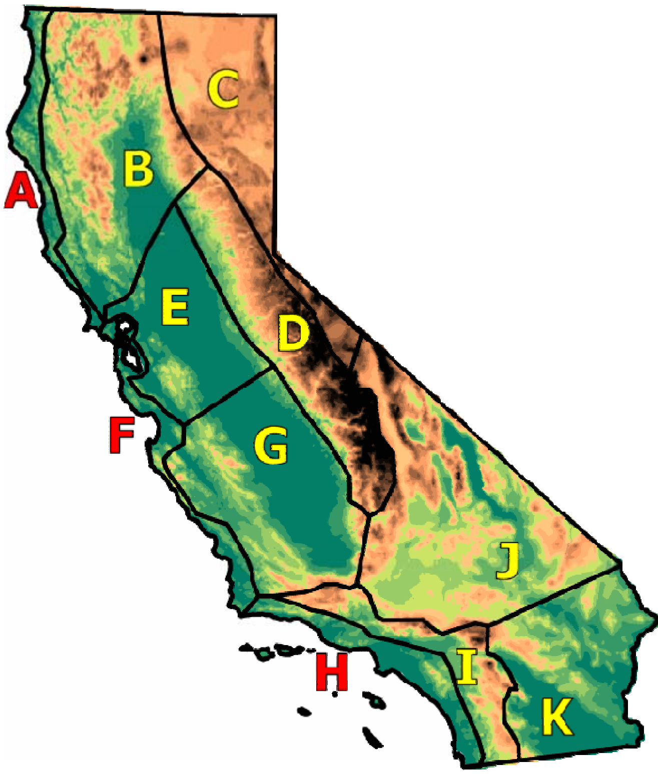
Even in the near term of the next 20 years, DWR has outlined potential climate change effects to water supplies, water demand, sea level, and the occurrence and severity of natural disasters. Some of these potential changes are presented below. Cal Water will investigate the following climate change and the effects on Cal Water's Districts:

- Water Demand — Hotter days and nights, as well as a longer irrigation season, will increase landscaping water needs, and power plants and industrial processes will have increased cooling water needs.
- Water Supply and Quality — Reduced snowpack, shifting spring runoff to earlier in the year, increased potential for algal bloom, and increased potential for seawater intrusion—each has the potential to impact water supply and water quality.
- Sea Level Rise — It is expected that sea level will continue to rise, resulting in near shore ocean changes such as stronger storm surges, more forceful wave energy, and more extreme tides. This will also affect levee stability in low-lying areas and increase flooding.
- Disaster — Disasters are expected to become more frequent as climate change brings increased climate variability, resulting in more extreme droughts and floods. This will challenge water supplier operations in several ways as wildfires are expected to become larger and hotter, droughts will become deeper and longer, and floods can become larger and more frequent.

## 7.4 Historical Climate Data Summary

The National Climatic Data Center (NCDC) has established 11 climate regions within California. Each region is defined be unique characteristics, and is shown in Figure 7.4-1.

**Figure 7.4-1: The Climate Regions of California**[7]




**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. Mohave Desert Region**
**K. Sonoran Desert Region**

Cal Water has water service districts in 7 out of 11 of the climate regions. The Salinas District is located in the Central Coast Region, as listed in Table 7.4-1.

**Table 7.4-1: Cal Water Districts Sorted by Climate Region**

| Climate Region | Cal Water Districts in Each Climate Region |
|---|---|
| North Coast Region | None |
| North Central Region | Chico-Hamilton City, Redwood Valley |
| Northeast Region | None |
| Sierra Region | Kern River Valley |
| Sacramento-Delta Region | Dixon, Livermore, Marysville, Oroville, Stockton, Willows |
| Central Coast Region | Bear Gulch, Los Altos, Mid-Peninsula, **Salinas**, South San Francisco |
| San Joaquin Valley Region | Bakersfield, King City, Selma, Visalia |
| South Coast Region | Dominguez, East LA, Hermosa-Redondo, Palos Verdes, Westlake |
| South Interior Region | None |
| Mojave Desert Region | Antelope Valley |

[7] http://www.wrcc.dri.edu/monitor/cal-mon/frames_versionSTATIONS.html

| | |
|---|---|
| Sonoran Desert Region | None |

The region has experience a general warming trend as indicated by the maximum, minimum, and mean temperature departure from average. Since 1895 these values have increased by 1.00°F, 2.10°F, and 1.55°F, respectively. More recently, since 1975, the maximum, minimum, and mean temperature departures have increased 1.24°F, 3.29°F, and 1.02°F, respectively. The historical data for these parameters are shown in Figures 7.4-2, 7.4-3, and 7.4-4.

**Figure 7.4-2: Maximum Temperature Departure for Central Coast Region**

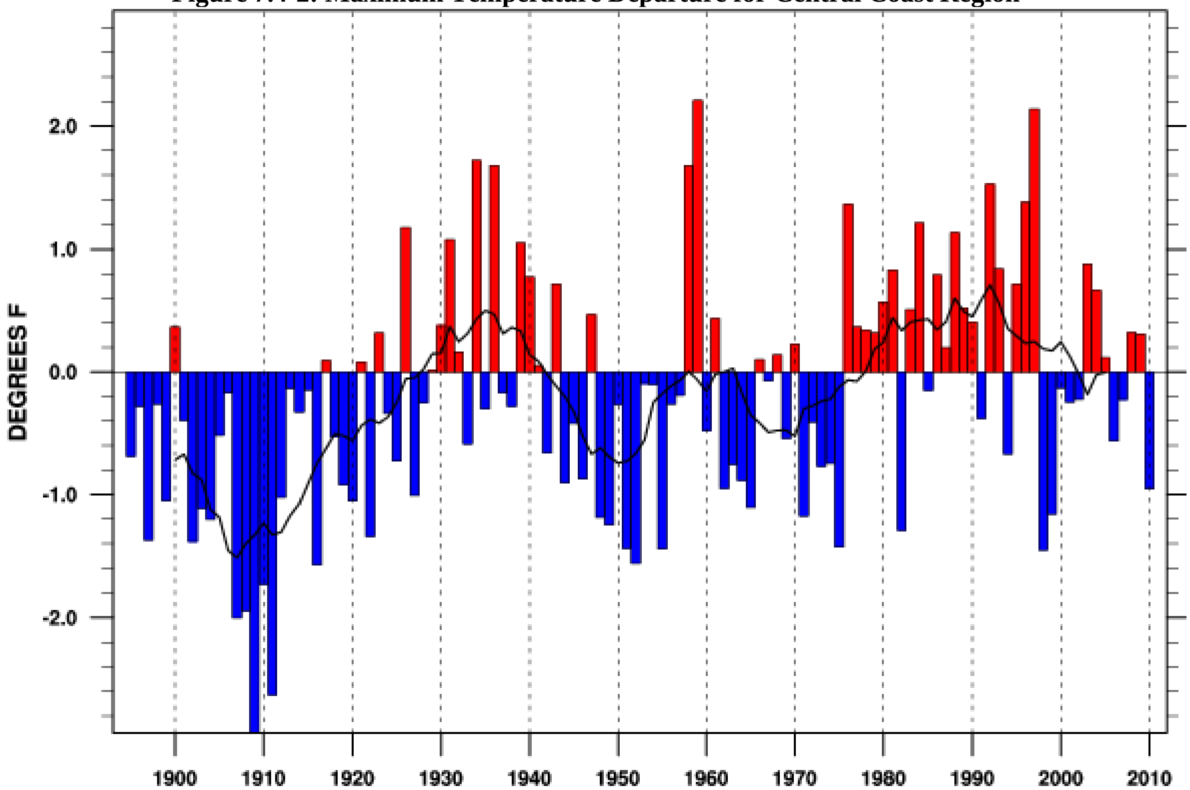


**Figure 7.4-3: Mean Temperature Departure for Central Coast Region**

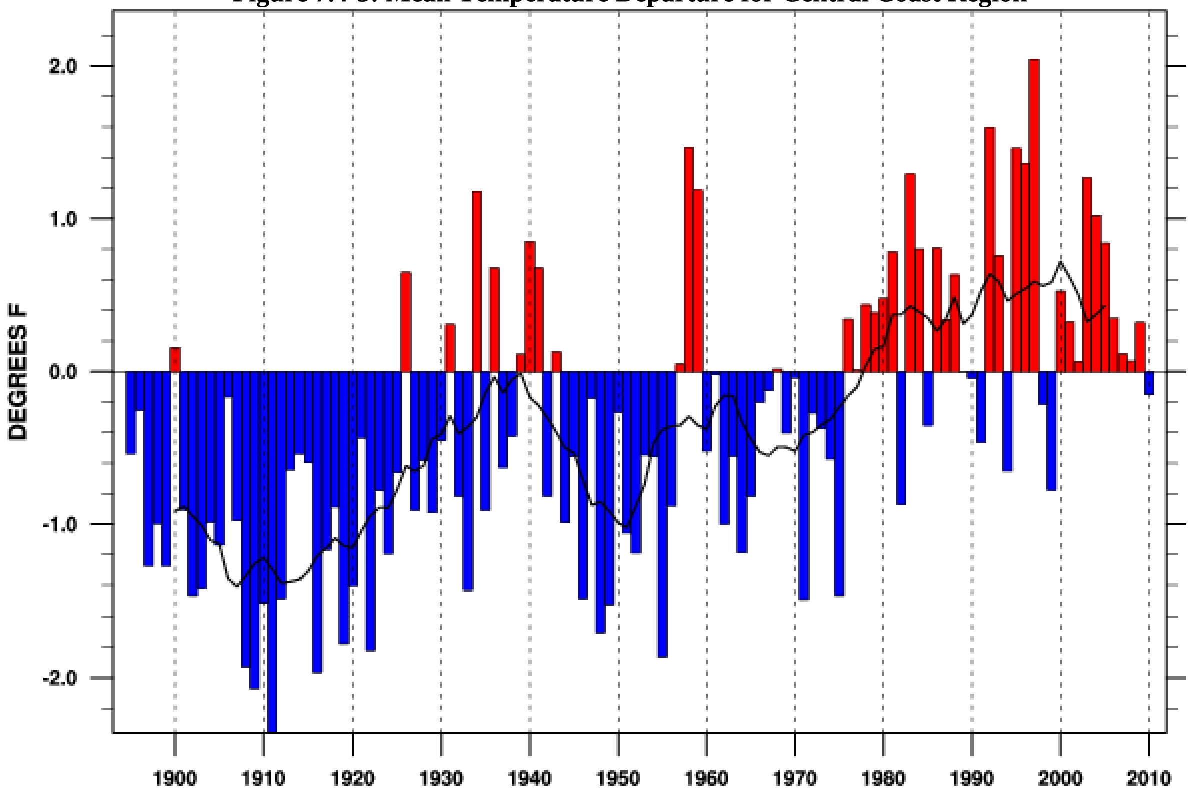
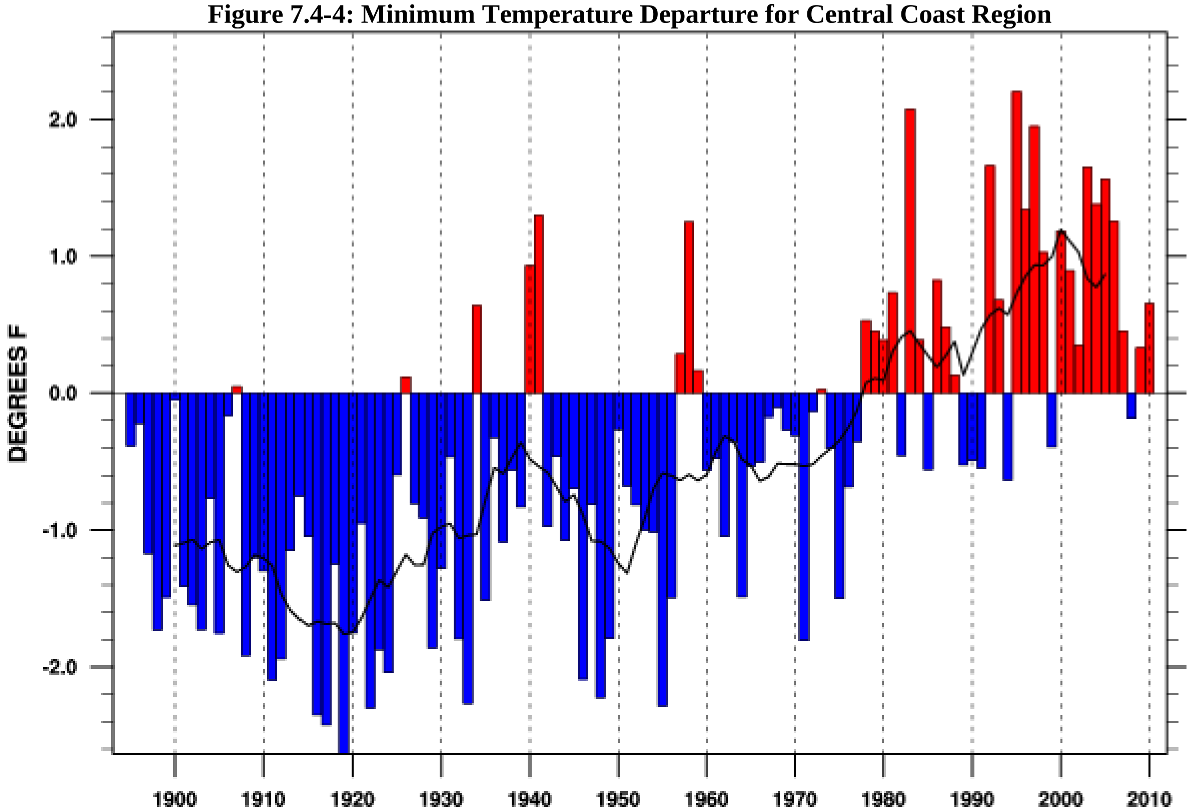
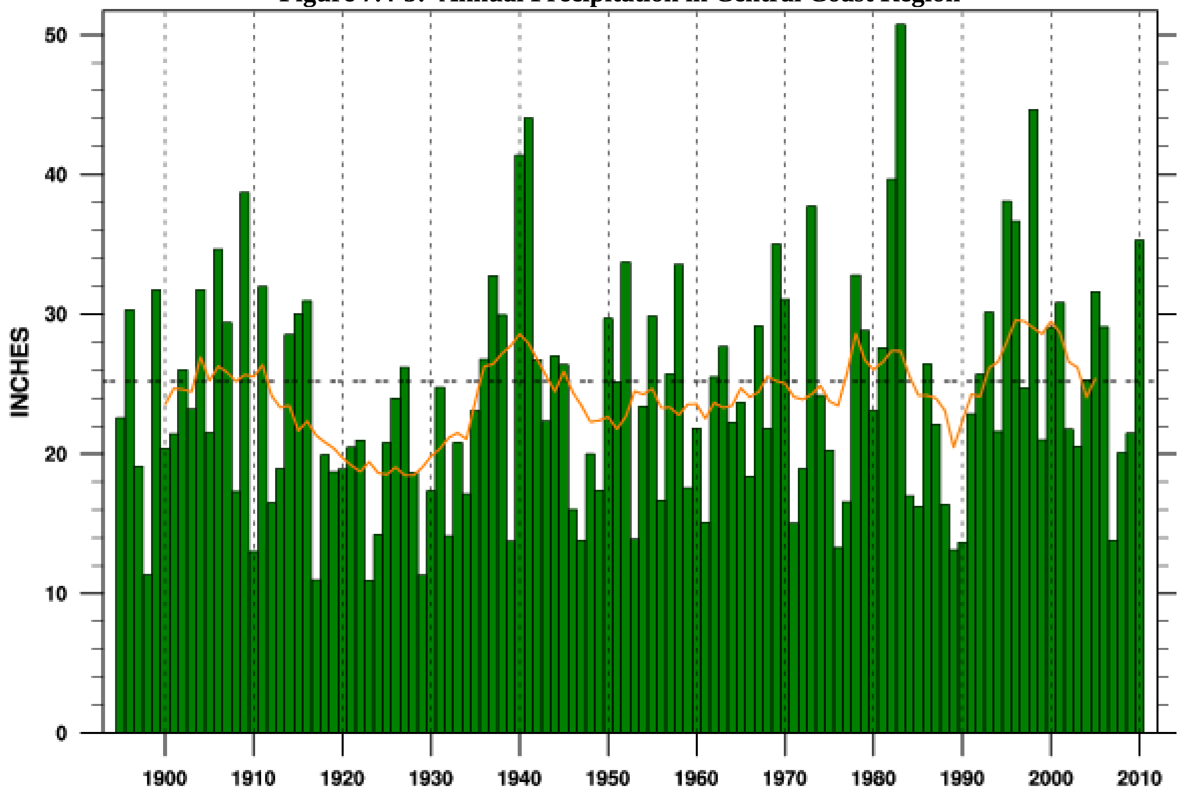



**Figure 7.4-4: Minimum Temperature Departure for Central Coast Region**



Variation in annual rainfall totals has also shown an increasing trend since 1900 with more deviation from average occurring in recent decades as compared to earlier part of the century.

**Figure 7.4-5: Annual Precipitation in Central Coast Region**




Historical data is showing a general correlation as to the general consensus for the different climate change scenarios. As stated above, a more comprehensive investigation will be prepared by Cal Water in 2013. The outcome of this report will outline mitigation and adaptation methods that will provide water supply reliability for Cal Water's service areas.

## 7.5 Climate Change Guidance

The California Department of Water Resources is currently in the process of compiling the potential actions and responses to climate change in the Integrated Regional Water Management (IRWM) climate change handbook. This handbook will provide guidance to water utilities for planning for the potential impacts of climate change and will offer a framework for responding to these impacts. Cal Water will review this handbook and other available literature when developing localized strategies for each of its water service districts.

# 8 Completed UWMP Checklist

## 8.1 Review Checklist

Table 8.1-1, adapted from DWR's *Guidebook to Assist Water Suppliers to Prepare a 2010 Urban Water Management Plan*, is included as a reference to assist DWR staff in review of this UWMP.

**Table 8.1-1: Urban Water Management Plan Checklist (organized by legislation number)**

| No. | UWMP requirement [a] | Calif. Water Code reference | Subject [b] | Additional clarification | UWMP location |
|---|---|---|---|---|---|
| 1 | Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data. | 10608.20(e) | Water Conservation | | 3.3.1 |
| 2 | Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions. | 10608.36 | Water Conservation | | 6.4 |
| 3 | Report progress in meeting urban water use targets using the standardized form. | 10608.4 | Water Conservation | | Appendix G |
| 4 | Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable. | 10620(d)(2) | External Coordination and Outreach | | 1.2 |
| 5 | An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions. | 10620(f) | Water Supply (Water Management) | | 1.4 |
| 6 | Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision. | 10621(b) | External Coordination and Outreach | | 1.2 |
| 7 | The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640). | 10621(c) | External Coordination and Outreach | | 1.2 |
| 8 | Describe the service area of the supplier | 10631(a) | Service Area | | 2.1 |
| 9 | (Describe the service area) climate | 10631(a) | Service Area | | 2.3 |
| 10 | (Describe the service area) current and projected population. . . The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier . . . | 10631(a) | Service Area | Provide the most recent population data possible. Use the method described in "Baseline Daily Per Capita Water Use." See Section M. | 2.2 |

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| 11 | . . . (population projections) shall be in five-year increments to 20 years or as far as data is available. | 10631(a) | Service Area | 2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents. | 2.2 |
| 12 | Describe . . . other demographic factors affecting the supplier's water management planning | 10631(a) | Service Area | | 2.2 |
| 13 | Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). | 10631(b) | Water Supply | The 'existing' water sources should be for the same year as the "current population" in line 10. 2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents. | 4.1 |
| 14 | (Is) groundwater . . . identified as an existing or planned source of water available to the supplier . . .? | 10631(b) | Water Supply | Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other. | 4.4 |
| 15 | (Provide a) copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management. Indicate whether a groundwater management plan been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization. | 10631(b)(1) | Water Supply | | 4.4.2 |
| 16 | (Provide a) description of any groundwater basin or basins from which the urban water supplier pumps groundwater. | 10631(b)(2) | Water Supply | | 4.4.1 |

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| 17 | For those basins for which a court or the board has adjudicated the rights to pump groundwater, (provide) a copy of the order or decree adopted by the court or the board | 10631(b)(2) | Water Supply | | N/A |
| 18 | (Provide) a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. | 10631(b)(2) | Water Supply | | N/A |
| 19 | For basins that have not been adjudicated, (provide) 10631(b)(2) Water Supply information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition. | 10631(b)(2) | Water Supply | | 4.4.1 |
| 20 | (Provide a) detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records. | 10631(b)(3) | Water Supply | | 4.4 |
| 21 | (Provide a) detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records. | 10631(b)(4) | Water Supply | Provide projections for 2015, 2020, 2025, and | 4.4 |
| 22 | Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following: (A) An average water year, (B) A single dry water year, (C) Multiple dry water years. | 10631(c)(1) | Reliability | | 5.3 |
| 23 | For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable. | 10631(c)(2) | Reliability | | 5.1 |
| 24 | Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis. | 10631(d) | Water Supply (Transfers) | | 4.7 |
| 25 | Quantify, to the extent records are available, past and current water use, and projected water use (over the same five-year increments described in subdivision (a)), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses: (A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof;(I) Agricultural. | 10631(e)(1) | Water Demands | Consider “past” to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years. | 3.3 |

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| 26 | (Describe and provide a schedule of implementation for) each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following: (A) Water survey programs for single-family residential and multifamily residential customers; (B) Residential plumbing retrofit; (C) System water audits, leak detection, and repair; (D) Metering with commodity rates for all new connections and retrofit of existing connections; (E) Large landscape conservation programs and incentives; (F) High-efficiency washing machine rebate programs; (G) Public information programs; (H) School education programs; (I) Conservation programs for commercial, industrial, and institutional accounts; (J) Wholesale agency programs; (K) Conservation pricing; (L) Water conservation coordinator; (M) Water waste prohibition;(N) Residential ultra low-flush toilet replacement programs. | 10631(f)(1) | DMMs | Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules. | 6.5 |
| 27 | A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan. | 10631(f)(3) | DMMs | | 6.2 |
| 28 | An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand. | 10631(f)(4) | DMMs | | 6.3 |
| 29 | An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following: (1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors; (2) Include a cost-benefit analysis, identifying total benefits and total costs; (3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost; (4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation. | 10631(g) | DMMs | See 10631(g) for additional wording. | 6.4 |

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| 30 | (Describe) all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program. | 10631(h) | Water Supply | | 4.9 |
| 31 | Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply. | 10631(i) | Water Supply | | 4.6 |
| 32 | Include the annual reports submitted to meet the Section 6.2 requirement (of the MOU), if a member of the CUWCC and signer of the December 10, 2008 MOU. | 10631(j) | DMMs | Signers of the MOU that submit the biannual reports are deemed | 6.5 |
| 33 | Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c). | 10631(k) | Water Supply | Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030. | N/A |
| 34 | The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier. | 10631.1(a) | Water Demands | | 3.3.2 |
| 35 | Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage. | 10632(a) | Contingency | | 5.3.5 |
| 36 | Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply. | 10632(b) | Contingency | | 5.2 |

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| 37 | (Identify) actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster. | 10632(c) | Contingency | | 5.3.9 |
| 38 | (Identify) additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning. | 10632(d) | Contingency | | 5.3.7 |
| 39 | (Specify) consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply. | 10632(e) | Contingency | | 5.3.5 |
| 40 | (Indicated) penalties or charges for excessive use, where applicable. | 10632(f) | Contingency | | 5.3.7 |
| 41 | An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments. | 10632(g) | Contingency | | 5.3.8 |
| 42 | (Provide) a draft water shortage contingency resolution or ordinance. | 10632(h) | Contingency | | 5.3 |
| 43 | (Indicate) a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis. | 10632(i) | Contingency | | 5.3.7 |
| 44 | Provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area | 10633 | Recycled Water | | 4.5 |
| 45 | (Describe) the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal. | 10633(a) | Recycled Water | | 4.5.1 |
| 46 | (Describe) the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project. | 10633(b) | Recycled Water | | 4.5.2 |
| 47 | (Describe) the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use. | 10633(c) | Recycled Water | | 4.5.3 |
| 48 | (Describe and quantify) the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses. | 10633(d) | Recycled Water | | 4.5.3 |
| 49 | (Describe) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision. | 10633(e) | Recycled Water | | 4.5.3 |

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| 50 | (Describe the) actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year. | 10633(f) | Recycled Water | | 4.5 |
| 51 | (Provide a) plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use. | 10633(g) | Recycled Water | | 4.5 |
| 52 | The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability. | 10634 | Water Supply (Water Quality) | For years 2010, 2015, 2020, 2025, and 2030 | 5.2.4 |
| 53 | Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier. | 10635(a) | Reliability | | 5.2 |
| 54 | The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan. | 10635(b) | External Coordination and Outreach | | 1.2 |
| 55 | Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. | 10642 | External Coordination and Outreach | | 1.2 |
| 56 | Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. | 10642 | External Coordination and Outreach | | 1.2 |
| 57 | After the hearing, the plan shall be adopted as prepared or as modified after the hearing. | 10642 | External Coordination and Outreach | | 1.3 |
| 58 | An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan. | 10643 | External Coordination and Outreach | | 1.6 |

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| 59 | An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption. | 10644(a) | External Coordination and Outreach | | 1.3 |
| 60 | Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours. | 10645 | External Coordination and Outreach | | 1.3 |

[a] The UWMP Requirement descriptions are general summaries of what is provided in the legislation. Urban water suppliers should review the exact legislative wording prior to submitting its UWMP.

[b] The Subject classification is provided for clarification only. A water supplier is free to address the UWMP Requirement anywhere with its UWMP, but is urged to provide clarification to DWR to facilitate review for completeness.

# APPENDIX A-1: RESOLUTION TO ADOPT UWMP

# APPENDIX A-2: CORRESPONDENCES

# APPENDIX A-3: RESOLUTION TO ADOPT UWMP

# APPENDIX B: SERVICE AREA MAP

# APPENDIX C: WATER SUPPLY, DEMAND, AND PROJECTION WORKSHEETS

# APPENDIX D: DWR'S GROUNDWATER BULLETIN 118

# APPENDIX E: TARIFF RULE 14.1 WATER CONSERVATION AND RATIONING PLAN, AND LOCAL ORDINANCES

# APPENDIX F: WATER EFFICIENT LANDSCAPE GUIDELINES

# APPENDIX G: CONSERVATION MASTER PLAN

# APPENDIX H: MONTEREY COUNTY GROUNDWATER MANAGEMENT PLAN